Cape Peninsula University of Technology

ANALYSIS OF SMALLHOLDER FARMER LIVELIHOOD STRATEGIES FOR COPING AND ADAPTING TO DROUGHT IN THE WESTERN CAPE PROVINCE, SOUTH AFRICA

by

MERCY FANADZO

A thesis submitted in fulfilment of the requirements for the degree

Doctor of Philosophy: Environmental Health

in the Faculty of Applied Sciences

at the Cape Peninsula University of Technology

Supervisor: Dr B. Ncube

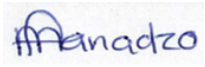
Co-supervisors: Dr A. French
Prof A. Belete

Bellville Campus

June 2021

DECLARATION

I, **Mercy Fanadzo,** declare that the content of this thesis represents my own work, and that this thesis has not previously been submitted for any academic examination or qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.



Signed

22 February 2022

Date

ABSTRACT

The South African government acknowledges the potential of the smallholder agricultural sector in improving rural livelihoods through sustainable farming. In South Africa, the smallholder farming sector comprises a diverse group of farmers in terms of their needs and livelihood outcomes. Smallholder farmers experience a myriad of challenges in their endeavours to develop and sustain their livelihood. Lately, drought has been a setback to the achievement of livelihood outcomes by smallholder farmers in South Africa. Meanwhile, the private sector, civil society and government organisations in South Africa have played a meaningful role in assisting smallholder farmers to satisfy their diverse needs. This has resulted in the implementation of various policies by different organisations and the adoption of various approaches to develop the sector. However, all the stakeholders, including farmers, have experienced their fair share of challenges in their endeavours. Therefore, the translation of different policies into programmes or initiatives to achieve their intended purposes requires vigilance and should be followed by an evaluation to determine their effectiveness. Although South Africa has sound policies for livelihoods and drought management, literature suggests a rare implementation of them. There is limited information available to facilitate the understanding of the approaches used and the implementation processes to determine the impact of the policies. The achievement of sustainability in this farming sector necessitates the careful consideration of the diversity existing amongst different livelihood strategies to understand the context in which operations are undertaken.

Against this background, this study was conducted based mainly on the context of the 2015-2018 drought, which started around early 2015 and lasted until the end of 2018. The four main objectives of this study were: 1) Analysing the livelihoods of smallholder farmers in the Western Cape; 2) Analysing the different strategies employed by smallholder farmers in adapting to the effects of the 2015-2018 drought in the Western Cape; 3) Understanding the role of different organisations in enhancing livelihoods and drought strategies in the Western Cape; and 4) evaluating a drought programme from a private or public organisation implemented to assist smallholder farmers in adapting to the 2015-2018 drought in the Western Cape. The Sustainable Livelihood Approach was largely used to conduct the analyses and the Sustainable Livelihood Framework to frame the research questions, formulated with reference to different parameters such as livelihood capital, coping and adaptation and organisations. Though the study largely utilised the qualitative design, very limited methods of quantitative research design were also utilised in collecting data, for instance.

Firstly, the access to and ownership of financial, physical, natural, social and human capital by the Overberg and West Coast districts farmers was analysed during the period 2017 to 2019. The existence of a diverse group of farmers in terms of how they access and own assets was

confirmed at the two study sites. Smallholder farming in the two districts was dominated by males (83%) and the youths (18 and 38 years) proportion of involvement was less than 13%. This shed a blurred picture of the future of smallholder farming in the sector. Only 10% of the farmers possessed tertiary education training and had under 12 years of education. Seventy-six per cent of the respondents had no access to credit. Land ownership was dominantly municipal lease for the respondents in both districts. Mainly, group farming was practiced through farming associations, trusts or co-operatives, and these influence smallholder farmer activities. Challenges experienced by smallholder farmers in the two districts included the lack of resources such as water and infrastructure, markets, land, and increasing production costs. The 2015-2018 drought which ravaged the province was highlighted in the Overberg and West Coast districts as one of the main challenges which farmers were facing. Majority of farmers had limited benefits from group membership, because of their large membership sizes and the associated limitations. Groups were not able to make unanimous decisions and different personalities hampered the effectiveness of the groups.

The perceptions of farmers towards droughts and their impacts determine the extent to which the phenomena are dealt with when they occur. The second objective in this study was to determine the perceptions of smallholder farmers towards drought, impacts, coping and adaptation strategies utilised by smallholder farmers in the two districts and the challenges they faced. Farmers in the Overberg District (67%) and West Coast District (60%) mainly perceived drought as a general water scarcity and expressed that it was becoming hotter and drier by every year. The common 2015-2018 drought impacts were identified as crop failure, livestock mortality and theft of livestock and crops. Respondents in both districts reported predation as a common environmental impact during the 2015-2018 drought, with its associated impacts of increased prevalent of wild animals. Other environmental impacts were poor water quality, increased prevalence of pests, weeds and diseases. Economically, farmers reported crop and livestock thefts, crop failure and alteration of market contracts, resulting in loss of income. Increased conflicts related to up/downstream water challenges among respondents was reported under social impacts in the two areas as a major concern.

To cope and adapt to water shortages during the 2015-2018 drought, respondents reported that they mainly transported water to the farms, while sharing water rights and using boreholes were also employed. In the Overberg District, 17% of the respondents received drought support from the government in the form of fodder vouchers while in the West Coast District, it was 72%. The researcher observed that respondents also received assistance from the private sector in the form of advice, information, technical support and provision of other resources including land. Four per cent of the respondents in the Overberg District reported that they had acquired insurance for their produce, while there was none in the West Coast

District. Another common adaptation strategy for the 2015-2018 drought was social networks through which respondents highlighted that they helped each other with grazing area, water and infrastructure, advice and emotional support. The access to livelihood assets influenced the extent to which smallholder farmers adapted to the 2015-2018 drought in the Overberg and West Coast districts and explained the heterogeneity among farmers, as is advocated by the Sustainable Livelihood Approach. The general lack of resources and increasing cost of production were mentioned by respondents as the main challenges in coping and adapting to the 2015-2018 drought the Overberg and West Coast districts.

The third objective considered the approaches utilised by organisations to enhance the livelihoods of smallholder farmers and drought coping and adaptation strategies in the study areas. The study revealed that the commodity approach was being implemented by the Western Cape government, in partnership with the private sector. Civil society was also involved in the development of the sector. The main goal for organisations to support smallholder farmers was that of facilitating them to graduate to large-scale commercial farming. The main kind of support provided to smallholder farmers by the organisations was the provision of information, among others such as finance and implementation inputs. Farmers were also provided with livestock fodder vouchers by government during the 2015-2018 drought period. The private sector and civil society assisted farmers indirectly before and during the 2015-2018 drought through their ongoing activities. This study revealed that there was a mismatch between the farming community and organisations' goals. Not all farmers had aspirations of operating at the large-scale commercial farming. Others highlighted that they were farming to improve their income and standard of living, while a few were farming because of the passion they inherited from their fathers. Few farmers reported the limited access to markets as a challenge, which may suggest that the commodity approach was working in their favour in that respect.

Some of the challenges faced by organisations in implementing the commodity approach in the two districts were, for instance, complex government systems, farmer personalities and a lack of funding and human resources. Challenges could be addressed by providing clarity on each stakeholder's role, integrating work, implementing development policies in a well-coordinated manner and conducting evaluations accordingly.

Finally, a process evaluation was conducted to assess the process and strategies adopted by the Western Cape Department of Agriculture through the Cape Agency for Sustainable Integrated Development in Rural Areas to implement its provincial drought management plan during the 2015-2018 drought, relationships among stakeholders involved and the challenges faced during implementation. Findings show that the agency was fulfilling its role of administering finances for the drought relief scheme. There were direct and indirect

relationships among stakeholders, and these influenced how work was done by each of them. Different challenges experienced during the implementation of the provincial drought relief scheme and livelihoods policies entailed the misappropriation of fodder by farmers, the inadequate human resources and finance, and the lack of coordination and communication among stakeholders. No specific drought programme was found in the private sector for evaluation.

In conclusion, smallholder farming in the two study sites had limited female participants who farmed as individuals and were mostly from the old-age category. The percentage of the youths involved in the sector was low. The future of smallholder farming in the province was blurred. Farmers access the five livelihoods capitals to varying extents. The diversity of the farmers in terms of individual farm enterprises requires that any developmental efforts be tailored to suit the specific objectives of the farming households. The limited effectiveness of the farming groups, access to adequate water and infrastructure, the existence of market-related issues such as long distances between farms and markets, land shortage, and increasing production costs were some of the challenges facing farmers in the two study districts.

The consideration of the smallholder farmer's perceptions of drought impacts in the two districts did not directly influence their decisions to utilise particular coping and adaptation strategies. Farmers were affected differently by the 2015-2018 drought, which implies that they also utilised different coping and adaptation strategies. External assistance from the government, private sector and civil society enhanced adaptation by smallholder farmers in the two districts. Thus, smallholder farmers who had access to any or all of the livelihood capitals tended to cope and adapt better than those who did not.

The study identified various organisations involved in the smallholder farmers' businesses in the two study areas who aspired to see them graduating to become large-scale commercial farmers. Among the five main categories of support services provided, information dominated the list, while finance was at the bottom. Through the implementation of the commodity approach in the Western Cape, farmers had a double benefit from working together and with the organisations. Organisations experience various challenges with smallholder farmers and among themselves as they implement the commodity approach.

The processes followed by the Western Cape Department of Agriculture and CASIDRA to implement one of the 2015-2018 drought programme in the province included the recruitment of smallholder farmers, facilitating the provision of feed vouchers to the farmers and other related activities. It was revealed that the programme implementers had direct or indirect relationships amongst themselves. The nature of the relationship influenced how they delivered their services at times. Challenges experienced by CASIDRA and the Western Cape

Department of Agriculture in implementing the drought relief schemes in the two districts were mentioned by respondents as the misappropriation of assistance by farmers, limited human resources and finance, and poor coordination of activities.

The need for initiatives to promote youths' involvement in smallholder farming should be upheld. These could include early exposure to farming, scholarships and bursaries for further education and mentorship and coaching programmes. Programmes for smallholder farmer empowerment should be flexible to incorporate the smallholder farmers' inputs, for example, drought management initiatives. They should be designed in a way that addresses their individual needs to promote effectiveness as a matter of urgency. More research should be conducted to investigate the impacts of droughts on the livelihoods of smallholder farmers in various provinces, alongside the strategies utilised for coping and adaptation. Similarly, farmers should be encouraged to utilise the available sustainable farming methods and other feasible opportunities. Further research should be conducted to determine how external assistance influenced the utilisation of various assets for livelihood, coping and adaptation by smallholder farmers in other provinces. Farmers should be equipped to take ownership of their businesses and run them effectively.

The government should ensure that all the roles for all organisations are clear to promote accountability and prevent overlaps. Further analysis focused on the nature of work done by each stakeholder in smallholder farmer development, including farmers, should be conducted to determine how they can all work together effectively. Again, activities for all stakeholders should be properly coordinated, while cooperation should be encouraged to successfully integrate all the development work. Implementation of policy documents should be prioritised without delay, as it is long overdue.

The Western Cape Department of Agriculture should commission a comprehensive process and impact evaluation of the drought programmes to determine the processes followed in implementing them. The challenges experienced should be used as lessons for future work. The extent of utilisation of independent and external evaluators should be re-considered. The evaluation of programmes would be successful only when there is adequate and relevant data, collected throughout the implementation processes. This should be prioritised by the programme designers and implementers.

ACKNOWLEDGEMENTS

I wish to acknowledge and thank:

- My husband Dr Morris Fanadzo, for investing money and other resources in my self-development and all the forms of support he provided. Words only are not enough to express the extent of my gratefulness towards him.
- Dr Bongani Ncube, my supervisor, for all the great work done towards the achievement of this qualification. I greatly appreciate your diligent efforts, guidance, advice, expertise, skills and unwavering support throughout my long and dynamic journey.
- Dr Adam French, my co-supervisor, for all the support and guidance that I received from him. I appreciate your tireless efforts.
- Professor Abenet Belete, my other co-supervisor, for all his support and guidance. All your valuable contributions were humbly noticed.
- Professor Alvin Lagardien, the former Director of the Centre for Water and Sanitation Research, for all the insights, financial and other resources provided, without which this study would not have been successfully conducted.
- Mr Joao Alberts, Administrator for Centre for Water and Sanitation Research, for all the assistance with all the administrative work involved. You were very instrumental in the arranging of field trips, meetings and visits. You really made the journey easier, and your support is greatly appreciated.
- Ms Awelani Sadiki, for all the emotional, physical and spiritual support during my journey.
- Ms Olwethu Pili, for always being there whenever I needed assistance and support, especially during field trips and meetings. Thank you for all the encouragement.
- Mr Recardo Carelsen, for all the support and assistance provided in planning the field trips, driving, translating during interviews and in information sharing. You were amazing.
- The farmers in the Overberg and West Coast districts, and the officials from different organisations for agreeing to be interviewed and providing valuable information. I appreciate your time, all the sacrifices you have made, the resources you have provided, and your attendance at the meetings. Without your presence and participation, this study would not have been a success.
- The Water Research Commission (WRC) for the financial assistance towards this research. Cape Peninsula University of Technology (CPUT), for enrolling me for the qualification and providing access to all the necessary academic, emotional and physical support.

DEDICATION

Firstly, I dedicate this work to the Lord God Almighty, for the strength, grace and ability to execute it to completion. He is the reason for all my successes. Secondly, to my husband Morris, for believing in me against all odds and lastly, to my mother, for being my role model!

RESEARCH OUTPUTS

Published Journal Article

Fanadzo, M., Ncube, B., French, A. & Belete, A. (2021). Smallholder farmer coping and adaptation strategies during the 2015-2018 drought in the Western Cape, South Africa. Physics and Chemistry of the Earth, Parts A/B/C, 102986. https://doi.org/10.1016/j.pce.2021.102986

Conference Presentations

Fanadzo, M., Ncube, B., Belete, A. & French, A. (2019). Smallholder farmer coping and adaptation strategies during drought periods, Western Cape, South Africa. 20th WaterNet/WARFSA/GWPSA Symposium: Integrated Water Resources Development and Management: Leaving No One Behind for Sustainable Water Security in Eastern and Southern Africa. Johannesburg, South Africa. October 2019.

Fanadzo, M., Ncube, B., French, A. & Belete, A. (2018). Preliminary results on smallholder farmer coping and adaptation strategies during drought periods, Western Cape, South Africa. Sixth U6 International Conference – Research Innovation and Technology for Africa. Cape Peninsula University of Technology, Cape Town, South Africa. September 2018.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

ABBREVIATIONS AND ACRONYMS

AFASA	African Farmers Association South Africa
ARC	Agricultural Research Council
BFASA	Black Farmers Association South Africa
BFAP	Bureau for Food and Agricultural Policy
BGCMA	Breede Gouritz Catchment Management Agency
CASP	Comprehensive Agricultural Support Programme
CAQDAS	Computer Assisted Qualitative Data Analysis Software
CASIDRA	Cape Agency for Sustainable and Integrated Development in Rural Areas
DAFF	Department of Agriculture, Forestry and Fisheries
DALRRD	Department of Agriculture, Land Reform and Rural Development
DFID	Department for International Development
DMA	Disaster Management Act
DOA	Department of Agriculture
DPME	Department of Planning Monitoring and Evaluation
DRDLR	Department of Rural Development and Land Reform
DRS	Drought Relief Scheme
DWS	Department of Water and Sanitation
EWS	Early Warning Systems
FARE	Future of Agriculture in the Rural Economy
FAO	Food and Agriculture Organisation
FSD	Farmer Support and Development
GDP	Gross Domestic Product
GWMESs	Government Wide Monitoring and Evaluation Systems
M&E	Monitoring and Evaluation
NDMC	National Drought Management Centre
NDMP	National Drought Management Plan
NDP	National Development Plan

NEPF	National Evaluation Policy Framework
NPC	National Planning Commission
NES	National Evaluation Systems
NSTF	National Science and Technology Forum
NWA	National Water Act
OBD	Overberg district
OCHA	Office for the Coordination of Humanitarian Affairs
PEP	Programme Evaluation Plan
PIPs	Policies, Institutions and Processes
SABC	South African Broadcasting Corporation
SAWS	South African Weather Service
SLA	Sustainable Livelihood Approach
SLF	Sustainable Livelihood Framework
SPSS	Statistical Package for Social Sciences
SRM	Sustainable Resource Management
WCD	West Coast district
WCDoA	Western Cape Department of Agriculture
WCDEA&DP	Western Cape Department of Environmental Affairs & Development Planning
WRC	Water Research Commission
WWF	World Wildlife Fund

CHAPTER 1
GENERAL INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction and background to the study

This study is part of a broader Water Research Commission (WRC) Project No. K4/2716/4, entitled 'Improving smallholder farmer livelihoods through developing strategies to cope and adapt during drought periods in South Africa'. This thesis, therefore, is built on this project, attempting to answer some of the questions related to the project's objectives, which are:

a) To assess the characteristics of livelihood strategies;
b) To explore the coping and adaptation strategies for agricultural water use; and
c) To cope with and adapt to drought in crop farming and livestock systems by smallholder farmers in the rural parts of the Limpopo and Western Cape provinces.

The study focused on the Western Cape and the thesis is linked with the three main project objectives. However, the analysis of drought strategies objectives in this thesis was not focused specifically on agricultural water use but included other related aspects of financial, physical infrastructure, social and human resources necessary for livelihood and coping with drought. This study also considered the evaluation aspect, which was introduced to the bigger project as it progressed, because it was seen as indispensable and consistent with the effective implementation of programmes by other stakeholders involved in the livelihood of smallholder farmers.

1.2 Problem statement

The smallholder farming sector in South Africa comprises a large diverse group of individuals whose livelihoods are not easily understood (van Averbeke & Mohamed, 2006). Despite the recognition of this heterogeneous nature, there are no clear criteria used to assign smallholder farmers into different categories, which makes it unclear why one category is different from the other (Fanadzo et al., 2010). Though numerous variables have been used to ambiguously define and describe smallholder farmers in the country (Fanadzo et al., 2010; Pienaar, 2013), the number and needs of farmers in the different categories are still unknown (Dubihlela & Park, 2016). The lack of relevant definitions and criteria for classifying smallholder farmers has hampered development in the sector and limited stakeholders' achievements of the objectives (Pienaar, 2013; Tshoni, 2015; Khapayi & Celliers, 2016). Programmes targeting smallholder farmers are seen as ineffective to make a meaningful impact on their socio-economic lives (Sikwela & Mushunje, 2013). This study did not seek to categorize the different types of farmers and their livelihoods in terms of assets. Rather, the recommendation by the WRC project by Ncube (2018), for follow-up investigations to fill the gap on understanding the definitions and classification criteria of smallholder farmers in the Western Cape was one of the bases for

conducting it. Thus, the purpose was to understand the various assets available to them, identify the factors influencing the access and utilisation of these assets in pursuit of their livelihood and to generate data that could also be used to improve the categorisation of smallholder farmers in the province and beyond, where applicable. The study, therefore, utilised smallholder farmers who were being supported by the Western Cape Department of Agriculture (WCDoA). The provincial departments do not use specific criteria to categorise farmers as smallholders. It is the mandate of the national government of agriculture to provide the guidelines through which farmers are placed into various programmes depending on the kind of assistance available. Therefore, provincial departments are only responsible for implementation of programmes. However, smallholder farming in the Western Cape, according to the limited information available at the conception of the study, consisted of one group of farmers who produce to improve their household food security while the other group was commercially-orientated, producing for selling.

The study also analysed the interventions and support given to smallholder farmers to determine the impact of such investments on the livelihood strategies of the farmers in the province. Effective smallholder farmer support is envisaged to improve the agricultural production and the livelihoods of farmers. An interest exists in understanding the high number of people participating in smallholder farming activities and their farming as a precondition to providing them with sustainable livelihood support contexts. In the South African National Development Plan (NDP), developed by the National Planning Commission (NPC), it is acknowledged that the smallholder farming sector can build the rural economy (NPC, 2011). Additionally, it is highlighted that by 2030, South African rural communities are expected to seize great opportunities to participate fully economically, socially and politically (South Africa, 2016). This would be possible through both substantial job creation and development of agriculture based on effective land reform, increased irrigated agriculture and land production (South Africa, 2016). The country's Department of Agriculture, Land Reform and Rural Development (DALRRD), previously labelled Department of Agriculture, Forestry and Fisheries (DAFF) until June 2019, provides evidence of the unutilised potential for smallholder farming to create economic opportunities in rural areas, where the poverty rate is high (DAFF, 2013).

Despite the above, the support provided to smallholder farmers during recent years has not improved livelihood strategies for the vast majority of farmers in South Africa. For example, the Comprehensive Agricultural Support Programme (CASP) allocation of R1 billion for the period 2011/12 has yielded unclear impacts on smallholder farmer livelihood (Thamaga-Chitja Morejele, 2014). As DAFF (2013) mentions, some of the challenges experienced in developing the smallholder farming sector included for instance the lack of institutional capacity of government, the lack of influence on policy by smallholder producers and problematic land

reform planning processes. This can also be linked to the lack of involvement of smallholder farmers in designing programmes so that they can be tailor-made to their needs.

Coordinating and integrating policies is not an easy task, as government structures often create policies that may change or be reformed (Drimie, 2016) due to a narrow lens of separate political mandates, where separate government departments need to address particular issues. Drawing on what is provided in the literature, there are no meaningful studies that were conducted to determine both the impact of support programmes for smallholder farmers in the country and the challenges experienced during implementation. Thus, this study was conceived to bridge the gap existing by generating up-to-date and relevant data that are useful for enhancing one's understanding of the nature of support available for the smallholder farmer, using the Western Cape as a case study.

To further contextualise this study, South Africa was experiencing a severe drought which had negatively affected the livelihoods of smallholder farmers. Being located in southern Africa, the country is naturally prone to prolonged droughts (Austin, 2008; Bahta et al., 2016; Baudoin et al., 2017), with regular and recurrent features, negatively affecting mostly vulnerable farmers such as smallholder farmers (Backeberg & Viljoen, 2004; Austin, 2008; Elum et al., 2017). This study sought to understand the forms of assets that were available to smallholder farmers in the Western Cape for utilisation during the 2015-2018 drought. As Alinovi et al. (2010) argue, smallholder farmers' drought adaptation strategies are influenced by different factors identified as either social, economic and/or environmental namely, finance, reliable markets, land, knowledge, managerial skills and extension support. Arguably, communities inhabiting drought-prone areas have demonstrated how complex or challenging adaptation strategies are, and have adapted to droughts either by evasion or endurance (Rakgase & Norris, 2014). In contrast to the preceding view, Elum et al. (2017) maintain that smallholder farmers are generally less able to adapt, compared to large-scale commercial farmers. Regardless, farmers are equally important role players in drought mitigation, regardless of the challenges they face (Ncube, 2018). As a follow-up to other drought-related studies in the Western Cape, this specific study focused on smallholder farmers for a deeper understanding of the challenges they experience, as they seemed to be most affected by droughts (Ncube, 2020). The 2018 study by Ncube focused on assessing indigenous knowledge and coping and adaptation practices for both large-scale commercial and smallholder farmers in the Karoo region of the Western Cape. It was revealed that people's choices for coping and adaptation strategies depended on, for instance, the farming enterprise and indigenous information they possess and that there was no established way of sharing information with the wider community.

Importantly, the research aimed at understanding the general perceptions of smallholder farmers towards droughts and their impacts in the period under review. This information is fundamental to determining the extent to which various capitals were affected by the 2015-2018 drought and to understanding the role of capitals in facilitating specific coping and adaptation strategies. The understanding of the perceptions of people or stakeholders involved in drought management is regarded as significant because it reveals the way they deal with drought and its associated effects. In addition to this view, the impact of drought can be complex hence the need to first identify and analyse those effects so that different stakeholders can implement adequate adaptation strategies convenient to each context or case. As Kallis (2008) points out, the measurement or determination of negative socio-economic effects of drought is quite problematic because invisible infrastructural damages caused are difficult to trace whereas secondary consequences are the ones grabbing the public attention. Therefore, the adaptation to droughts is a challenge as no solution is suitable for a wide range of situations or problems among smallholder farmers. Determining the nature of drought and the extent to which it impacts the livelihood of farmers are prerequisites for the stakeholders and policymakers to be able to learn lessons for future adaptation planning and to come up with adequate mitigation strategies.

Since in South Africa drought management is a shared responsibility among all the stakeholders such as farmers, government, private sector and civil society, it was necessary to identify the approach used to enhance drought adaptation. This is so, because all spheres of government, in collaboration with civil society and the private sector, are tasked to undertake different activities protecting people, infrastructure and other national assets from the impact of disasters. This emanates from the view that the role of all three organisation levels during drought periods in the country was unclear.

The undertaking of drought management activities comes with many challenges. One of the subtle impediments to the development of the smallholder farming sector is the ever-increasing effects of climate change, including droughts. The Department of Agriculture (DoA) highlights that South Africa's weaknesses in drought management programmes have included a slow and ineffective response by the governmental structures, and the absence of clear roles of stakeholders in responding to drought (DoA, 2005). The role played by the government, civil society, the private sector and the farmers in drought coping and adaptation is not clearly stated in the National Drought Management Plan (NDMP) of 2005. Ideally, all stakeholders involved in providing support to smallholder farmers should effectively understand their roles and be aware of different matters such as their interaction with others, their level of influence, the competitors and the opportunities available for them to exploit. Integration of stakeholders and their work can only be possible when activities are well coordinated when there is a

common goal, when there is cooperation, and when there is a healthy and strong working relationship.

As Ngaka (2012) points out, the provision of drought assistance to farmers by the government has been poorly coordinated and unfortunate. A substantial amount of money has been invested in drought relief interventions with however little impact while in the past, the drought relief saved livestock[1] even though it was unlikely to reach most of the smallholder farmers as many farmers were still unable to deal with the losses (Bio Watch SA, 2016). As a way of clarification, the Disaster Management Act (DMA) of 2002, guided the response to disaster risks such as drought in South Africa and is executed by the Cooperative Governance Department, through the National Disaster Management Committee (NDMC) (Baudoin et al., 2017).

Before the 1980s, the South African government managed agricultural drought as an abnormal disaster event, which required the affected farmers to be provided with emergency assistance or relief (Hassan, 2013). However, the improvements to this reactive approach to drought management were made until the early 1990s, through the introduction of more stringent impact-assessment criteria and relief-eligibility requirements, to promote self-reliance in coping and adapting to drought risks. By so doing, a forum was created to tackle overarching issues such as water and infrastructure management and early warning systems. South Africa, therefore, has specific and world-leading legislation for disaster risk reduction, which has evolved over decades, although drought response remains reactive and ineffective (Wilhite & Pulwarty, 2005; Baudoin, et al., 2017; Afful & Ayisi, 2020). Moreover, the non-structural characteristics of drought impacts have certainly hindered the development of accurate, reliable and timely estimates of its severity (Ogenga et al., 2018). The formulation of drought-preparedness plans by most governments is, therefore, challenging or problematic even though the structural impacts response focuses on restoring other services such as providing safe drinking water. The study, therefore, focused on the nature of the drought response resulting from the implementation of the provincial drought policy by the Western Cape government while identifying any other drought support that might be provided by the private and civil organisations.

The understanding is that the implementation of different development projects is consistent with their monitoring and evaluation, which makes it difficult to determine whether they are serving their intended purpose and what needs to be improved. Process evaluation can yield quality assurance information by assessing the extent to which a programme is properly

1 Government drought relief in South Africa is mainly provided for livestock farmers in the form of fodder vouchers.

implemented and operating to the standards established for it (Rossi et al., 2004). In process evaluation, many approaches can be used, including in-depth description, analysis and synthesis of a particular programme. Thus, a programme can be monitored as it occurs or as it occurred in the past or regarding its geographic, cultural, organisational and historical contexts (Stufflebeam, 2001). This study used the process evaluation separately without combining it with other types of evaluation. This was, therefore, the approach used to analyse the implementation of the drought management plan in the Western Cape.

1.3 Objectives of the study

This thesis had four main objectives that were linked to the broader project, which are:

1) To identify and analyse the Western Cape smallholder farmers' livelihood strategies;
2) To analyse the coping and adaptation strategies adopted by smallholder farmers during the 2015-2018 drought in the Western Cape;
3) To determine the role played by the South African government, the private sector and civil society in the livelihood, coping and adaptation strategies of smallholder farmers in the Western Cape; and
4) To determine the implementation process of a drought coping and adaptation programme by the South African government in the Western Cape.

1.4 Justification and delineation of the study

The South African smallholder farming sector has received support for a long time, however, with limited positive results. The focus has been on providing as much financial support as possible, while limited efforts have been made towards enhancing the effectiveness thereof. Compared to other provinces in the country, little is known about the smallholder farming sector and its participants in the Western Cape. The majority of the farmers in the province are not black and there are no former homelands, hence, their location is different from those of other provinces in South Africa. The study was conceived and conducted when the province was experiencing a severe drought. Smallholder farmers were suffering because of the lack of strategies to cope and adapt to drought. A desktop study on the occurrence and management of drought had revealed that the approach used to respond to drought was far-fetched in terms of its effectiveness. Farmers practising rainfed farming suffered more than irrigation farmers. It is for the above reasons that the study was conducted in the Western Cape, with the focus on smallholder farmers who practised rainfed farming.

1.5 Thesis outline

The thesis comprises eight chapters, four of which are empirical. The chapters are outlined as follows:

Chapter 1 introduces the study and discusses the concepts of smallholder farming, drought and its management in South Africa, and contains a brief background to the study. The chapter contextualises the study by giving an overview of the Sustainable Livelihood Approach (Krantz, 2001), the approach used for investigating livelihoods in all four objectives of the study.

Chapter 2 is a general literature review. Topics including smallholder, livelihoods, drought, coping and adaptation strategies, coping and adaptive capacity, and approaches to livelihoods analysis are discussed in-depth.

Chapter 3 presents the general methodology used for the four empirical chapters. It discusses the sample and site selection criteria, research designs, data collection methods and tools, and data analysis.

Chapter 4 presents the findings of Objective 1 which consists of analysing the livelihood of smallholder farmers in the Western Cape.

Chapter 5 presents the findings of Objective 2 which consists of identifying and analysing the coping and adaptation strategies adopted by smallholder farmers in the Western Cape during the 2015-2018 drought.

Chapter 6 presents the findings of Objective 3 by revealing the role of organisations in assisting farmers with coping and adaptation strategies to the 2015-2018 drought, and the influence of such support.

Chapter 7 presents the findings of Objective 4 by evaluating the government drought programme implemented in the Western Cape during the 2015-2018 drought.

Chapter 8 provides a general discussion, conclusions and recommendations by mainly presenting a reflection on the four empirical chapters (4 to 7) and by providing a summary of the key findings of the study.

CHAPTER 2
OVERVIEW OF THE LITERATURE

2.1 Introduction

The literature review focused on smallholder farmer livelihoods, approaches used to analyse them, drought, coping, adaptation, organisations, monitoring and evaluation. This chapter presents an overview of selected literature on these components and brief descriptions of how they are related and connected and the extent to which these interactions influence the goals of smallholder farmers in South Africa.

Therefore, the chapter starts by presenting smallholder farming in South Africa, and the livelihood concept and components of the Sustainable Livelihood Framework (SLF). The literature on smallholder farmer livelihoods and policy frameworks in South Africa is then presented, followed by definitions of important terms. This is followed by highlights on drought impact, coping and adaptation strategies adopted by smallholder farmers, the South African drought policy, and the monitoring and evaluation policy framework. Challenges for implementing drought mitigation policies and strategies in South Africa are also highlighted in this chapter. The chapter concludes by emphasises the impact of the 2015-2018 drought in South Africa, and the response thereto by the country's government, civil society, private organisations and the farmers.

2.2 Smallholder farming and the sustainable livelihood concept

People residing in rural communities in South Africa prefer being employed instead of being involved in farming, thus shifting their preferences towards a consumer-based lifestyle (Puttergill et al., 2011). Employment is regarded as providing regular or reliable monthly cash income, thereby playing a key role in securing livelihoods. However, the declining role of agriculture and the shift in livelihoods becoming increasingly reliant on non-farm income sources in South Africa (van Averbeke, 2008), has not deterred most rural households from engaging in agriculture as part of their livelihood strategy. Similarly, rural livelihoods in the country are increasingly becoming dependent on claims against the government (van Averbeke, 2008).

The concept of livelihood facilitates the understanding of the factors that influence people's lives and wellbeing. It comprises the capabilities, assets, and activities required to live (Scoones, 1998; Ashley & Hussein, 2000; van Averbeke, 2008). Knowing or investigating factors influencing livelihood strategies utilisation requires different approaches. For example, SLA is a people-centred and holistic approach that seeks to capture all that capacitates people to build a satisfactory living. It facilitates the analysis of the extent to which strategies utilised are sustainable and the achieved outcomes. The approach goes beyond conventional

definitions and approaches to poverty eradication, which were too narrow as they tended to focus on certain poverty aspects, such as low income without including vital ones such as vulnerability and social exclusion (Krantz, 2001). Therefore, attention should be given to various factors and processes constraining or enhancing people's ability to make a living sustainably.

Livelihood capabilities refer to the ability of individuals to realise their potential in the sense of being, such as being adequately nourished and free of illness, and of doing, such as exercising their choices, acquiring skills, knowledge, and experiences, and participating in social activities or events (van Averbeke, 2008). They also mean the ability to cope with stresses and shocks and being able to find and make use of livelihood opportunities. In this study, the dimensions of livelihood mentioned here were considered, as it was understood that many livelihood analyses tended to neglect them.

Livelihood activities can be numerous, and their nature varies as they may be composed of formal employment, informal labour trading, home gardens and food processing, livestock production, use of natural or common property resources, labour exchange among family or neighbours, contracted homework, borrowing, scavenging, stealing and begging (Adato & Meinzen-Dick, 2002). Therefore, they may be categorised as on- or off-farm and may include local or international migration, involve the elderly or children and may be legal or illegal. The SLF is thus a tool that enhances the analysis of the various elements and the determination of how they are linked together. The following sections describe and give a context of how the SLA was used in this study.

2.2.1 The sustainable livelihood framework

The understanding of livelihood is facilitated by the consideration of different types of information concerning the components of the SLF, namely vulnerability context, livelihood assets, strategies, and outcomes or goals and policies, institutions, and processes (PIPs). Figure 2.1 shows the elements of the SLF that are discussed in the sections that follow.

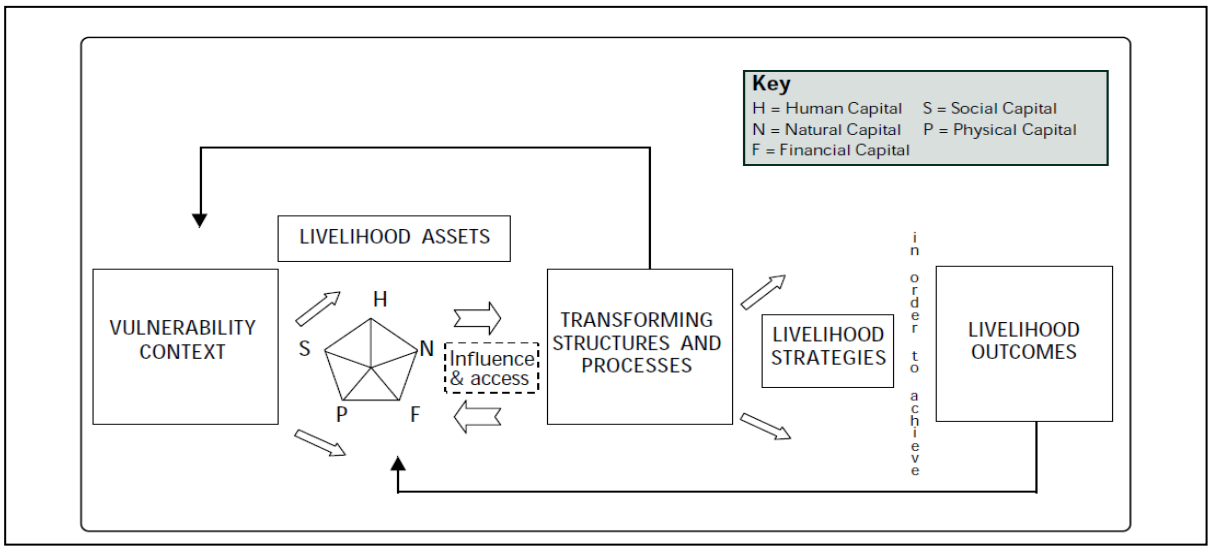


Figure 2.1: Sustainable Livelihood Framework

Source: Department for International Development (DFID) (2000)

2.2.2 Vulnerability context and resilience

The vulnerability context refers to the full range of factors such as trends in population, resources and economic indicators (Food and Agriculture Organisation [FAO], 2007; Alinovi et al., 2010), shocks such as the extreme and sudden or unexpected changes in people's livelihoods (Hammill et al., 2005), and seasonality in prices, agricultural production, employment opportunities, resource availability, or health (DFID, 2000; Allison & Ellis, 2001; Adato & Meinzen-Dick, 2002; Gbetibouo & Ringler, 2009). Shocks could be changes in human or animal health, natural disasters, sudden economic changes, conflict, or any other incident that might destroy assets directly or force people to abandon their homes and land. At the same time, people's ability to cope with shocks depends on the options available to them due to assets ownership or access (FAO, 2007). However, people can become resilient through experience and/or lessons learned from previous incidences. On the other hand, the resilience of the vulnerable to future shocks and stresses could be enhanced by external assistance, which is possible through the building of a livelihood assets base.

Resilience refers to the capacity of a community, society, or livelihood system to resist and reach an acceptable functionality level after the exposure to shocks and stresses, thereby adapting (Allison & Ellis, 2001; Folke, 2006; Jordaan, 2014). The vulnerability context of the 2015-2018 drought is the basis under which the analysis of farmer livelihoods in the Western Cape, together with their adaptation approaches and the role of the organisations supporting them. This was the case because vulnerability can be external and internal. External vulnerability entails structural dimensions and risks to which people are exposed, while the internal focuses on coping strategies and actions taken to overcome or at least mitigate the

negative effects (Bohle, 2001). External factors may include climate and markets, while internal factors could be different capital, assistance from relatives, community, or government (Allison & Ellis, 2001). Given the close linkage existing between vulnerability and livelihood (Gbetibouo & Ringler, 2009) both dimensions of vulnerability were applied to understand the livelihood of and adaptation strategies adopted by smallholder farmers. The key objective of analysing the vulnerability context of people was to strengthen their overall resilience as the future becomes uncertain and to link these to practical action, as suggested by Alinovi et al. (2010).

As FAO (2002) points out, numerous conceptual frameworks examining the causal structure of the vulnerability of people have been proposed. For example, in an analysis of smallholder farmer vulnerability conducted by Gbetibouo and Ringler (2009) in the nine provinces of South Africa, the Western Cape and Gauteng Provinces recorded low vulnerability indices, ranging from -4 to -2.5. When compared to the other provinces, the most vulnerable regions were characterised by more smallholder farmers' high dependencies on rainfed agriculture, land degradation and populated rural areas, while low vulnerabilities were attributed to high levels of infrastructure development and literacy rates and low shares of agricultural Gross Domestic Product (GDP). Jordaan (2011) attributed the increasing vulnerability of smallholder farmers to a lack of financial safety nets.

Wilk et al. (2013) found that large-scale commercial farmers had different levels of vulnerability and that their adaptive capacities influence their coping and adaptation to different climate effects and how they capitalise on opportunities. Wilhite et al. (2014) argue that drought relief support or any other reactive interventions to those affected have resulted in increased vulnerability to droughts, dependence on the government and reduced self-reliance by smallholder farmers. The sustainability of these reactive strategies is overlooked, as their success is often measured in terms of the number of beneficiaries, instead of considering the root causes of the vulnerability addressed and the risk capacities built for future droughts. As a result, smallholder farmer development support initiatives have been ineffective in facilitating growth and poverty alleviation in rural areas (Pienaar & Traub, 2015).

2.2.3 Livelihood resources

In the livelihood approach, resources are referred to as 'assets' or 'capitals'[2] and are often categorised into five types owned or accessed by family members. However, it should be taken into consideration that the five capital categories are interconnected and that various categories are required to sufficiently bring results for all livelihood outcomes that people seek. Smallholder farmers utilise various livelihood capitals to construct their complex livelihood

2 The words 'assets' and 'capitals' are used interchangeably in this thesis.

portfolios (Scoones & Wolmer, 2003), and their livelihood is mainly derived from farming. Access can be defined as the ability to benefit from material objects, people, institutions, and symbols (Ribot & Peluso, 2003). People may have control over assets through, for instance, ownership, and exercise decision-making powers over those assets possessed (van Averbeke, 2008), while they can also have access to assets belonging to others even though they might not have the power to make decisions over them (Ellis, 2000).

The Future of Agriculture in the Rural Economy (FARE) of the Western Cape notes that agriculture is considered as one of the most important sectors of the province's economy due to its meaningful contribution to GDP and formal employment in South Africa (FARE, 2013). Therefore, various stakeholders involved in smallholder farming development efforts are faced with numerous challenges, including the complex and dynamic nature of the farming sector. Thus, a clear understanding of the types of farmers practicing smallholder farming is needed to inform policy on support. The lack of the former is associated with the difficulty of different stakeholders in streamlining their support services to the desired target groups. Hence, the diversity of farmers and all the other factors that influence the achievement of a sustainable livelihood and prevent the provision of support services that do not meet the specific needs of individual farmers should be considered (Pienaar, 2013; Tshoni, 2015). Cousins (2014) acknowledges the need to consider farmer diversity when designing policies and programmes for the support of smallholder farmers, whether they are located on farms transferred through land reform, in communal areas, or on private lands. A pilot study conducted in Limpopo Province to implement a Farmer Register Project that could be used by the DAFF to develop a database for smallholder farmers' support revealed the inconsistencies in their numbers (Aliber & Hall, 2012). This was attributed to the fact that perhaps the agricultural support services are not adjusted to the reality around them. This study acknowledges the limitation in terms of empirical data available for use in categorising smallholder farmers in the Western Cape and aims at providing new data for this purpose. The new data are thus anticipated to enhance the design, development and implementation of livelihood support by all stakeholders.

Off-farm activities also generate a significant proportion of smallholder farmers' livelihood income, such as salaries and wages, social grants, private businesses, pensions and remittances (Thamaga-Chitja & Morojele, 2014). Gollin (2014) highlights that rural non-farm employment has many advantages for agricultural households, for instance, enhancing drought coping and adaptation, providing ways of managing seasonal fluctuations in labour demand, and generating extra cash income. However, there was a continuous flow of people from rural to urban areas, regardless of the increased employment of people in other non-agricultural sectors (Gollin, 2014).

The purpose of this study was to analyse the livelihood of smallholder farmers in the Western Cape by identifying the natural, physical, human, social and financial capitals utilised by the farmers to make a living and to determine the factors influencing their access. The study took into consideration some of the variables useful in determining the characteristics of smallholder farmers, including the respondent's land size, the purpose of production, age, education levels and gender, to classify them. Moreover, other variables such as race, the status of the household head and location of the farm were considered important in describing smallholder farming in the province. This study did not redefine or categorise smallholder farmers but rather focused on generating empirical data which could be used to improve the former processes. Thus, the fundamental objective of this analysis was to address the lack of high-quality, relevant and up-to-date data in the existing literature for describing smallholder farmers in the Western Cape.

Human capital includes the skills, knowledge, education, ability to work, good health, and nutrition that enable people to pursue different strategies and achieve their livelihood objectives (DFID, 2000; Adato & Meinzen-Dick, 2002; Ellis, 2003; FAO, 2007). The study analysed various human aspects or factors influencing farmers' activities because they were critical for production capabilities. For example, the age and education levels of farmers can inhibit the widespread adoption and application of new agricultural technology, as found in the Limpopo Province by Mapiye et al. (2018) and in Kenya by Chingala et al. (2017) and Mulinya (2017). The gender of farmers also impacts their access to development assistance and should be considered accordingly when analysing their livelihood. Various studies suggest that smallholder farming is dominated by females, the majority of who are in the middle to old-age category (Gandure et al., 2013; Mulinya, 2017; Ubisi et al., 2017). Meanwhile, investing in old-aged individuals may pose challenges to the government and other stakeholders in terms of the continuance of the farming sector. However, in this study, the health status of the farmer was not directly targeted because of the perceived difficulty in measuring it and the sensitivity associated with it. However, these elements can potentially become important when participants describe their challenges, the existence of natural assets and the access to and quality of those assets, the way they are combined and vary over time.

Typically, small farms use family members rather than hired labour (Gollin, 2014), thereby harnessing the flexibility of members to work around the clock and engage in other off-farm activities to supplement their income. Thus, the sizes of households of smallholder farmers were considered to determine whether they had a direct link to labour availability for farm production activities, as noted by Makate et al. (2019). Reid and Vogel (2006) argue that any decrease in available labour may also decrease productivity, potentially increasing the vulnerability of those households that do not have sufficient human capital to work in the fields. On the same note, continuous skills development exercises are important due to the

continuous technological advancements globally. Adato and Meinzen-Dick (2002) noted that human capital, in the form of knowledge and skills, is often a requirement for the proper use of many new technologies. Thus, in this study, the researcher attempted to determine the levels of skills and knowledge possessed and the sources of such by smallholder farmers in the province.

Financial assets include savings, credit or loan access, investments, and income from employment, trade, and remittances (DFID, 2000; Adato & Meinzen-Dick, 2002; Ellis, 2003; FAO, 2007). In terms of stocks, savings are the preferred type of financial capital, because they are not attached to any liabilities and usually do not entail reliance on others, and they can be held in several forms such as cash, bank deposits or liquid assets such as livestock and jewellery, and obtained through credit-providing institutions (DFID, 2000). The financial aspect of livelihood capitals should also be given attention to understand sources of income available and appealing to people. Improving access to borrowed money is often regarded as one of the key elements in increasing agricultural productivity (Machethe, 2004). However, in South Africa, many smallholder farmers do not like borrowing money for farming and those who have such preferences, often find it difficult to access funds.

Findings by Chauke and Pfumayaramba (2013) revealed that the need for credit and extension contact positively influenced the respondents' access to it, while negative attitudes towards risk, repayment period, lending procedures and the total value of capitals resulted in decreased access to it. In contrast, Tibesigwa and Visser (2015) found that access to credit improved with increases in education levels and farm size. Smallholder farmers in South Africa were experiencing challenges of finance to operate their farms, procure goods and meet working capital requirements (Chisasa & Makina, 2012). Thus, this study sought to determine whether the same challenge was being experienced in the Western Cape and to find out about the smallholder farmers' perceptions towards borrowing money for improving their farming productivity. The study focused on how farmers maintain cash flows, the preferred ways of saving money and the types of credit they had secured. The study also aimed at finding out about experiences for those with access to credits, the setbacks for those without any, and lessons on the use of borrowed money learnt over time.

Physical assets comprise the basic infrastructure, i.e. changes to the physical environment that influence how people meet their basic needs and be productive (DFID, 2000; Adato & Meinzen-Dick, 2002; FAO, 2007). They also comprise producer goods such as tools and equipment used by people to function more productively, and affordable transport, roads, shelter, buildings, water and sanitation, energy, information and communications technology (Ellis, 2003; FAO, 2007). The absence of these infrastructure components causes people to spend time engaging in non-productive activities and depriving themselves of achieving their

expected outcomes. Physical capitals influence most aspects of production. Access to transport, relevant communication modes, energy, shelter and other buildings for storage, all enhance how farming succeeds. In southern Africa (Malawi, Mozambique and Zambia), Makate et al. (2019) found that only 29% of respondents travelled more than 10 km to access markets, implying low to moderate transportation costs, while in the Free State Province, Gandure et al. (2013) found that the closest reliable market for smallholder farmers was about 80 km away from the village, presenting transport challenges for farmers.

Social capital is specific social resources upon which people draw to achieve their livelihood objectives (DFID, 2000; Adato & Meinzen-Dick, 2002; Ellis, 2003; FAO, 2007). They can be built through, for instance, i) networks and connectedness, to increase people's trust, ability to work together and to expand people's access to wider institutions; ii) membership of more formalised groups, in which people are bound by mutually agreed, or commonly accepted rules, norms, and sanctions in their community; and iii) relationships of trust, reciprocity, and exchanges that facilitate cooperation, reduce transaction costs, and may provide the basis for informal safety nets amongst the poor (DFID, 2000). Thus, most attempts to build social capital focus on directly or indirectly strengthening local institutions, through the creation of an open and democratic environment in which they flourish. The study considered the individual farmer's membership to farming groupings and the extent to which they were involved in the group activities, the functioning of the groups and how they were benefitting from the goals of the groups. This was so because social capitals play a very crucial role in farmer livelihood. Different studies have shown that members belonging to farming groups have better chances of accessing resources, especially information and finance in the form of loans or grants (Chikazunga & Paradza, 2013; Makate et al., 2017; Zamasiya et al., 2017; Makate et al., 2019). Thus, natural capitals remain central for rural livelihoods (Scoones & Wolmer, 2003).

Natural assets consist of the natural resource stocks from which resource flows and services useful for livelihoods are derived (DFID, 2000; Adato & Meinzen-Dick, 2002; Ellis, 2003; FAO, 2007). These include intangible public goods such as the atmosphere and biodiversity, and visible assets used directly for production, including trees, land and soil, water, marine resources, air quality, erosion protection, and biodiversity (Adato & Meinzen-Dick, 2002; Ellis, 2003). The two main natural assets considered in the study in question were land and water because in South Africa, a nexus exists between the two resources, meaning that it was important to determine how it played out in the Western Cape.

2.2.4 Policies, institutions and processes

As many authors (such as Adato & Meinzen-Dick, 2002; FAO, 2007) highlight, PIPs are an important set of man-made external factors that shape peoples' options to achieve their livelihood goals, influenced by the access to capital. Accordingly, institutions are the framework

or the settings, such as civic, political, and economic agencies (FAO, 2007), within which human interactions take place (Jütting, 2003). The livelihood approach facilitates the understanding of social (Olsson et al., 2014), economic and environmental contexts (Bohle, 2001; Ellis, 2003), institutional and political context and risk factors that influence resource management (Clark & Carney, 2008) in each level or context.

The shift of viewpoint from a structurally oriented perspective, which dominated the 1970s and 1980s, to a more actor-oriented point of view, was closely linked to the concept of livelihood (Sakdapolrak, 2014). The role of informal governance often becomes more important where formal governance is weak or collapsed, and local institutions can play a positive role in maintaining public order (FAO, 2007). Livelihood, therefore, includes complex, contextual, diverse and dynamic strategies developed by households to meet their needs (de Haan, 2012). Diversity, in this context, is the watchword, and livelihood approaches advocate for a multiple-sector way of solving complex rural development problems (Scoones, 2009). Processes determine the way institutions and people operate and interact (FAO, 2007).

2.2.5 Livelihood strategies

This thesis set out to identify the on-farm and off-farm activities in which smallholder farmers engaged during the drought. Diversifying off-farm activities through access to formal education, skills and knowledge can enhance livelihood and adaptation. Livelihood strategies is a collective term used to clarify the range and combination of activities and choices undertaken by people in pursuit of their livelihoods (Ellis, 2000; FAO, 2007; van Averbeke, 2008; Tittonel, 2014). These strategies can be derived from natural resource-based activities, such as crop and livestock production, and non-natural resource-based activities, such as trade, services and remittances and most households utilize the combination of both (FAO, 2007).

The three broad rural livelihood strategies are agricultural intensification, diversification or extensification, and migration (Swift & Hamilton, 2001). Agricultural intensification entails the expansion of the resource-base being utilised and this is done through increasing the cultivated area or livestock herds, whilst simultaneously developing or implementing levels of labour, capital or technology to maintain productivity (Ellis, 2000; van Averbeke, 2008). Livelihood diversification may refer to the construction of increasingly diverse activities and assets to achieve outcomes and to improve one's living (van Averbeke, 2008). It enables rural household farmers to devise other means promoting their level of income (Gebru et al., 2018), and minimize susceptibility to different livelihood shocks (Oduniyi & Tekana, 2019). Typically, this involves widening the range of either or both on-farm or off-farm income sources. Identifying the livelihood strategies that rural people pursue, consequently, is necessary to understand the livelihood processes and dynamics.

2.2.6 Livelihood outcomes

Livelihood outcomes result from outputs of livelihood strategies (DFID, 2000). For example, economic outcomes refer to the ability to satisfy basic living needs, biological measures to mortality and malnutrition rates, and dignity to impressions, including a sense of self-worth, control over one's future, and status (FAO, 2007). Thus, the SLF was used in this study to investigate the intended outcomes of smallholder farmers in the Western Cape by determining their priorities, available opportunities and factors influencing their strategies.

2.3 Limitations of the sustainable livelihoods approach

Theoretically, SLF is perceived to have failed to determine a range of issues that are related to, for instance, violence, conflict and gender relations as this emphasises material capital (Levine, 2014). It is criticised for not recognising that poverty is also a matter of social wellbeing and good health (de Haan, 2012). Thus, a holistic approach to livelihoods should include cultural, social, economic and political dimensions to enhance the understanding of the complexities of poverty and vulnerability. It is with this understanding that the researcher envisaged that encompassing aspects including the political dynamics under which smallholder farmers were operating and their access to institutional assistance would be necessary. Furthermore, the quality of capital accessed by the farmers was considered in terms of the physical condition and adequacy, among other dimensions.

The SLF has also been criticised for its difficulty to determine the feasibility of translating the analyses into interventions that could result in livelihood enhancement (Hautala, 2013; Morse & McNamara, 2013; Levine, 2014). It is, therefore, argued that different takes on the livelihood perspective and variations of the framework may ultimately provide different results in different contexts, although the analysis may provide an understanding of complex livelihood systems (Hautala, 2013). It is further argued that within the SLA, though it emphasises people-centredness, the people themselves are invisible, hence, participants can only be liberated when they can utilise options available to them and exercise the power to bring about change for themselves (Morse & McNamara, 2013). Power can indeed be a highly skewed property as it may allow some households to adapt to help to improve their lot following an SLA, while others may be limited in what they do (Morse & McNamara, 2013). The danger is that the SLA becomes an end in itself and does not provide a lot except to form the basis for lengthy reports and papers in academic journals. This is never an issue strictly for SLA, as it is often vocalised in participatory methods critiques (Toner & Franks, 2006). Also, the inconsideration of some important elements such as leisure in the SLF is to be noted as these elements can also impact resources.

The SLA is further criticised for its failure in dealing with global environmental change and the way it would affect poor rural livelihoods in the future (Hautala, 2013). It is argued that although

the term ‘sustainable’ is frequently used in the SLA, it usually refers to the ability to cope with shocks and stresses (Hautala, 2013). The need, therefore, to ask sufficient questions on local strategies and integrate concerns regarding climate change cannot be ignored. Analysing capitals is not a clear and straightforward process and requires the consideration of specific contexts (Morse & McNamara, 2013). A good example would be from farming households, whereby a land as the physical asset may be easy to measure while determining its ownership might be more complex, a situation in which smallholder farmers usually find themselves. Thus, in this study, the ownership of land was an important aspect to look into closely. Furthermore, it is argued that individuals may decide to substitute one capital for another, although the issue of sustainability should be considered.

The SLA is also accused of not considering ways to promote trust and openness by the participants. Some questions, for example on assets ownership, can be sensitive, and participants may decide to withhold certain information (Morse & McNamara, 2013). Participants may fear the consequences of providing sincere, honest, and truthful answers if they are, for example, related to the support being provided to them. Power is an integral part of a dynamic process within which livelihoods exist, hence, the SLA is criticised for the lack of attention to power relations (de Haan, 2012; Hautala, 2013).

A myriad of challenges faced by smallholder farmers in South Africa in pursuit of their livelihoods and adaptation to drought have been identified. These include, for instance, limited or lack of access to resources (Khapayi & Celliers, 2016), such as credit or finance, land, information infrastructure and production implements (DAFF, 2012a). This is a limiting factor in terms of the exploitation of available opportunities. The lack of physical and institutional infrastructure limits the participation of farmers in the formal markets. While market access by smallholder farmers is generally limited, poor infrastructure can result in high transaction costs, thereby influencing the level and type of production by farmers. A lack of human capital, such as education, entrepreneurial skills and technological skills is also another challenge hampering the access of useful formal institutions that disseminate technological knowledge and legal resources (DAFF, 2012a).

Scoones (2009) argues that the SLF must examine wider structures of inequality, in which a strategic understanding of the social and political realities of power can provide a sense of and enhance livelihood perspective. Since the SLA can be applied in the analyses of particular components, depending on what needs to be addressed, this study adopted that framework to analyse the complexity of vulnerability, livelihood assets, strategies and outcomes. Note that the concepts of drought and vulnerability are discussed briefly in the sections below.

2.4 Drought impact on smallholder farming in South Africa

2.4.1 Drought: definition, categories and impact

Defining and categorising droughts is necessary to inform its management by all stakeholders involved. Thus, this review considers the various definitions and categories of drought to facilitate how the 2015-2018 drought was characterised and managed. The National Drought Mitigation Centre (NDMC) describes drought in two ways: (1) conceptually, as an idea or a concept and (2) operationally by how it functions or operates specifically in ways that its onset, severity and end can be measured (NDMC, 2020). Conceptual definitions are generic in their description of drought and generally give the boundaries of the concept and are not specific enough to be used to detect its onset (Wilhite et al., 2000). For example, drought, in relation to farming, is described as protracted insufficient rain, resulting in extensive damage to crops, and a consequential loss of yield. Operational definitions, on the other hand, attempt to identify the precise characteristics and thresholds that define the onset, continuation, and termination of drought episodes, as well as their severity, intensity and duration (Wilhite, 2000). They are the foundation of an effective early warning system. Generally, droughts are characterised as slow-onset natural hazards, combined with a general shortage of water for some activity, group or environmental sector (Rouault & Richard, 2003; van Zyl, 2006; Vetter, 2009; Solh & van Ginkel, 2014; Botai et al., 2016; Hornby et al., 2016). Therefore, in this review, some of the elements of the 2015-2018 drought were considered, to understand its nature and the implications on the coping and adaptation strategies by all stakeholders.

Droughts are mainly categorised as meteorological, agricultural, hydrological and social (Botai et al., 2016; Muumbe et al., 2017) as shown in Figure 2.2.

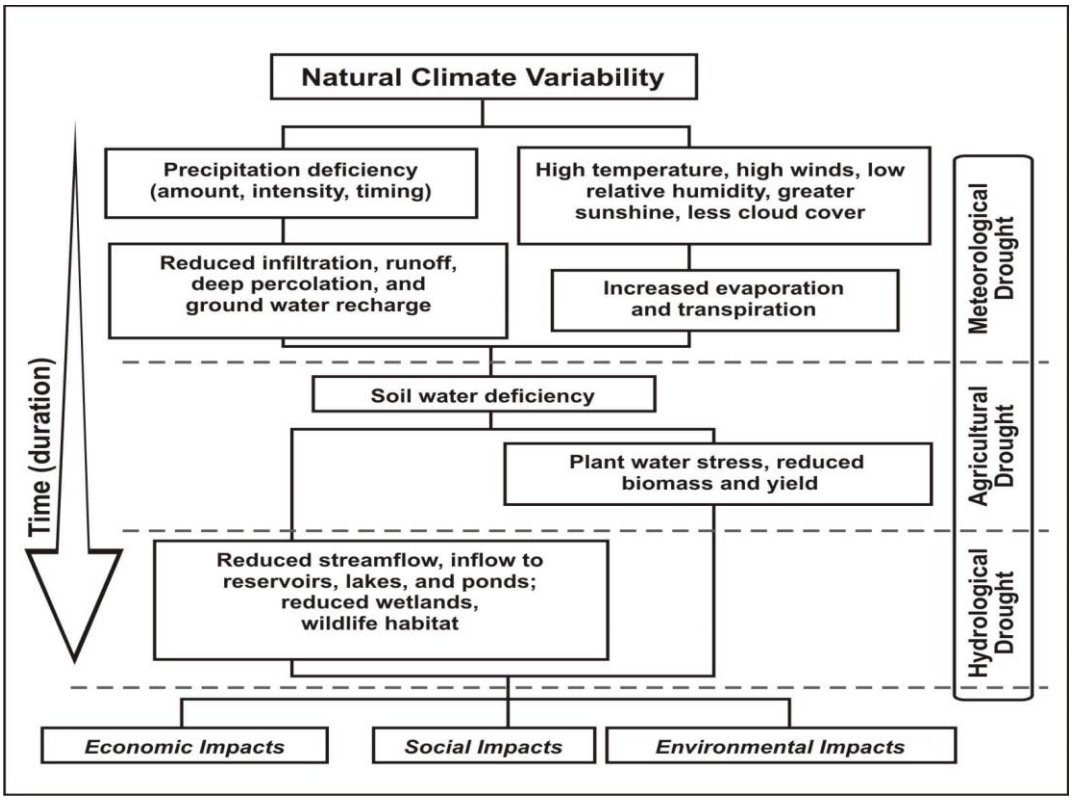


Figure 2.2: Categories of droughts

Source: NDMC (2020)

Meteorological drought is usually defined based on the degree of dryness, in comparison to some normal or average amount of rainfall, and the duration of the dry period (NDMC, 2020). Meteorological drought usually varies from one region to the other due to the variability in atmospheric conditions resulting in the lack of precipitation. This scenario was expected in this study, for the South African context and specifically for the Western Cape, because of the differences in the climate, seasons for rain, and its variability. Hydrological drought occurs when river flow is lower than the normal value or when the water level of an aquifer drops (Xianfeng et al., 2016). Therefore, hydrological drought is associated with insufficiencies in bulk water supply in water levels in streams, lakes, reservoirs and aquifers (Keyantash & Dracup, 2002). As Wilhite (2000) stresses, hydrological drought may develop slowly but endure longer because of the longer time required to recharge groundwater sources. During its onset, soil moisture is affected first, hence the effects are felt first by the agricultural sector.

Agricultural drought reflects the extent to which soil moisture is lower than the least requirement of plants (Xianfeng et al., 2016). Since agricultural drought is mainly concerned with a water deficit in crops because of a reduction in water supply in the soil, loss of soil moisture caused by the decreases in precipitation is the earliest phenomenon. When precipitation decreases, meteorological drought occurs first, followed by agricultural drought and hydrological drought, which gradually occur because of continuous water evaporation

(Xianfeng et al., 2016). The onset of an agricultural drought may be rapid and last for a short period (Wilhite, 2000; Keyantash & Dracup, 2002). The characteristics of an agricultural drought are linked with meteorological or hydrological drought to agricultural impact and they focus on rainfall shortages, differences between actual and potential evapotranspiration and reduced groundwater (NDMC, 2020).

Socio-economic drought is the phenomenon in which production and consumption are affected by the lack of water in both the natural system and human socio-economic system (Xianfeng et al., 2016). The impact of this typology of drought may vary depending on the way things were affected. For example, in a study conducted in the Karoo area of the Western Cape (Ncube & Lagardien, 2015; Ncube, 2018), the authors found that drought can have negative effects on the environment, economy and society in general. In addition to this, they have also found that farmers were able to adopt various coping and adaptation strategies as shown in Table 2.1. The review of the potential impact of drought in South Africa, and specifically in the Western Cape, was to contextualise the study in an endeavour to facilitate the understanding of the threats that farmers were facing and the expected response for mitigation.

Table 2.1: Potential drought impacts, coping and adaptation strategies identified by farmers in the Karoo, Western Cape, South Africa

DROUGHT IMPACT	COPING STRATEGY	ADAPTATION STRATEGY
Environmental impact		
General water shortages	Sustainable water management, through kitchen water Perforated bottle/can dug into the soil to provide soil moisture to root zone Shade netting to reduce evaporation Planting and irrigating small areas Dam water management and saving	Sustainable water management Perforated bottle/can dug into the soil Shade netting to reduce evaporation Drilling boreholes and windmill usage Planting cover crops to conserve moisture Building silt traps Construction of contours Rainwater harvesting Construction of stock dams
Invasive plant encroachments	Cutting and burning alien vegetation	Rehabilitation of cleared lands by planting trees
Land degradation/ shortage of grazing	Grazing on road reserves Migration Import fodder	Create paddock Construct spreader banks Planting lucerne Create fodder banks
Poor soil fertility	Using manure to improve soil fertility Picking and applying cow dung into soil Applying household rubbish into the soil increases soil fertility	Establish crop rotation to maintain soil fertility Soil fertility maintenance using manure Construction of permanent compost
Land degradation	Using donkey pulled scoopers to rehabilitate	Building weirs for erosion control
Economic impact		
Loss of vegetable/fruit yield	Creating own seed banks Planting different vegetable varieties Growing short-season cash crops	Change in planting and harvesting times Using short-season varieties Introducing new seed varieties Setting up an alternative low input system High-value cash crops only
Loss of animal condition	Destocking Early marketing of livestock Maintaining a small herd of livestock	Changing the ahead to drought-resistant livestock breeds
Low survival/ productivity of livestock	Early marketing of livestock Destocking and keeping the breeding herd Manipulating feeding strategies to conserve the herd	Breeding for survival during a drought Changing breeds Changing systems to low input
Increased loss of lambs due to predation	Weaning around homesteads	Use of trained shepherd dogs to protect livestock in the veld
Low survival of animals due to disease	Treating with natural plants Use of brushwood/stones to conserve soil	Traditional animal disease management methods
Social impact		
Food shortage, suicide, violence, crime, mental and physical distress, increased poverty and unemployment, migration, loss of human life	No specific coping and adaptation strategies provided. However, social networks may play a significant role, in which support such as counselling, sharing of ideas in dealing with suicide, anxiety, loss of human life and mental and physical distress can be provided among members.	

Source: Ncube and Lagardien (2015); Ncube (2018)

A report by the Western Cape Department of Agriculture (WCDoA) shows that in the year 2015 the rainfall amount in some of the provinces in South Africa was low, with the Western Cape and Northern Cape Provinces receiving a total rainfall ranging from 0-50 mm, the lowest rainfall amount since 1904 (WCDoA, 2018). The Western Cape's drought was, due to its duration, frequency, intensity, and severity, the worst in terms of the water shortages from 2014 to 2017 when compared to more than 113 hydrological years in the past (Botai et al., 2017). Most parts of the Eastern Cape Province received 50% below normal rainfall in 2018 (DAFF, 2018). The Office for the Coordination of Humanitarian Affairs (OCHA) (2016) highlighted that there was a growing indication of a water crisis in South Africa. Hornby et al. (2016) reported that the levels of water in dams in 2016 decreased by 22%, while the average of dam levels was estimated at 54% in 2015. The same study also shows that the Western Cape recorded dam storage of 26.6% in 2018 when compared to 41.6% of the previous year (Hornby et al., 2016). Goudriaan et al. (2019) reported that at the end of October 2017 the average dam storage level in the Western Cape was approximately 39%; highlighting that this was not adequate for all the water demands during the South African summer. In a study by Archer et al. (2021) in the Eastern Cape, a number of farms reported water resources drying up, increasing the need for more pipelines for boreholes and other investments to provide water for stock.

The planted areas by crop farmers during the duration of the 2015-2018 droughts were reduced, hence a reduction in the yield. The production of wheat in the Western Cape declined sharply during this period (Archer et al., 2021). Less demand for seed, fertilisers and pesticides resulted in serious financial losses for inputs suppliers (Makube, 2016). In South Africa, 53% of wheat crops were produced under dryland conditions (Agri Western Cape, 2016). In the Western Cape, the impacts of drought on wheat yield fluctuated sharply, with a steep decrease in 2015 and 2017, and a higher yield again in 2016 and 2018 (Theron et al., 2021). Therefore, there were concerns that with reduced production volumes, the country would eventually become a net importer of food (Grain SA, 2016; Makube, 2016).

The report of the Bureau for Food and Agricultural Policy (BFAP) (2015) showed that beef production tended to increase during drought because some farmers responded by reducing their livestock herds through slaughtering or selling. Thus, in 2015 an increase of 8% in beef slaughters was recorded, while huge livestock mortalities occurred in KwaZulu-Natal, Limpopo, North West and the Free State provinces (Agri Western Cape, 2016). The reduction of livestock through destocking was necessitated by the high prevalence of predators and the need to feed animals to maintain their condition, resulting in income losses. In the Eastern Cape, conception was as low as 10% due to the poor condition of livestock, while farmers reported little or no milk production, increasing lambs' mortality and poor weaning percentages

(Archer et al., 2021). However, improvements in the livestock condition and prices were noted in the Northern Cape (DAFF, 2018). The Western Cape vegetation and natural grazing conditions were also reported as extremely poor in 2017 (WCDoA, 2017).

Socio-economic drought links up the supply and demand of some economic goods or services with elements of meteorological, hydrological, and agricultural drought. These may include a higher demand of water supply due to rainfall variability, resulting in water scarcity. Hydrological and agricultural drought can be affected by environmental and socio-economic factors, while socio-economic droughts are those that affect the social function of life (Gollis, 2008). Latham (2016) and Archer et al. (2021) reported that low agricultural productivity resulted in job losses because of retrenchments and business closures, increasing unemployment and social instability. For example, about 80% of businesses in the Free State Province reported having lost above 50% of their employees due to the recent drought (Hlalele et al., 2016). The Western Cape experienced significant job losses which were estimated at 33,000 by the end of 2017 (WCDoA, 2017). Job losses in agriculture directly affected all spheres of life and livelihood due to the links between agriculture and other industries. In a survey conducted by Agri SA (2019), over 50% of the commercial farmers indicated that they had communicated the need to retrench farmworkers, because of the prevailing drought conditions. More than 50% of the farm workers were suffering from a form of depression, anxiety or other behavioural health issues. This impact confirms the notion that drought is complex to deal with and that there is a need to provide relevant support to match the individual needs of farmers.

Given the year-on-year cost increase of 11% for fertiliser and 10% for fuel that was reported in agribusiness in South Africa (Latham, 2016), exports in agri-businesses and agriculture-related businesses, such as butcheries using large volumes of water for boerewors production and fruit and vegetable businesses for keeping vegetables fresh, were as well affected (Hlalele et al., 2016; Schreiner et al., 2018). As Botai et al. (2016) highlight, drought impacts are complex and influence many economic sectors as water resources, agriculture and natural ecosystems. Thus, this study sought to determine the short and long-term effects of the rainfall variability on the livelihoods of smallholder farmers in the Western Cape, in relation to agriculture and socio-economic aspects.

2.4.2 Drought coping and adaptation strategies by smallholder farmers in South Africa

The variation of drought effects from individual, group and region has implications on the coping strategies utilised. (de Waal, 2004; Smucker & Wisner, 2007). Therefore, Wilhite (2000) argued that regions and specific impacts should be the basis for defining drought and that definitions must be ready for use by decision-makers. Drought coping refers to the strategies

that are utilised by various stakeholders including organisations, individuals and communities to prevent or reduce the negative effects of a climate (Jordaan, 2014). Thus, this study, being inspired by the above understanding, focused on the strategies utilised by farmers. However, the influence of the assistance provided to smallholder farmers by the government, private sector and civil society for coping with drought was acknowledged.

Adaptation can be regarded as a process of responding to shocks and stresses by various stakeholders (Jordaan, 2014). Summing it up, Mpandeli et al. (2015) describe adaptation as being reactive, simultaneous or anticipatory and spontaneous or planned (Mpandeli et al., 2015) and can occur at macro, meso and micro levels. Micro adaptation takes place at individual or farm level, meso at group level and macro at national or community policy changes or implementation of livelihood strategies (Jordaan, 2014). Adaptation strategies to drought should be context-specific (Smit & Wandel, 2006). Similarly, it is regarded as a function of wealth, technology, education, information, skills, infrastructure, societal entitlement and access to resources, and stability and management capabilities (McCarthy et al., 2007).

Regardless of the setbacks faced by smallholder farmers during drought, they have created various ways of coping and adapting. This review identified a few coping and adaptation strategies used by livestock and crop farmers in the past droughts in some parts of South Africa. Livestock farmers mitigated the effects of water and feed shortages by, for instance, sourcing livestock feed, selling, slaughtering or moving livestock to other camps, increasing remedies for sick animals and transporting water to the farm, as it was identified in the North West, Eastern Cape and Free State provinces (Hudson, 2002; Ngaka, 2012). The purchase of feed and fodder was probably the most popular coping mechanism used by farmers in South Africa (Jordaan, 2014). However, this was encouraged when the end of the drought was in sight because with prolonged droughts, the cost-benefit could eventually force farmers to sell off their livestock.

The study by Hudson (2002) in the North West revealed that the selling of livestock was the last option after the savings had been depleted due to the purchasing of extra feed and this implied that their condition would have deteriorated to the extent of fetching very low market prices. This would further result in loss of income by farmers. On the other hand, farmers in the dry Karoo region of the Western Cape and the arid Northern Cape provinces were flexible concerning destocking as a coping mechanism, as well as preserving the natural resource base (Archer, 2004; Jordaan, 2014). However, destocking was not common in most instances because of the difficulty faced by farmers in replacing the genetic material after drought. Meanwhile, Jordaan (2014) argues that the destocking of herds and possession of adequate land for crop production is equally important for drought adaptation.

When grazing land has been depleted and can no longer sustain the nucleus breeding stock, pen feeding is used. Social structures and networks were also potentials for the survival of all farm production types during a drought (Stone, 2001). They enabled members to share mutual assistance and support when the need arose. However, social networks did not always appeal to everyone as an effective means of drought risk reduction, as confirmed in a study by Bahta et al. (2016). The increasing financial expenditure and lower incomes during drought periods require drastic measures. Thus, financial stress is the most challenging aspect of coping with drought, and it involves compromising budgets to satisfy new needs, sourcing additional funding, community efforts in pooling resources, labour sharing or applying for subsidised support (Jordaan, 2014).

In light of the understanding of the common coping and adaptation strategies in South Africa, the research reported in this study considered adaptation at the micro (or farm household), meso and macro levels. The idea was to understand the linkages among stakeholders' strategies and how they were influenced by each other. Therefore, the analysis of the coping and adaptation strategies of the individual farmer's household was envisaged to shed some light on the choices they made and the interactions among themselves as farming communities within their district. Necessarily, the DoA (2005) advises that although the government is obliged to assist farmers when disasters occur, farmers should take proactive measures to mitigate them on their own. Thus, the assistance schemes in South Africa were not designed to replace what has been lost by the farmers but to enable them to continue farming despite the setbacks. In that light, farmers were expected to show an understanding of their role in drought planning, coping and adapting and to fulfil the preconditions for qualifying for drought relief, when required.

2.4.3 The role of organisations in smallholder farmer livelihoods

African governments, including South Africa, have noticed the need to foster and strengthen agricultural development as many communities depended on farming. The effectiveness of agriculture on people's livelihoods and wellbeing is evident in, for instance, Xaba and Dhlamini (2015) who report that the Southern African Development Community member states acknowledged that 70% of the population in the region depended on agriculture for food, income and employment. The need to significantly increase the productivity of smallholder farmers to ensure long-term food security, achieved by encouraging them to pursue sustainable intensification of production through improved inputs has been clearly identified by the South African government (DAFF, 2012b). Thus, since 1994, government support has largely shifted in favour of smallholder farmers. The democratic elections in 1994 and the lifting of international economic sanctions against South Africa stimulated the creation and/or implementation of an underlying principle for virtually all government policy (DAFF, 2012b).

The DoA, in 2014, increased its budgetary allocations for smallholder support programmes by R2.38 billion as an acknowledgement that the smallholder sector can achieve poverty reduction and rural development (Pienaar & Traub, 2015). Differentiated policies and programmes, well-fitted to and designed with flexibility for diverse farming systems and populations should be implemented (Cousins, 2014). This study was conducted to determine what actions were taken by the government of the Western Cape to develop the smallholder sector.

There has been a growing interest in the role that private finance can play in supporting the efforts made by smallholder farmers, although its role and impact in developing countries is less understood (Canales et al., 2017). Nonetheless, in South Africa, the private sector has been regarded as a key to agricultural development, as is the case in all other sectors of the economy. The NPC (2011) highlights that the private sector accounts for over two-thirds of investment, research and development and that it should thrive in creating an environment where income levels are rising. The private sector efforts towards any sector's development, if they are made in isolation, may not reach their potential and the results may be limited. The government has an important role to play in building trust and confidence to encourage long-term investment by the private sector. In South Africa, for instance, the government should provide clarity for all stakeholders responsible for implementing the strategies of the NDP. Hence, it was necessary for this study to determine the interactions of the government and private sector, and the implications of those on the livelihoods of smallholder farmers in the studied province.

One of the dominant view of supporting smallholder farmer productivity in South Africa to promote their entrance into the mainstream agricultural commodity economy was partnering them with specialised private-sector commodity agencies (Van Averbeke and Khosa, 2004). The entrance would facilitate the private sector's economic viability in the provision of support services to deal with constraints preventing smallholders from participating in a main stream commodity. Farmers are encouraged to participate in agriculture cooperatives or farmer groups, because they provide an institutional framework through which local communities gain control over productive activities for their livelihoods. Such prospects as the securing of land rights and better market opportunities are possible when cooperatives are utilised (DAFF, 2012b). This approach is termed the commodity approach. Another minority view of supporting smallholder farmers' productivity was the utilisation of economic activity as an expression of indigenous knowledge (Van Averbeke and Khosa, 2004). This aspect was taken into account mostly in the aspects of drought coping and adaptation by smallholder farmers.

Commodity approach tends to be specialised on certain commodities and is coordinated by governments and or private organizations working with contracted farmers. It primarily

assumes that concentrating on a commodity or utilization of a certain input increases production, while utilising modern farming technologies, traditional farming practices, research, input supplies, and marketing places these under one administration (Kidane & Worth, 2016). The commodity approach can be efficient because of its flexibility for specific agro-ecological zones and the potential to target a fragmented series of farmers (Swanson & Rajalahti, 2016). However, the focus on certain commodity production and potential limited prioritisation of other farmers' interests can be some of its major weaknesses. Under this approach, the utilisation of other farmers to deliver information to their fellows has increasingly become prominent; thereby promoting participatory extension approaches (Duvel, 2000; Baig & Aldosari; 2013; Kaur & Kaur, 2018). This approach acknowledges and reinforces the critical role played by farmers in disseminating the localised information that they possess, including drought-related information (Ziervogel et al., 2014).

The effectiveness of this process, which is conducted through demonstration sessions and meetings can then be measured in terms of the number of farmers actively participating, the continuity of local extension organizations and their systems, and the ultimate benefits that accrue to the community (Kromah, 2016). This can be ceased as an opportunity to expose them to new technologies and farming practises (Mapiye et al., 2021). The approach can be advantageous in that it allows farmers to be involved in decision-making pertaining the program goals, methods used; hence improving the programs' relevance in addressing their needs and mutual support among themselves. However, government can lose control in reporting and management processes of the programs to farmers. In South Africa, the commodity approach to smallholder farming was meant to be implemented in all provinces. In light of this, the study aimed at determine how the Western Cape government was implementing this approach in partnership with the private sector, its impact on the livelihoods of smallholder farmers and challenges experienced during implementation.

There are various ways to implementing the commodity approach. These include the Farmer Field School Approach, in which farmers learn in groups, while extension officers play the facilitator role rather than instructors' (Mapiye et al. 2021). The approach uses iterative and interactive adult learning practices involving periodic meetings, following a planned schedule, observations, and experiential learning to enhance the development and transfer of innovation (Kidane & Worth, 2016). The Project Extension Approach involves an identified, specially-defined location in which the aim is to address the needs of the previously disadvantaged people such as poverty, over a period of time (Kaur & Kaur, 2018), while utilising externally sourced funds. The process then utilises certain technologies to determine whether they could be utilised and sustained in similar situations elsewhere. The Farming Systems Research Extension Approach focuses on solving farmer problems through holistic, systems-based, localized, and iterative technology development and delivery processes through tailored

practices to fully meet the heterogeneous demands of the farmers (Bingen & Gibbon). The Cost-Sharing Extension Approach entails the users paying a fee for accessing relevant agricultural extension services (Gary & Willem). The approach promotes the use of agricultural programs with a potential to address local situations, contribute to farm improvements, and make frontline extension agents more accountable to the interests of the farmers (Kromah, 2016). The success of the approach can be measured through the farmers' willingness and ability to contribute a share towards the cost individually or through their local government units (GFRAS, 2016). The Education Institution Extension Approach is a decentralized approach often implemented by well-established educational institutions possessing the technical knowledge and research capacity to conduct the extension activities to smallholder farmers (Kromah, 2016). This study considered the different ways in which these aspects of commodity approach implementation were at play in the province under study. This was necessary, in the case multiple or single aspects were being utilised, to determine the implications and if there were improvements to be made.

Civil society, although its leaders sometimes represent narrow development interests and issues closest to their hearts, forms an integral part of a vibrant democracy and must be taken seriously (NPC, 2011). Thus, the review considers the policy that governs smallholder farming in South Africa during drought and normal years, to identify and understand the policy for improving smallholder farmer livelihoods and adaptation strategies. Nonetheless, determining organisations' approaches to the numerous and complex challenges faced by smallholder farmers is complicated. The policy governing the sector is not solely stipulated but is rather embedded in various government policies and strategies. In general, the agricultural policy objectives are defined in the context of broad economic reforms, in which the government envisions sustainable and profitable participation by all stakeholders, through addressing the historical legacies and biases of apartheid (OECD, 2006). The review of the literature exposed the existence of numerous policy documents that were continuously designed and introduced in the agricultural sector, with some lacking any history of being implemented. While in the cases that implementation has taken place, it has been poorly coordinated and poorly managed.

The National Science and Technology Forum (NSTF) highlights that the NDP, released in 2011 and adopted in 2012 by the South African Cabinet as a long-term vision and plan for the country, is regarded as a guiding document and positioned as a blueprint for tackling the country's challenges (NSTF, 2018). The NPC documented the intention to move towards an inclusive and integrated rural economy through the creation of additional direct and indirect jobs in the agriculture, agro-processing, and related sectors by 2030 (NPC, 2011). To achieve this, different strategies were put in place, namely the implementation of different proposed policy imperatives such as investing substantially in providing innovative market linkages for

smallholder farmers, the creation of tenure security, and the improvement and development of skills through training in terms of agricultural sector and entrepreneurial skills (DAFF, 2013). The major pieces of legislation are presented in Table 2.2.

Table 2.2: Major pieces of legislation for agricultural policy in South Africa[3]

Legislation	Launching date	Purpose/objectives
Financial Assistance and Land Administration	2019	The Financial Assistance and Land Administration aims at facilitating effective administration and disposal of agricultural government land through the provision of basic water infrastructure, fencing, creation of firebreaks, and natural resources management (DAFF, 2015).
The National Infrastructure Plan	2012	Designed to implement the aspirations of the NDP with the impression to achieve sustainable development by 2030, and the need for South Africa to invest in a strong network of economic infrastructure designed to support the country's medium and long-term objectives (NPC, 2011; South Africa, 2020). Would be used to transform the economic landscape to integrate Africans while simultaneously creating employment and strengthening basic service delivery.
Strategic Integrated Project 11	2012	One of the 18 projects implemented and is coordinated by the National Agricultural Marketing Council (NAMC, 2020).Emphasis on investment in agro-logistics and rural infrastructure to promote the expansion of production, development and employment, i.e. through storage facilities, transport-network links, and fencing of farms (DAFF, 2012b).
NDP	2011	South Africa's long-term vision and plan, serving as a blueprint processes to achieve a prosperous society by 2030, while focus is on poverty reduction, unemployment and inequality (South African Government, 2016).
New Growth Path	2010	Identifies agriculture as a key job driver. Advocates for broad policy guidelines for the restructuring of land reform to provide farmers on irrigation schemes with comprehensive support around infrastructure, marketing, finance, and extension services (DAFF, 2012b).
Second Economy Strategy Project	2008	Provides a framework for addressing inequality and economic marginalisation in South Africa. Promotes structural change to achieve a broad-based economy through empowering the smallholder farming sector (DAFF, 2012b).
The Accelerated and Shared Growth Initiative for South Africa and the National Industrial Policy Framework	2006 and 2007	Emphasise the importance of promoting and developing small enterprises to stimulate growth in the second economy and for meeting the Sustainable Development Goals (DAFF, 2012b).
Micro Agricultural Financial Institutional Scheme of South Africa (MAFISA)	2006	One of the financial service's pillars for the CASP (DAFF, 2015). Implemented to address the smallholder farmer needs of and equitable and increased access to finance on an affordable, diversified and sustainable basis through facilitating the purchasing of production inputs (DALRRD, 2021).
Proactive Land Acquisition Strategy (PLAS)	2006	Based on the legislative framework of the Provision of Land and Assistance Act, No. 126 of 1993, the PLAS aims to accelerate the land reform process, through the proactive acquisition of farms by the government and the leasing to black South Africans for agricultural purposes (DLA, 2007).
Integrated Growth and Development Plan	2004	Replaced the 2001 Strategic Plan for South African Agriculture, serving as a strategic reference document for provincial departments of agriculture, and advocating for food security, economic growth, and rural economic development (DAFF, 2012b).
CASP	2004	Aims to empower smallholder farmers. Provides them with support to facilitate increased production, poverty alleviation and job creation to close the gap of inequalities among them (Xaba and Dlamini, 2015).

		The CASP has six pillars namely, information and knowledge management, technical and advisory assistance, financing mechanisms, training and capacity building, marketing and business development, and on and off-farm infrastructure (DAFF, 2015).
The Agricultural Broad-Based Black Economic Empowerment (AgriBBBEE)	2003	Implemented to provide funding for black people to promote their entry and participation in the entire agricultural value chains and agriculture in general (DAFF, 2021).
The Settlement Land Acquisition Grant and the Land Re-distribution for Agricultural Development	2000	The Settlement Land Acquisition Grant, which ended in 2000, was a cash grant for which poor and landless black South Africans could form some production, cooperative production and /or commonage schemes, or farm settlements of farmworkers and farmworker equity groups to apply to buy and develop farmland. This was replaced by the Land Redistribution for Agricultural Development introduced later in the same year to be inclusive of the previously disadvantaged people to become effective farmers on their own land, improve their living standards by enabling them to access and use land productively, decongest overcrowded former homeland areas and expand opportunities for women and youth in rural areas.
Land Care Programme	1997	Meant to optimise productivity and sustainable use of natural resources to increase agricultural production, food security, job creation and better quality of life for all (DAFF, 2015).
White Paper on Agriculture	1995	The mission for the White Paper on Agriculture was to ensure equitable access to agriculture and promote the contribution of agriculture to the development of all communities, society at large and the national economy.

[3]

3 The above pieces of legislation were mainly developed and designed to promote and sustain the development of the smallholder farmers in South Africa. However, it can be emphasised that policy implementation and coordination remain a concern.

2.4.4 The role of organisations in drought management in South Africa

Governments are considered resilient when they can cope and adapt to shocks such as drought, and adaptation at this level is anticipated to be better planned and proactive when compared to the individual level (Jordaan, 2014). In the meantime, drought effects mitigation has become a huge responsibility of governments globally, with developing countries known to be lagging and facing numerous challenges in implementing plans due to a lack of resources support (Wilk et al., 2013). Drought reduction entails the implementation of strategies to reduce the impact of risk, whereas management encompasses policy, administrative decisions and operational activities which apply to various stages and levels of a disaster (Vermaak & van Niekerk, 2004). Reduction strategies include, for instance, the vulnerability and risk assessment of facilities, the development of social and economic infrastructure, information systems, water management practices, drought planning activities, the implementation of awareness building and education activities and the application of scientific, technical and other skilled institutional and operational abilities (DoA, 2005; Wilhite et al., 2014). It reflects a new global approach, entailing both systematic development and application of policies, strategies and practices within the broad context of sustainable development (Salzmann et al., 2016). Drought management, in its international form, entails the integration of pre- and post-disaster activities to safeguard lives and property against possible disasters. Disaster risk reduction in South Africa is, therefore, naturally multidisciplinary and responsibility is shared among various stakeholders.

The changes in various policies in South Africa, including the drought policy, resulted in the establishment of the DMA of 2002, in which the NDMP of 2005 is embedded (DoA, 2005). Meissner and Jacobs-Mata (2016) noted that the changes have resulted in several coping interventions being implemented, with a shift from a reactive to a proactive approach. The Green and White Papers were compiled around the years 1994 to 1999, resulting from consultations with various stakeholders in disaster management (Wentink & van Niekerk, 2017).

This era was characterised by a more hands-off approach by the government towards the agricultural sector but with continued provision of support for the previously disadvantaged smallholder farmers (O'Farrell et al., 2009). Efforts were made from 2003 to 2005 to establish a legal framework and funding of a national implementation plan, which marked the beginning of the third phase of policy development, as it is reflected in the NDMP (DoA, 2005). Thus, this study explores whether the drought policy was implemented properly to mitigate the impact of the drought in South Africa first, and in the Western Cape, and whether the proactive approach had been upheld.

The tools for implementing the NDMP include the South African Constitution (South Africa, 1996), the White Paper on Agriculture (South Africa, 1995), the White Paper on Disaster Management (South Africa, 1999), the Disaster Management Act (South Africa, 2003) and the Strategic Plan for the Department of Agriculture, and Conservation of Agricultural Resources Act of 1983 (DoA, 2005). The NDMP sets out four key performance areas for disaster risk management namely, institutional arrangements and integrated institutional capacity for disaster management, disaster risk assessment, planning and response and recovery. At the local level, the NDMP mandates that Municipal Interdepartmental Disaster Management Committees should be established to provide the structure in which different municipal departments can coordinate and integrate their disaster risk management activities, and reduction plans and strategies (Wentink & van Niekerk, 2017). Four important aspects of drought management in South Africa were then considered in this study and these are early warning systems, water management, declarations and relief.

2.4.1.1 Early warning systems

Early warning systems (EWS) play a crucial role in mitigating drought effects (Ziervogel et al., 2010). The DoA (2005) reiterates that the public should be aware of drought information and its related issues, through an effective early warning and monitoring system. Sources of forecast information in South Africa include the South African Weather Services (SAWS), which is expected to be the primary weather and forecast service provider (Ziervogel et al., 2010). Note that university research groups, such as the Climate Systems Analysis Group at the University of Cape Town, may also serve as a source of forecast information. Ways of disseminating forecast information in the country include community libraries, the internet, agricultural development centres, extension services points and information and farmers' days (DoA, 2005). The source and/or channel of dissemination of forecast information determines its access by end-users and the uptake of forecast information, which is the key to successful EWS. Additionally, farmer study groups and seminars are used as platforms for drought-related experiences and information sharing, including public awareness campaigns, experiential learning, extension, training and distribution of booklets as ways of disseminating information to adapt to natural hazards (DAFF, 2018). These booklets are reported to be available in nine South African languages. Ngaka (2012) identified the radio as the main source of early warning information for the respondents in the Eastern Cape, followed by television, while the internet was last. All the same, the nature and structure of an individual user's decision-making problems, various characteristics of the information on which decisions are based and behaviour of the user may all affect forecast effectiveness (Ziervogel et al., 2010).

In a study by Parks et al. (2019), the limitation on the availability of data to facilitate forecast with a greater level of certainty was identified as one of the factors underlying a slow response

to the prediction of drought. On the other hand, forecasting is always based on probability; the assessment of the probability as a basis for forecasting requires understanding the severity of the situation by decision-makers. Factors including uncertainty, poor communication, users' needs, inadequate trust and resources, poor timing of forecasts, and training among users may impede information access and use by farmers (Cooper et al., 2008; Ziervogel et al., 2010). In South Africa, there is ignorance concerning the persisting poor packaging and information dissemination, regardless of the improvements made in scientific climate and seasonal forecasts (Cooper et al., 2008).

Strengthening EWS in South Africa, possibly through engaging citizens (Mthembu & Zwane, 2017), and gathering rainfall data from individuals (Meissner & Jacobs-Mata, 2016) may improve the implementation of the drought policy. The significance of this engagement or collaboration is evident in, for example, the engaging activities launched by the WRC in 2014 as these have stimulated citizens' and other private data collectors' initiatives and produced a significant response culminating in a hydrology data service centre (Meissner & Jacobs-Mata, 2016). This was developed in collaboration with the South African Department of Science and Technology, the United States Agency for International Development, the United States Army Corps of Engineers and the United States Bureau of Reclamation. However, it is advised that the vetting and/or verification of such data, implying the need for human, financial, and other resources, which could be another setback, be conducted. This could facilitate the reduction or alleviation of theft and vandalism of infrastructure which are reported as other challenges for the meteorological data gathering systems in South Africa (Meissner & Jacobs-Mata, 2016). Forecast system development and improved application should be the focus, while carefully considering the relevant conditions to inform adaptive measures in realistic and practical ways (Archer et al., 2019).

2.4.4.2 Water management

The South African water supply system plays a pivotal role in the country's drought response strategy, placing the biggest responsibility on the Department of Water and Sanitation (DWS) to manage the water systems (Meissner & Jacobs-Mata, 2016). While water management is an integral part of drought management, the role of the Department of Water and Sanitation (DWS) is not clearly set out in the National DMA of 2005. The country's water management is governed by the National Water Act (NWA) 36 of 1998 and the Water Services Act 108 of 1997. According to Hornby et al. (2016), the governance of water resources distribution and the responsive planning for reduced rainfall affect the severity of the impacts of drought on people, agriculture and ecology. During drought, the agricultural sector suffers the most, as it is the biggest water user, consuming up to 60% of the total available water resources (Meissner & Jacobs-Mata, 2016). Water supply and demand management during drought entail the

modification of catchment vegetation, the construction of reservoirs and dams, the reduction of evaporation, the development of groundwater resources, the utilisation of inter-basin transfers, the invasive plant clearing, and an emphasis on water conservation and augmentation (Mukheibir & Sparks, 2003; Vermaak & van Niekerk, 2004; Wilhite et al., 2014; Hornby et al., 2016; Midgley & Methner, 2016). Invasive plants cause a loss of about 7% of the annual flow in South Africa's rivers each year, equating to approximately 33 million cubic metres of water (Hornby et al., 2016). Thus, education, voluntary compliance, pricing policies, legal restrictions and rationing of water use are all ways of conserving water.

The 2015-2018 drought resulted in water restrictions being implemented in most parts of the country during the period under review but mostly in the Western Cape, where intensified restrictions to consumers, up to level 6, were imposed (Botai et al., 2017; DAFF, 2018; Goudriaan et al., 2019). It is on record that on average, the agriculture sector in the Western Cape had about 60% water usage cut since 2017, with restrictions from 50% in the Breede Valley, 60% in the Berg River and Riviersonderend region and 87% in the Lower Olifants River Valley (Clanwilliam, Klawer and Vredendal) towards the end of 2016 irrigation season over the dry summer months (DWS, 2017; Goudriaan et al., 2019). Farmers in the Western Cape have embarked on a water resilience journey in which water use patterns have shifted due to the successive droughts in the province recently. Farmers have been encouraged to understand water uses, improve efficiencies, change farming practices and explore re-use and alternative sources (GreenAgri, 2022).

Reduced water demand could be achieved through, for instance, recycling, use of ground and surface water, exchanging crops, climate forecasting, use of versatile inter-basin transfer schemes and flexible operating rules for water systems (Mukheibir & Sparks, 2003). Allocation of water supplies by market-based systems, through water pricing that includes variable tariff rates to cater for periods of scarcity and peak demands, and marginal cost pricing, can as well be adopted. During the 2015-2018 drought, smallholder farmers in Limpopo and KwaZulu-Natal experienced water provision challenges due to the lack of planning and resorted to buying and transporting water to their farms (Hornby et al., 2016). The DWS had to implement medium to long-term measures, including rainwater harvesting through the provision of water storage tanks, groundwater use and desalination (Hornby et al., 2016). A report on the City of Cape Town drought indicated that three containerised desalination plants that were built yielded 16 million litres (Parks et al., 2019). Additional boreholes were drilled and equipped to increase the water supply in the country (Hornby et al., 2016). Water resource management and planning should promote the reduction of risks and vulnerability associated with changing rainfall regimes (Wolski et al., 2021).

2.4.4.3 Drought declarations

The DMA provides for the declaration of disasters through national, provincial and local governments. According to DoA (2005), the national executive is primarily responsible for the coordination and management of national disasters. The Minister of the Department of Rural Development and Land Reform (DRDLR) is responsible for declaring a national disaster if the existing contingency arrangements for the disaster cannot be dealt with effectively (South Africa, 2002). As this thesis was being written, an interview was conducted between a South African Broadcasting Corporation (SABC) news anchor and the chairperson of the African Farmer Association South Africa (AFASA) to provide insight into the 2015-2018 drought that was at the peak of devastating the nation. As it is evident in the extract provided below, the chairperson made calls for the Minister to declare the 2015-2018 drought as a national disaster, because of the severe damages in the Northern and Eastern Cape provinces, among others (SABC, 2019). During the interview, the Chairperson said the following:

> The situation is so bad that we as AFASA have even called upon our government to declare a disaster in the whole country. The hotspots for us are Northern Cape, Eastern Cape, Limpopo, KwaZulu-Natal, and partly the Free State but the whole country has spots where farmers' cattle are dying (SABC, 2019).

The provincial and local governments are responsible for determining a pending disastrous drought and adopting applicable contingency plans and emergency procedures (DoA, 2005). In the interim, the provincial premier and municipality council declare a drought disaster in terms of sections 41 and 55 of the DMA. Drought declarations in South Africa influence the process of rolling out the drought assistance to those who qualify. However, the process could take 2–6 months after a declaration of disaster has been submitted (Baudoin et al., 2017). The slow process potentially results in a waste of resources by the government and by the farmers as they wait for assistance.

The 2015-2018 drought was declared at different times in the different provinces of South Africa, for example, the North West was the first on 29 July 2013 and again on 24 July 2015. As of January 2017, all the provinces had declared a state of provincial drought disaster in some of their municipalities, except for Gauteng (Baudoin et al., 2017). In the Western Cape, following various drought assessments, the NDMC classified drought as Provincial Disaster on 25 April 2017, which allowed Provincial Cabinet to declare a provincial state of disaster on 23 May 2017, and again reclassified in terms of section 23 (6) of the DMA on 13 February 2018 as a National Disaster (Kwela, 2018). Drawing on the above, this study was undertaken to determine the implications of the processes followed in 2015-2018 drought declarations in the Western Cape smallholder farmer, government and other stakeholders' responses.

2.4.4.5 Drought relief

The DoA (2005) acknowledges that the costs of drought-mitigating activities such as public awareness programmes and EWS are borne by governments and the private agricultural sector. Each provincial agriculture department is mandated to provide for disaster in their annual budget and if the disaster is of a magnitude beyond provincial capacity, then the National Treasury, through the DAFF, can be approached for additional funding. As Tadesse et al. (2008) highlight, the annual drought reduction programmes cost was less than that of post-disaster recovery and restoration. This has resulted in difficulty to support smallholder farmers in South Africa because it has become a costly exercise. For instance, during the 2015-2018 drought, DAFF reprioritised R305.3 million towards drought relief and drilling of boreholes and an additional R66.4 million was spent on Land Care programmes in 2015 and 2016 (DAFF, 2016), while R528 million was allocated to smallholder farmers in 2016 (Midgley & Methner, 2016). On the same note, the drought relief funding for smallholder farmers was reported to have had a very high shortfall in 2016, while the dependence on relief was viewed as clearly becoming financially unsustainable (Midgley & Methner, 2016). Additionally, Bahta et al. (2016) and Ncube (2020) found that drought relief reached the intended beneficiaries late when they had already lost their livestock or crops, and this was previously reported by Jordaan (2011) in the Northern Cape and Ngaka (2012) in the Eastern Cape and Free State provinces. Moreover, in some cases, no drought relief was received at all. The challenge is that the success of drought strategies providing relief is often measured in terms of the number of beneficiaries, neglecting to address the root causes of vulnerability and building capacities to reduce future risk (Holloway, 2003). Instead, financial safety nets are suspected to result in the increased dependence syndrome on the government by farmers (Ngaka, 2012).

2.4.5 Challenges in implementing the drought policy in South Africa

The implementation of the disaster risk management policy in South Africa has been hampered by many factors. The policy evolved at a slow pace, since the adoption of the DMA in 2002 (DoA, 2005). Reportedly, several municipalities were slowly putting the most basic disaster risk management structures in place (Wentink & van Niekerk, 2017). This challenge was usually compounded by the under-staffing (Mukheibir, 2008; Midgley & Methner, 2016) and coupled with a declining knowledge base and a rapid turnover rate that has curtailed the potential for them to make positive changes (Wilk et al., 2013; Meissner & Jacobs-Mata, 2016). Under-staffing was also noted by Wentink and van Niekerk (2017) when they revealed that some government centres had no volunteers and had limited temporary staff. The understaffing may be a result of limited financial resources available for drought mitigation. Related to this financial challenge, a notable shrinking government budget to replace and/or maintain damaged monitoring stations and to purchase the unavailable rainfall data from

SAWS and the Agricultural Research Council (ARC) was noted in a study by Meissner and Jacobs-Mata (2016).

Bureaucracy and rigidity of existing institutions (Hellmuth et al., 2007; Wilk et al., 2013), corruption, and lack of transparency and accountability at the government level also hamper the effectiveness of drought coping by stakeholders. Mthembu and Zwane (2017) found that in 2015, cattle farmers in Mpumalanga Province had difficulty in applying for government supplementary animal feed. However, no proper immediate risk management plan was in place to enhance the coping to drought by the government and the long queues forced some of the farmers to drop out of the programme.

The formulation and implementation of national policies to provide a framework for proactive and risk-based management for the increasing drought and impacts was not being given concerted efforts globally (Wilhite et al., 2014). Clear sets of operating guidelines for drought management should be provided and policy must be consistent with the goals of sustainable development equitable for all regions, population groups and economic sectors (Wilhite, 2002). The successful implementation of the NDP, for example, requires strong leadership from government, business, labour and civil society, while the responsibility of implementing recommendations remains that of the government (NPC, 2011).

Meanwhile, the lack of clarity on the responsibilities and accountability roles of stakeholders by the government chains for all stakeholders, including social partners, which in some cases needs to be formalised, hampers the coordination and integration among stakeholders and is a huge setback (DAFF, 2014). This results in contested roles and responsibilities, weak intergovernmental cooperation and a poor understanding of the paradigm shift from response to prevention (Mukheibir, 2008; Midgley & Methner, 2016). In the study by Ngaka (2012), extension services were not delivered in the province, this unpopularity was attributed to their exclusion from disaster management within the provincial departments of agriculture. This is problematic because extension officers are known to be involved regularly with farmers. Thus, limiting their contact with farmers during a drought may negatively affect the effectiveness and efficiency of related initiatives.

Regarding drought response, Baudoin et al. (2017) claim that even though the South African government had been provided with adequate warning of the possibility of the occurrence of the 2015-2018 drought and well in time, with the first appearance of El Niño conditions in the Tropical Pacific in 2015, there was minimal evidence of preparedness. This means that the proactive approach has not been fully embraced and could remain a mere wish in terms of its implementation. Taking into consideration all these challenges, the need for Monitoring and Evaluation (M&E) of livelihoods and drought adaptation interventions for the development of

the rural economy by stakeholders becomes evident. These circumstances lead to the discussion of the policy context in which the M&E of smallholder farmer programmes occur.

2.4.6 Policy framework for monitoring and evaluation in South Africa

The provision of the M&E framework by the South African government expresses its interest and commitment in ensuring that the implementation of developmental projects everywhere in the country is effective. This framework has been carefully considered to determine how it applies to drought and adaptation policy M&E at the provincial level. This process was necessary to inform and guide on the understanding of the implementation of drought initiatives for the benefit of the vulnerable farmers under specific conditions and requirements.

The policy framework for the Government-wide Monitoring and Evaluation System (GWMES) was approved by the Cabinet in 2005, to provide guidance for M&E in South Africa (South Africa. The Presidency, 2007). The GWMES seeks to describe and explain the relations among the existing data collection systems within the government, for information needed for planning the delivery of services and for reviewing and analysing the success of policies (South Africa. National Treasury, 2007). The Department of Planning, Monitoring and Evaluation (DPME) provides the legislation that makes up the policy framework for GWMES, which includes the Framework for Managing Programme Performance Information, the National Evaluation Policy Framework (NEPF) and the South African Statistical Quality Assessment Framework (DPME, 2020).

The NEPF foregrounds the importance of evaluation in government to assess different issues to improve the relevance, effectiveness, efficiency, impact and sustainability of its interventions (South Africa. The Presidency, 2011). Therefore, the policy provides the basis for a minimum system of evaluation across government levels and promotes quality, ensuring the use of credible and objective evidence in planning, budgeting, organisational improvement, policy review, as well as ongoing programme and project management. The revision of the NEPF took place in 2017, as a way of taking critical steps in taking forward the National Evaluation System (NES) evaluation recommendations (DPME, 2020).

Six specific types of evaluation are provided by the NEPF (South Africa. The Presidency, 2011):

i) Diagnosis

ii) Design

iii) Implementation/process

iv) Impact

v) Economic evaluation

vi) Evaluation synthesis

The evaluation consistent with this study, namely implementation evaluation, aims at assessing the intervention's operational mechanisms implemented versus the achievement of the intended objectives. This is done by, for instance, looking at activities, outputs and outcomes, use of resources and the causal links during implementation. It was important to determine such things to understand the processes followed in providing assistance to the farmers and the relationships among them. This information would inform where there are gaps in terms of implementation and how to close them. For this reason, departments are responsible for incorporating evaluation into their management functions by providing all necessary resources to improve their performance. Note that the uptake and utilisation of the results of any evaluation are dependent on the commissioners of that evaluation. Thus, it is recommended that a model in which evaluations are conducted be jointly used to avoid potential tensions between the degree of ownership and independence and credibility when the evaluation is conducted internally and externally (South Africa. The Presidency, 2011). In light of this, an implementation evaluation of the NES was undertaken by the DPME during the 2016/17 financial year to assess whether the implementation of the system was having an impact on the government and to determine how the system could be strengthened to maximise impact and value for money (DPME, 2020).

The potential utilisation of the results of this study would depend on the communication of the results to the Western Cape Government since it was not commissioned by a particular department involved in this study. The evaluation of the NES revealed an increasing uptake of the results. However, there was, in terms of funding, a gap between evaluation, budgeting and planning, while there was a lack of clarity in the shared vision among stakeholders. The need to build stronger partnerships to cement and promote the roles of institutions such as offices of the premier, universities, civil society organisations and programme beneficiaries throughout the evaluation lifecycle was also evident in the study (DPME, 2020). This study meant to identify whether there were M&E directorates within the WCDoA, responsible for ensuring that regular evaluations are conducted.

Since 2012, the Western Cape Government institutionalised the NEPF at the provincial level, through, for instance, the development and implementation of the Programme Evaluation Plan (PEP) (Ishmail & Tully, 2020). The Western Cape Government was selected as a pilot province to spearhead the development of the country’s first formal evaluation system and the rollout of the NEPF. Since then, the provincial government has steadily progressed in terms of the

quality of evaluations conducted, and implementing departments were valuing the effectiveness and usability of planned evaluations.

As Rossi et al. (2004) highlight, process evaluation is the most frequent form of programme evaluation as it entails the assessment of fidelity and effectiveness of a programme's implementation. It involves both the determination of how well the services are rendered to the recipients and if they are delivered consistently in accordance with the programme goals, and the organisation of the programme activities, the use of resources and how well the programme is operating. Process evaluation can be used as a freestanding evaluation to generate data for quality assurance, assess whether its intended purpose is being fulfilled and whether it is operating according to standards established for it (Rossi et al., 2004). The NDMP of 2005 highlights that the monitoring and/or evaluation of the government drought management programmes must be effective (DoA, 2005).

This study was carried out to determine the implementation process of the Western Cape Drought Management Plan. This was a follow-up to the analysis of the drought relief support provided by the WCDoA to the smallholder farmers in the province during the 2015-2018 drought. As already established in Chapter 6 (Figure 6.8), the process began at the national level, from which provincial DMPs were delivered, and at the level of the farmer, where support was delivered.

The Disaster Management Act (DMA) (no. 57 of 2002) provides for an integrated and coordinated disaster management policy emphasising the prevention and reduction of the risky severity of disasters, emergency preparedness, rapid and effective response to disasters and post-disaster recovery (WCDoA, 2016a). The WCDoA has adopted the NDMP of 2005 and put in place some structures to support its implementation, as stipulated by the DMA. Elsewhere, the literature suggests that the implementation of the NDMP has been slow, hence limited progress despite the number of droughts that have been experienced lately in South Africa. Since 2015, the WCDoA was reported to have institutionalised evaluations through the inclusion of the Departmental Evaluation Plan as an annual strategic performance indicator, and the number of evaluations completed was included as a province-specific indicator in its annual performance plan (Mandondo & Troskie, 2019). The Western Cape was hailed as one of the provinces that have performed well in M&E, and the WCDoA was officially recognised as the best in terms of institutionalising provincial evaluations by the national DPME, at the 6th Biennial South African M&E Association Conference in 2017 in Johannesburg (Mandondo & Troskie, 2019).

The analysis of the role of organisations in providing drought support to smallholder farmers in the Western Cape (Chapter 6) revealed that the directorates at the WCDoA, namely

CASIDRA, the SRM and FSD were responsible for implementing the provincial relief programme. Drawing from the above, there was then a need to determine how each part was involved in the implementation of relief interventions during the 2015-2018 drought and the relationships existing among those departments. Following the realisation that the WCDoA has developed four evaluation plans since 2016, a search for some of the evaluation reports identifying findings relevant to the DRS was conducted. However, none of the evaluation plans approved for execution revealed that a DRS evaluation had been done or would be conducted soon.

2.5 Conclusions

A number of individuals in South Africa still consider farming as an important source of livelihood. Concurrently, they engage in non-farm activities to complement their income. The review of these two aspects of livelihoods analysed the strategies adopted by smallholder farmers in South Africa and the Western Cape in a bid to understand the kind of data that is useful in describing smallholder farmers and how it can be generated. data Additionally, the review was intended to establish farmers' assets accessibility can vary from one household to another. The SLF was analysed to determine its merits and weaknesses when identifying livelihood assets and strategies, PIPs and outcomes.

Since South Africa was experiencing a severe drought during the period under review, the need to ascertain the extent to which livelihood assets that could be used for coping and adaptation were compromised. The various definitions, categories and impacts of the 2015-2018 drought in South Africa and specifically in the Western Cape, were also reviewed. However, it was outside the scope of this review to measure each category of the various and general characteristics of drought. The understanding of the different ways in which drought impacts manifest in South Africa was envisaged to provide insights into how farmers perceive, cope and adapt to them. Smallholder and large-scale commercial farmers are distinguished in this study because of the focus which is on smallholder farmers.

The review has highlighted some documented impacts as reported in other studies in South Africa. These included reduced crop yields, high prices of inputs, livestock mortality, reduced dam levels and compromised grazing, leading to other socio-economic impacts such as income losses, and increasing unemployment rates. Drought coping strategies that have reportedly been adopted for the above impacts included destocking of livestock, buying feed, reducing planted area, among others.

The review focused on the implementation of the national drought management plan, which was envisaged as having great potential to yield significant results in the adaptation strategies for smallholder farmers. Through its implementation in other parts of South Africa, the

strategies that had been utilised included the EWS, water restrictions and other management measures. Climate-smart agriculture was introduced in some provinces. The review was carried out to inform the processes of determining how this implementation had played out in the Western Cape. However, most reports on the drought were not specific about the number of farmers supported and the criteria used to select them for assistance provision. Information on the numbers of smallholder farmers supported could enable researchers and policymakers to determine the scope of support required and whether it would be sustainable. The criteria used to determine who qualified for support could facilitate the understanding of the approach used, and the bottlenecks that hinder farmers to access drought relief. This information could inform future interventions. Thus, the review served as an eye-opener in terms of how questions around the implementation processes, especially those that programme managers were responsible for, would be framed in this study. Furthermore, the information could facilitate the understanding of a clear picture of how the government and private sectors had approached drought coping by smallholder farmers in the country. The determination of the role played by all organisations identified was critical in interpreting the extent to which it influences decision making and how it impacts the achievement of livelihood outcomes by farmers.

As was evident in the review, a large amount of money was spent on drilling boreholes and supplying fodder for livestock. The use of EWS remains limited in a few areas of the country. The implementation of policies continues to be limited due to different underlying factors such as the lack of resources and clarity on stakeholder roles, heavy bureaucracies, and poor coordination and integration of stakeholder activities.

The objectives of this study were, therefore, to fill in some of the gaps identified in the literature such as the lack of information that could be used to define and characterise smallholder farmers in the Western Cape. This would be helpful in understanding why they have unique access to resources and the difference in the utilisation of those available resources to adapt to drought. The gap in the lack of information also made it difficult to understand how all the players in drought management in the Western Cape responded to the 2015-2018 drought, strengthening the conception of this study. Therefore, the approach taken to provide such information consisted of analysing each stakeholder's role in the implementation of the drought coping interventions by focusing on the 2015-2018 drought. The claim that implementation of policies in South Africa is rare and poorly coordinated needed to be confirmed, using the case study of the Western Cape, by identifying and determining any of the drought relief interventions provided and how the implementation process was done. The determining of processes followed in project implementation could be done through M&E of programmes and interventions and this aspect is critical and consistent with achieving sustainable outcomes.

Therefore, the review considered the framework which is used in South Africa for public programmes evaluation and the challenges and gaps in the system. This was envisaged to contextualise this study, to guide the prospective evaluation and determine the setbacks in the implementation of drought programmes in the Western Cape. All these actions would answer these broad questions:

a) What variables could be used to best characterise and define smallholder farmers in the Western Cape?
b) What did the smallholder farmers in the Western Cape do to remain in farming during the recent drought?
c) How did the Western Cape government, private sector and civil society do during the 2015-2018 drought to assist smallholder farmers in mitigating its impacts?
d) What processes were followed by the WCDoA in implementing the drought relief schemes for the benefit of smallholder farmers during the 2015-2018 drought?

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the general methodology adopted to address the four objectives that constitute the empirical Chapters 4 to 7 of this thesis. Details on study sites as well as sample selection are presented in this chapter. It outlines the two main research designs used for the study, namely quantitative and qualitative methods. The tenets, strengths and weaknesses of the two designs are discussed and the methods of data collection, tools used and analyses are also reported.

3.2 Overview of the study sites

The Western Cape is situated on the south-western tip of the African continent and is bordered by the Northern Cape Province to the north, the Eastern Cape Province to the east and the Indian and Atlantic Oceans to the south and west (du Plessis & Schloms, 2017). The province comprises six district municipalities, namely the Cape Winelands, Central Karoo, City of Cape Town, Eden, Overberg and West Coast. The Western Cape covers 129,370 km² of South Africa's land. It accounts for 11.8% of the national population with more than 7 million people (Statistics South Africa [Stats SA], 2021). As of 2018, the unemployment rate was 30.3% (StatsSA, 2021).

The Western Cape has a warm temperate Mediterranean climate, hot dry summers and cold wet winters. The climate of the Western Cape is winter rainfall. The average temperatures range from 15 °C to 27 °C in summer and 5 °C to 22 °C in winter. The annual precipitation in the province varies from approximately 300 mm to more than 900 mm, with extremes of as low as 60 mm and as high as 3345 mm (Western Cape Government, 2017). The province is the main player of South Africa's agricultural export production, in which fruits and wines are mainly produced for high-value export markets. Figure 3.1 is a map of South Africa showing the location of the Western Cape and the approximate location of the two study sites, the Overberg district (OBD) and the West Coast district (WCD).

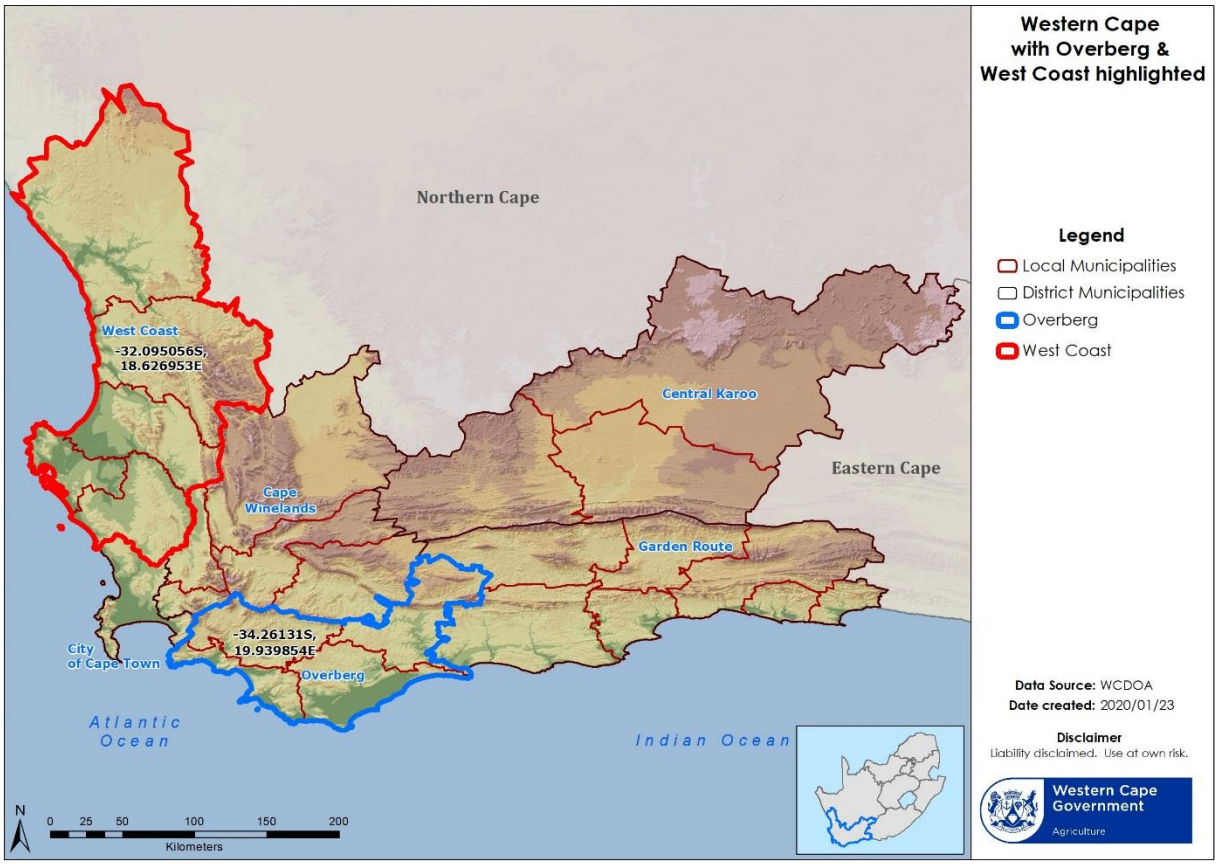


Figure 3.1: Map of South Africa showing the location of the two study sites

The Western Cape agricultural sector is made up of approximately 6 653 large-scale commercial and 9 480 smallholder farmers (Pienaar & Boonzaaier, 2018). The province produces between 55% and 60% of the national agricultural exports and contributes approximately 20% towards the total agricultural production of the country (Western Cape Department of Environmental Affairs and Development Planning [WCDEA&DP], 2018). The Western Cape's agricultural sector contributes 24% of the total national agricultural GDP which is about 4% of the total economy, and together with agro-processing, is responsible for 18% of all formal employment opportunities in the province (Basson et al., 2018).

3.2.1 Overview of the Overberg district

The OBD municipality is situated in the south of the Western Cape, bordered by the Indian and Atlantic oceans to the south, and Cape Town, Cape Winelands and Eden district municipalities to the west, north and east, respectively (Western Cape Government, 2018). The municipality is the smallest district in the province, covering 12,239 km², and making up only 9% of its geographical area, comprising four local municipalities (Western Cape Government, 2018). The OBD has a strong agricultural sector, contributing about 10.8% to the Western Cape provincial economy. Agriculture comprises 11.6% of all agricultural production in the province

and includes grain (mainly wheat grown in winter, barley and canola), fruit (mainly berries), livestock, and grapes for export and wine-making and the district has always been considered the breadbasket of the Western Cape (Overberg District Municipality, 2020).

The main sources of water in the OBD are boreholes, springs, dams, pools, rivers, streams and rainwater, distributed by the Overberg Water Board and catchments to the surrounding rural areas (Western Cape Government, 2017). Most parts of the district have a Mediterranean climate, with typically wet, cold winters and warm and dry summers, although this trend weakens towards the eastern part, which falls within the winter and summer rainfall areas (WCDEA&DP, 2018). The average rainfall for the OBD is 650 mm with a maximum of 1010 mm and a minimum of 350 mm.

3.2.2 Overview of the West Coast district

The WCD is located to the north of the City of Cape Town (West Coast District Municipality, 2015). It has the second-lowest population and is a non-metro district municipality in the Western Cape (Western Cape Government, 2016) covering 31,119 km² (West Coast District Municipality, 2019) with 450,610 people. The district is known primarily for producing wheat, canola, rooibos tea, citrus fruit, grapes and wine, poultry, fresh milk and dairy products, beef, mutton, lamb and pork products (West Coast District Municipality, 2015). It also exports canned, bottled or packaged fruits and vegetables, or fruits and vegetables that have been converted to other products, e.g. juices and purees, and its animal products contribute 45.3% of the agricultural income (West Coast District Municipality, 2015). It is divided into North and South West Coast sub-districts and comprises five local municipalities (West Coast District Municipality, 2015). The WCD obtains its water through the Western Cape Water Supply System from dams and reservoirs (Basson et al., 2018).

3.2.3 Site scoping

A meeting was held with the Chief Director of the WCDoA on the 31st October 2017 to introduce the bigger project in which this study is embedded, to seek the approval of the WCDoA and confirm the study sites. During the meeting, indications were that the 2015-2018 drought status in the two selected districts was different. At that time, the OBD had not yet been declared a drought disaster area, while the WCD had already been declared as such. It was envisaged that this scenario could allow for comparisons between the two sites, in terms of the extent of the impacts, coping and adaptation strategies adopted by the smallholder farmers, and the interventions by public and private organisations. The two districts were also selected based on the extent to which rainfed farming was practised because of the need to understand how farmers involved in this type of farming were adapting to the drought without

adequate irrigation infrastructure in place. However, it is known and understood that some supplementary irrigation takes place in some instances.

3.2.4 Sampling

3.2.4.1 Selection of farmers

The farmers who participated in this study were selected using non-probabilistic sampling, which can be divided into accidental or convenience, quota, snowball, purposive and self-selected (Wilson, 2014). A combination of accidental, quota, purposive and self-selected methods was then utilised to arrive at the final sample size. The reason for the use of all these methods was that of the complication caused by the heterogeneous nature of farmers and the difficulty in locating them due to the lack of information in that respect. Convenient or accidental sampling would facilitate the exploration and selection of the desired number of people (Wilson, 2014) while not being limited by their characteristics (Etikan & Bala, 2017). This aspect was taken care of by the quota sampling, in which steps were taken to ensure that the significant diverse elements of the population were included (Wilson, 2014). The use of purposeful (or purposive) sampling enabled the researcher to carefully select participants based on the researcher's knowledge of the potential population of the study subjects and the objectives of the research (Wilson, 2014). This knowledge was obtained through literature and the meetings held with the organisations working with smallholder farmers in the province.

The population of smallholder farmers (including those that were not supported by the provincial government) in the respective districts under study could not be established as all efforts to do so were futile. However, 52 and 60 farmers from the OBD and WCD respectively eventually participated in this study. The WCDoA assisted in providing the locations for the smallholder farmers to whom they provided support and this is partly how the sample size of 112 farmers was achieved. This means that of the 112 farmers, the majority (87.5%) were defined as smallholder farmers by the DAFF (2012b) and were receiving support from the provincial government.

A self-selected sample involves people who self-identify with the desired population criteria and volunteer or consent to participate in a study (Wilson, 2014). Therefore, of the 60 farmers from the West Coast, although 14 of them were not being supported by the WCDoA, they yet showed interest in participating hence their inclusion in the study. These 14 farmers were advised by neighbours who had attended interviews that a project was running in their area and they requested to be included. This way of selecting cases is consistent with purposive sampling, which often uses evolving criteria over the course of analysis, and researchers continually explore data to identify new cases or perspectives (Russell & Gregory, 2003). The researcher can include more cases to fill the gap of information from those knowledgeable or

experienced in the subject matter. Altogether, the 112 farmers participated in the livelihood (Chapter 4) and coping and adaptation strategies (Chapter 5) studies, while they facilitated the identification of organisations that were later to be interviewed in the role of organisations (Chapter 6) and evaluation (Chapter 7).

3.2.4.2 Selection of key informants

Some of the key informants in this study were identified through the farmers who participated in the surveys between 2017 and 2019. The farmer surveys included questions that required them to list organisations that provided any kind of support and to specify who assisted them during the 2015-2018 drought. This exercise facilitated the researcher's general understanding of the number of private, public and civil society organisations involved in the support structure of smallholder farmers in the two study areas. The researcher then considered the main stakeholders in the support structure for interviews to confirm and further understand related processes. These main service providers were deemed so because of the kind of support that they provided to farmers, their connections with mainly the WCDoA. The selection of the WCDoA drought relief intervention to be evaluated (Chapter 7) was based on whether the programme that has been implemented was either drought and smallholder-specific, and whether there was interest for participation.

3.3 The theoretical/conceptual framework

3.3.1 Research approach

The livelihood approach was used as a framework of analysis in this thesis because of the diverse approaches containing livelihood elements that can be applied or modified to suit particular situations, as suggested by the Food and Agriculture Organisation (FAO) (2007). A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Chambers & Conway; 1992; Morse et al., 2009). For this thesis, this definition was embraced because it captures the issue of sustainability, which is a milestone for smallholder farmers. The Sustainable Livelihoods Approach (SLA) allows the use of a holistic perspective to livelihood analyses, facilitating the identification of different strategic interventions, entry points and levels for effective poverty reduction or eradication. A livelihood is, therefore, sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and does not compromise the future of the next generation (Khatiwada et al., 2017). Taking the aspect of sustainability into the context of this study, the livelihood and adaptation strategies analyses considered the extent to which households were able to recover from the

recent drought. The expectation for smallholder farmers by the South African government was to contribute to the rural economy through, for instance, job creation and improved productivity, and to the wellbeing of other people depending on them. Therefore, the failure to ensure the sustainability of smallholder farmers' livelihood strategies could have devastating impacts on those who depend on them.

The SLA came into existence to improve the technical approaches to analysing the livelihoods of the poor people in developing countries as these were neglecting the factors that influenced decision-making and the constraints faced when applying solutions to peoples' problems. The understanding of the reality, according to the people involved and their means of coping with it to achieve adequate livelihoods, is required to recognise a people-centred development thinking and action. In the first objective, the SLA, through the utilisation of the SLF tool, was used to analyse the general livelihood assets and strategies of smallholder farmers in the Western Cape. The framework facilitates the development of a checklist of important issues and expands on how they are linked to each other (Scoones, 1998; DFID, 2000; de Haan, 2012).

Sustainable livelihood systems can be understood by analysing individuals and communities' coping and adaptation strategies pursued in response to external shocks and stresses such as drought (Ranganathan et al., 2011). The Cooperative for Assistance and Relief Everywhere, the DFID and the United Nations Development Programme agencies have been applying the SLF in their studies and have used similar definitions of what constitutes sustainable livelihoods. The agencies were of the view that livelihood resources must be conceptualised broadly by including the physical and economic dimensions, human and social assets. Thus, in this study, the analysis of the five types of assets (Objective 1), coping and adaptation strategies used by farmers in the province during the 2015-2018 drought (Objective 2), and the impact of policies and economic structures on the vulnerable farmer's livelihood, coping and adaptation strategies, as stressed by Krantz (2001), were performed. Coping strategies are often a short-term response to a specific shock, while adaptation strategies can be long-term behaviour changes (Krantz, 2001).

The SLA, outlined in Chapter 2, was adopted for the four empirical studies presented in Chapters 4 to 7. The SLF was, therefore, used in Chapter 4 to frame the questions around the livelihood capital and adopted strategies for smallholder farmers and in Chapter 5 used to determine the coping and adaptation strategies adopted by the farmers during the drought. In Chapter 6, it was used to determine the relationships among organisations and their influence on the methodology reported in Chapter 3 could be included in one empirical chapter on the livelihoods of smallholder farmers. This consideration was extended in Chapter 7, by assessing the implementation process of the drought relief scheme in the Western Cape province.

Therefore, the SLF facilitated the research to be conducted using both main research designs. The adopted designs are discussed accordingly.

3.3.2 Research designs

This study utilised mainly the qualitative design and very limited methods of quantitative nature to collect data. Therefore, the focus of this chapter is mainly on the qualitative research design. Quantitative research was only used to profile smallholder farmers and generate descriptive statistics of their livelihood capitals. The research was conducted using the least-known and commonly defined multiple or multi-method research design, which uses various data collection methods which are mostly borrowed from qualitative research, and partly from quantitative research.

3.3.2.1 Qualitative research design

A variety of approaches facilitated comprehension, description and interpretation of different phenomena as perceived by individuals, groups and cultures involved (Malagon-Maldonado, 2014). Qualitative research is based on a constructivist epistemology, which explores the assumed socially constructed dynamic reality, through a value-laden, flexible, descriptive, holistic and context-sensitive framework (Yilmaz, 2013). Qualitative studies address the social aspect of research (Choy, 2014) and of reality that cannot be quantified (Almeida et al., 2017). It can be best used to understand a phenomenon with limited information and insufficient instruments measuring it (Malagon-Maldonado, 2014; Rutberg & Bouikidis, 2018). This design was regarded as suitable for filling the knowledge gap in smallholder farming sector studies in the Western Cape and to provide in-depth insight into the diverse livelihoods of the farmers, which quantitative research cannot do (Yilmaz, 2013; Goertzen, 2017). This is because qualitative methods generally aim at answering the ‘what’, ‘how’ or ‘why’ of a phenomenon, rather than the ‘how many’ or ‘how much’ (Brikci & Green, 2007).

While there are many ways of conducting qualitative research, the phenomenological approach was deemed the best fit for this study as it focuses on the participants’ perceptions of the event or situation, to answer the question and meanings of their experience (Polit & Beck, 2012; Sutton & Austin, 2015; Alase, 2017). Remember that this study aimed at understanding how smallholder farmers operate to achieve their livelihood outcomes. Case studies can also be used to conduct an in-depth investigation of a problem over an extended period, using a combination of data collection tools such as interviews, personal observations and internal or external documents (Bhattacherjee, 2012). Case studies would have been used in conjunction with the phenomenological research but time constraints made it impossible since the study was conducted in conjunction with a bigger project. The grounded theory (Williams, 2007; Rutberg & Bouikidis, 2018), ethnography (Sutton & Austin, 2015; Rutberg &

Bouikidis, 2018), and content analysis (Williams, 2007) are also methods available for use in qualitative research but were not utilised in this study.

In qualitative research, a considerable range of qualitative approaches uses semi-structured and unstructured interviews (Chowdhury, 2015), while the third fundamental type of research interview is structured (Rutberg & Bouikidis, 2018). The current study used semi-structured and unstructured interviews to collect qualitative data. The flexibility of the data collection methods of semi-structured and unstructured interviews allows the study subjects to freely express themselves, which was compatible with the need to gain an in-depth understanding of the livelihood and adaptation strategies of farmers. This is so because structured interviews are limited as they contain predetermined questions and do not allow both interviewees and interviewers to seek elaboration or follow-up. On the other hand, semi-structured interviews consist of several key questions to define the areas for exploration, allowing the interviewer or interviewee to diverge, pursue an idea or response in more detail (Rutberg & Bouikidis, 2018). Similarly, useful when the subject is unknown or another perspective of a theory is needed, unstructured interviews are conducted without any preconceived theory or idea, following any specific order and they allow the participants to guide the discussion (Rutberg & Bouikidis, 2018). This approach to interviewing was upheld in interviewing farmers and key informants involved in this study.

Focus groups are a form of interviews that can be used in their own right (Gibbs, 2007; Rutberg & Bouikidis, 2018). In this study, following individual interviews with farmers, focus groups were also used to clarify and confirm data collected and to obtain group views on issues concerning farming, such as perceptions of farmers on group-farming, drought and the functions of the organisations supporting them. Focus group participants discuss a subject of interest and share their experiences and they can sometimes draw upon other respondents' attitudes, feelings, beliefs, experiences, reactions, perceptions or ideas (Marrelli, 2008).

The need to build rapport with the participants cannot be overemphasised. The scoping visits and interviews with individuals were taken as an opportune time to do so, whereby some farmers were identified, informed about the research and advised that their participation would be appreciated. This process was very relaxed, as the farmers and the researcher engaged in light discussions over a cup of tea and sometimes on the farm, with the farmer busy working.

The use of focus groups is very effective as these allow interaction of the interviewer with the interviewees (Marrelli, 2008) by providing them with a platform facilitating their involvement in decision-making about issues that concern them (Gibbs, 2007). In addition, a large amount of data can relatively be collected inexpensively and quickly through focus group discussions. However, despite the above, focus groups do not give the facilitator adequate control over the

data generated, because participants may withhold some information. Focus groups can be cumbersome to organise and conduct, especially with too heterogeneous groups requiring careful considerations of the gender and class of individuals (Rutberg & Bouikidis, 2018). This was the case with the smallholder farmers about whom the research team had limited information.

The ideal focus group size is 6 to 8 participants, excluding researchers, while as few as 3 and as many as 14 participants can comprise a group (Rutberg & Bouikidis, 2018). The least number of participants per focus group in this study was 6 and the maximum was 19. The maximum number was a result of the need to combine some of the participants from areas close to each other because of time constraints. In other areas, for example in the WCD, some of the farmers had deserted their homes because of the drought, and only a few had remained. As Rutberg and Bouikidis (2018) point out, small groups are more likely to limit discussions, while large groups can be challenging to manage for the moderator. Other participants who feel they get insufficient opportunities to speak may end up being frustrated. However, this challenge was not encountered in any of the focus group discussions conducted for this study.

The interview guide and social network mapping were used as techniques for collecting data. An interview guide is used in in-depth interviews because it enables the interviewer to obtain coverage of important areas missed out and ensures uniformity in the general data collected. Social network analysis involves mapping relationships or ties among people or organizations to gain unique insights into wide aspects of social phenomena (Hawe & Ghali, 2008). The network map is, therefore, used to facilitate the understanding, visualisation, discussion, monitoring, evaluation and improvement of the situations in which many different actors influence the outcomes of any intervention by the interviewer and interviewees (Schiffer, 2007). This technique was used to generate data, by developing maps that had links and levels of influence, about the nature of relationships between organisations and the farmers.

Manual and computer-assisted qualitative data analysis software (CAQDAS) are the two main ways of analysing qualitative data and they were both utilised in this study. More commonly, researchers use qualitative research software for example, NVivo or Atlas.ti to facilitate the management of data transcriptions (Sutton & Austin, 2015). As Baugh et al. (2010) highlight the manual process is sometimes needed to avoid missing crucial evidence and provide trustworthiness in the process. It also needs to be interspersed with CAQDAS for intimacy with the data and for drawing credible and defensible conclusions. The researcher used Atlas.ti software version 8.0 to organise and code data consolidated and transcribed from interview audios and field notes into various themes, and for generating network diagrams that would be used to explain some linkages in, for example, challenges during drought scheme implementation, relationships among organisations and impact of drought categorically. This

was done in acknowledgement of the fact that qualitative data analysis requires highly active engagement and a great deal of intellectual, practical, physical and emotional effort from researchers to carry out the research (Mason, 2013). Additionally, even though analysing qualitative data would greatly benefit from the use of CAQDAS, the process can still be tedious and exhaustive because organizing, tracking, encoding and managing the data are not trivial tasks (Evers, 2016). The research team had prior training in handling Atlas.ti software for the same purposes mentioned, so this was used as a strength.

The narrative style was adopted for reporting the findings and the discussion was done at the same time. A narrative style of reporting involves presenting findings in story form in thematic and chronologic reports or using reflexive first-person style in providing details of how researchers arrived at questions, methods, findings and considerations for the field (Levitt et al., 2018). In research reporting, headings reflecting the values in their tradition, such as findings instead of results, are presented, because qualitative researchers often see these aspects as intertwined (Yilmaz, 2013; Levitt et al., 2018). The subject matter under investigation, for example, livelihood and adaptation, have intertwined aspects in their nature given that the answers to the questions lie in the statements of the respondents, requiring that the discussion be done at the same time as the presentation of results, to maintain the connectivity of the matter.

When conducting qualitative interviews, audio or video recordings must be incorporated (Sutton & Austin, 2015). During the interviews conducted with the farmers, organisational staff and key informants, a voice recorder was used. The audios were later transcribed into transcripts that would be uploaded on Atlas.ti. Field notes were also taken during the interviews, together with recordings.

3.3.2.2 Quantitative research design

Descriptive quantitative research was used to complement the qualitative research design by facilitating the collection of data on the livelihood capital of farmers and background information such as the age, gender and level of education of the respondents, among other details (Pallant, 2013). Surveys were conducted with the farmers, using a researcher-administered questionnaire to collect the data and through face-to-face interviews over a minimum period of a week in each district. Surveys are commonly used to gather data in social sciences. Theoretically and methodologically, quantitative methods require the researcher to use a pre-constructed standardised instrument or pre-determined response categories into which the participants' varying perspectives and experiences are expected to fit (Yilmaz, 2013). Surveys use standardized questionnaires or interviews to collect a wide variety of unobservable data, such as people’s preferences, traits, attitudes, beliefs and behaviours (Almeida et al., 2017). This approach of collecting quantitative data was then used to identify trends in the adoption

of livelihood, coping and adaptation strategies by farmers, and to compare the findings for the two districts. The difference in the extent to which the farmers' livelihood capitals had been affected by the 2015-2018 drought required this kind of comparison.

Individual households of smallholder farmers in both districts were used as units of analysis in this study, to determine the trends in their strategies. The quantitative data analysis was done using the Statistical Package for Social Sciences (SPSS) version 26. The use of this software facilitated the generation of descriptive statistics by using mainly the cross-tabulation function for some variables, especially the different assets in each of the five categories. This further enabled the researcher to compare trends, for example, in the access of assets and drought coping strategies used in each district, among others.

3.3.2.3 Mixed and multi-method research designs

The collection of multiple forms of qualitative or quantitative data without integrating until inferences are made is called multi or multiple method (Creswell, 2015; Mark, 2015; Morse, 2015; Salmons, 2015). In this study, the multi-method was preferred because the component of quantitative data was small and the weight of the two designs was not comparable. Therefore, different qualitative methods of collecting data were used to answer some questions, given that the aim was to simply identify and describe the smallholder farmer's livelihood capital using quantitative data, as well as provide narratives of their experiences in farming, drought coping, and those of the organisations as they perceived them.

Reliability of the interpretation and representation of the participants' narratives in qualitative research is difficult to measure (Sutton & Austin, 2015). This means that in qualitative research triangulation and validity checking are important (Gibbs, 2007; Marrelli, 2008; Rutberg & Bouikidis, 2018). However, the quality of qualitative data analysis validity and reliability cannot be determined by any statistical or mathematical formula but lies in the power of its language to display a picture of the world in which people discover something about themselves (Chowdhury, 2015). It is suggested that trustworthiness can be used for the purpose and can be established through four criteria, namely credibility, transferability, dependability and confirmability (Sutton & Austin, 2015).

Validity testing in qualitative research is also possible through triangulation, that is, the convergence of information from different sources in which data source, method, investigator and theory are used (Carter et al., 2014). The data source triangulation can be between-method or within-method (Fusch et al., 2018). This is the closest method to the study in question, in which focus groups and individual interviews were conducted. The involvement of the key informants was also considered a way of adding clarity to the data provided by farmers concerning the support they were receiving. This aspect of using various data sources was

envisaged to clear issues of misinformation, bias, inconsistency and lack of understanding of some processes by farmers. It could be possible for farmers to misinterpret things because of lack of knowledge or as a way of venting their frustrations if they were not satisfied with the services provided to them. In the same way, the personnel from organisations could conceal some information if they felt that it could compromise their work integrity. Carter et al. (2014) point out that these two forms of interviews can be intentionally selected by the researcher for the purpose of data triangulation, or when focus groups are to be selected later during the research process, resulting from unanticipated challenges in data collection (Carter et al., 2014).

The research findings in Lambert and Loiselle (2008) revealed that comparing data from focus groups and individual interviews yielded an iterative process, seeking a deep understanding of the context of the phenomena and the convergence of the data. A combination of quantitative and qualitative techniques in a mixed-methods study would be between method or across method triangulation (Fusch et al., 2018). As Denzin (2009) stresses, the between-method triangulation is the ideal approach to account for flaws and deficiencies of each research method. However, Tobin and Begley (2004) argue that there needs to be recognition of the epistemological cannons of approaches used if the work is to demonstrate a true mixture of quantitative and qualitative research methods and that the option to incorporate triangulation must be carefully thought out and articulated. Method triangulation involves using multiple methods of data collection about the same phenomenon (Polit & Beck, 2012), such as interviews, observations and field notes and is frequently used in qualitative studies (Carter et al., 2014). Investigator triangulation involves the participation of two or more researchers in the same study to provide multiple observations and conclusions (Fusch et al., 2018), while theory triangulation uses different theories to analyse and interpret data, and it assists the researcher in supporting or refuting findings (Carter et al., 2014).

3.4 Ethical issues

Ethical clearance for the main WRC project and the PhD study was obtained from CPUT, while additional clearance was obtained from the WCDoA since the smallholder farming systems analysed belonged to the Western Cape province. Ethical considerations were upheld when communicating and involving the smallholder farmers in focus groups and other interviews. The purpose of the research was explained to the participants. The participants were assured of their anonymity. They were also informed that the data would remain confidential and only be shared with the researchers and the funders of the project and that the reports and thesis would be written from the data collected. All the participants were requested to sign a consent form (Appendices D and E) before the commencement of the focus group discussions and the individual interviews.

3.5 Limitations of the study

Several smallholder farmers were not fluent in English. However, a local Extension Advisor was used to interpret for Afrikaans-speaking farmers, while an IsiXhosa speaking Master's student assisted with IsiXhosa. Note that both the Extension Advisor and Masters student were part of the WRC project. The Extension Advisor did his Master’s degree studies within the project. Language was, therefore, not a major limitation. A number of farmers also spoke fluent English, and where required, they clarified some questions for their fellow farmers during focus group discussions.

CHAPTER 4
ANALYSIS OF THE SMALLHOLDER FARMER LIVELIHOOD STRATEGIES IN THE WESTERN CAPE PROVINCE, SOUTH AFRICA

Part of this chapter will be submitted for publication in the journal Water SA.

4.1 Abstract

The objectives of this study were to identify and analyse the capitals that smallholder farmers in the Western Cape had access to, and identify the challenges they faced in realising their livelihood outcomes. A qualitative research design was used, with quantitative data generated for descriptive statistics. A sample of 112 smallholder farmers from the WCD and OBD of the Western Cape was drawn using purposeful sampling. The sustainable livelihood framework was used to examine household capitals, along with the institutional policies and processes influencing the livelihood strategies of the farmers. Findings revealed the heterogeneous nature of smallholder farmers in the two study areas, as evidenced by the different ways in which they accessed capitals and utilised them as strategies to achieve their livelihood outcomes. Respondents were primarily involved in livestock and mixed production, with limited vegetable and field crop production. Farming was dominated by males, who constituted 83%. The proportion of the youth involved in farming (18 and 38 years) was less than 13%, implying that the future of smallholder farming in the province is bleak. The majority (90%) of the farmers did not have any tertiary education training and had up to 12 years of education. The proportion of respondents who did not have access to credit was 76%. The dominant land ownership in the two districts was the municipal lease. Group dynamics was a major setback resulting from large membership and the limited unanimous decisions taken. The possession of or access to various capitals does not necessarily result in successful livelihood outcomes, as was revealed by this study. The implication of the observed diversity of the farmers in terms of individual farm enterprises means that any developmental efforts should be tailored to suit the specific objectives of the farming households. More research should be conducted to investigate the impacts and strategies adopted by smallholder farmers during drought periods.

Keywords: Capitals, livelihoods, smallholder, Western Cape

4.2 Introduction

The purpose of Chapter 4 was to understand how smallholder farmers in the OBD and WCD could be described in terms of their location, assets and outcomes. This was envisaged to provide insights into the understanding of how access to different assets by different farmers determined how they utilised them for their livelihood. Furthermore, this exercise would facilitate the understanding of the diversities among farmers and how they would influence the

design, development, implementation and impact of programmes that enhance their livelihood in the future. The two main sub-objectives were:

- To identify and analyse the smallholder farmer's natural, physical, human, social and financial assets; and
- To identify the challenges faced by the smallholder farmers in the two districts.

4.3 Methodology

The sample comprised 52 farmers from the OBD and 60 farmers from the WCD. The farmers were selected using the purposeful sampling method and assistance from the WCDoA, as described in Chapter 3. Quantitative and qualitative data were collected through face-to-face and focus group interviews, using a semi-structured questionnaire (Appendix A) and an interview guide (Appendix B). The interviews took place between 4 to 9 December 2017 in the OBD and 7 to 13 January 2018 in the WCD. Focus group discussions were then conducted from 8 to 11 and 15 to 18 May 2018 in the OBD and WCD respectively, using the same participants. Five focus group discussions were conducted in each district. Recording devices and an interpreter were used during the interviews. Farmers signed attendance registers (Appendix C) and the completed questionnaires were numbered accordingly, to represent each interviewee. The questionnaire numbers were used in capturing and analysing the data.

The SPSS was used to generate descriptive statistics of the respondents in terms of demographics and capitals. The procedures of frequencies, descriptives and explore were followed to generate the statistics on the variables of the five livelihood capitals (natural, physical, human, social and financial). Cross-tabs were used to generate information about bivariate relationships and describe the interaction between two categorical variables. The data were mainly presented in bar graphs and simple expressions of percentages. Focus group discussions and individual qualitative interviews data were analysed using Atlas.ti software, specifically for the challenges and capitals to determine their linkages. All the focus group interview scripts generated from transcribing the interview audios were uploaded on the Atlas.ti software for coding, using different project names according to each district. The functions of open/list coding were used in most cases. Data were coded into sub-themes within challenges, while free quotations were generated for capitals, especially from focus group discussions. Most of the qualitative data were presented using direct quotations and network views, for example, challenges faced by smallholder farmers in their farming. This study used the SLF to structure questions on the five main livelihood capitals. Chapter 2 provides a detailed description of this approach. In this chapter, the idea is to apply the framework in determining the state of affairs of each capital category in the two districts.

4.4 Results and discussion

4.4.1 Access to human livelihood capitals

The findings of the study indicated that farmers in the two study areas had extensive farming experience. Approximately 48% of the respondents in the OBD and 60% in the WCD indicated that they had been farming for about 10 years, while in the OBD 29% and 18% in the WCD had been farming for 20 or more years. Considering the experience of a farmer is important to determine the possible reasons why some strategies for livelihood are adopted. Also, the feeling of some farmers that they were no longer comfortable to be defined as smallholder farmers emanates from the amount of experience acquired through the many years of farming. Table 4.1 shows some of the characteristics of human capitals by farmers, as identified in the two study areas.

Table 4.1: Human capital characteristics of farmers in the Overberg and West Coast

Characteristics	Percentage of respondents	
	Overberg district (n=52)	West Coast district (n=60)
Farming enterprise of the respondents		
Livestock	46	28
Field crop	6	2
Vegetable	2	7
Mixed	46	63
Age category of the respondent		
18-38 (Youth)	13	12
39-59 (Middle-age)	52	45
60-74+ (Old-age)	35	43
Gender of the respondent		
Male	88	77
Female	12	23
Education levels		
Never been to school	2	3
Grade R to grade 8	31	42
Grade 9 to grade 11	46	25
Matriculated (Grade 12)	13	17
Higher national certificate	4	5
University qualification	4	8
Size of the respondent's family		
1-3	42	32
4-6	52	58
7 and above	6	10

As shown in Table 4.1, respondents in the two study areas were primarily involved in livestock and mixed production, with a mean of 37% and 54.5% farmers involved in livestock and mixed farming in the OBD and WCD respectively. Of all the farming enterprises, the two with the least number of producers were vegetable production (such as green beans, tomatoes, carrots butternuts and pumpkins) in the OBD and field crop production in the WCD. Field crop production entailed mostly small grains such as wheat, barley and canola. Integrating crop and animal production holds potential advantages in smallholder farming, such as the creation of additional produce markets in the form of crops to be used as animal feed and animal products and the local supply of animal manure for use in the management of nutrient availability in cropped land (van Averbeke, 2008).

A key informant indicated that the reasons why there was limited vegetable production during the period when the study was conducted were because when the funding for the vegetable commodity group was approved, it coincided with drought. The money which was meant to be given to the farmers in the vegetable production commodity group was, therefore, reversed due to agricultural water shortages for production. During the study, one of the vegetable farmers indicated that his land had remained fallow for three years as he could not farm because of the lack of funding. This is because the farmer relied on the government for funding his vegetable production. Thus, in this case, vegetable production was discouraged due to drought, which means the commodity approach takes into consideration various factors before implementation is promoted. This impacts how smallholder farmers can be influenced in their decision-making by the organisations supporting them. However, among the vegetable-producing farmers, some managed to continue planting because they had water available for supplementary irrigation. Examples are those farmers who had boreholes and those who could afford to fetch water from the rivers or dams.

Table 4.1 reflects the involvement of farmers in one or more types of livestock production, including sheep, goat, pig and cattle production, while others specialised in poultry production. The dominant livestock enterprises were cattle in both districts. The small stock consisted of sheep and pigs. However, the commodity approach seemed to be a factor in what respondents could specialise. One of the OBD respondents revealed that she would have loved to keep cattle because she loved them. However, the commodity approach limited her in that she could not fully enjoy the right to choose her preferred commodity so she ended up settling for sheep production. In other words, the WCDoA had a final say in determining the commodity that the farmers would end up being engaged in. This is just one of many cases whereby support provided to the smallholder farmers influenced the livelihood strategies adopted to achieve the desired outcomes.

Concerning the age category of farmers, the findings revealed that the 39-59-year age category had the highest percentage of respondents in the two districts (Table 4.1). The least number of respondents belonged to the youth category (i.e., aged between 18 and 38 years) with a mean of 12.5% for the two districts. However, in a few households, children were furthering their studies in fields like Agriculture, Financial Management, and Administration, so that they could assist in managing the farming businesses. Nonetheless, there was limited interest by youth to be involved in farming in the Western Cape, as also confirmed by Molotsi et al. (2019). The same was confirmed by respondents in both districts during focus group discussions. The held a view that the removal of agriculture from the school curriculum had deprived the young people of agricultural exposure. One respondent from the OBD said the following concerning the earlier submission:

> Yes, first the agriculture subject has been removed from our schools. The government must put an experimental farm and invite the schools to the farms over the weekends and expose the children to physical stuff.

In the WCD, during a focus group discussion, a participant expressed that:

> Our children are not exposed to agriculture. Some of our children do not even know how to handle the tools and they don't know how to plant even a simple bean.

As far as exposure to farming is concerned, one of the farmers added that the lack thereof was a concern because it tended to create a perception and/or attitude that farming was always associated with dirty work. Another view related to this was that the perception was being created by large-scale commercial farmers hiring people to work on their farms, with little to show. One respondent commented on this view:

> The white commercial farmers are giving our children the perception that farming is hard labour because the mothers wake up at 4:00 am to jump onto the trucks, they work and become tired and the children are afraid. Other children, they do not see; they are not exposed to agricultural activities. These are some of the reasons why the young ones do not see a future in farming and prefer looking for other jobs in the towns.

This lack or limited interest by youths to be engaged in farming activities was not only peculiar to the Western Cape, as confirmed in a study by Gandure et al. (2013). Similar results were reported in Limpopo Province where 64% of the respondents were between the ages of 46 and 65 years (Mapiye et al., 2018). Similarly, Mapiye et al. (2009) reported the dominance of older people (>50 years) in smallholder farming over youths. The low percentage of the younger generation implies that the future of farming was becoming a concern and that it needed attention. The same could inhibit the widespread adoption and application of new agricultural technology. The study by Gandure et al. (2013) in the Free State Province revealed that the youths viewed agriculture as requiring large investments in financial and human resources, whereby the benefits would accumulate over a long time. A possible remedy to this

might be to promote youths' inclusion in farming businesses through improved financial support and increased information access as suggested by FAO (2014).

Smallholder farming in the two districts was dominated by males, as shown by the number of respondents in this study (Table 4.1). Fanadzo et al. (2010) reported the same results in the Eastern Cape Province, whereby 85% of the farmers were men while 15% were women, all being widows. These results seem to be in contrast with most other provinces and African countries, where the majority of smallholder farmers were women (Gandure et al., 2013; Mulinya, 2017; Ubisi et al., 2017). A possible reason why farming is dominated by men in the study areas could be the nature of the farming enterprises which are mainly livestock and mixed production. Women are commonly involved in vegetable production which normally requires smaller pieces of land. One key informant indicated that the reason why the Western Cape smallholder farming sector is dominated by men was that the men involved in farming were previously employed full-time and only started venturing into farming after retirement. The farmers used to stay in towns with their families when they were fully employed and only moved to rural areas to start farming. This may help to explain why the farmers used remittances and pensions as the most important sources of non-farm income. This is in contrast to other provinces in South Africa, where men largely worked in the mines, leaving women to engage in crop or vegetable farming on smaller pieces of land.

Female farmers in the age category of 39-52 years (8%) were more than those in the age categories of 18-38 (2%) and 53-74 (2%). The highest percentage (11%) of women in the WCD was in the 53-74 age category and slightly different from the 39-52 age category (10%) (Table 4.1). This suggests that the few women involved in farming were middle-aged and older. There were few reports of discrimination against women in the two study areas. One woman in the WCD expressed that sometimes during their farming group meetings, decisions were made without her input. Women involved in farming were mostly old and those who did not belong to a formal group were taking decisions for their activities. There were households where women were involved in the farming business with their husbands, in which there was a sense of mutual relationships. Division of labour, according to strengths, in some cases, allowed some women to be hands-on and sometimes lead the business. Another woman who was working together with her husband had won a national female farmer award.

As shown in Table 4.1, the majority of farmers (63% for the two districts) did not have any tertiary education training. Overall, less than 6% of the respondents in the two districts had obtained a tertiary qualification. Apart from formal education, 40% and 60% of the respondents in the OBD and WCD respectively, indicated that they acquired knowledge through farm-related activities conducted by the WCDoA and other private organisations. These activities included demonstration sessions, training, farmer information days and workshops. The

provision of ongoing farmer training was also reported by Ndoro et al. (2014) in South Africa and Homann-Kee Tui et al. (2013) in Mozambique. Gandure et al. (2013) reported contrasting results in which respondents had no access to any extension services. Over 50% of farmers attended farm-related activities conducted by the WCDoA in both districts under study. The topics covered during these activities included recordkeeping, tractor driving and maintenance, fire-fighting, fencing and production, and were provided to respondents according to their area of specialisation. These topics were centred on some of the challenges experienced by the respondents in everyday farming activities, such as theft of livestock, and administration. In Wilk's study (2013) respondents mentioned that they also required knowledge on budgeting and farm finance because it is needed to plan and maximize profits on the farm.

Only 19% and 11% of the respondents in the OBD and WCD respectively indicated that they did not need any skills development. This translates to a mean of 15% for respondents who did not need further training, while an overwhelming majority of 85% indicated that they needed capacity building through training. The lack of need or necessity for further training by some respondents can be attributed to the availability of farm-related activities in the areas, which they possibly consider adequate. However, the dominance of the farming sector by the middle to old-aged individuals can potentially influence the desire to acquire skills and increase the percentage. It could, therefore, be argued that the older farmers get, the more they consider retiring from farming. However, this was not the case, since the majority of farmers are aged 39 years and above. All the same, the overwhelming majority of those who would want to improve their skills was consistent with the attendance at the farm-related activities, which was encouraging. Areas of skills improvements, as mentioned by some of the participants, were livestock production (mainly animal health), farming in the tunnel, financial management, book-keeping, administration and management of the farm, to mention a few of them.

With respect to the family size of the respondents, Table 4.1 shows that the majority of respondents' households comprised 4 to 6 family members, with a mean of 55% for the two study areas, while those with 7 members and more were the least, with a mean of 8%. Fanadzo et al. (2010) reported similar results for smallholder crop producers in the Eastern Cape Province where the mean household size was 5 people with a range of 1 to 8. Mapiye et al. (2018) obtained similar results among beef producers in Limpopo Province where 54% of the respondents had 3 and 6 members as household size ranges and 6 as the overall mean household size for the sample. Household size is used as an indicator for labour availability among smallholder farmers as they depend mostly on family labour (Kabunga, 2014).

It is shown in Table 4.1 that about 23% of the respondents in the two study areas indicated that they did not involve their family members in farming activities, implying that the family is a common source of labour in the two study areas. Family members were involved in various

activities, such as watering the vegetables, feeding livestock and administration work. Apart from using the family as a source of labour, respondents in the two study areas indicated that they hired casual labour, according to the work available and their capacity to pay the workers. In the two study areas, 15% of respondents indicated that they did not hire casual labour. The frequency of hiring casual labour in the two study areas varied from weekly, monthly, seasonally to annually, depending on the agreement made. The highest percentage of the respondents hired casual labour seasonally, with 33% and 40% for the OBD and WCD, respectively. Seasons referred to in this case varied, for example, cultivating and harvesting time, breeding, and other production-related activities. However, some of those who indicated that they did not hire casual labour identified the lack of capacity as the main reason for not doing so, while others had adequate family labour for their farming. The 2015-2018 drought had affected people's livelihoods to the extent that labour hiring was cut, as one respondent indicated. Permanent workers were hired by 39% of the respondents in the OBD and 27% in the WCD.

4.4.2 Access to financial capitals by respondents in the two districts

All the respondents in the two study areas indicated that they received a portion of their income from farming. Smallholder farming with support, specifically land and water access from the government, requires that the practices be registered and that they operate as businesses. In the OBD, 6% of respondents indicated that they do not regard their farming practice as a business, while in the WCD it was 2%. Besides the registration of farming practices being a prerequisite to obtaining support services from the public and private sector, operating a farm as a business was proposed to enhance operations by smallholder farmers, eventually translating to ownership and decision-making. This was evidenced by a concerning statement from one of the respondents, in a focus group discussion in the OBD, who said:

> Smallholder farming is not a farming business, like commercial farming. It's very, very small-scale, so you don't have a budget or any planning, you just go day by day, once you got five cows you just go, you don't think in the future but we can expand.

Farmers received advice on how to operate farming as a business, and this was possible when a change of one's mind-set occurred, enabling ownership of their work and operating in a way that makes their enterprises profitable and sustainable. However, it was not determined how significant the farming income was contributing to the financial capital of the respondents. Other non-farm activities contributed to the income of smallholder farmers in the two districts, as depicted in Figure 4.1.

Pension funds (mean of 33.5%) and remittances (mean of 29%) were the main sources of non-farm income for the two study areas (Figure 4.1). Of those who were receiving remittances, it was from son, daughter, mother or father.

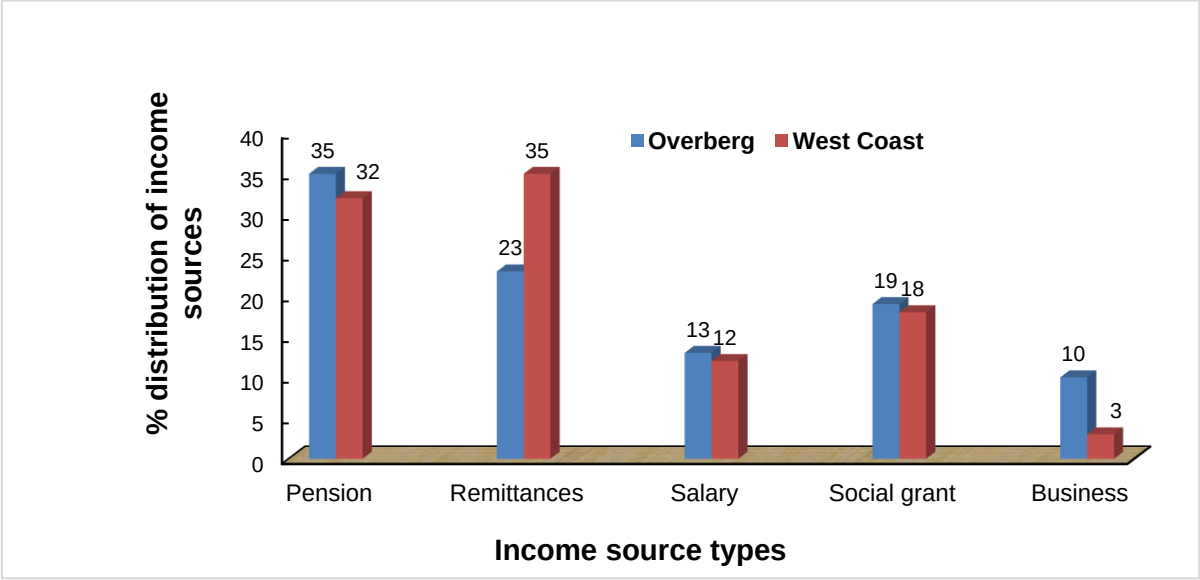


Figure 4.1: Non-farm income sources for smallholders in the Overberg and West Coast

In the OBD 4% and the WCD 10% of the respondents were employed part-time, while full-time employment was reported by 21% (OBD) and 10% (WCD) of respondents, enabling them to earn salaries. In total, 52% of the respondents in the OBD and 62% in the WCD indicated that they possessed other non-farm skills such as painting, construction, and other skills, which they utilised to engage in activities that contributed to their financial capital. Social grants were received by 19% and 18% of the respondents in the OBD and WCD respectively. This reflects the importance of such an income source in South Africa, as reported by Chikazunga and Paradza (2013). The understanding of this scenario in South Africa is consistent with that of DAFF (2013), that farming was not always the main source of income for smallholder farmers. Chingala et al. (2017) found similar results in Malawi.

Private business income was the least source of non-farm income among the respondents in the two districts. Private businesses included, for instance, taxi, coffee shops, guesthouses, mechanics and construction. Figure 4.2 is a photograph taken from one of the coffee shops in the OBD, operated by one of the respondents.

Figure 4.2: Private coffee shop products of a smallholder in the Overberg district

In the OBD, 69% of respondents and 83% in the WCD reported that they had no access to credit providers. Among the respondents who indicated that they had access to credit, 23% of them were paying interest rates in the OBD whereas those paying interest rates were estimated at 5% in the WCD. The farmers who engaged in contract farming arrangements were 13% of respondents in the OBD and 8% in the WCD. The service providers included cooperatives, commercial banks and the Land Bank of South Africa. However, 2% of the respondents in the OBD reported having access to the Land Bank, while in the WCD there was none. Among those who had not borrowed money, some respondents indicated that they preferred debt-free farming businesses, citing that it was expensive to borrow. A respondent in one of the OBD focus group discussions said:

> Sorry! I think it's not affordable, it's expensive, because of interest rates, it's too much and you are worried at the end of the year, whether I will be able to return their money, you know?

Ndoro et al. (2014) reported on the negative effects of indebtedness on market participation among small-scale livestock farmers in the Northern Cape Province in South Africa. The variance in the numbers and affordability to hire casual labour in the two study areas, as noted earlier, could be a good example of how financial capital or the lack thereof can influence the adoption of other aspects of livelihood strategies and their implications on farm productivity. The perception of borrowing for farming should be considered seriously when assisting smallholder farmers through enhancing their access to financial capitals to avoid entangling them in a vicious cycle of poverty and heavy indebtedness. Among the respondents who indicated that they saved money, 39% in the OBD and 42% in the WCD invested in livestock or grain production, while those who used commercial banks were 43% and 40% for the OBD and WCD respectively. The proportion of respondents who had cash savings was 27% for the OBD and 19% for the WCD.

4.4.3 Access to natural capital by respondents in the two study areas

Individual land sizes in the OBD and WCD were difficult to ascertain because farming was mainly practised in groups, such as cooperatives and trusts. Nonetheless, the land sizes ranged from 0.5 to 1,325 hectares in the OBD and 0.5 to 6,088 hectares in the WCD. Land ownership types for the respondents in the two districts are shown in Figure 4.3. The dominant land ownership type in the two districts was municipal lease (52% in the OBD) and 30% in the WCD (Figure 4.3). Government lease was the least type in the OBD (8%), while in the WCD, purchased land received the least (12%). In OBD, inherited land ownership was purchased (13%) and private leased (14%). In the WCD, private lease was the second most important (24%), followed by inherited (17%) and purchased (12%). In a study conducted in the Limpopo Province by Mapiye et al. (2018), over 60% of the respondents were farming on leased land, 23% farmed on communal land and 16% farmed on privately-owned farms. The majority of these were leasing land under the government's land restitution programme.

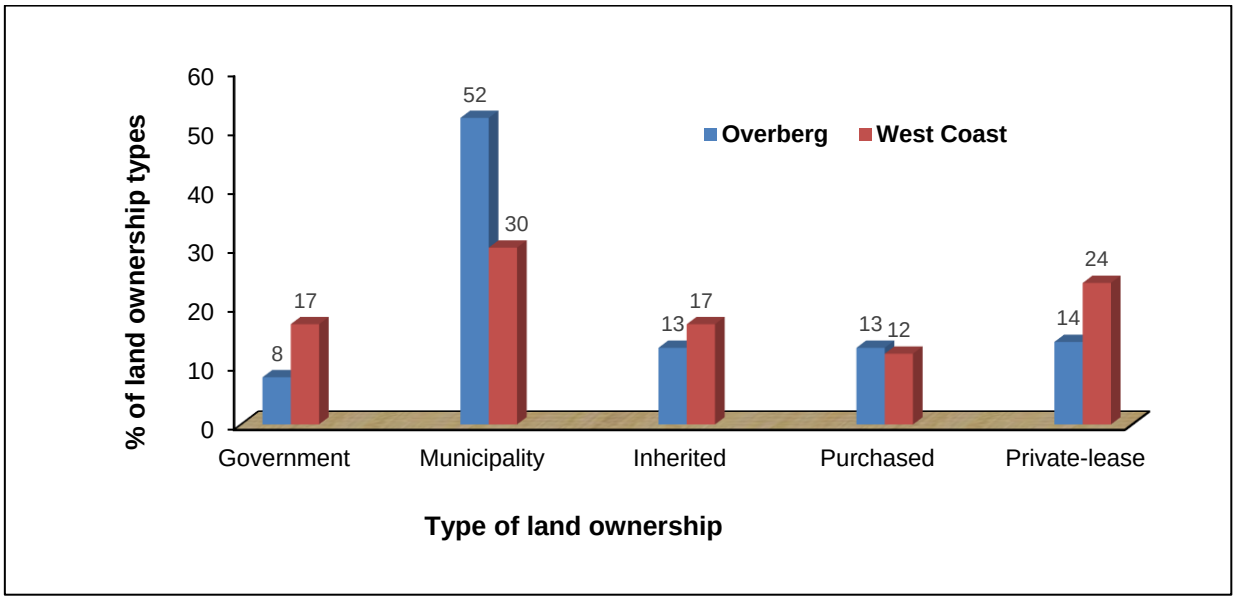


Figure 4.3: Typology of land ownership for smallholders in the Overberg and West Coast

In the OBD, 72% of the respondents indicated that their land was not adequate, while in the WCD 67% indicated this same sentiment. However, even those who accessed adequate land through different means still experienced challenges with the leases that were short, or in most cases, there were no written contractual agreements. This complicated their access to other resources, such as water, which was usually attached to the land. About 92% of the OBD respondents who had indicated that their land was not enough had to borrow more land, while in the WCD it was 51%. Some respondents indicated that even though they had sought additional land from the government and individuals, they were not successful because the available additional land was sometimes unworked and required clearing, which proved to be very expensive and time-consuming. Machethe (2004) argues that the limitation of land drives farmers to engage in other non-farm activities to make ends meet, keeping the small land as a form of security.

Sources of water identified in the two study areas included dams, wells, rivers, tap and boreholes. Figure 4.4 shows the various water sources for the two study areas.

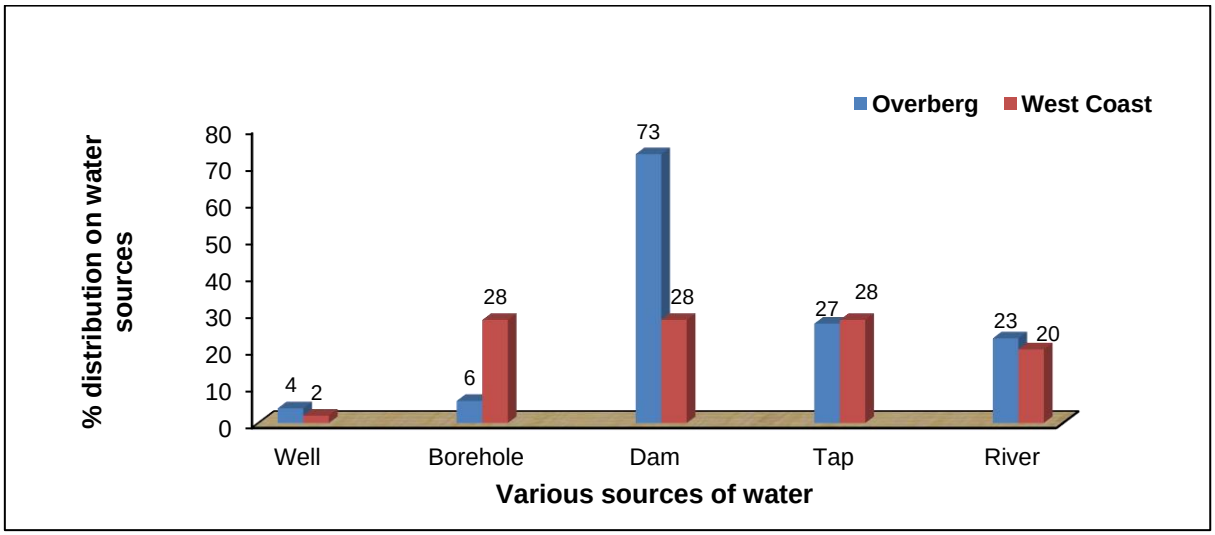


Figure 4.4: Water sources used by respondents in the Overberg and West Coast districts

In the two study areas, the dam was the main source of water, while the least used was the well (Figure 4.4). The three main water authorisation types for smallholder farmers in the two study sites were municipal, general and water use license. These had almost the same distribution—municipal authorisation (27% - OBD; 33% - WCD), general authorisation (31% - OBD; 22% - WCD) and water use licence (29% - OBD; 33% - WCD). General authorisation does not require smallholder farmers to have legal documents to qualify (Sadiki & Ncube, 2020), and initially, allowed people to use any amount of water without paying (van Koppen & Schreiner, 2014). The water use licence is dependent on whether the individual has the capacity to apply for it in terms of information needed and the know-how to use it (Sadiki & Ncube, 2020), while the municipal authorisation applies to those who lease land from the municipality. Again, in the latter case, the land-water nexus comes into play[4]. Water pumps or pipelines were the main infrastructure used to transport water from the source to the farms in the OBD, while it was the canal systems or pipeline in the WCD.

4.4.4 Access to physical capital by smallholder farmers in the two study areas

Grain and livestock farmers in the OBD indicated that they had arranged markets with BKB Wool for wool, SA Breweries for grain and local abattoirs for livestock, Overberg Agri and Soil for Life factory and the community, among other organisations. In the WCD, abattoirs, Syngenta and Tiger Brands were mentioned as the major markets. The community and neighbours were also mentioned as part of the markets by the respondents in the two study

4 Further discussion on water authorisation, land-water nexus and the implications of these factors on smallholder farmer's livelihood strategies are identified in Chapter 6.

areas. Molotsi et al., (2019) found that farmers in the WCD were more likely to sell their products to the informal market because of the little amount that they fetched when they sold their sheep to the abattoirs. In this study, local community, off-take agreements (arranged markets), auctions for livestock and the word of mouth were identified as the common strategies for marketing farm produce in the two study areas. Email, social media and telephone were also mentioned as media for promoting marketing and advertising products. The distances between the respondents' farms and markets varied from 1 to 300 km in the OBD and up to 400 km in the WCD. Transport used was dependent on where the markets were and the arrangements between the producer and market supplier. There was no transport cost for those who sold their products to the local community, while others paid transport costs of up to R3,600 for a return trip. Mostly, those with off-take agreements did not have to worry about hiring transport from neighbours, as was the case with other farmers.

The proportion of respondents who did not own houses was 17% in the OBD and 53% in WCD. In terms of additional buildings such as animal and storage facilities, 60% and 75% of the respondents in the OBD and WCD, respectively, indicated that they had no ownership of such. The lack of freehold land ownership limited the usage of their financial capitals on the land occupied through lease agreements, as expressed by one of the respondents in the OBD:

> When I started, I received 3 years lease agreement. Now I received a 1-year lease. I cannot go to the bank to borrow money. I am at high risk.

Figure 4.5 shows a storage building, which is not being renovated because of insecure land ownership arrangements.

Figure 4.5: Storage building in the Overberg, not renovated due to land tenure insecurity

The lack of appropriate lease agreements between farmers and the owner of the land may be destructive by affecting not only the production but also different assets such as secure storage facilities for animals, feed storage, storage of harvested produce, inputs and the costly production equipment, as these can as well be a setback to farming (Bembridge, 2000). Electricity and gas were the main sources of energy used in both study areas. Solar power and diesel generators were the least used. Electricity cost was increasing due to the drought in the two study areas, because of the growing need to pump water. Moreover, lights were being kept on for the animals throughout the night, because of increased cases of theft. The study by Kotze and Rose (2015) highlighted that there was an increase in the interest for the use of renewable energy sources such as wind, solar, geothermal and effluent heat, although there were foreseen challenges of the lack of capital and incentives, the perceived high risk involved in new technology

The most common mode of communication was the smartphone, with 94% and 92% of respondents citing its use in the OBD and WCD respectively. The least common communication modes were fax (2% and 10%) and two-way radio (6% and 3%) for the OBD and WCD respectively. Although the smartphone was the most common mode of communication in both districts, there was a need to understand that this required high levels of literacy and competence to navigate all its benefits.

4.4.5 Access to social capital by smallholder farmers in the two study areas

Membership to a trust, cooperative and other forms of informal group was estimated at 79% in the OBD when compared to the WCD, which had 73%. The proportion of respondents who paid group membership fees was 83% in the OBD and 64% in WCD. Table 4.2 summarises the responses of participants on the frequency of group meetings, their attendance and their opinions on the functioning of the groups.

Table 4.2: Responses of Overberg and West Coast participants on group meeting frequency, attendance and opinions on performance of the groups

Question	Response	% Overberg (n=52)	% West Coast (n=60)
How often do you meet as a group?			
	Once a week	37	5
	Once a month	27	30
	Once a year	8	2
	Other	6	33
	Not applicable	22	30
How often do you attend your group meetings?			
	Always	32	52
	Most of the time	27	5
	Once in a while	9	13
	Other	10	0
	Not applicable	22	30
In your view, is your group functioning well?			
	Yes	63	37
	No	6	6
	Maybe	9	1
	Not applicable	22	16

Group meetings were held weekly and monthly in the OBD, while in the WCD, monthly meetings and 'other' were dominant. The concept of 'Other' includes those spontaneous meetings that were not planned or those meetings that were suddenly called for specific issues. Respondents in both districts indicated that they discussed various farm-related issues in their meetings, such as water, land, job creation, conflict resolution, challenges, plans and climate change, among others. Some indicated that they shared ideas on the different ways of production and running the farming business. They also mobilised resources for the benefit of all, accessing assistance from the government and private organisations as groups. The reasons stopping some respondents from being part of any group included a lack of time and interest. Other farmers expressed their feeling of having enough experience to become a member of any group. The issue of security and safety at the farms tended to hinder some farmers from attending meetings.

4.4.6 Challenges faced by smallholder farmers in the two study areas

The challenges reported here are those that the respondents experienced when partaking in the activities allowing them to achieve their desired livelihood outcomes. These challenges were identified and are reported within the five livelihood capitals. Figures 4.6 and 4.7 depict the challenges faced by the respondents in the OBD and WCD respectively.

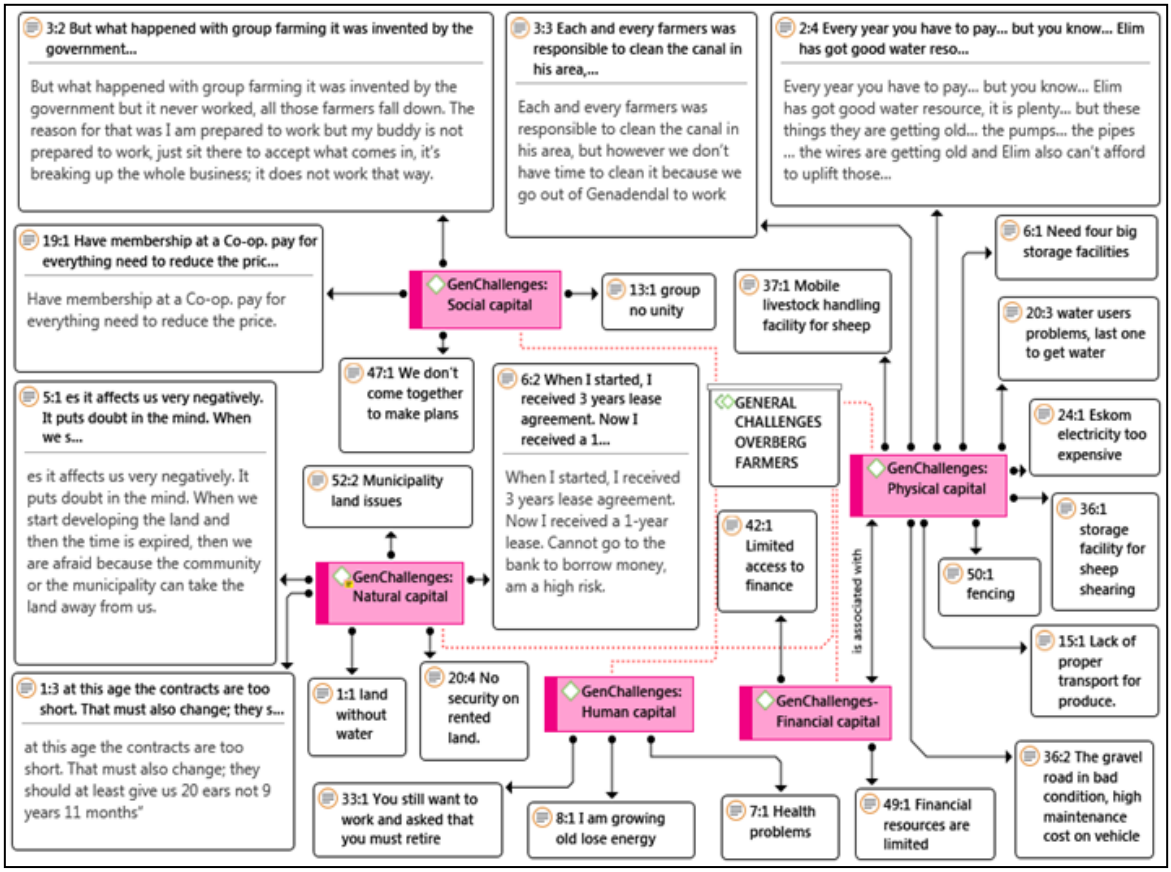


Figure 4.6: Network view of the challenges faced by farmers in the Overberg district

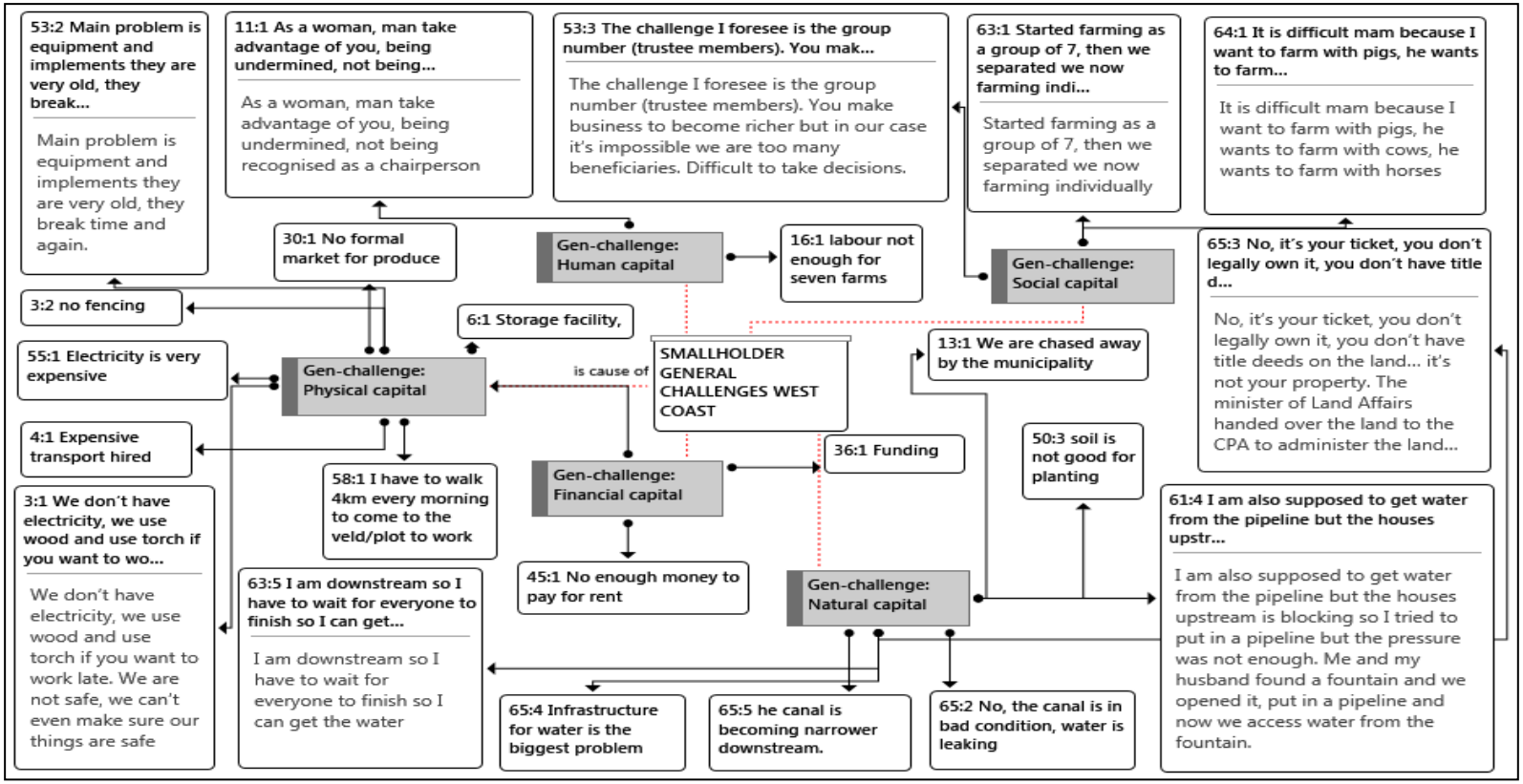


Figure 4.7: Network view of the challenges faced by farmers in the West Coast district[5]

5 The numbers that are included on respondents' quotations do not represent any value in this and other similar figures or network views. They are automatically generated by the Atlas. ti software during data coding.

4.4.6.1 Smallholder farmer challenges in accessing human capital

In the WCD, only one woman reported that she was experiencing challenges in being integrated into the farming group due to her being undermined. However, the irony around this claim was that she was the chairperson for that particular group, which may suggest that her election and appointment into that position may have been with certain motives. There were no gender-related issues reported in the OBD. Regarding old-age, two respondents in the OBD indicated that old age was catching up with them, while another one complained of ill-health (Figure 4.6). Although the highest percentage of old-age was recorded in the WCD, compared to the OBD, no complaints about ill-health were received from the former. However, this does not exempt the district from the fact that the health status and age of an individual are subtle impediments to livelihood productivity.

4.4.6.2 Smallholder farmer challenges in accessing physical capital

The major challenge reported in the WCD was the lack of access to or affordability of electricity (Figure 4.7). The same challenge was reported in the OBD. This was due to the increased usage of the resource in pumping water, lighting, and fencing, among other things, making it expensive. Activities such as transporting produce to the market, water to the farms and feed to storage were also a challenge to some because of the costs associated with hiring transport and the bad condition of the roads. Lahiff and Cousins (2005) argue that effective development of the smallholder sector needs higher level upgrading of roads and bridges in rural areas, construction of marketplaces, storage and processing facilities, such as mills and abattoirs, and support for local providers of agricultural services. Similarly, the government needed to acknowledge the need to reshape markets to achieve wider changes in the market environment, in which small producers were often marginalised (DAFF, 2012a). There were also reports on the shortage or lack of water storage, animal housing and fencing from the OBD and WCD (Figures 4.6 and 4.7) respectively. Gandure et al. (2013) found that in the Free State farmers lost their crops and livestock to theft and physical attacks because of the lack of fencing around the farms. Accordingly, the same Figure (4.6) highlights that respondents in the OBD reported that water infrastructure was old, and constantly breaking down. Sadly, in places where water was abundant, negligence in maintaining the infrastructure was apparent, as witnessed by the researcher during focus group discussions. This shows how dynamic the challenges for smallholder farmers can be and the implications of providing solutions tailor-made for their needs.

4.4.6.3 Smallholder farmer challenges in accessing financial capital

There was a general lack of finance, as reported by the respondents in both sites (Figures 4.6 and 4.7). The reason for the lack of financial capital was not specifically sought from all individuals. However, as indicated earlier, some of the farmers were simply not interested in

borrowing money for farming, fearing the high risk of high-interest repayment rates. On the other hand, information about sources of finance for credit was also limited. This was a general and persistent challenge for a great number of smallholder farmers and was potentially the influencing factor on the other four livelihood capitals, despite it being influenced by other capitals as well. This was also evident in the reports by other respondents, who indicated that they had no fences, storage for water and transport for produce, as these were associated with the lack of financial capital to invest in such activities and assets. However, as expressed by respondents from both districts, particularly in the OBD, there was a mixed feeling in accessing funding through borrowing, whereby one group regarded debt as frightening, while others had borrowed or could not, due to the lack of access to creditors.

4.4.6.4 Smallholder farmer challenges in accessing natural capital

Respondents in the OBD (Figure 4.6) indicated challenges around land access in terms of lease agreements that were too short, and of land sizes that were too small. This resulted in farmers struggling to access enough water since it is well-known that land and water are tied together in South Africa. These circumstances presented farmers with doubt and insecurities and influenced their decision-making concerning how they could make long-term investments on the land. On the other hand, the water infrastructure challenge manifested itself through the unequal upstream-downstream distribution of water in the two study areas. There were reports of farmers manipulating the water infrastructure and diverting water into their own farms from both districts. This resulted in other farmers in the same area not having water, while others had plenty. A study by Reid and Vogel (2006) revealed such challenges in an irrigation scheme and argues that this was due to the lack of institutional support and appropriate governance structures. There could be aggravation of such vulnerabilities by water conflict, resulting in reduced livelihood securing capacity in future stresses related to climate.

4.4.6.5 Smallholder farmer challenges in accessing social capital

One of the major challenges in the two districts was the theft of livestock and crops, resulting from social ills caused by the drought. Too large group membership sizes and failure in taking decisions to further everyone's interest, as expressed during focus group discussions and reflected in Figure 4.6 (OBD) and Figure 4.7 (WCD). In a focus group discussion of the respondents from OBD, it was revealed that some funds that were meant to benefit the group in the rehabilitation of a canal had been misallocated. Different personalities of group members were reported as derailing others in the two study areas, for example, where some people do not want to work. All these and other factors resulted in the malfunctioning of some of the groups. Gadzikwa et al. (2006) identified the 'free-rider' challenge apparent when working in groups, their management and technical capacity was found to be elusive (Thamaga-Chitja &

Morojele, 2014). Thus, there was a need to understand community group dynamics to effectively support and strengthen social networks.

4.5 Conclusions and recommendations

This study was conducted with the aim of determining the types of accessed livelihood capital, the adopted strategies and the challenges faced by smallholder farmers in the OBD and WCD in the Western Cape. Smallholder farming in the two study sites was dominated by men. The few women who were involved in the farming sector were old and were mostly farming as individuals. The percentage of the youths engaging in farming was low, implying that the future of smallholder farming in the province was bleak. The access to livelihood capitals and the strategies used varied from one farmer to another. However, the access to these capitals did not necessarily translate into their utilisation. The main challenges for smallholder farmers included the malfunctioning of the farming groups, the lack of enough water and adequate infrastructure, market-related issues such as the long distance between farm and market, land shortage, and increasing production costs. The 2015-2018 drought contributed to the latter and the shortage of water. Further research should look into how the 2015-2018 drought compromised the livelihood capitals of smallholder farmers in the Western Cape, and how they utilised their assets to adapt to it. The implication of the observed diversity of the farmers in terms of individual farm enterprises meant that any developmental efforts should be tailored to meet each one's needs.

CHAPTER 5
SMALLHOLDER FARMERS' COPING AND ADAPTATION STRATEGIES DURING THE 2015-2018 DROUGHTS IN THE WESTERN CAPE, SOUTH AFRICA

The following paper has been published as part of this chapter:

Fanadzo, M., Ncube, B., French, A. & Belete, A., 2021. Smallholder farmer coping and adaptation strategies during the 2015-18 drought in the Western Cape, South Africa. *Physics and Chemistry of the Earth, Parts A/B/C*, 102986. https://doi.org/10.1016/j.pce.2021.102986

5.1 Abstract

Smallholder farmers are vulnerable and hardest hit by droughts in Africa. One of the main causes of the increased vulnerability is limited access to resources, hence; their limited drought preparedness. The heterogeneous nature of smallholder farmers means that they deal with droughts differently. Meanwhile, the perceptions of farmers towards droughts and their impacts determine the extent to which they plan and deal with them when they occur. Responses to drought are context-specific, depending on the socio-economic, political, and cultural dimensions, which make it difficult to generalize. However, information on smallholder farmer perceptions, impacts on livelihoods, and the way droughts are dealt with at farm level is scarce and mostly site-specific.

This paper presents the findings from a study conducted in in the West Coast and Overberg districts, in the Western Cape Province, South Africa, to assess the impacts of the 2015-2018 drought on the smallholder farmers' livelihoods. The study aimed at determining the drought perceptions of smallholder farmers, impacts and the coping and adaptation strategies utilised in the study areas. The Sustainable Livelihoods Approach was used to frame questions on the coping mechanisms used by farmers, and any other strategies developed to adapt to future droughts. The study employed the qualitative research design and a sample size of 112 smallholder farmers from the two districts. Face-to-face interviews and focus group discussions were used to collect data, which was analysed using Atlas.ti version 8.1 for Windows.

The majority of the respondents in the two districts (67% and 60%) in the Overberg and West Coast districts, respectively, expressed that it was becoming hotter and drier each year, while others associated drought with climate change and increasingly high temperatures. Predation was reported as a common 2015-2018 drought environmental impact, associated with habitat disturbances and resulting in increased presence of wild animals. Other environmental impacts included poor water quality, increased prevalence of pests, weeds, and diseases. Economic impacts such as income loss due to altered market contracts, reduced crop yields from crop failure and theft of livestock/crops were reported by respondents in the Overberg and West Coast districts. Under social impacts, farmers complained that up-downstream water-related

conflicts were increasing in the two areas. Theft of livestock and crops was also reported, because people no longer had jobs.

Coping and adaptation for water shortages reported by the farmers in the two districts were the transportation of water to the farm, sharing of water rights, use of boreholes and reducing the planted area for crops. For the shortage of livestock feed, majority of farmers in the Overberg and West Coast district mainly bought extra. In the Overberg District 17% of the respondents received drought support from the government in the form of fodder vouchers while in the West Coast District, it was 72%. Indirect assistance was also received by smallholder farmers in the form advice, information, technical support and provision of other resources including land. Four per cent of the respondents in the Overberg District reported having used insurance as an adaptation strategy, while there was none in the West Coast District. Social networks were reported in both districts as an important coping and adaptation strategy to the 2015-2018 drought. Challenges reported by the smallholder farmers in the Overberg and West Coast districts in coping and adapting to the 2015-2018 drought included the increased production cost and the lack of or limitation of resources to employ different strategies.

This study concluded that the perceptions of farmers had limited influence on the extent to which they had prepared for the 2015-2018 drought. The flexibility in the access to various livelihood assets facilitated better coping and adaptation to the 2015-2018 drought in the two districts. Hence, the different ways in which the drought was dealt with confirmed their heterogeneity in their livelihoods assets possession.

Further research is required to determine the best models of support to smallholder farmers to empower them for adaption to future droughts. There was a need to determine how external assistance had influenced the utilisation of various assets for livelihood, coping and adaptation by smallholder farmers in the two districts. Tailor-made solutions should be designed and implemented to cater for the diverse needs of the farmers. There is also need for farmers to be empowered to take ownership of their businesses and run them effectively.

5.2 Introduction

During the 2015–2018 period, South Africa experienced one of the worst droughts in history, with a rainfall average of 403 mm in 2015, the lowest average recorded since 1904, and as some authors (such as Baudoin et al., 2017; Pienaar & Boonzaaier 2018) highlight, the level of severity of the 2015-2018 drought was greater than that of 1992–1993. A survey conducted by Agri SA (2019) revealed that 173 municipalities out of 278 had been affected by the drought, representing 62% of all municipalities in the country, to the level that financial and fodder support were the most urgent support needed for the farmers to survive and deal with the loss

created by the drought. Increased drought frequency, changing temperatures and rainfall patterns occurring nationwide are expected to pose a continued risk to farming, especially to smallholder farmers who usually lack resources (Schulze, 2016; WCDoA, 2016a). Taking the example of the Western Cape, a zone which is said to be prone to numerous climate variability-related hazards such as droughts (Braham et al., 2018), Naik and Abiodun (2019) found that this province had experienced one of the most severe droughts in history, manifesting across the four drought categories of meteorological, agricultural, hydrological and socio-economic.

This study, therefore, set out to identify and explore the drought perceptions of smallholder farmers in the Western Cape. It was aimed at determining the extent to which the farmers' perceptions influenced the adoption of coping and adaptation strategies during the 2015–2018 drought. It is acknowledged that smallholder farmers are the most vulnerable group to the impact of drought, hence the need to enhance capacity to future droughts adaptation (Muthelo et al., 2019) as they depend on rainfed agriculture for their livelihood (Eckstein, 2018). Thus, this capacity empowerment requires the understanding of how farmers perceive drought, as these perceptions and attitudes have a great influence on decision-making in terms of strategies for adaptation (Popoola et al., 2018). Studies on perception and adaptation cater for a better understanding of communities' conception of drought and their existing adaptation strategies (Apata et al., 2009). Botai et al. (2017) emphasize that the assessment of the impact of drought on livelihood capitals may facilitate the identification of those capitals and the understanding of the extent to which they were compromised and how they were utilised as coping and adaptation strategies. Most of the existing studies have, however, focused only on identifying farmers' adaptation strategies in general without establishing the most effective strategies in coping with drought (Apata et al, 2009; Tung et al., 2019).

This links to the idea that farmers' perceptions of drought effects are regarded as a key precondition for their choice to adapt (Gbetibouo, 2009; Mandleni & Anim, 2011; Rakgase & Norris, 2014; Antwi-Agyei & Nyantakyi-Frimpong, 2021). Perceptions enhance the adoption of options and inform policy development, among other benefits (Bryan et al., 2009). Nevertheless, it is argued by Pickens (2005) that perceptions could be far different from reality, hence their consideration to determine the extent to which the propositions hold the truth in specific contexts. The findings by Bryan et al. (2009) suggest that there are many factors other than perceptions that may influence the decision-making process. These include changes in other climate signals, such as short-term variability, extreme weather events, rainfall intensity, timing, duration, and frequency.

Apart from perceptions, it is also important to identify drought impacts and to determine how people deal with them. Although Botai et al. (2017) emphasise the assessment of the negative effects of drought on livelihood capitals and the use of these capitals in coping and dealing

with drought, few studies have been conducted to determine the impacts of drought and adaptation strategies at household and farm level in the Western Cape (Ewert & du Toit, 2005; Jacobs & Makaudze, 2012; Ncube, 2018). For this reason, there is a knowledge gap, since information on strategies used by smallholder farmers to prepare for and adapt to drought is scarce and, where available, site-specific. The lack of such knowledge and/or information has as well resulted in the farmers and other relevant groups missing some opportunities that could inform and inspire critical decisions in drought adaptation. Ncube and Lagardien's (2015) study of reviewing and capturing indigenous knowledge and coping and adaptation strategies adopted by both commercial and smallholder farmers in the Karoo region during the 2009/10 and past droughts did not assess livelihood. This study was therefore conducted to fill the gap in terms of how smallholder farmers dealt with the 2015-2018 drought in the Western Cape.

The need to understand factors that influence smallholder farmers' choices and usage of coping and adaptation strategies at farm level is reiterated. The heterogeneous nature of smallholder farmers in South Africa implies that their livelihood, coping, and adaptation strategies vary and differ from one place to another. Compiling information on the potential drought impacts and adaptation strategies could enhance smallholder farmers' decision-making. In this study, the focus was on the farm level, to understand how livelihood capital was utilised by households to cope and adapt to drought. Therefore, the analysis of the coping and adaptation strategies by individual farmers was assumed to shed light on the choices made, and how individuals interacted with each other within the farming communities. The main objective of this study was to understand how drought and its impacts were perceived and responded to by smallholder farmers in two districts in the Western Cape.

The access to livelihood capital can influence the extent to which farmers utilise them as strategies for coping and adapting to droughts (Olaleye, 2010; Gandure et al., 2013; Tung et al., 2019). Assets such as education level influence the perception of skills needed to mitigate the effects of low rainfall predictions (Muthelo et al., 2019). In the World Wildlife Fund report (WWF, 2018) the increasing problem of contaminated downstream water in the Western Cape due to the lack of proper knowledge on the effective use of fertilisers and harmful pesticides on crops was noted as one relevant example. Perceptions of smallholder farmers on the financial aspect of adaptation play a role in how they consider it for utilisation. For example, insurance is considered an attractive coping strategy (Elum et al., 2017; Ubisi et al., 2017).

It is common knowledge that most households nowadays engage in multiple non-farming livelihood activities in an attempt to avoid destitution associated with crop failure and other diverse drought impacts (Ubisi et al., 2017). Maltou and Bahta (2019) suggest that access to credit could enhance farmers' ability to adapt during drought, by enabling them to purchase enough inputs, such as feed and medicines for their livestock. However, this consideration is

expected to be dependent on individuals' perceptions of credits since some smallholder farmers do not feel comfortable borrowing money for farming, while others perceive loans to be expensive due to interests attached to them (Wilk et al., 2013).

Human capital such as sources of adequate and quality labour may reduce the burden of labour or work because tasks are shared among different individuals. Large household family size, for example, makes it possible for division of labour to be used to cope better by adopting more labour-intensive options (Bryan et al., 2009; Gbetibouo, 2009). During drought periods, the young and other able-bodied members divide their production time between farming and other unusual activities for adaptation. It is also apparent that the hiring of labour is impacted during drought periods because smallholder farmers may no longer be able to afford it.

Farming households with access to any form of assistance from other institutions, such as agricultural private organisations, are expected to enhance their adaptation strategies (Maltou and Bahta, 2019). One condition that farmers should meet to qualify for government drought relief is that they should avoid overstocking and exceeding the carrying capacity of the farm. Nevertheless, there is a common understanding that smallholder farmers in South Africa do not consider destocking as a first option when drought strikes hence the need to know whether destocking is done for access to government support or as an independent strategy. Smallholder farmers sell off a portion of their livestock as a last resort.

Coping and adaptation strategies such as water harvesting and transporting water to the farm during water shortages require access to physical capitals such as storage tanks and dams. Although the WCDoA advises that large farm dams and deep enough boreholes be constructed, their construction and maintenance may be expensive and require private and freehold land for one to invest in them (WCDoA, 2016a). Meanwhile, boreholes could play a role in both coping and adaptation, once installed. However, there is a need to consider the legislation on boreholes, as well, and whether smallholder farmers in the Western Cape can meet the requirements. Smallholder farmers in the Western Cape province may not own the land on which they could implement such strategies. Besides the above, pumping water into tanks and dams depends on the pressure of water and those transporting the water from elsewhere depend on the availability of transport and fuel, and the type of road infrastructure. In some worst-case scenarios, farmers have had to buy municipal water for agricultural purposes. All these strategies can be linked to financial capital and whether smallholder farmers can afford them.

Saving water is also an important aspect of drought coping that smallholder farmers should regard as their responsibility. The WWF (2018) advocates for individual and collective innovative ways of using water efficiently by, for instance, encouraging farmers to value

precision in farming, through practices such as conservation agriculture, use of drip irrigation and using safety nets. Farmers need agronomic information and skills to adopt such alongside advanced technologies that come with it. Individually, farmers are encouraged to adopt the latest agricultural technologies and online tools to provide insight into water use on their farms, while collectively tackling shared water risks upstream. For example, invasive plants clearing, education of water users, and other water-steward initiatives have been identified as some of the measures that communities could put in place to improve water-use efficiency (WWF, 2018).

As with water storage, the stocking of feed for livestock requires storage facilities. Thus, to be able to stock feed for the future, farmers are expected to forecast feed shortages as early as possible and put an action plan in place before it is too late. However, stocking of feed is also dependent on the availability of transport to take the feed to the farm, and adequate land to plant lucerne, for example. Land issues in terms of size, lease duration and ownership are major limiting factors for smallholder farmers' production.

This study was undertaken to determine the capacity of smallholder farmers to deal with future droughts, through seeking to understand factors that influence their adoption of coping and adaptation strategies at the farm level. The study envisaged determining whether access to or ownership of livelihood capital influenced the extent to which smallholder farmers in the Western Cape utilised them. Furthermore, compiling information on the potential drought impacts and adaptation strategies would enhance smallholder farmers' decision-making when the information is shared with the wider farmer community.

5.3 Methodology

The study was conducted in the OBD and WCD and with the same smallholder farmers who participated in the livelihood analysis. Farmers from the OBD (52) and the WCD (60) participated. Farmers receiving support from the WCDoA and practising rainfed farming (but also supplementing with irrigation during drought periods) were selected. There are 25 towns in the OBD, of which 7 were chosen for this study, namely Swellendam, Elim, Napier, Bredasdorp, Suurbraak, Genadendal and Barrydale. The WCD has 34 towns and five of them were selected, namely Vredendal, Goedverwacht, Hopefield, Lamberts Bay and Darling. The focus on the two districts was based on the recommendations by the WCDoA which consisted of comparing the highly affected and declared disaster area (WCD) with one that was not severely affected (OBD). The WCD was the first to experience the impact of the 2015-2018 drought, hence the first to be declared a disaster area. A comparative analysis of data on coping and adaptation strategies by smallholder farmers in the two areas of study could inform decision-making by stakeholders responsible for implementing the drought support strategies,

specifically the WCDoA, to avoid a one-size-fits-all approach. The study was conducted with purposively sampled smallholder farmers, as defined by the DAFF (2015).

Using the SLF, questions were generated within the vulnerability context of the 2015-2018 drought. The framework advocates employing a holistic perspective for analysing the poor and vulnerable livelihood to identify different strategic interventions, entry points, and levels for effective poverty reduction or alleviation (Krantz, 2001; Serrat, 2017). Since the analysis of the coping and adaptation strategies pursued by individuals and communities as a response to external shocks and stresses such as drought, civil strife and policy failures facilitates the understanding of sustainable livelihood systems (Ranganathan et al., 2011), the SLF was then used to guide the development of research questions for this particular study. Note that the effectiveness of this framework in analysing drought coping and adaptation strategies is evident in many different studies (Reid & Vogel, 2006; Mabuku, 2019; Shinbrot et al., 2019). The focus of this study was on understanding the vulnerability context in which farmers find themselves, the livelihood assets and strategies at the disposal of farmers, and how these played out during the recent 2015–2018 drought experienced in the Western Cape. The danger of shocks is that they have the potential to destroy people's livelihood assets directly by, for instance, generating a total change in the quality of life and/or even forcing them to abandon their homes and land. It is within this context and framework that the study was conducted. Qualitative data on the farmers' perceptions towards drought, the 2015-2018 drought impacts and coping and adaptation strategies, and/or on other drought-related setbacks faced by smallholder farmers were collected through face-to-face interviews and focus group discussions. The qualitative data was analysed using Atlas.ti 8.1 for Windows. Data was presented using direct quotations and network views for different and related themes. Impacts of the 2015-2018 drought were presented in their categories of environmental, economic, and socio-economic. The type and nature of questions that were used to collect data are presented in Table 5.1.

Table 5.1: Nature and type of data collected from farmers in Overberg and West Coast districts

Question	Description
(a) Farmers' drought perceptions	Data was collected from farmers using the aspects of temperature, dryness, rainfall variability, and other environment-related aspects and they relate to drought.
b) Farmer livelihood assets and strategies	Farmers were asked to describe the different ways in which they were affected by the 2015-2018 drought in terms of their financial, physical, natural, social, and human livelihood assets. Human assets: age, gender, education level and skills, knowledge, and labour sources. Social capital: social networks, membership to formalised groups and other social connections. Natural capital: water and land were the main natural capitals considered. Physical capital: availability and type of transport and roads, secure buildings/storage, facilities, energy. Financial capital: savings, cash, credit/loan availability, earnings, pensions, transfers from the government and remittances.
(c) 2015-2018 Drought impacts	Data on the impact of the 2015-2018 drought were collected in terms of the three categories: environmental, economic, and social. Environmental impacts: shortage/quality of water and grazing, the infestation of weeds and pests and poor quality of livestock. Economic impacts included crop failure, livestock mortality, input price increases, loss of market contracts and income. Social impacts: emotional/depression, theft resulting from social ills.
(d) Utility of livelihood assets in coping and adaptation to drought	Farmers were asked to describe the different ways in which they used different livelihood assets to mitigate the effects of drought. They also provided data on how they had managed or planned to continue with farming during the 2015-2018 drought season. This type of data could be used to determine the extent to which access to certain livelihood assets enhanced the coping and adaptation strategies adopted by farmers in the two districts.
(e) Challenges encountered by farmers in adapting to the 2015-2018 drought	Farmers were asked to identify the challenges that they have experienced in adopting different strategies.

5.4 Results and discussion

5.4.1 Drought perceptions of smallholders in the two study areas

Approximately 67% and 60% of the respondents in the OBD and WCD respectively perceived drought as a shortage or scarcity of water. Respondents felt that it was becoming hotter and drier each year. Meanwhile, other farmers associated drought with climate change and increasingly high temperatures, resulting in livestock grazing being affected. Other studies found similar perceptions (Bryan et al., 2009; Okonya et al., 2013; Ncube, 2018). There was a perception in the WCD that drought destroys, expressed as follows:

> Drought is a killer in the farming business, the main culprit of the farm.
> It is painful.
> It is a disaster.

Two respondents from the OBD stated their feelings about drought:

> It takes away everything from you, even your future.
> Nothing can be done to better you.

As already mentioned, the way farmers perceived drought and its potential impacts influenced the way they responded to the disaster.

One gets the impression that respondents understood how badly drought could affect their livelihoods and they should have, therefore, planned for the disaster. Contrary to this view, 54% and 75% of the respondents in the OBD and the WCD respectively, reported that they had no plan in place before the 2015-2018 drought occurred. This confirmed the argument that perceptions of drought do not always result in the related planning or the capacity to cope and adapt. Respondents in the OBD shared their sentiments revealing how they were unable to plan for drought. This is evident in expressions such as:

> There is nothing I can do.
> I can't determine when the rain is going to come. You can't always have a secret weapon, planning for what you are not sure when it is going to come.

Similar sentiments were expressed in the WCD:

> You get into the thing and get involved, you don't plan;
> Smallholder farming is not a farming business like commercial farming. It's a very, very small scale, so you don't have a budget or any planning, you just go day-by-day, you don't think of the future;
> You just take it as it comes.

Gbetibouo and Ringler (2009) and Wilk et al. (2013) found similar results in Limpopo and KwaZulu-Natal respectively, where farmers were reluctant to put any plan or remedial action in place. However, other studies found contrasting results, for example in Uganda farmers

managed risks regularly as part of their everyday lives (Okonya et al., 2013). Other factors may be at play in drought planning in this study, particularly lack of information as found by previous studies in the given study area (Ncube, 2018).

5.4.2 Impacts of the 2015-2018 drought on livelihood capital of smallholder farmers in the two districts

In the OBD, 79%, and 90% of the respondents in the WCD, reported that they were affected by the 2015-2018 drought. Those who were not affected by drought in the two areas had either prepared themselves enough beforehand and had continued to put measures in place to manage the drought as it unfolded. Another possible reason could be that areas within a district may be different, for example, Barrydale in the OBD was drier than other towns. In a focus group discussion in Elim in the OBD, a respondent expressed that:

> But I must tell you … years ago there was also drought but then our area doesn't require a lot of water in the winter and the summer.

The same conditions were revealed in a study by Wilk et al. (2013), in which respondents indicated that too much water from excessive rainfall decreased crop yields, collapsed house walls and increased human and cattle diseases.

5.4.2.1 Environmental impacts

Figure 5.1 shows an Atlas.ti output network of the identified environmental impacts of the 2015-2018 drought in the West Coast and the OBD. The common environmental impact reported in the two districts was predation. Farmers complained that they had noticed an increased presence of wild animals and that they were losing their livestock. Associated with predation was habitat disturbance, although it was not explicitly mentioned in the two study areas. In a study by Gandure et al. (2013), a lack of fences to protect crops and livestock from theft and physical attacks caused farmers to suffer heavy losses. In the Karoo, farmers reported an increased loss of lambs due to predation during drought periods (Ncube, 2018).

Water quality was another concern, as highlighted by respondents in the focus group discussions in the two districts. The farmers reported water being salty and poisoned from upstream, making it not suitable for consumption by livestock. This was a common problem, exacerbated by the excessive use of fertilisers and harmful pesticides on crops, vineyards and orchards which ultimately contaminated the freshwater from downstream resources in the Western Cape (WWF, 2018). Excessive evaporation probably resulted in increased concentration of the water, hence the salty taste. Reduced water levels in water sources were reported in two focus group discussions in the OBD, while in the WCD there were no reports of such an impact by the respondents. The major water source in the WCD was the Clanwilliam dam, among other sources, and water was distributed through a canal and pipelines.

Individuals might have not noticed the change in water levels at the main source, which was located far from them.

Pests, weeds, and diseases were reported in the two districts. Studies in Limpopo (Ubisi et al., 2017), in the Free State (Gandure et al., 2013) and Eastern Kenya (Kichamu et al., 2018), found similar results. Livestock conditions were compromised, resulting in farmers spending more on feed and medication. Seeds and fertilisers also became expensive, as indicated by the respondents in one of the WCD focus groups.

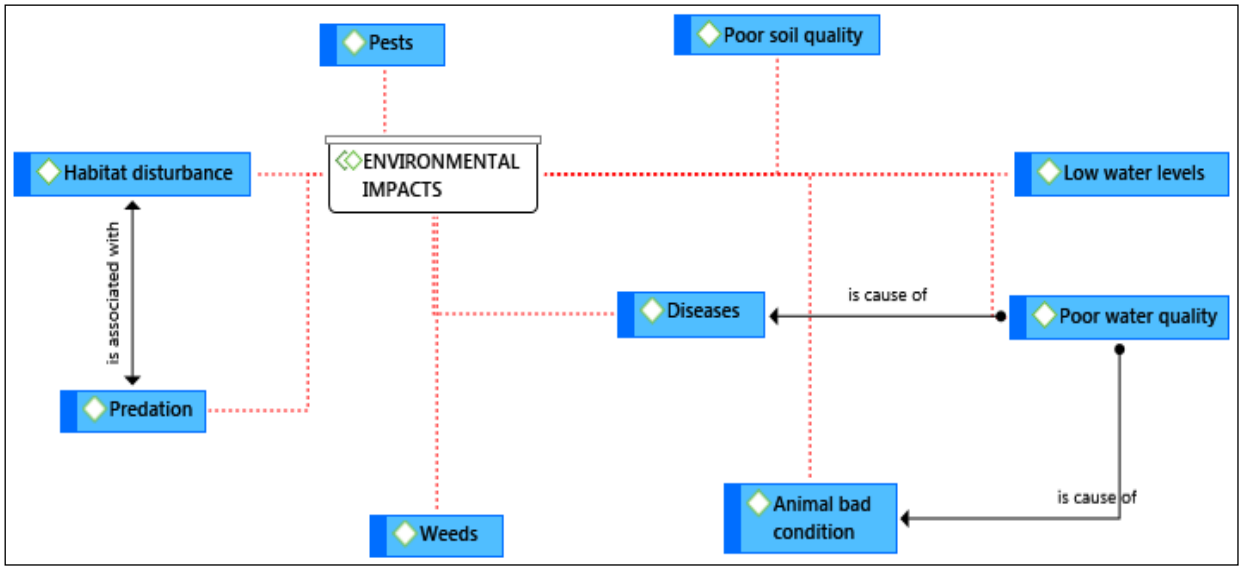


Figure 5.1: Network view: distribution of 2015-2018 drought environmental impacts in the Overberg and West Coast districts

5.4.2.2 Economic impacts

Figure 5.2 shows the distribution of economic impacts in the OBD and WCD. Due to reduced crop and vegetable yield, the existing market contracts were either cancelled or altered. A respondent in the WCD indicated that he had borrowed produce from neighbours to meet the market requirements. The fear of being marginalised put pressure on some farmers to make risky decisions to maintain their presence in the marketplace. Income loss was reported by the respondents who were able to account for it, while others did not realise how other unusual farming activities indirectly affected their cash flows. As evident in many studies, income loss is a challenge commonly reported in areas that experience drought (Pandey & Bhandari, 2009; Keshavarz et al., 2013; van Duinen et al., 2016). Other impacts, such as reduced yields due to crop failure, inflation, theft of livestock and crops/vegetables, predators killing livestock, termination of contracts and livestock losses, all contributed to the economic losses in the two

study areas. One farmer in the WCD mentioned that he stopped hiring labour during the 2015-2018 drought and raised the concern about the sustainability of individual coping and adaptation strategies because those who were hired usually lost their means of survival during drought periods.

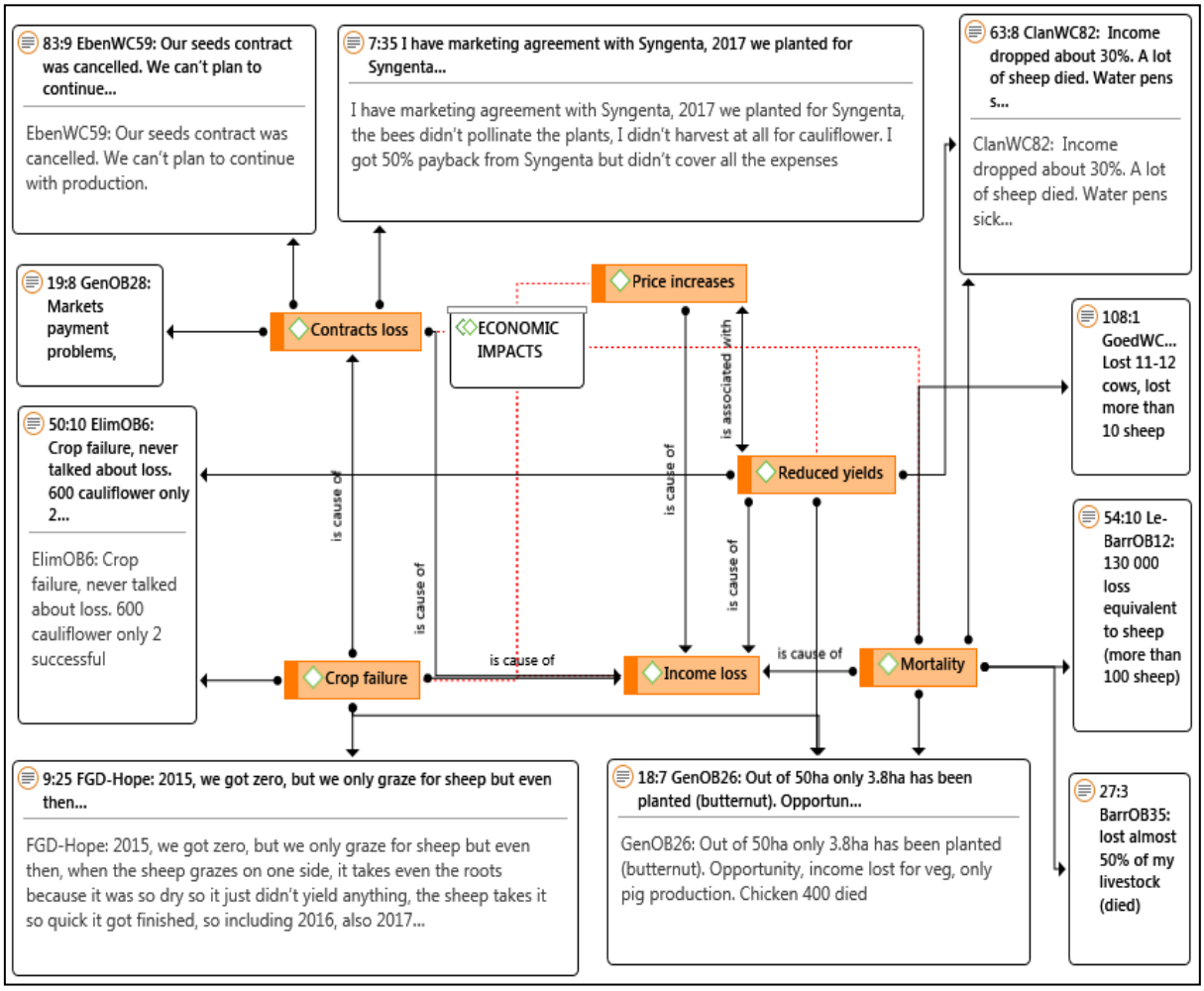


Figure 5.2: Distribution of economic impacts in the Overberg and West Coast during the 2015-2018 droughts

Key: FGD: focus group discussions

Overberg Towns: Gen (Genadendal); Elim (Elim); Barr (Barrydale)

West Coast Towns: Clan (Clanwilliam); Hope (Hopefield); Darl (Darling); Eben (Ebenhaezer); Goed (Goedverwacht)

5.4.2.3 Social impacts

Respondents in two focus group discussions in the WCD expressed the following:

> The upstream farmer is coming at 4 o'clock in the morning to irrigate his farm, open the tap and start irrigating and then close it so that nobody can access it. The upstream farmers do not have respect for the downstream farmers. They just use water for themselves.

Another one stated:

> Upstream farmers used all the water, we are downstream, the water did not reach us

Conflicts being not resolved have the potential to result in social unrest, killings, and tension. In Uganda, Quandt (2021) reported such rare incidences where people had to lose their lives due to conflicts. Cases of suicides were reported in the WCD and later confirmed by one of the key informants. However, this finding proved to be very sensitive and further probing was avoided. One other respondent indicated that he experienced episodes of depression. The researcher received information that one of the farmers in the WCD had deserted his home due to depression that resulted from the canal located near the home that had dried up. Similar results were obtained by Ubisi et al. (2017). Theft of livestock was also reported as a major social impact in both the OBD and WCD. Similar results were obtained among smallholder farmers in Uganda (Quandt, 2021).

5.4.3 Smallholder farmer coping strategies during the 2015-2018 drought in the Overberg and West Coast districts

Farmers in the two study areas used a variety of drought coping strategies (Table 5.2). The transportation of water from various sources such as rivers and dams to the farm, using containers carried on private or hired transport was the commonly adopted coping strategy for water shortage in both districts. However, this required much labour, transport, and time. The division of labour or distribution of tasks made it possible for those with adequate human resources to cope better than those with none, by adopting more labour-intensive options (Gbetibouo & Ringler, 2009; Bryan et al., 2009). Other water-related strategies utilised in the two districts were the sharing of water rights. Farmers with large volumes of water shared with those who had exhausted theirs. Water conservation and clearing of alien vegetation were also utilised. The WCD respondents showed consciousness in saving water, while in the OBD none mentioned it. Crop producers in the two districts reduced planting area or did not plant at all, as a mitigating strategy for the shortage of water. Some crops that failed to meet the harvesting time were used as feed for livestock. The respondents mentioned that a part of their income was channelled towards paying for municipal water for agricultural use in the two sites. Water storage was utilised by those who had access to tanks or stock dams, transport and fuel. Moreover, the pumping of water into storage facilities was influenced by the pressure of water

and other transporting infrastructure. In some instances, there were reports of broken or blocked water pipes and canals, resulting in low water pressure downstream. Access to adequate water infrastructure reduced the number of trips to the river, dam or any other water source and the cost of provision.

Table 5.2: Smallholder farmer coping strategies during the 2015-2018 drought in the Overberg and West Coast districts

Impact	Coping strategy	Selected quotations: Overberg District	Selected quotations: West Coast District
Water shortage	Transportation of water to the farm	"We have to hire someone to fetch water for us from the river" "There is water available 40 km from here on my other farm, have to transport it to this farm in containers" "Use my wheelbarrow to transport water to the livestock"	"At times we depend on rainy water, at times we have to drive 28 kilometres from here to go and ask for water in the township in Moreesburg, it's 28 kilometres from here to Moreesburg" "I have to transport water to the farm"
	Borehole	"Have to use an old borehole" "Activated the borehole"	"Using borehole"
	Conservation agriculture	"Conservation agriculture"	"Put some nets to protect the plants"
	Drip irrigation	"Drip irrigation"	None
	Water sources augmentation	"First, use water in the dams, when finished use water from boreholes" "Use water from the river. Use water from the tank"	"Mixing water from water rights" "Mixing water"
	Reducing planting area/no planting	"Cut the size of planting area"	"To do things in a smaller way, didn't plant"
	Alien clearing	Not applicable	"Three years back we had a project of cleaning up the river, so people had precautionary measures in place because we see that the supply of water in the river was going down much lower so three years ago we started cleaning up the river and taking out some alien plants. So that helped us a lot otherwise we would have been in trouble in terms of drought"
	Saving water	Not applicable	"Save water, use less water" "Use the water sparingly"

			"Knowing how much water to use to save water"
	Buying water	"Bought water from the municipality" "You must pay; you must buy the water" "We are forced to use municipal water"	"Buy extra water" "Have to spend money on water supply"
	Harvesting	Not applicable	"Harvested from the roof, stored it in a tank for irrigation but it's not enough"
Shortage of livestock feed	Buying feed	"Have to sell a lot of cattle to buy feed" "Bought straw bales mixed with molatag. Have to make own feed, Lucerne bales"	"Have to spend money on buying feed for livestock" "Have to spend a lot of money to buy extra feed" "Buy bales for livestock"
	Controlled feeding	"To control the grazing capacity, restrict livestock to smaller camps" "Graze livestock in the veld"	"Graze animals on grasses"
	Migrate livestock	"Move livestock to other places"	"Move goats to home"
	Government drought relief	*The farmers in this district received support later after interviews had been conducted with them, as confirmed by a key informant.	"Government supported us with animal feed" "We got pellets only… but we no longer get them" …
Financial coping	Insurance	"Had to use my insurance"	Not applicable
	Pension	"Old age pension" "Have to use my pension"	Not applicable
	Alternative job	"Uses of other assets\sources of income. Tenders pending (DAFF), Environmental Affairs project implementer".	"I looked for a job from the industry to get income to survive" "I looked for work "
	Private business	"Driving taxi"	Not applicable
	Savings	Not applicable	"We have to buy feed from our own pockets"
	Reduce labour	Not applicable	"Only use workers 3 days a week"
Livestock Mortality	Quarantine	"Have to buy medicine and feed them more"	"Have to treat livestock for parasites regularly. Test livestock"

		“Bought straw bales mixed with molatag”	“Have to buy vaccines”
	Reducing herds	“I can’t allow my herd to grow”	“We have to sell the livestock at a low price”
Emotional	Prayer	“Prayer” “Prayer”	Not applicable
Other	Private support	“Support from Overberg Agri, Viking Chemical Company gave advice”	“Agri-SA” “Grain SA”
	Social networks	“Commercial farmer assisted during drought, (sharing feed)” “Reached out to other farmers around... we help each other” “Another farmer”	“But we react quickly because we need water, so we come together and we put money together to buy the pump, it costs us R7,000 and then we buy a generator that generator that costs us R5,000 so it's all our money that we put together” “Another farmer encouraged me to continue and offered help for me to recover”

Other respondents used casual labour but others could not afford this strategy because of the lack of financial resources.

Buying livestock feed was commonly adopted in the two districts, mostly in the OBD. O’Farrell et al. (2009) reported similar findings, where the money to buy additional fodder was sometimes made available through the sale of livestock or government subsidy schemes. There was also harvesting of biomass from road verges and chopping down branches or trees so that animals can forage off these trees. This strategy was associated with controlled grazing, which was mentioned in the two districts. The shortage of feed for livestock is associated with the dependence on grazing lands with limited conservation and supplementation to which the farmers need to be capacitated with information and skills to produce and manage feed during the dry season (Nalubwama et al., 2014).

Supplementary feeding was utilized in the OBD, in which farmers mixed various and nutritious ingredients to make extra feed for the livestock. This reduced the cost of buying extra as it provided animals with the necessary and available nutrients while simultaneously preventing and mitigating the deterioration of animal health and condition. Figure 5.3 shows a farmer producing livestock feed in the OBD.

Figure 5.3: Farmer mixing ingredients to make livestock feed in the Overberg district

About 72% of the respondents in the WCD received drought support from the government in the form of fodder vouchers since the district had been declared a disaster area. On the other hand, a key informant confirmed that 17% of the respondents in the OBD later received fodder from the government. However, this percentage was only from one town in the district which was declared as a drought disaster area. The respondents also indicated that they received private support, especially in the OBD. Thus, farming households with access to any form of assistance from other institutions such as agricultural private organisations tended to enhance their adaptation strategies, as is also shown by Maltou & Bahta (2019) and Ojo et al. (2021). For example, the provision of information concerning droughts can inform the decisions taken by the farmer to utilise a particular capital. However, respondents in another study in the Northern Cape Province by Bahta (2020) confirmed that not enough support was received and that it arrived late, suggesting the need for the government to enhance its provision mechanisms in the future. In a study conducted by Maclellan & Vincent (2013), other respondents were reported that they were not aware of the services available for their benefit.

In this study, livestock farmers indicated that they had reduced their herd sizes to mitigate mortality, through early marketing and slaughtering for food, as was the case in the Northern Cape in 2015-2016 (Bahta, 2020). Apart from preventing mortality of livestock, reducing herd size was one of the prerequisites for qualifying for drought relief from the government. Hudson (2002) found that smallholder farmers in the North West Province started selling animals only

under severe conditions when, for instance, they needed money to buy feed and fodder. However, by then animals were already in such poor condition that they were not going to be sold at the normal market prices. Other studies found that farmers in the dry Karoo region of the Western Cape and the arid Northern Cape Provinces were flexible concerning the reduction of stock numbers as a coping mechanism, as well as preserving the natural resource base (Archer, 2004; Jordaan, 2014).

Financial coping was limited in the two districts. Insurance was not perceived as an attractive coping strategy in the two study areas, as is evidenced by 4% of the respondents mentioning it in the OBD. Maclellan & Vincent (2013) found similar results in other three provinces of South Africa. Financial limitation can affect the planning of and investment into long-term adaptation. In another study, farmers indicated that they could not invest in good fencing and security guards to protect their livestock from theft because they had limited finance (Wilk, 2013). Findings by Elum et al. (2017) and Ubisi et al. (2017) in Limpopo, South Africa, attributed the financial limitation to the respondents' limited awareness of insurance products and the inability to afford premiums. Those with financial assistance tend to cope better because they can increase their purchasing power for implements and other things (Matlou & Bahta, 2019).

Meanwhile, participants in one of the focus groups in the OBD indicated that they had sourced extra jobs during the recent drought, such as fishing, to complement their income, a finding consistent with that of Bahta (2020) in the Northern Cape, Antwi-Agyei Nyantakyi-Frimpong (2021) in Ghana and Kamara et al. (2019) in Swaziland and Lesotho. Private businesses were mentioned in the OBD as another non-farm coping strategy used. This is one of the multiple non-arable farming livelihood activities in which most households engage to avoid destitution because of climate variability (Ubisi et al., 2017).

Social networks played a very important role in coping with the 2015-2018 drought in both study sites. Membership in farming groups by the respondents, for example, cooperatives, enabled farmers to exchange advice, ideas, and livestock feed, as was confirmed by Matlou & Bahta, (2019). Neighbours, friends, and private individuals allowed other farmers to graze their livestock in their veld. Mthembu (2013) in KwaZulu-Natal observed that social networks also played a role in coping with drought. However, according to Ubisi et al. (2017), smallholder farmers in the Limpopo Province had very limited access to social networks. Bahta et al. (2016) found that respondents did not consider social networks as an effective means of reducing drought risk. Social networks can be limited in their impact on coping by factors such as group dynamics and other individual aspects such as personalities. Prayer was mentioned by the respondents as another coping strategy in the OBD. This was a direct response to anxiety, depression and emotions resulting from farmers watching all that they had worked for going down the drain.

5.4.4 Smallholder farmer adaptation strategies during the 2015-2018 drought in the Overberg and West Coast districts

The respondents' choices of adaptation strategies in the two study areas are presented in Figure 5.4. Reducing the sizes of livestock was a commonly adopted strategy. This strategy can work both for coping and adaption, depending on the household, because establishing a nuclear herd is considered difficult. Stocking feed for livestock was another way of mitigating the shortage of grazing in both the OBD and WCD.

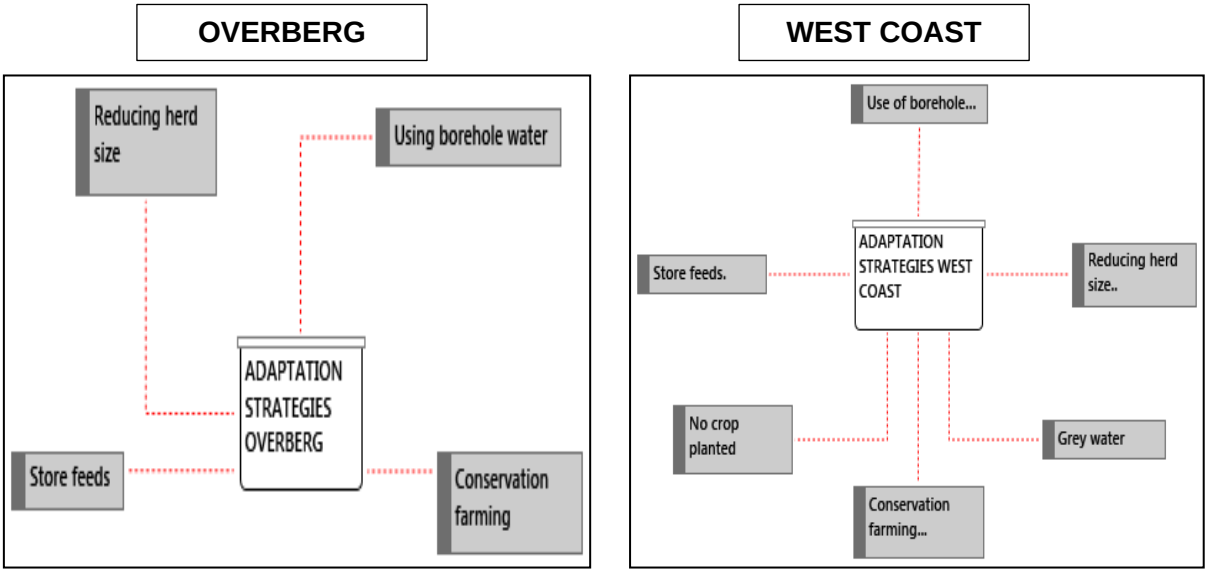


Figure 5.4: Adaptation strategies of smallholders in the Overberg and West Coast districts

Wilk et al. (2013) and Ncube (2018) also found that the same strategy was adopted in Kwa-Zulu Natal and the Karoo region in the Western Cape Province. However, farmers can only stock livestock feed for future use if they have access to storage facilities. Extra feed for storage can be collected residues from neighbours or Lucerne planted during wet seasons. The need for adequate land cannot be overemphasised. The land sizes varied from 50 square metres to 6,000 ha in the WCD, and from 0.5 ha to 2,000 ha in the OBD. The existence of cooperatives and farming groups meant that some farms were not owned individually hence the large sizes, in which farmers had no control of what is planted in a particular season. In other cases, the farms under short lease agreements were on small pieces of land. In the study by Ncube (2018), it was evident that Barrydale farmers in the OBD had leased very small pieces of land of 1–2 ha, which had limited their ability to intensify production.

The use of borehole water as another strategy applies to both districts, depending on the time of installation and use of water. As mentioned earlier, using borehole water is a last resort, as farmers tend to first use water from various surface sources. Additional strategies adopted in the WCD were windmills for pumping water and the installation of greywater systems. The

WWF (2018) advocated for individual and collective innovative ways of using water efficiently by, for instance, encouraging farmers to value precision farming. Individually, this could be achieved through the adoption of the latest agricultural technologies and online tools, to provide insight into water use on their farms. Collectively, tackling shared water risks upstream, for example, alien clearing, education of water users and other water-steward initiatives have been identified as some of the measures that communities can put in place to improve water-use efficiency. Although the WCDoA advises that stock dams could be built, these were still expensive and required private land for one to invest in them. Smallholder farmers in the province did not own the land on which they could implement such strategies.

The respondents in two focus groups in the WCD indicated that they were considering changing farming enterprises, a strategy also reported by Ncube (2018) in the Karoo. However, this was not a clear-cut strategy to utilise. Farming as groups implied that farmers could not just do what they wanted as individuals. There was a need for consensus in how land is to be used. Additionally, the nature of assistance had an influence on which strategies were eventually adopted by smallholder farmers. This finding is consistent with the study by Bryan et al. (2009) who found that farmers did not adjust their farming practices to abide or adapt to different terms and conditions involved or meet the expectations of the organisation providing the support. In this current study, the fact that none of the changing enterprise strategies have been implemented implies that this might be considered an easy and viable option for the near future. Another possible reason could be that changes may require greater investments, and this may be limited due to the lack of money, water, land, inputs, and lack of information.

Notably, some of the strategies for crop or vegetable farmers were not reported by either the WCD or OBD respondents. These included changing planting and harvesting times, using short-season varieties and introducing new seed varieties. However, Ubisi et al. (2017), Mpandeli et al. (2015), Gandure et al. (2013) and Popoola et al. (2018) found differently, in that smallholder farmers were using these adaptation strategies in Limpopo, Free State and Eastern Cape Provinces. Possibly, these adaptation strategies did not appeal to farmers in the two study areas as they had limited flexibility in what they could produce because of the implementation of the commodity approach.

5.4.5 Challenges faced by smallholder farmers during 2015-2018 drought

Figure 5.5. shows an Atlas.ti output of the challenges faced by respondents in coping and adapting to the 2015-2018 drought in the OBD and WCD in the Western Cape.

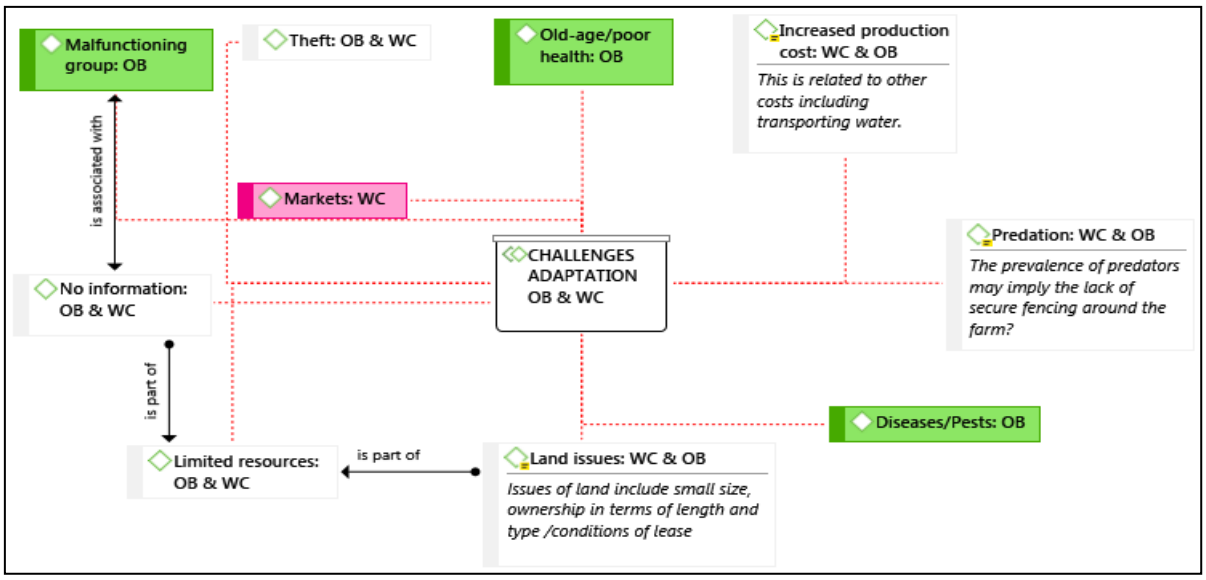


Figure 5.5: Challenges faced by the farmers in coping and adapting to the 2015-2018 drought in the Overberg and West Coast districts of the Western Cape

Limited resources proved to be the major challenge for smallholder farmers to cope and adapt to drought. Such resources included water and animal feed storage infrastructure, finance, information crucial for decision-making and land. The limited capitals usually accessed by the respondents had been compromised by the drought. The same findings that small size of land and short leases limited adaptation were also found by Ubisi et al. (2017) in Limpopo, Wilk et al. (2013) in KwaZulu-Natal and Ncube (2018) in the Western Cape. Land size and short leases were among the main issues which emerged in the two districts. Information is also a very important resource during drought periods because it informs many decisions concerning its planning, and mitigation, as found by Reid and Vogel (2006). Unfortunately, in both study sites, drought information and its sharing were limited.

The unusual activities or expenditures including payments for water, high electricity bills, supplementary feeding of livestock and treating diseases were responsible for the increased cost of production. Although Maltou and Bahta (2019) argue that access to credit would allow farmers to purchase enough inputs such as feed and medicines for their livestock, some of the farmers in the two districts were however not interested in borrowing money to improve production, even during drought periods, because they feared high interest rates. This same concern was revealed in the KwaZulu-Natal in South Africa (Wilk et al., 2013). A respondent in the OBD mentioned that old age was affecting him, while another indicated ill-health challenges. Similar findings were reported by various authors such as Reid and Vogel (2006), Gandure et al. (2013) and Ubisi et al. (2017).

5.5 Conclusions and recommendations

The smallholder farmers in the WCD and OBD mainly perceived drought as a shortage of water, caused by factors such as increased temperatures and decreased rainfall. Farmers understood the devastating risks and potential impacts of drought on their livelihood, although their perceptions did not result in or lead to meaningful planning for the 2015-2018 drought. The main challenge they faced was a lack of resources across all the livelihood capitals. Maybe, with tailor-made and livelihood-focused support, smallholder farmers can be empowered to sustain farming during drought periods in the future. However, this should start by gaining an understanding of impacts from the grassroots to the policy level.

The major environmental impacts of the 2015-2018 drought in the two districts were the shortage of water, resulting in the prevalence of weeds, pests, diseases, and predation, among other impacts. Environmental impacts had a bearing on economic and social impacts, as witnessed in the two districts. Economic impacts in the two districts included the loss of contracts for produce and income loss. The major social impacts were emotional and the theft of livestock and crops. Coping strategies for water shortages by the respondents in the two districts consisted of transporting water and reducing crop production. Livestock farmers sourced extra feed and reduced herd sizes. The provision of government drought relief in the form of fodder played a role in mitigating the effects of the shortage of grazing, especially in the WCD, while private support came in various forms.

Smallholder farmers who had access to any or all of the livelihood capitals tended to cope and adapt better than those who did not. However, access to livelihood assets does not benefit farmers when used in isolation. Access to and utilisation of more than one strategy is needed to enhance drought coping and adaptation. This study has provided insight into how farmers in the two districts used their livelihood capitals to cope with droughts. There was a need to determine the role of the government and of the private sector in enhancing farmers' drought coping and adaptation strategies in the Western Cape. The respondents highlighted that adapting to the 2015-2018 drought was coupled with various impediments such as the lack of secure and adequate land, resources, water storage infrastructure and increasing production costs. There is an urgent need to determine how these challenges can be overcome if success is to be seen in the development of the smallholder farming sector. For some farmers to survive from the 2015-2018 drought negative effects, they had to affiliate to different farmer groups and/or social networks. However, the major weakness of the social networks was that they did not go beyond the farmer groups. Falayi et al. (2020) found that inter-organisational trust played an essential role in enhancing knowledge sharing and coordination and that learning was a critical prerequisite for finding solutions to address structural dimensions within a transformative space over time. If the farmer support organisations and the smallholder

farmers created more formalised structures for learning and sharing knowledge and information future drought preparations could be enhanced.

Farmers' knowledge around drought and perceptions need to be considered in the designing and development of interventions to enhance their coping and adaptive capacity. Part of empowering smallholder farmers is by providing them with drought-related information and feedback from research, which can inform farmers of the opportunities and options available for consideration in future droughts. However, the provision of information should be done with the recognition that smallholder farmers' coping and adaptation strategies are not one-size-fits-all because smallholder farmers are diverse in their needs and capabilities. Farmers need to run the farms as businesses and begin to operate with profit in mind. There is also a need to manage resources such as water efficiently through, for instance, adopting efficient water-saving technologies. Extension services have a role to play in ensuring that farmers learn how to implement some of these technologies.

The study focused on the five livelihood capitals as indicators of coping with drought. However, the impacts of drought on smallholder farmers are far more complex than that. In studies on food security in India, Patel et al. (2015) found that approaches used in determining food security (including the livelihood approach) were not adequate because they failed to take into consideration peoples' subjective experiences of everyday livelihood practices, their aspirations and struggles to achieve better wellbeing in fragile areas. There is, therefore, a need for in-depth livelihood studies that consider the wellbeing and try to understand a farmer's individual circumstances. Long-term socio-ecological studies could provide some of these answers. Future studies should also conduct an in-depth analysis of the nature of relationships between smallholder farmers and support organisations, to understand how they can effectively work together. This is necessary to inform decision-makers and policymakers so that appropriate entry points for enhancing adaptation by smallholder farmer production can be identified. As demonstrated by Falayi et al. (2020), this will help in finding solutions over time.

CHAPTER 6
ROLE OF LIVELIHOOD AND DROUGHT-RELATED ASSISTANCE PROVIDED TO SMALLHOLDER FARMER BY VARIOUS ORGANISATIONS IN THE WESTERN CAPE, SOUTH AFRICA

Part of this chapter will be submitted for publication in the African Journal of Agricultural and Resource Economics (AfJARE)

6.1 Abstract

Smallholder farmers in the Western Cape have overcome the challenge of the lack of resources for farming through organised mobilisation into cooperatives or farming groups which enhances their access to various institutional support and assistance. This process is facilitated by various organisations working together with farmers to facilitate the sector's development. Regardless of the tireless efforts put by various organisations in the province, information on the support provided to smallholder farmers remains scant and does not provide a clear direction of how they are assisted. It is argued that the programme implementation by stakeholders involved in smallholder farmer development has achieved little results, and is accompanied by challenges such as lack of human and financial resources, the difficulty in categorising smallholders and lack of clarity of roles and a mismatch between organisations and farmers' goals. Meanwhile, integration of any development projects is established and thrives in an enabling environment. This study aimed at determining:

a) The role of civil society, the private and public organisations in smallholder farmer livelihoods and the 2015-2018 drought coping and adaptation;
b) The achievements and challenges for organisations in implementing the commodity approach in the Overberg and West Coast districts in the Western Cape.

Overall, the aim was to determine the implementation of the commodity approach in the province. Farmers identified 24 private and 6 civil society organisations and four government departments involved in their farming businesses. A list of all the identified organisations was consolidated and their websites used to determine their goals and objectives. One civil society group, three private and two public organisations were selected for interviews with their personnel. The SLF was used to develop questions for data collection. Semi-structured interviews were conducted with the farmers and later, the personnel from organisations, using interview guide and social network mapping techniques to collect the qualitative data. The support services were divided into information, production inputs, finance, markets and drought relief. The findings show that the common goal of organisations in supporting smallholder farmers is for them to graduate to commercialisation, although not all farmers hold that goal in their farming. Among the five categories of support, information was the most common service

provided by three types of organisations. Organisations realise that although their mandates are different, the goal is the same, and working together in supporting farmers, they achieve more. The relationship between farmers and organisations is one-way, whereby the former lack influence at any level. The WCDoA influences most of the stakeholders' work and operations. Organisations found it difficult to measure their achievements, except that farmers were being assisted where they needed help. Nevertheless, the commodity approach seems to have assisted farmers to access resources and services and to overcome the unavailability of markets for their produce. However, the nature of the farmers' interactions with the markets for their products needs to be determined. Complex government systems, farmer personalities, lack of funding and human resources were the main challenges faced by organisations as they implement their programmes. There is a need for M&E of programmes to ensure the effective provision of support to smallholder farmers.

Keywords: Commodity approach, drought, livelihood, organisations, smallholder farmers, Western Cape Province

6.2 Introduction

Chapter 6 is a follow-up to the two preceding Chapters 4 and 5 on the determination of the livelihood, coping and adaptation strategies for smallholder farmers in the OBD and WCD in the Western Cape. The purpose of this study was to understand the processes followed in the implementation of the commodity approach to smallholder farmer livelihoods development in the two districts, the extent to which the efforts of the organisations influenced the actions of farmers and the challenges experienced by all stakeholders involved. In total, there were eleven commodities and organisations identified by the WCDoA, who were working with the farmers. For farmers to qualify to participate in the commodity approach, they were expected to choose a commodity to specialise in its production, depending on the types of commodities recommended for the specific area where the farmer was based. The national DAFF released funding to the WCDoA which then subcontracted the Cape Agency for Sustainable and Integrated Development in Rural Areas (CASIDRA) to implement. CASIDRA subcontracted private organisations to deal with specific aspects of the implementation of commodities, while coordination remained with the WCDoA. Supporting smallholder farmers in the Western Cape is meant to improve their productivity, and ultimately, their livelihoods. The second aspect of this study was to determine the implementation of the national drought management plan of 2005 in the province to enhance the smallholder farmer's coping and adaptation strategies for the 2015-2018 drought. It was also meant to understand the involvement of the private sector and civil society, as drought management is a shared responsibility in South Africa. Thus, the study aimed at determining:

a) The role of civil society, the private and public organisations in smallholder farmer livelihoods and the 2015-2018 drought coping and adaptation;
b) The achievements and challenges for organisations in implementing the commodity approach in the Overberg and West Coast districts in the Western Cape.

6.3 Methodology

The smallholder farmers from the OBD and WCD who participated in Chapters 4 and 5 of this study were asked to identify organisations that had always been involved in their livelihood and specifically during the 2015-2018 drought, and to indicate the kind of support that they had received. During the focus group discussions, conducted with the farmers from 8 to 11 May 2018 in the OBD and 15 to 18 May 2018 in the WCD, an interview guide and a social network mapping exercise were used to collect data. The SLF (Chapter 2, Figure 2.1) suggests that the complexity of vulnerability influences the livelihood capitals, while access to these capitals is influenced by PIPs. The latter also influences livelihood strategies and eventually the outcomes. Therefore, the SLF was used to develop research questions aiming at collecting data on the contribution of public and private organisations and the impact of such support on the livelihood of farmers.

The criteria for selecting organisations for desk reviewing and further interviewing was started by asking farmers from the West Coast and the OBD to identify all the organisations from which they had received any kind of support for livelihood and adaptation. This was done with the intention of having an overview of the structure of the support designed for farmers in the two districts. The farmers identified 24 private institutions, 6 civil societies and 4 public organisations as being involved in their farming businesses. The list of all the organisations was consolidated and their websites were visited to identify their objectives, goals and approaches to providing support. The WCDoA worked closely with CASIDRA, an organisation that implements agricultural projects on its behalf.

The DWS worked with the Breede Gouritz Catchment Management Area (BGCMA), in implementing the NWA and fulfilling its mandate. The DWS and the BGCMA were both considered under the departments they are assisting in the matter of implementation of the projects and legislation, as their work could not be separated. In the public sector, the DWS, BGCMA, WCDoA and CASIDRA were selected for further interviews, while from the private sector, only three organisations, namely Grain SA, VinPro and Agri Western Cape, were considered. Further interviewing of the personnel involved in programme implementation from both sectors was assumed to provide clarity on issues about the processes involved when helping farmers and also to confirm the authenticity of data provided by the farmers.

Two representatives from the Moravian church (Overseas Council) were included for further interviews on the side of civil society groups. Some of the reasons behind the criteria used to select organisations for further participation were that some of them were in partnerships hence the need for the researcher to understand how their interactions influenced their work. Additionally, to be able to determine the nature of relationships and the challenges they faced when working together, there was a need to at least have equal representation and participation of the personnel. Therefore, personnel from organisations also identified other stakeholders with whom they worked and explained the nature of their relationships and the extent to which they were involved with each other. A network map for the farmers from the two districts and another from all organisations were developed and presented in the relevant results section.

Atlas.ti was used to analyse the qualitative data and the results were presented in network views, especially for the challenges experienced by organisations in implementing their programmes. The livelihood and drought support services provided to the smallholder farmers were divided into five broad themes for easy analysis and presentation of the results. These are information, production inputs, finance, markets and drought relief. Information entailed workshops, training, demonstration sessions, field trips, on-farm trials, informative sessions, farm-related advice, mentorship and tours. The market category is concerned with the provision of markets for farm products. Production inputs included the provision of seeds, fertilisers and pesticides. The provision of water and land-related services was also considered under production inputs. The finance category involved grants and credit provision or any other means of funding that farmers were able to receive. Drought relief relates to any form of support from organisations that are directed to smallholder farmers through a specific programme meant to mitigate the 2015-2018 droughts.

6.4 Presentation and discussion of the results

6.4.1 Background information on the identified organisations

In both districts, the smallholder farmers' supporting organizations that were classified as belonging to civil society groups include, for instance, the AFASA, Moravian church, Black Farmers Association South Africa (BFASA), Swartland Emerging Farmers' Forum, Goedverwacht Development Forum, and Goedverwacht Mechanisation Centre.

6.4.1.1 African Farmers Association South Africa

The AFASA was only identified by farmers in the OBD but a key informant confirmed that AFASA also existed in the WCD. The vision of the AFASA is to have competent and successful commercial African farmers and their mission is to facilitate increased meaningful participation of smallholder farmers in the agricultural sector (AFASA, 2020). The association aims at

creating a sustainable and united body of farmers with the capacity to influence policies, facilitate the development of their competencies to participate meaningfully in formal and informal markets, and mobilize resources.

6.4.1.2 The Moravian church

The Moravian church, through the Overseas Council, was involved with farmers in the two study areas. Although its goals and objectives could not be identified on their website, it was however said that the Moravian church in South Africa leased land to smallholder farmers and was responsible for facilitating access to water by the farmers through land contracts.

6.4.1.3 Black Farmers Association South Africa

BFASA strives to provide and integrate an inclusive approach recognizing human dignity, through skills training and job placement, and unleashing the potential of farmers, so that they become commercially viable (BFASA, 2020). The main objectives are to harness and nurture entrepreneurial flair and develop skills for the establishment of smallholder to large-scale commercial farmers in South Africa and facilitate their access to land and collaboration with investors.

6.4.1.4 Goedverwacht Development Forum, Goedverwacht Mechanisation Centre and Swartland Emerging Farmers' Forum

The goals and objectives of the two forums and the Mechanisation Centre were not identified, and no websites could be found. However, it can generally be understood that forums act as mouthpieces for vulnerable individuals and communities through the exchange of information useful for policy and decision-making.

6.4.2 Background information of the private and public organisations in the two study areas

The respondents in the WCD and OBD identified 24 private organisations who were providing them with assistance. The 24 identified organisations are not exhaustive, as the exercise of establishing them was compromised by the lack of information that describes the support structure for smallholder farmers in the province. The organisations existed either in one of the districts or in both. The list of the 24 private organisations identified by farmers and their goals and objectives are provided in Table 6.1.

Of the interviewed organisations, the respondents from Agri Western Cape confirmed that they played a role in advocating and in influencing policy in favour of the farmers. A respondent from Grain SA emphasized that their goal was about supporting farmers in all matters concerning the grain industry through training, mentorship, and funding. Note that the public

organisations identified by farmers in the OBD and WCD were WCDoA, CASIDRA, DWS and BGCMA, DRDLR and local municipalities.

Table 6.1: Identified private organisations and their goals and objectives

Organisation	Goals and objectives
1. The National Wool Grower's Associations of South Africa	Representing the wool farmers in their working with institutions, providing markets, government programmes and policies, universities and research institutes, to improve all aspects of the industry (National Wool Growers Association, 2020).
2. Virbac	Is concerned with warehousing and manufacture of Act 36 liquids, tablets and pesticide products, secondary packaging (where applicable), marketing and distribution of veterinary products (Virbac, 2020).
3. Potato SA	Aims at building a viable South African potato industry, through the provision of information, extension services, technical services, facilitating marketing of produce and assisting in transformation, by developing smallholder farmers to graduate to commercial potato farming (Potato SA, 2020).
4. Lionel's Veterinary Supplies	Provision of veterinary and cattle medicine supplies, equipment, animal medicine, cattle medical supplies and animal health products to cooperatives, veterinarians and farmers (Lionel's Veterinary Supplies, 2020).
5. Cape and Mohair Wool	Provides comprehensive selling and support infrastructure for mohair, wool and livestock clients (Cape Mohair Wool, 2020).
6. VinPro	Focuses on four areas of advocacy, specialised soil and services, information transfer and people development (VinPro, 2020).
7. BKB Wool	Maximising value creation through innovation and efficiency (BKB, 2021).
8. Red Meat Producers' Organisation	Equips red meat producers with practical, factual information, helping them manage successful farming businesses, through the promotion of a sustainable and profitable red meat industry in South Africa (Red Meat Producers' Organisation, 2020).
9. Overberg Agri	Aims at becoming the business partner of choice, committed to do more than just selling a product or service to a customer and to add value to its stakeholders in such a way that they benefit as the company grows (Overberg Agri, 2020).
10. Agri SA (known as Agri Western Cape in the province)	Core purpose of preservation and promotion of healthy local agriculture and food supply chain, able to serve society's immediate and long-term needs (Agri Western Cape, 2020).
11. Grain SA	Involved in all matters bearing on the wellbeing of the industry and to be consulted about policy issues relating to the industry (Grain SA, 2020).
12. Surplus People's Project	Committed to challenging neoliberal capitalism, power and patriarchy and to promoting and advocating for agrarian reform for food sovereignty with strategic alliances (Surplus People's Project Annual Report, 2017).
13. Sentraal-Suid Co-operative Ltd	Ensuring the prosperity and survival of the organisation and its members by promoting growth and diversification, whilst maintaining stability (Sentraal-Suid Cooperative, 2020).

14. Syngenta Global	Facilitates the bringing of plant potential to life, through investing and innovating to transform the way crops are grown and protected. It also aims at bringing about positive lasting change in agriculture (Syngenta, 2020).
15. Pioneer Foods	Provides wholesale, retail and informal trade customers with products of a consistently high standard (Pioneer Foods, 2020).
16. Kaap Agri	Specialises in retail and trade in agricultural, fuel and related retail markets in southern Africa, and offers financial, grain handling and agency services (Kaap Agri, 2020).
17. OVK	Strives to create prosperity and sustainability through the supplying of competitive inputs to agricultural producers, acquisition, marketing and processing of agricultural products and the supplying of products and services to the broader public (OVK, 2020).
18. Tiger Brands	The organisation's purpose is to nourish and nurture more lives every day (Tiger Brands, 2020).
19. SA Breweries	The dream for SA Breweries is to be the best beer company, bringing people together for a better world (SAB, 2020).
20. South African Pork Producers' Association (SAPPO)	The organisation is the mouthpiece of pork producers in South Africa, serving South African pork producers by co-operating within the organised agricultural fraternity and liaising with various sectoral organisations, role-players within the supply chain of the meat industry, the government and international interest groups (SAPPO, 2020).
21. ARC	A premier science institution, conducting research with partners, developing human capital and fostering innovation to support and develop the agricultural sector. The core business has four aspects of Agricultural Economics and Capacity Development, Animal and Crop Science, Research and Innovation (ARC, 2020).
22. Khakula	No information was found.
23. Tygerberg Private Hospital	No information was found.
24. Abattoirs	Various abattoirs inside and outside the two districts act as markets for livestock farmers of these districts.

6.4.2.1 Western Cape Department of Agriculture

Since the DAFF and DRDLR are currently merged (since June 2019), the support that was considered in this study is what was provided before the merge and is considered under the WCDoA. Figure 6.1 is a summary of the Western Cape's strategic goals.

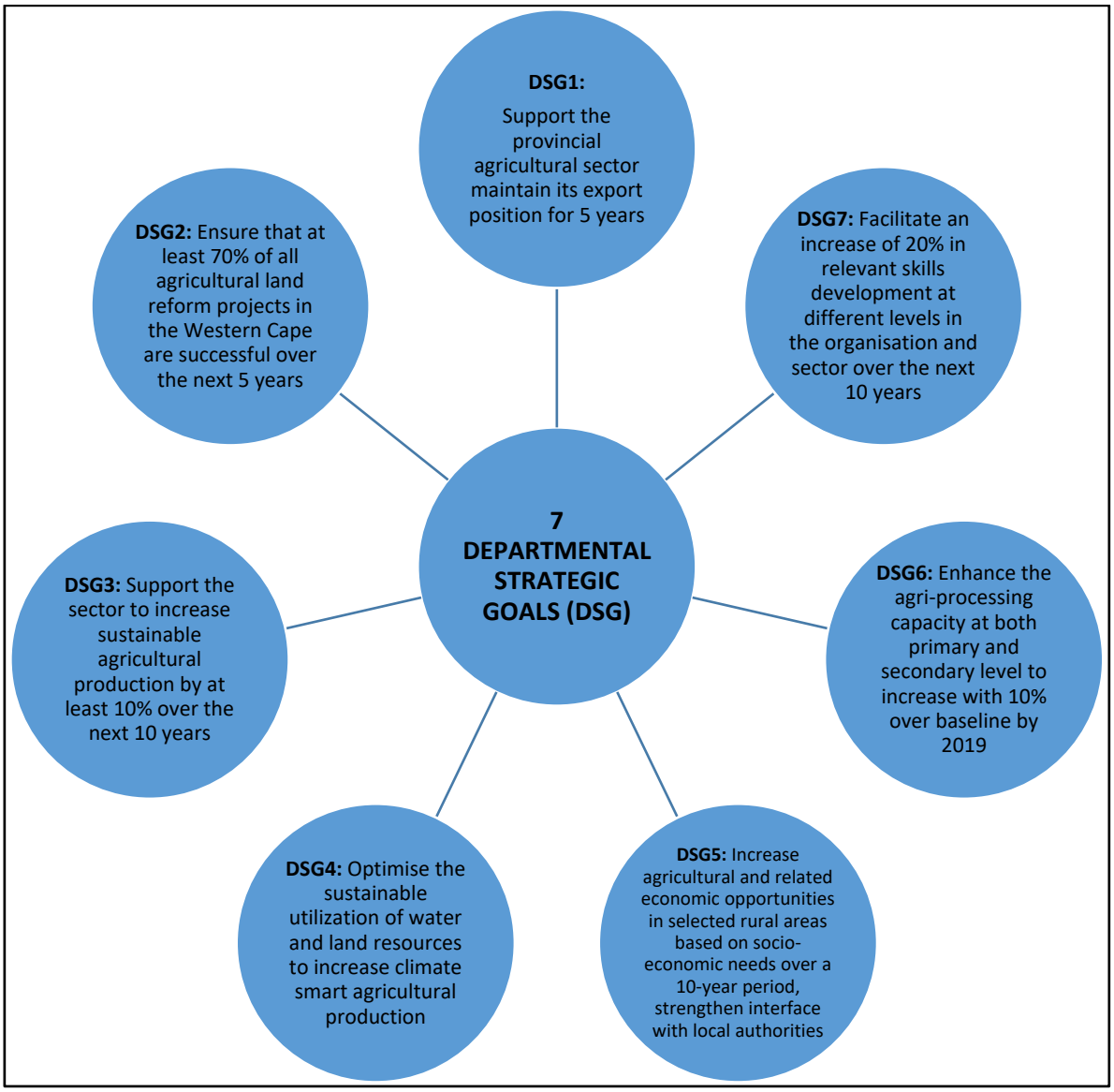


Figure 6.1: Summarised strategic goals for WCDoA

Source: WCDoA (2020a)

The WCDoA was mainly responsible for coordinating all the activities of smallholder farmer development in the Western Cape, as is consistent with the implementation of the commodity approach. The vision of the department was to have a united, responsive and prosperous agricultural sector that is in balance with nature (WCDoA, 2020b). The Department delivers a broad range of services to animal and crop producers and all users of natural resources nodes across the province, through, for instance, the Sustainable Resource Management (SRM), Farmer Support and Development (FSD), Research and Technology Development, Agricultural Economics Services, Structured Agricultural Education and Training, Veterinary Services and Rural Development programmes (WCDoA, 2019). Within the WCDoA, this study focused on FSD, in which livelihood support for smallholder farmers was embedded. The FSD encompasses the broad development agenda of the department and was designed and

implemented to predominantly support smallholder farmers in the Western Cape (WCDoA, 2019). The purpose of the FSD was to ensure sustainable support mechanisms, quality service and advice for farmers, and measure the impact of interventions of the programme and leverage investment from the private sector and commodity groups.

The SRM programme aimed at providing sustainable resource management solutions and methodologies, through different activities such as providing land care services and facilitating the implementation of projects. In addition, the programme oversees the implementation and management of disaster aid schemes. Figure 6.2 (A and B) depict the sub-programmes under the FSD and the SRM.

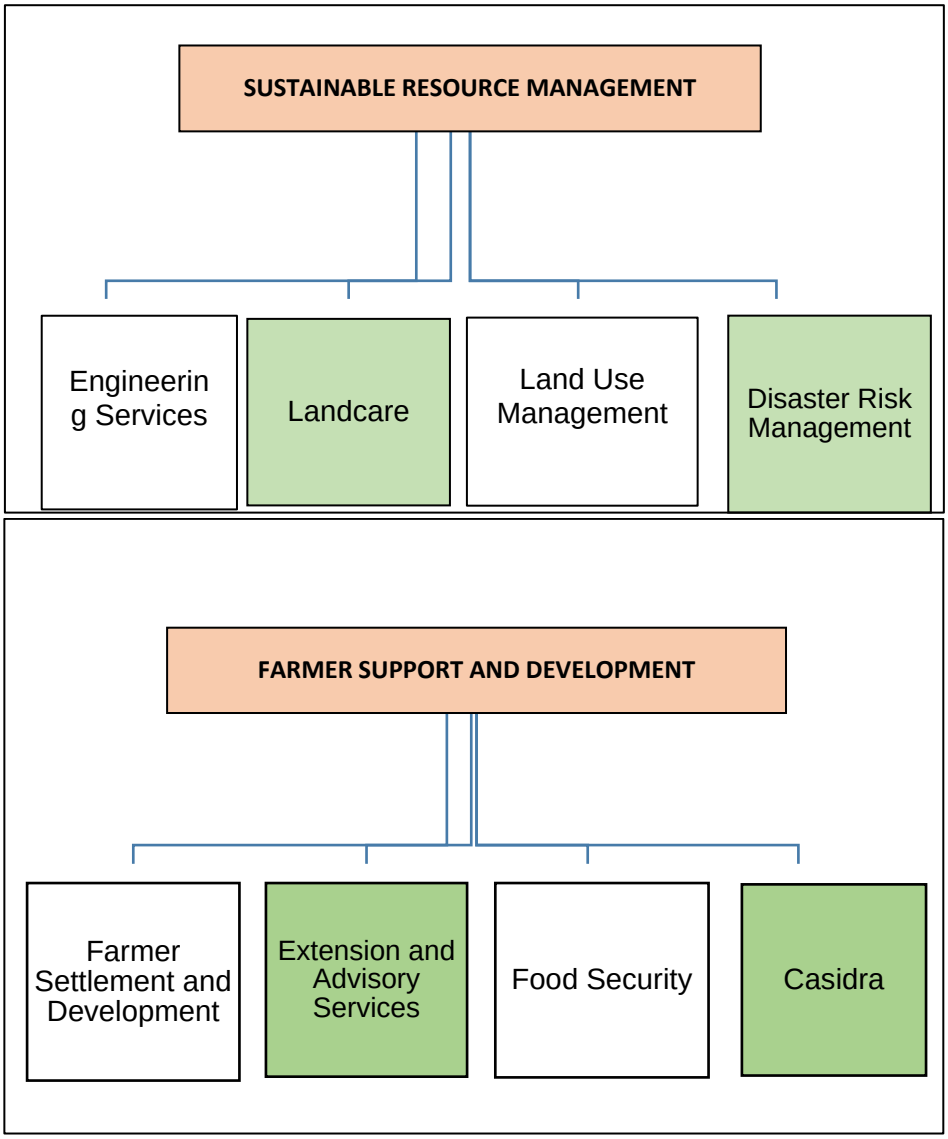


Figure 6.2: Sub-programmes under Sustainable Resource Management and Farmer Support and Development

(Adapted from WCDoA, 2019).

The highlighted green boxes in Figure 6.2 represent the sub-programmes that were relevant and the focus of this study. Land Care Services were active in 20 communities in the Western Cape, through the funding of the provincial government budget. The National Land Care project was concerned with the erection of farming infrastructure for the sustainable utilisation of the resources at the disposal of land users (WCDoA, 2020b) The purpose of Extension and Advisory Services was to provide extension and advisory services to farmers, by scheduling farmers' days of delivery and information, and by facilitating the process of skills audit, and the appointment of mentors to assist smallholder farmers, through the commodity approach (WCDoA, 2020a).

With respect to drought management, the Disaster Risk Management division assists in the enhancement of institutional capacity, disaster risk reduction, declaration of a disaster, and disaster response (rehabilitation and reconstruction) programmes and services (WCDoA, 2020b). The national legislation governing drought management consists of the Constitution of South Africa, Section 24, NWA 36 (of 1998), Section 5(3), Conservation of Agricultural Resources Act (No. 43 of 1983), DMA (No. 57 of 2002), Government of South Africa's Strategic Outcome 10 and the NDP. The provincial legislation includes different implemented plans and programmes of the Western Cape Government, namely the Provincial Strategic Goals, the Climate Change Strategy (2014) and Implementation Framework (2014) and the Water Supply System Reconciliation Strategy (2014). The provincial drought plan focuses on proactively managing disaster risk for the entire Western Cape through addressing planning and preparedness measures (WCDoA, 2016a), as per the provisions of the national legislation. Therefore, the WCDoA coordinates all the activities related to drought management in the province. To determine the role played by the WCDoA in implementing its provincial Drought Management and Water Scarcity Plan, which was last revised in 2016, a closer look at the whole drought management structure was taken.

CASIDRA seeks to accelerate the growth towards self-sustainable rural communities by maximising agricultural and economic development opportunities (CASIDRA, 2020). It has four programmes, namely Corporate Services, Agriculture and Land Reform, Rural Infrastructure Development and Poverty Alleviation, and Local Business and Economic Development. As highlighted earlier in this thesis (Chapter 2), CASIDRA plays a key role of ensuring implementation of the commodity approach in the Western Cape. The two programmes of CASIDRA considered in this study were the Agriculture and Land Reform and the Rural Infrastructure Development and Poverty Alleviation.

Figure 6.3 depicts the adapted Western Cape drought management structure with the stakeholders involved from the national to the farm level. Within this structure, the highlighted boxes contain stakeholders from the private and public sector and civil society groups that were identified by farmers to have assisted them during the recent drought. These are focal points for discussion in this section.

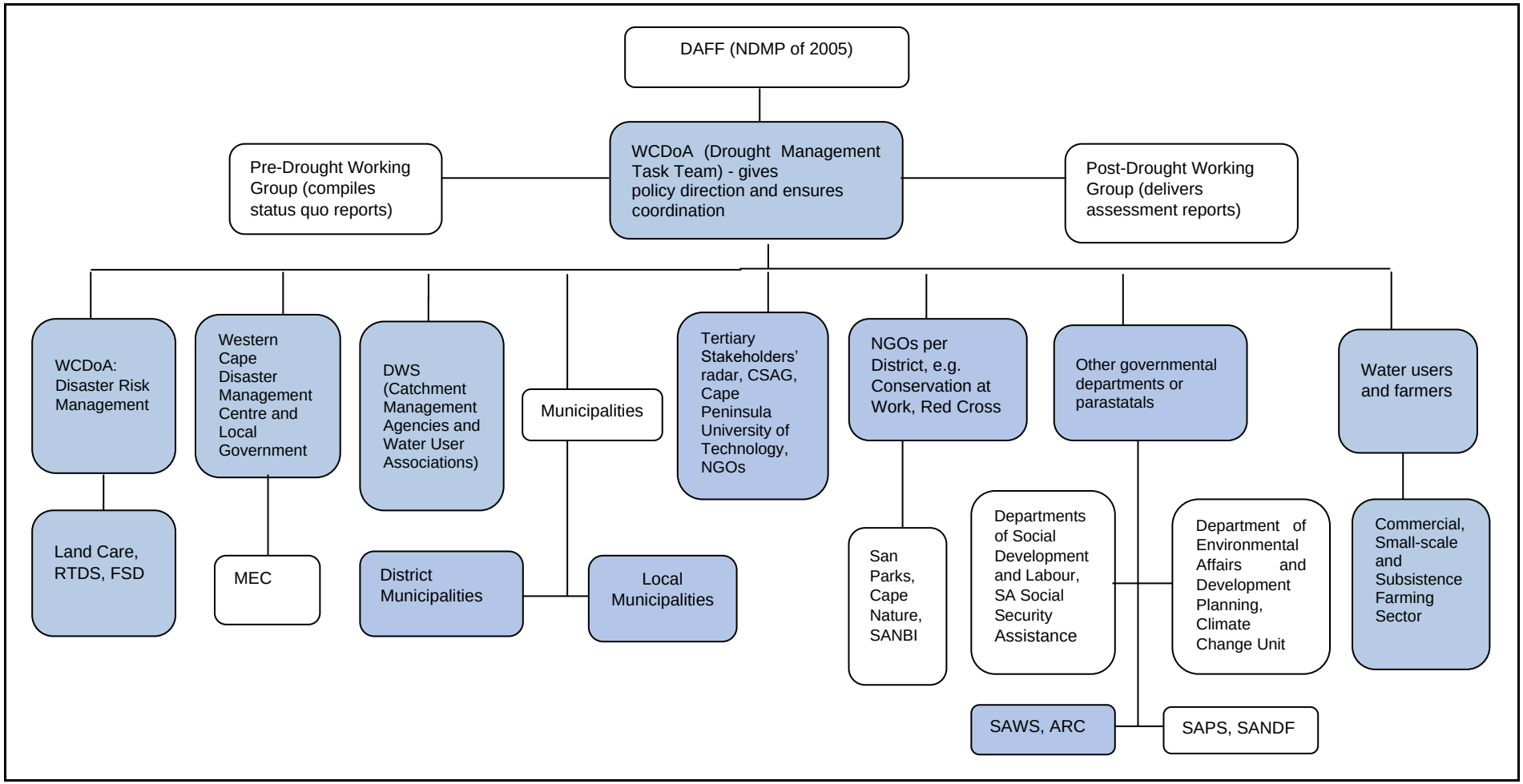


Figure 6.3: Structure of drought management in the Western Cape

(Adapted from WCDoA, 2016a)

6.4.2.2 The Department of Rural Development and Land Reform

The DRDLR was created in 2009 to enhance the social and economic development of rural South Africa, committing to ensure rural South African residents' enjoyment of the guaranteed constitutional human rights and basic dignity (DAFF, 2018). Its four main strategic goals are:

a) Facilitating effective and efficient strategic leadership, governance and administration;
b) Enhancing the production, employment and economic growth;
c) Enabling environment for food security; and
d) Promoting sector transformation and sustainable use of natural resources (DAFF, 2018).

6.4.2.3 The Western Cape Department of Water and Sanitation

The Western Cape DWS envisions being a dynamic people-centred department, leading the effective management of its water resources to meet the needs of all generations (DWS, 2020). The BGCMA was established in July 2005, in terms of the NWA (36 of 1998), to mainly protect, use, develop, conserve, manage and control water resources cooperatively (BGCMA, 2017). The Agency is tasked with playing a central and coordinating role regarding water use by linking all levels of government and hosting sector partners and stakeholders while accounting to the DWS minister (BGCMA, 2017).

6.4.2.4 The goal of organisations in implementing the commodity approach in the Western Cape

Having considered all the necessary background information on the organisations assisting smallholder farmers in the Western Cape, achieving viable large-scale commercial farming was predominant. Among the private organisations, Grain SA confirmed that they had a specific programme to graduate farmers to large-scale commercial farming as it is evident in the following speech of one of the Grain SA respondents:

> Um, how can I say this? Grain SA has a Farmer Development Programme with the main aim to uplift and develop farmers and to take them to commercialisation, so that is the focus or priority of the organisation.

This point was also supported by an Agri Western Cape official, who said:

> We would like to see a vibrant commercial industry and we would like to see more emerging commercial farmers, of course, we see it comes in stages where are smaller and you become a commercial farmer. I think we need food production for food security for our country, so we need more producers, so yea we support it.

Earlier interviews with smallholder farmers in the two districts had confirmed the aspirations of some of them to become large-scale commercial farmers. One of their reasons for the desire to grow to the higher level of farming was to increase their own income and lifestyles. Besides

the above, some of the stakeholders involved in this study have as well confirmed the desire of the farmers to be promoted to the large-scale level and/or to improve. For example, an official from DWS highlighted that there were such cases in the WCD by stating the following:

> But here, the majority does want to grow, they want, for example, maybe they are on municipal land, they want their own land, um because they also worry that the land is gonna be taken away.

On the other hand, some were comfortable remaining at a small-scale level of farming. This is also confirmed in the literature, in which it is argued that not every rural household involved in farming really wanted to engage in farming as a business and at large-scale commercial (van Averbeke, 2008). Moreover, a CASIDRA official, for example, indicated that they assisted farmers who would have been approved by the WCDoA, whom the official described as:

> The target group is in the rural areas, just the last person there. We have got smallholder farmers, who just started and they have got potential to be commercial, the smallholder has got a business plan, bank account, all the things, it's a business but it's a small one and then the commercial who doesn't need our help anymore.

The findings in this study suggest that there could be a mismatch in the goals of organisations and of their clients, which may imply the failure of the support system to address the diverse needs of farmers.

The selection criteria of farmers into the programmes for assistance may be biased because of the failure to recognise their heterogeneity and diverse needs and expectations which are to be handled differently. Thus, organisations may not strictly apply specific guidelines/criteria in terms of who qualifies to be in the 'smallholder' category. The operation of a farm as a business and everything that is implied by that kind of operation was being used as criteria for recruiting farmers into support programmes by both private and public organisations. Thus, the principle of a business is that it must grow, and for smallholder farmers, the desire would be of graduating to the higher level of farm production. The challenges emanating from this understanding was that other farmers who were simply farming to complement their income, for the love of farming or any other reason and in some instances, were failing to understand the reasons why they were expected to toe the line when it comes to operating their farms.

At DWS, the farmers were recruited during events, such as workshops, meetings and awareness campaigns and sometimes they were referred by other departments, such as WCDoA and DRDLR. This was possible because the services provided were interconnected and organisations could not work in silos. The DWS respondent expressed that:

> Remember here we do not actually recruit them because remember these are individuals who decided themselves to come for help for whatever the project, and then they go somewhere they get the land. They are just now coming to a place to complement what has been done by those who gave them the land lease agreement, so that the production

> can go ahead, so then we assist. As I said earlier on, we are coming in strictly in terms of water. So, now once we give water only when the person already occupies the land, so we don't actually do the recruitment.

These reflections on the various perceptions of organisations on smallholder farmers' characteristics and variables used to categorise them show that there seem to be a challenge in how those organisations approach smallholders with support. As the findings reveal, there are no clear criteria for categorising farmers into different groupings hence the lack of knowledge of the support that they need the most. This may strengthen the claim that the categorisation of smallholder farmers was a challenging and complex exercise and that it hampered the development of efforts to be made in the farming sector. In a nutshell, although organisations were assisting smallholder farmers in the province, it was likely to make a significant change in the quality of life of those farmers. If there is no review of that assistance provision, this might as well suggest that the farmers might be benefitting little, while they remain in the programmes for the fear of victimisation and being segregated. However, there might be others who are in real need of the kind of assistance being provided and are benefitting accordingly. Similarly, the same programmes need to be reinforced in their intended purpose and should organisations should be decisive in the implementation of specific smallholder farmer support programmes to avoid a waste of resources. The haphazard selection of farmers into the programmes should be revisited to enhance the effectiveness and efficiency of such. Instead, programmes should be designed in such a way that attracts the right people.

The pursuance of the commercialisation of smallholder farmers should only hold if they explicitly indicate their desire to grow. Therefore, goals for assistance recipients should be established first, to match them with those of organisations willing to support them. this will result in the tailor-made interventions being implemented and the diverse needs being made.

6.4.3 Livelihood support provision to smallholder farmers by the organisations

The four main support services of the private organisations are information, finance, production inputs and facilitation of markets access, which are presented in Figure 6.4.

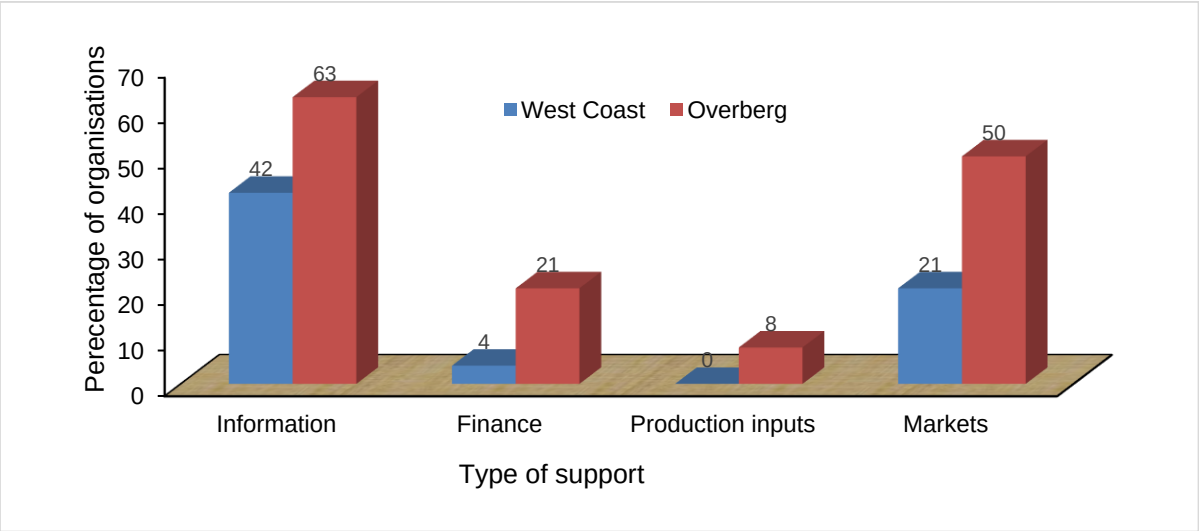


Figure 6.4: Private organisation support services provided to smallholders in the Overberg and West Coast

Overall, the OBD received more support services, with 71% of the organisations offering one or more support services compared to the WCD, where only 50% of the organisations were involved. Of the 17 organisations involved with OBD farmers, 14 of them (82%) offered one or two services while all four services were offered by only one organisation, Overberg Agri. On the other hand, of the 12 organisations involved with the West Coast farmers, 11 of them (92%) offered one or two services but no organisation offered all four services.

All the private, public and civil society organisations providing livelihood support to smallholder farmers, as identified by farmers, are presented in linkage networks in Figure 6.5 (OBD) and Figure 6.6 (WCD). In the figures, the kind of support provided is depicted by the different coloured arrows pointing to the farmers.

OVERBERG DISTRICT FARMERS FOCUS GROUPS

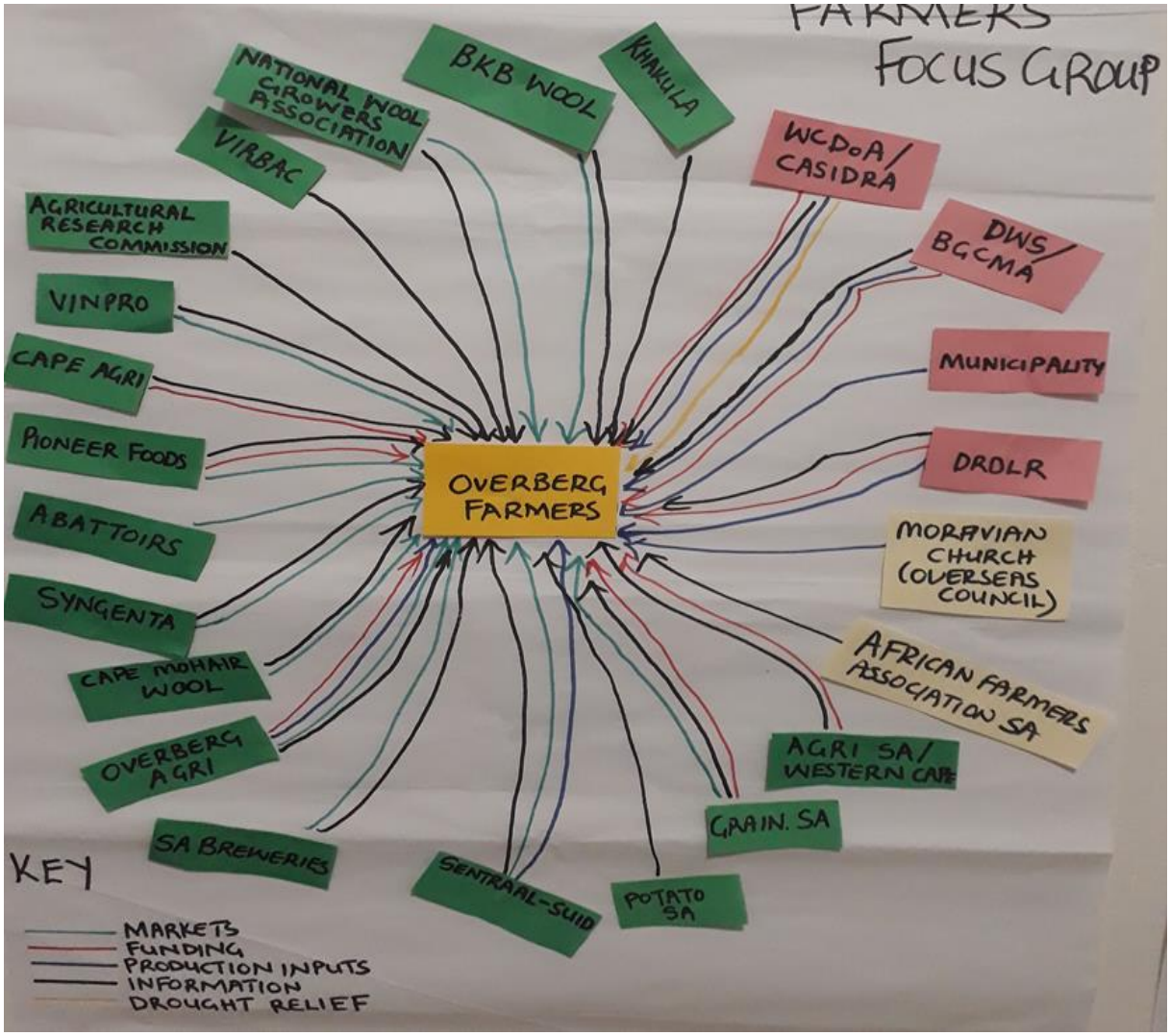


Figure 6.5: Linkages network–Overberg farmers and organisations supporting them

WEST COAST DISTRICT FARMERS FOCUS GROUPS

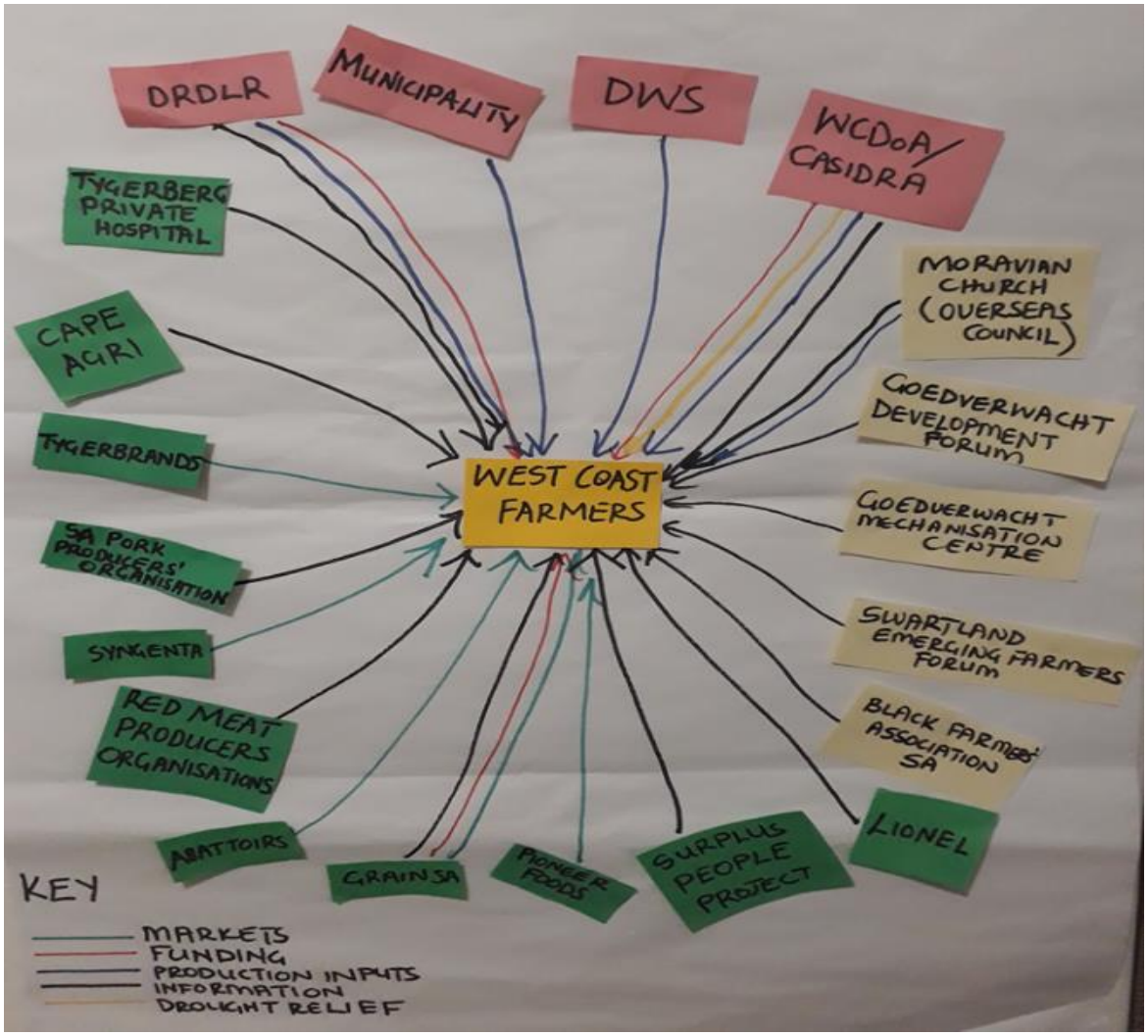


Figure 6.6: Linkages network–West Coast farmers and organisations supporting them

6.4.3.1 Provision of farm-related information

Information provision to farmers by the organisations in both districts was the main service, as depicted in Figures 6.4, 6.5 and 6.6. Among civil society groups, the Swartland Emerging Farmers' Forum, BFASA, Goedverwacht Development Forum and Mechanisation Centre provided the WCD farmers with marketing, land and other farm-related information. The respondents indicated in one of the focus group discussions that the Goedverwacht Development Forum used to organise an Annual Potato Festival where farmers would attend to display their produce, exposing them to local, national and international markets. However,

the service was no longer available for farmers and they expressed that they would appreciate its re-establishment. The mechanisation centre was also non-functional. In the OBD, AFASA provided the same service of information.

All three interviewed private organisations, Grain SA, Agri Western Cape and VinPro, confirmed that they provided information support services to farmers. However, although respondents did not mention VinPro as an information-providing company in the WCD, a key informant from WCDoA highlighted that the organisation was providing such support. The Grain SA respondent indicated that their organisation ran study groups in different areas in the two districts and conducted production tours. During these tours, smallholder farmers visited large-scale commercial farms and gleaned information on how farming was successfully done. Furthermore, farmers were contacted twice a year, depending on their needs, and large-scale commercial farmers were invited as guest speakers, to transfer skills and information. Topics on which information and ideas were shared included business, general production and financial planning. Lionel's and Tygerberg Private Hospital were providing respondents in the WCD with information related to veterinary services in animal health and production.

Respondents in both districts highlighted that the WCDoA was conducting various information sessions, such as farmers' days, information and demonstration sessions, training and workshops, as presented in Chapter 4. However, farmers in one of the areas in the WCD indicated that farm-related events conducted by the WCDoA had since stopped and they had no explanation for the claim. The farmers were also receiving on-site advice in any area of concern. The DWS and BGCMA assisted farmers with information, through the National Water Week awareness campaigns, roadshows, capacity building programme and workshops. During the roadshows, farmers got the opportunity to meet with all stakeholders and asked questions concerning their farming activities. Local municipalities were not reported in the provision of information categories in both districts.

Another important way in which information was provided to the participants was mentorship. Grain SA indicated that they had a mentorship programme in place, in which farmers were connected to various large-scale commercial farmers as their mentors. Grain SA was responsible for the implementation of this programme and all the mentors were expected to report their activities to the organisation. Reports highlight the appointment of over 200 mentors since 2014, to support farmers across the commodities at no cost to farmers of the WCDoA (Hartebeest, 2019). Therefore, the WCDoA works on the side-lines of the private sector in ensuring that smallholder farmers receive all the mentorship services needed for successful farming. The respondent at Grain SA emphasised that although mentoring farmers could yield positive results, there was a need for a strong foundation, including the prospective farmer in planning, sourcing funding and training. The respondent explained:

> Sometimes the biggest challenge with… when I started working here is if they say, for example, a business has been going for a year or two when the foundation wasn't right, it wasn't started in the right way, the things aren't in place, the procedures aren't in place, it's a struggle.

Therefore, for mentorship to effectively work, all other factors should be taken into consideration. The same approach should be done when considering information as a resource or ingredient for successful farming. In this light, one farmer had a feeling that information was not enough. He had this to say:

> When I was elected we have been having events on monthly basis. The thing to us, the reason for that is that we do not have water, so they can teach us but if we do not have water we cannot do anything with the knowledge. We have stopped projects until we sort the water issue.

This points to the diversities of challenges that smallholder farmers experience and the reason why solutions should be tailor-made. For example, if skills are provided to farmers who do not have key resources for farming, such as land and water, it could be regarded as a waste. There should, therefore, be a way of coordinating and integrating services by organisations, so that they do not overlap their interventions.

In addition to the support discussed, Grain SA's respondent indicated that a schools' programme was in place in the two districts, to expose the young generation to the potential benefits of farming and its role in the country's economy.

> The main aim is to provide exposure to the children, to show them agriculture has a massive spectrum of jobs. You know, children are interested in different things, technology, working with people and just to make them realise that there are jobs that would accommodate them and also just the basics, where does your food come from? How does the economy operate? Things like that.

In this light, one farmer had suggested in one of the focus group discussions in the OBD that the government could play a more pivotal role in the sustenance of the future of farming in South Africa. Therefore, Grain SA seemed to be going in the right direction and such efforts should be reinforced by the government. The WCDoA was committed to developing skills, mentoring and financing the rural young people, the unemployed and the previously disadvantaged individuals and females who aspired to further their education and engage in agriculture to increase its potential employee pool. This was done through the External Development Initiatives, in which the Internship Programme, External Bursary Scheme, Young Professional Persons and Premiers Advancement of Youth Projects sub-programmes were being implemented (WCDoA, 2020b).

6.4.3.2 Provision of funding

Funding was provided by 4% of the 24 private organisations in the WCD and 21% in the OBD. Farmers from both districts indicated that they received funding from Grain SA, while in the OBD, Cape Agri, Syngenta, Pioneer Foods, and Overberg Agri were added to the list. Indeed, this confirmed the approach in the private-public sector partnership that the government was mainly responsible for the finance aspect of supporting smallholder farmers, while the private sector focused on activities such as training and facilitation of access to resources and markets. The DWS and BGCMA officials reported that there was a grant policy programme for smallholder farmers, with a budget from the national DWS, and that farmers were encouraged to apply for any water-related project. The WCDoA, and the DRLDR were also providing financial support to smallholder farmers in both districts.

6.4.3.3 Provision of production of inputs

The Moravian Church (Overseas Council) was identified as providing land and water-related support in the two districts. One of the key informants in the focus group discussions in the WCD explained that the Oversees Council was in the process of linking the farmers to external and international markets and that they were processing contracts so that the burden of land ownership could be lightened. However, farmers expressed that they were not happy with the services of the Overseas Council because their interests were being ignored.

It was reported that the Sentraal-Suid Cooperative Ltd and Overberg Agri provided respondents in the OBD with production input such as seeds and fertilisers, while Potato SA had assisted farmers to buy land in the OBD. Okunlola et al. (2016) reported that farmers in Thaba Nchu in the Free State benefitted from accessing sheering and storage facilities collectively, through the services of BKB Limited and the National Wool Growers' Association in preparation for external exports.

Production inputs were also received by farmers from WCDoA, through CASIDRA, in the OBD and WCD, in the form of livestock, seeds, fertiliser and pesticides. Respondents in the OBD reported that they had received tractors from WCDoA, while in the WCD some of the farmers had received land from the DRDLR. The municipalities rented out land to the respondents in the two districts and facilitated their access to water through municipal water authorisations. The DWS and BGCMA provided production inputs in the form of water and infrastructure in the WCD and OBD respectively. A respondent at BGCMA confirmed the claim, saying:

> We provided water infrastructure, e.g. water tanks and boreholes, we gave 600 farmers water tanks in the Overberg district.

6.4.3.4 Facilitation of farmers to access markets

The WCD farmers were assisted by 21% of the private organisations in marketing their products, while in the OBD it was 50%. It seems that the WCD farmers were not well-coordinated in terms of accessing markets, although there were only two respondents who shared the concern that they had limited markets. A respondent from the Overseas Council expressed the need for the farmers to realise that the availability of water and land only was not enough and would not solve all their challenges. Nevertheless, the nature of market participation by smallholder farmers in the two districts needs to be explored to understand the extent to which farmers influenced transactions. On the commodity approach, the farmer associations and cooperatives seem to be working well in this aspect, which is a common outcry for most of the smallholder farmers in South Africa.

The attitude of farmers towards the support provided to them may hinder or facilitate the provision of services. Comparing the two districts, the presence of the private organisations, for example, was higher in the OBD than in the WCD. Similarly, only two civil society groups were assisting farmers in the OBD, while in the WCD it was five. Apparently, in one of the areas in the WCD, a key informant from the Moravian church highlighted that the private sector was no longer interested in investing in the area because of in-fighting among farmers. The researcher also witnessed heated exchanges among the participants in one of the focus group discussions in the district, which confirmed that there were deep-seated issues in the area. The same sentiments about the Moravian church were shared among farmers in the OBD, in which they felt that the church did not have any interest in improving improve their livelihood. In light of this, it was very difficult to understand the interests of the church and the motive behind its involvement in the farming businesses in the two districts.

One of the key respondents from the Moravian church in the WCD indicated that farmers were uncooperative when being advised of procedures to access capital for farming. She explained that:

> The other problem in this town is the people do not want to pay for anything, the water and whatever services rendered to them and that is the culture that is coming out from the people that they don't want to pay and that is dividing.

So, there was a sense of animosity between the two entities, because smallholder farmers felt that the land belonged to the community and the church should give it for free, even without them paying rates and tax. The uneven spread of private, public and civil society organisations is illustrated in Figure 6.7, which depicts one town in the Overberg and another in the WCD.

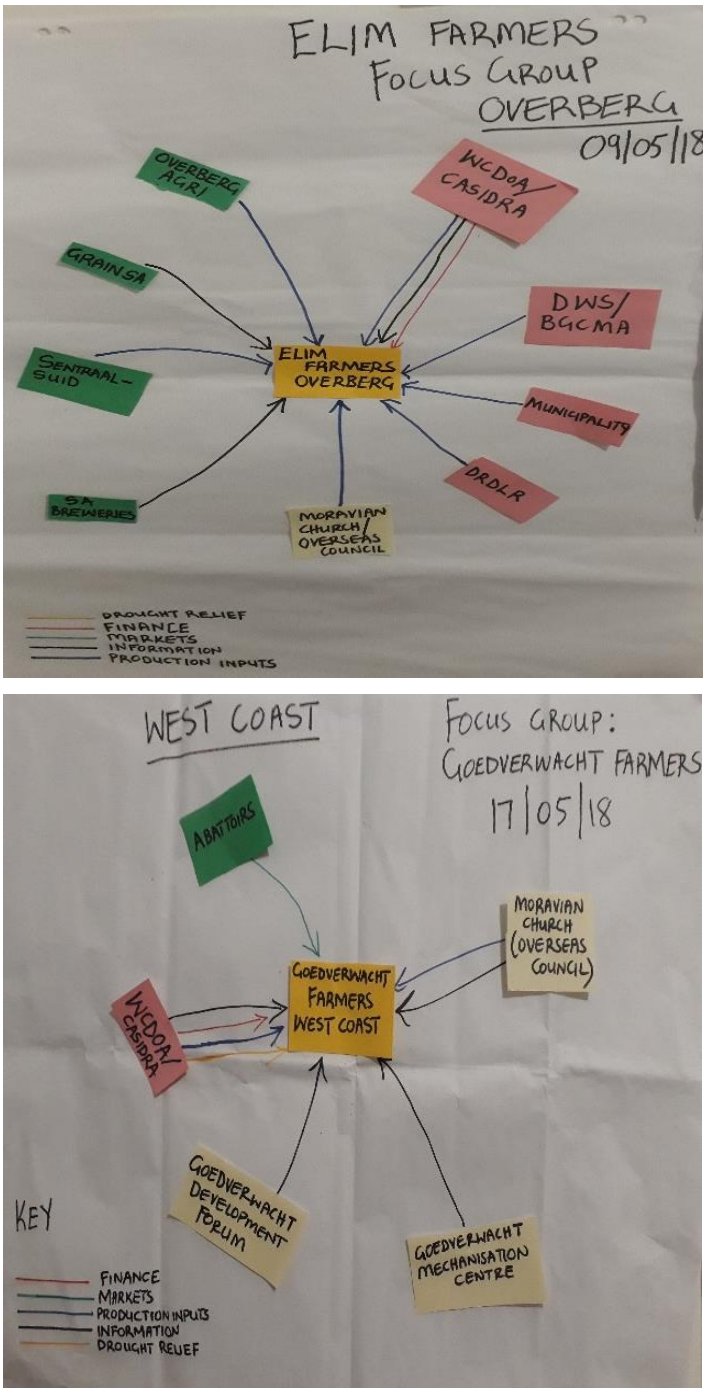


Figure 6.7: Linkage network maps for Elim area in the Overberg (top) and Goedverwacht area in the West Coast (bottom) for comparison of the presence of private and civil society organisations

The various organisations involved in the provision of services to smallholder farmers in the two districts through different ways and platforms have highlighted the implementation of the commodity approach using almost all the approaches that have been identified earlier (Chapter 2). These are reiterated as the Farmer Field School Approach, Project Extension Approach, Farming Systems Research Extension Approach, Cost Sharing Extension and Education

Institution Extension Approach. This implies that the commodity approach has been implemented holistically, and that smallholder farmers were benefiting from a whole range of support and assistance in the OB and WCD.

6.4.4 Drought relief provision by the Western Cape Department of Agriculture

During the interviews with WCDoA personnel, it was confirmed that the Department, through CASIDRA, implemented its provincial drought plan during the 2015-2018 drought. The reports by farmers that they had been assisted with drought relief in the form of fodder for livestock in the WCD and OBD were confirmed. Needful to highlight, determining the extent to which livestock farmers were assisted, in terms of the scope, quality of service, manner of distribution, selection criteria for farmers who benefitted and so forth would reveal the processes for the implementation of the drought plan in the two districts. The full process of the drought plan implementation in the Western Cape is included in Chapter 7.

However, reports by the farmers about the assistance they had received showed that the assistance came late and that it was inadequate. Mthembu and Zwane (2017) noted that government drought relief was often limited to make any meaningful impacts on the recipients, and fell short of their expectations, because of the huge number of those who were affected by it. The inadequacy and late timing of drought relief in the Western Cape were consistent with studies by Ngaka (2012) and Bahta et al. (2016) in other provinces. However, in terms of adequacy, it could be that farmers were failing to understand the requirements for drought relief, for example, fodder was provided based on the minimum size of the livestock herd, and this was determined during the farm assessments visits by officials from organisations.

The dissemination of 2015-2018 drought forecasting information to farmers in the two districts drought was limited in its impact on their decision-making about adaptation strategies. To substantiate this claim, the WCDoA (2016a) reported that weakness was noticed during the 2015-2018 drought in the dissemination and communication of information. Therefore, no up-to-date information and recommendations on the management of specific crops and livestock to reduce on-farm disaster risk were not achieved (WCDoA, 2016a). This confirmed the finding in Chapter 4, in which smallholder farmers seemed to have been caught unaware by the drought, as they reported that they could not plan because they did not know that it was coming. Among those who received limited information on the pending drought, some indicated that they did not interpret it to mean drought, because of the use of terms such as ozone layer, global warming and climate change. Accordingly, this study has shown that smallholder farmers' access to adequate, timely and well-interpreted drought forecasting information should be prioritised. The uptake of such information should be encouraged and monitored and farmers should be empowered to enable them to apply it for their own benefit.

This is so because the smallholder farmer perceptions of drought and impacts did not contribute meaningfully to planning for adaptation, as confirmed in this thesis in Chapter 5. This finding is similar to the one of Kamara et al. (2019) Lesotho and Swaziland, in which some participants in both countries expressed their ignorance on drought as they had not received early warning information disseminated by government agencies.

6.4.4.1 The role of Department of Water and Sanitation in drought management in the West Coast and Overberg districts

Respondents in the two districts reported that they had received tanks to store water, as shown in Figures 6.4 and 6.5 and as confirmed by one of the respondents from BGCMA. However, some farmers could not store water because of the lack of infrastructure. Furthermore, the provision of water storage tanks did not provide a solution to issues such as the transportation and cost of fuel because of the increased use of electricity for pumping of water. On the other end, the DWS official highlighted that they had encouraged farmers to use water sparingly and to achieve their desired outcome, the organisation imposed water restrictions. Farmers struggled to access water for agricultural purposes. However, imposing restrictions for agricultural water use does not achieve sustainable and effective water behaviour change by users. It also might be too late to save water during drought, because of the difficulty that farmers would be facing, witnessing their crops fail and livestock dying, as reflected in Chapter 5 of this thesis in which saving water was cited by two farmers as a coping strategy. The view that water-saving strategies introduced during drought fail to create stable or enduring water use behaviour is supported by Simpson et al. (2020). Therefore, water practitioners should encourage sustainable and efficient ways of managing water by monitoring and modelling peoples' behaviour (Muller, 2018).

Reportedly, the DWS' limited management of the province's water supply system resulted in the invasive vegetation spread and ill-operation of water harvesting augmenting pumps and canals (Ziervogel et al., 2019). Several breaks in some sections of the Clanwilliam Dam canal maintenance project in the WCD had been reported, due to ageing infrastructure (WCDoA, 2017). Nonetheless, water management in the Western Cape, as in other provinces, was dependent on the strategic planning of the malfunctioning national DWS, which contributed to the province's crisis during the 2015-2018 drought (Ziervogel et al., 2019). This dependence had resulted in poor coordination and collaboration among stakeholders, knowledge gaps and capacity challenges (Ziervogel et al., 2019).

The same mismanagement of water was manifested by farmers in the two districts in which they were failing to clean pipelines and canals, the action which resulted in the usual up-downstream challenges. This finding suggests for the organisations to invest in water infrastructure revitalisation and maintenance, while it places equal responsibility on the farmers

to change their mind-set and own the infrastructure in their area. This would also address the issues of conflicts and violence that result from the failure to address the up-downstream water access challenges. This means that there is a need for all water users to play their part efficiently and willingly, for water management to be sustained in both drought and good years.

Some of the farmers received boreholes from DWS/BGCMA (Chapters 4 and 5), and this was confirmed by an official during an interview. However, there had been reports by some of the farmers that the process for applying a borehole installation was not easy and that they could not afford it. On the side of organisations, there were many considerations to be made carefully, before approving an application for a borehole installation. One of the respondents at CASIDRA had this to say concerning the drilling of boreholes as a coping strategy for the 2015-2018 droughts:

> When the government came up with the idea of drilling boreholes during drought, it was not a good idea. In some places, the water is acidic, it is not suitable for use. The minimum to drill one borehole is about R150,000. Fortunately, for those who had working boreholes they had to pay only for electricity and although it was high, they could at least farm, whilst the other ones stopped because the farm water was cut. It was hectic for the small farmers. Remember if you drill a borehole on the land that is not yours and the lease expires, that borehole the Department has lost money.

The expression above also highlights the fact that only those who had finance and land of their own could at least qualify for a borehole. Therefore, with the circumstances of smallholder farmers who do not own private land, and have no financial means to install and sustain its maintenance, it suggests that the scope of mitigating water shortages this way was very limited. A look at the application form for a borehole installation indicated that it attracted numerous maintenance costs.

6.4.4.2 The role of the private organisations in the 2015-2018 drought coping in the two districts

Direct private support was very limited in the two studies during the 2015-2018 drought. In the exercises where smallholder farmers were asked to identify organisations that had assisted them during the drought, no one reported having received such from any private organization. Regardless, Agri Western Cape's respondents indicated that they had a drought-specific programme and had supported smallholder farmers. However, the official explained that the relief programme was implemented through the 19 district representatives in all the five district municipalities in the Western Cape. He explained that:

> We have got our own programme for drought where we get donations and we assist our members with transport or buying of fodder. We have 19 district representatives so we get feedback from them, they lodge an inquiry and we say this area we can assist. We also ask other areas if they have feed and then we pay for the transport if it is not free and then they themselves decide in their area which area is critical because they distribute to their

> members there in terms of what actually is on the ground. So, we don't get involved there, because for me to sit in this office and say X needs this, it's a bit difficult. So we ask our representatives there to distribute.

The Agri Western Cape respondent mentioned that the drought relief programme was specifically for the organisation's membership and that the number of those supported during the 2015-2018 drought could be around 3800. This was also the estimated number of members affiliated with different farmer unions across the province.

The consideration of the assistance that was provided by organisations to mitigate the 2015-2018 drought impacts on smallholder farmers in the Western Cape has confirmed the persisting reactive approach to its management. It is on record that the severity of the 2015-2018, by the year 2016 in the Western Cape, had not been sufficiently recognised, resulting in a slow and limited response going forward (WCDoA, 2016b; Vogel, 2019). This is evidenced by the seemingly poor coordination of all stakeholders' initiatives in such a way that each organisation focused on its own mandate without the consideration of the implications on the sustainability and effectiveness of its assistance on the coping and adaptation strategies of its beneficiaries. This aspect of managing droughts has been persistently neglected long enough by stakeholders and implies that the achievement of enhanced and sustained smallholder farmer adaptation in the future was far-fetched. This means that the already costly exercise of providing drought relief could further expose the farmers to drought vulnerability and other climate-related shocks, and plunge them into a vicious cycle of poverty and indebtedness, instead of enhancing their adaptive capacity.

The above scenario further implies that the need for the provision of targeted and tailor-made assistance for smallholder farmers to address their diverse needs and challenges for adaptation has not been given priority and deserved attention by organisations. This study has confirmed the fragmented work that was done to assist smallholder farmers during the 2015-2018 drought by all the organisations involved. There seemed to be no clear direction of the approaches of organisations in drought management in favour of smallholder farmers. Okunlola et al. (2016) argued that it was not known whether there was adequate engagement of small-scale farmers by stakeholders when designing support programmes to determine their real needs and problems. An earlier discussion on the criteria for recruiting smallholder farmers into development assistance programmes in this study has revealed the urgent and serious need for targeted and decisive approaches to enhance the achievement of livelihood outcomes and coping and adaptation. The private sector could play the role of actively leveraging government funding for the implementation of drought relief support programmes. Lunga and Musarurwa (2015) found that in Zimbabwe, some government departments, NGOs and the private sector had built strong extension/farmer linkages and technical partnerships to promote drought risk reduction initiatives.

6.4.5 Relationships among organisations and farmers in the West Coast and Overberg districts

The objective of identifying the relationships that existed among organisations and farmers was aimed at understanding the extent to which they influenced work done. Figure 6.8 presents a social network map, depicting the linkages and extent of influence among the organisations that were interviewed. However, some of the organisations in the network diagram were not reached for interviews but they were identified by those with whom they were in partnership. Hence, the network of linkages among organisations is not exhaustive.

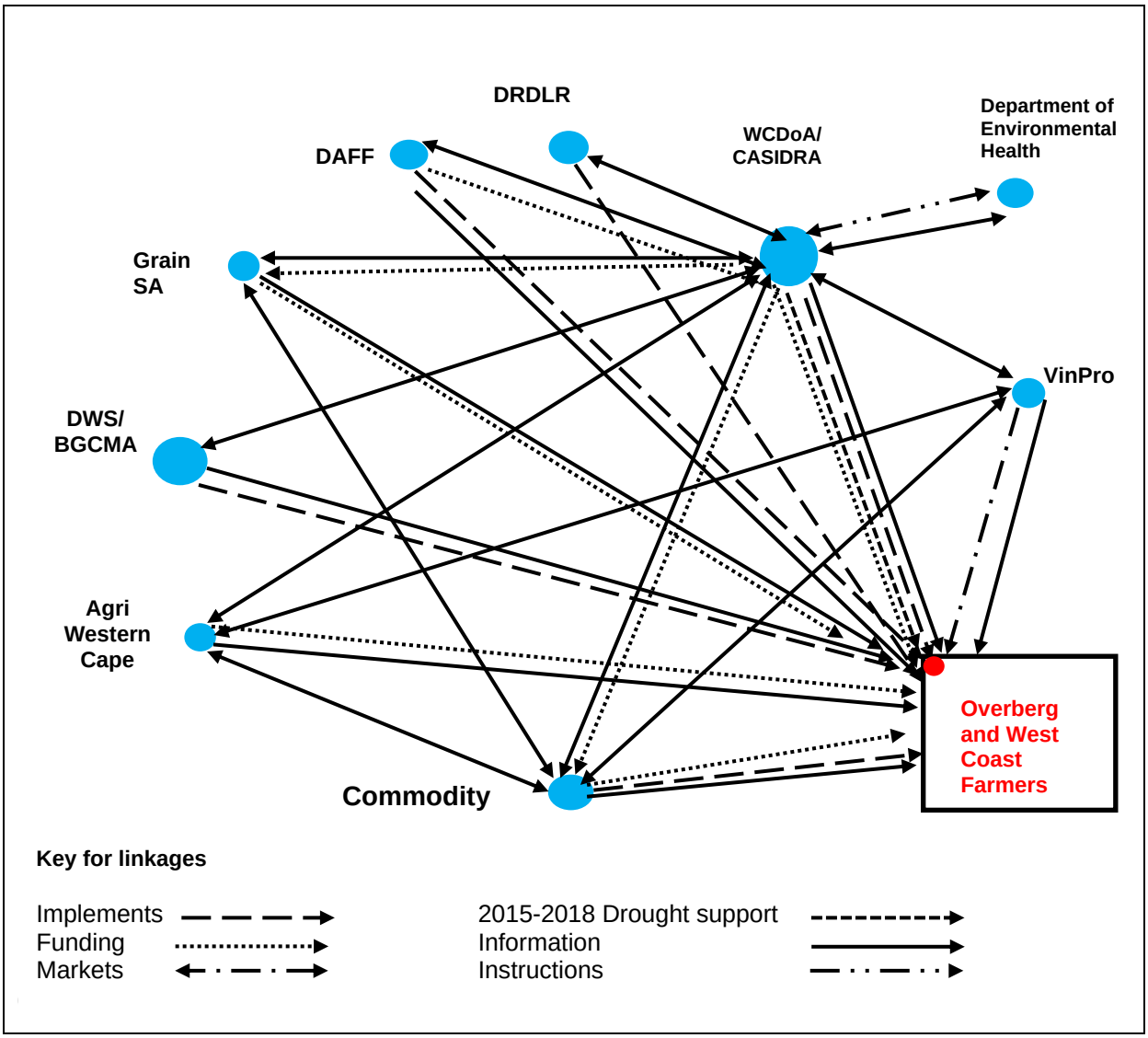


Figure 6.9: Interviewed organisations' linkages and influence network map

6.4.5.1 Relationship between farmers and organisations

The arrows designated in different ways show the network linkages of organisations and farmers in the two districts, thus, the relationship that exists between them. Figure 6.8 portrays an ostensibly non-reciprocal relationship, as shown by all the arrows pointed to the farmers,

from various organisations. This may imply a situation in which farmers are at the receiving end and do not have any influence in how they are supposed to operate, and that organisations do not have anything to lose. However, in a scenario where organisations facilitated access for markets by farmers, production inputs sometimes are received by the farmer and a product is produced on a farming contract. Therefore, money was received by a farmer, while the organisation received the produced goods. Nonetheless, this nature of relationship means that the voice of farmers was likely to drown, resulting in them not having a stake in decision-making. For instance, when the impacts of 2015-2018 drought resulted in the failure by farmers to fulfil their contracts for offtake agreements, the farmers faced the risk of their contracts being cancelled (see Chapter 5).

In light of this, the activities of smallholder farmers in the OBD and WCD were influenced significantly (either positively or negatively) by the involvement of the organisations. This resulted in farmers not being able to independently determine the course of action for their livelihoods, coping and adaptation strategies. Needless to say, the goal to promote large-scale commercial farming by the organisations in the Western Cape should be re-looked into and re-considered in its implementation to address the diverse needs of smallholder farmers. This may be an all-encompassing solution to many challenges that were experienced during the implementation of development projects by organisations, such as the free-rider challenge within groups, the implications of illiteracy and incompetency by farmers, lack of responsibility

6.4.5.2 Relationship among organisations

The first nature of relationship is between private-public organisations (Figure 6.8). The eleven commodity groups (private organisations) and other ones like Agri Western Cape were linked to the WCDoA in one way or the other. In their role of facilitating the access of services by farmers, through the provision of information and other kinds of support, they worked with the WCDoA to implement the commodity approach. The arrows for WCDoA and these organisations were double-pointed, implying that there were mutual relationships. The linkage that was common between these organisations was that of information coming through to the WCDoA. This could explain the responsibility of the department of coordinating all other stakeholders' activities, thereby requiring effective communication. This contributed to the circle for the WCDoA being bigger than all stakeholders in the influence network (Figure 6.8), meaning that the department influenced what other stakeholders were doing.

Secondly, there was a general understanding that government departments do not operate in isolation, regardless of their different mandates. For instance, the Department of Environmental Affairs and Development Planning was identified as the main organisation influencing the operations of the WCDoA and CASIDRA. The respondent at CASIDRA had this to say:

> The Environmental Health, we don't have programmes within their departments. It makes things to take long. We have submitted plans to them, now it is six months, because it's not their priority. I can't start a certain development if I didn't receive a certain approval from them. Should I go ahead it's a penalty, the department is in trouble and remember now it influences the prices because I can't build now. Let's say next months the price has gone up and the project has a small amount of money. Therefore, it influences many things like the timing.

Meanwhile, CASIDRA, because of its alignment with the WCDoA and as an implementer of development projects, was influenced by more organisations, compared to others, such as the DRDLR and DWS. The above expression implies that the decisions taken at the WCDoA and CASIDRA were influenced by those at the Environmental Health Department and that any planning and execution of initiatives was based on that understanding.

Partnerships among organisations enabled them to achieve more. An official at Grain SA had the following to say about the influence of others on its work:

> Only positively, that is one of the things I can pride ourselves on is that we do not try to do anything alone, it's teamwork we need to… we really make effort to make other people on board. No one is not gonna operate on an island.

Another respondent from DWS echoed the same sentiments, saying:

> Um… initially we used to go alone and then we saw that it's not working and then we maximised by combining with other departments. Usually, when we meet with the resource-poor farmers, we have someone from Agriculture and then we have someone from Rural Development (Department of Rural Development and Land Reform) because when we talk about water, they want to know about supplements.

Some organisations indicated that they were playing a facilitation role for respondents to access resources and support, including anything project-related, for example, lease agreements, registration of businesses and drafting of business plans. One of the respondents from the DWS mentioned that they engaged CASIDRA for assistance in terms of farmers registering their businesses, as they do not give access to water to unregistered farming businesses. A respondent from BGCMA expressed that:

> We take into cognisance of what other people's mandate is, e.g. Cape Nature looks at environment but we look at people and social aspect, we then engage them and understand their point of departure for development.

This way, farmers were assisted from all corners. However, there were other negative side effects of partnerships. The fact that there were delays and the existence of different mandates mean that there was a lack of coordination and integration of activities. This is a common challenge in a setup where various stakeholders are involved for a common goal. However, this can be managed when the involved partners understand that for the common goal to be

achieved, there should be concerted efforts and harmony in the implementation of the various initiatives.

To substantiate this view, an interview with one of the CASIDRA officials highlighted that in some meetings, for example, commodity organisations meetings, in which applications for support for smallholder farmers were considered, the WCDoA had the final say in the approval of the funding applications. The respondent at CASIDRA said:

> In the past, I used to influence decisions in the CPAC (Commodity Project Allocation Committees) but that right was taken away, between the department and CASIDRA. We don't have a voting right but your contribution is the most important but when it comes now when we don't agree on a certain thing I can't vote. When I had that right it was easier because what I would be saying is based on we can't approve this because of 1,2, 3, or because we can't implement it when it comes to PFMA (Public Finance Management Act). Now if I don't agree, they just minute it, they will continue then it comes back to us when we have to implement it becomes a problem, the farmer gets frustrated because of the decision we have taken as a committee.

Again, the sentiments above point to the fact that the influence of each other's work should be mutual for the achievement of the common goal of developing the smallholder sector. The use of the top-down approach should be avoided at all costs, as is suggested by the expression of the CASIDRA respondent. Ideally, those involved in implementing programmes should be regarded as equally important, as those who approve them, because the former were the ones who had the actual experience of working with the beneficiaries.

Moreover, on the negative side of partnering, the lack of integration and cooperation by other organisations was viewed as a setback to achieving more together. An official from DWS expressed that:

> Everyone has their own mandate. Where we meet, we progress but when we do not meet, there is a gap. For example, Rural Development (Department of Rural Development and Land Reform) can acquire land and there is still a gap. We can improve by being integrated and not only working. Lease agreements are finalised in the higher office of the Minister. I cannot do much. Let us all do our best.

This study confirmed that different departments in the government had different mandates and were supposed to do their part effectively. The respondent at DWS acknowledged that although mandates were different, the integration of work could still facilitate the achievement of the common goal. Thus, the integration of activities should be prioritised and can only be successful if all organisations understand the goal for assisting smallholder farmers. However, only understanding this would not be enough. Rather, for integration to happen, there should be the willingness and the necessary cooperation by the stakeholders to achieve it. A respondent at DWS expressed that:

> The goals are the same as the ones of the National Department … remember we are a National Government and we are governed by this [National Water Act], this is my Bible. If I was in church, I was gonna say this is my Bible… so anything that is not in this Bible, it's not mine to deal with.

Of importance to note is that mandates in themselves were not a problem, because they guided the implementation of programmes and facilitated accountability by those involved. However, the need for working together of departments cannot be overemphasised. The interconnectedness of government departments should ideally harness each entity's strength and the different mandates should promote efficiency and effectiveness. In light of this, the findings in this research have proved that the lack of or poor coordination of activities by the government has resulted in limited success. Moreover, the integration of activities for organisations was lagging and the implementation of programmes was suffering.

6.4.6 Achievements by organisations during provision of services in the two districts

6.4.6.1 Scope of assistance

A respondent at the BGCMA indicated that:

> We helped a farmer in Barrydale (Overberg district) to draft a water licence from A-Z in 2013. We assisted 72 small-scale farmers in 2016 in the Overberg.

The expression does not provide a clear explanation of the level of achievement and the new status of the farmers after they had been assisted. It was, therefore, difficult to determine the impact on the livelihoods, coping and adaptation strategies for smallholder farmers. On another note, a respondent at Grain SA highlighted that measuring the impact of support provided to smallholder farmers was not that straightforward. She said that:

> It is related to what I said, that farmers are becoming more independent… it's very difficult to measure… difficult to say we have achieved this or that … we can say that farmers are becoming independent as they experience growth … the majority have very good conducts by now.

Needless to say, the implementation of projects requires the continuous and vigorous collection of data by programme personnel during all the stages to facilitate their smooth evaluation. This process requires clear indicators of what would be measured during evaluations.

6.4.6.2 The commodity approach

The implementation of the commodity approach, although not directly mentioned by organisations and farmers may have been useful through the provision of abundant information and facilitation for farmers to access wider markets for their produce. The researcher also observed that farmers were able to work in groups rather than in silos. This had advantages

of pooling together resources such as human, information and physical production inputs, within their specific farming enterprises. The commodity approach had in a way facilitated the coordination of the private sector activities and the building of partnerships with the government.

6.4.7 Challenges faced by organisations, in working with their counterparts and farmers

The working together of organisations with each other and with farmers had its own challenges, which are discussed below.

6.4.7.1 Financial constraints

Financial constraints were identified as limiting what could be achieved, as mentioned by BGCMA, DWS, WCDoA, CASIDRA, Grain SA and Agri Western Cape. The same finding was obtained by van Niekerk (2014) in South Africa and Zimbabwe, it was observed that disaster risk reduction in most institutions was not budgeted for, hampering the process of mitigating their effects (Lunga & Musarurwa, 2015). The lack of or limited finance had implications on the hiring of personnel, as reported by WCDoA, CASIDRA, Agri Western Cape and BGCMA. The lack of or shortage of personnel could force those who bridge the gap to underperform, compromising the efficiency and effectiveness of the support programmes. Similarly, a respondent from WCDoA reported that the farmers were scattered throughout the province, making it costly, in terms of money and time. This could actually result in the few available staff to travel long distances to deliver services, which is not ideal, as it can result in burnouts and stress. Mapiye et al. (2018) in Limpopo South Africa found that very few farm visits were provided, assistance was provided over the phone and farmers had to reach out to extension officers themselves. These, among others, were sources of dissatisfaction with the inefficient systems. Accordingly, Aliber and Hall (2012) highlighted that the lack of manpower and support resources compound the challenges related to extension services.

Linked with the lack of funding, the result could be the compromise in implementation of programmes or failure of other services to be rendered at all. The lack of funding by farmers was seen as an impediment, in the sense that while large-scale commercial farmers could employ lawyers to assist in drawing up their application for a support service, smallholder farmers did not enjoy the same privilege. This premise was reported to have sometimes forced smallholder farmers to abandon the process or miss deadlines, delaying the implementation at the level of government or private sector and compromising their work.

6.4.7.2 Strained relationships among organisations

Reports were received from other organisations that their relations were strained A respondent from the WCDoA reported that some of the government departments were not doing their part

and that this strained their relationships. One of the contributing factors for this strain was that of the complex nature of government systems, in which personnel were operating. The different mandates, too many policies and bureaucracy for programme implementation, and the lack of clarity on the roles of personnel, sometimes overlapping, for example, were among the compounding factors. One of the WCDoA respondents said:

> It may work better if directors are not involved in farmers' daily issues, and make use of e.g. Land Bank, farmers should purchase their own things, we can concentrate on implementing programmes for developing farmers, more on the national level than provincial level. Government should not be involved more in the farming activities, for example procurement, that should be left in the hands of the farmer, not us. We should be concentrating more on farmer development, not on the funding issues, which should be placed on the commercial banks in terms of loans and borrowing. Government is not designed to deliver but to preserve.

Therefore, other officials complained that because they would have to spend time explaining things and that some still failed to understand, there would be misunderstandings, resulting in friction among themselves, a finding supported by Makova et al. (2019) in Zimbabwe. Similarly, van Niekerk (2014), in South Africa found that other departments involved in drought management lacked understanding of disaster risk management, hence they were not cooperating. Additionally, the lack of or shortage of personnel should be a cause for concern to protect them from being overwhelmed and to encourage efficiency and effectiveness.

6.4.7.3 Too much "red tape"

In this study, it was indicated that the red tape challenge slowed the 2015-2018 drought declaration and the process of applying for funds from the national government, as evidenced by a case where the application of funds to the WCDoA was reported to have taken time to be approved (Salzmann et al., 2016). The WCDoA noted too many bureaucratic bottlenecks in the government policies, such as the water legislation. It therefore advocated for an urgent revisiting of the water policies and regulations hampering the development of water infrastructure and additional sources, to facilitate agricultural adaptation to changing and increasingly extreme climatic conditions (WCDoA, 2016b). The DMA of 2002 should eliminate any form of financial and bureaucratic bottlenecks to promote timely programme outreach (Rukema, 2013; WCDoA, 2016b).

Organisations identified some challenges that they experienced when rolling out their programmes in the farming communities. Figure 6.9 below is a network view of the challenges reported by organisations related to smallholder farmers.

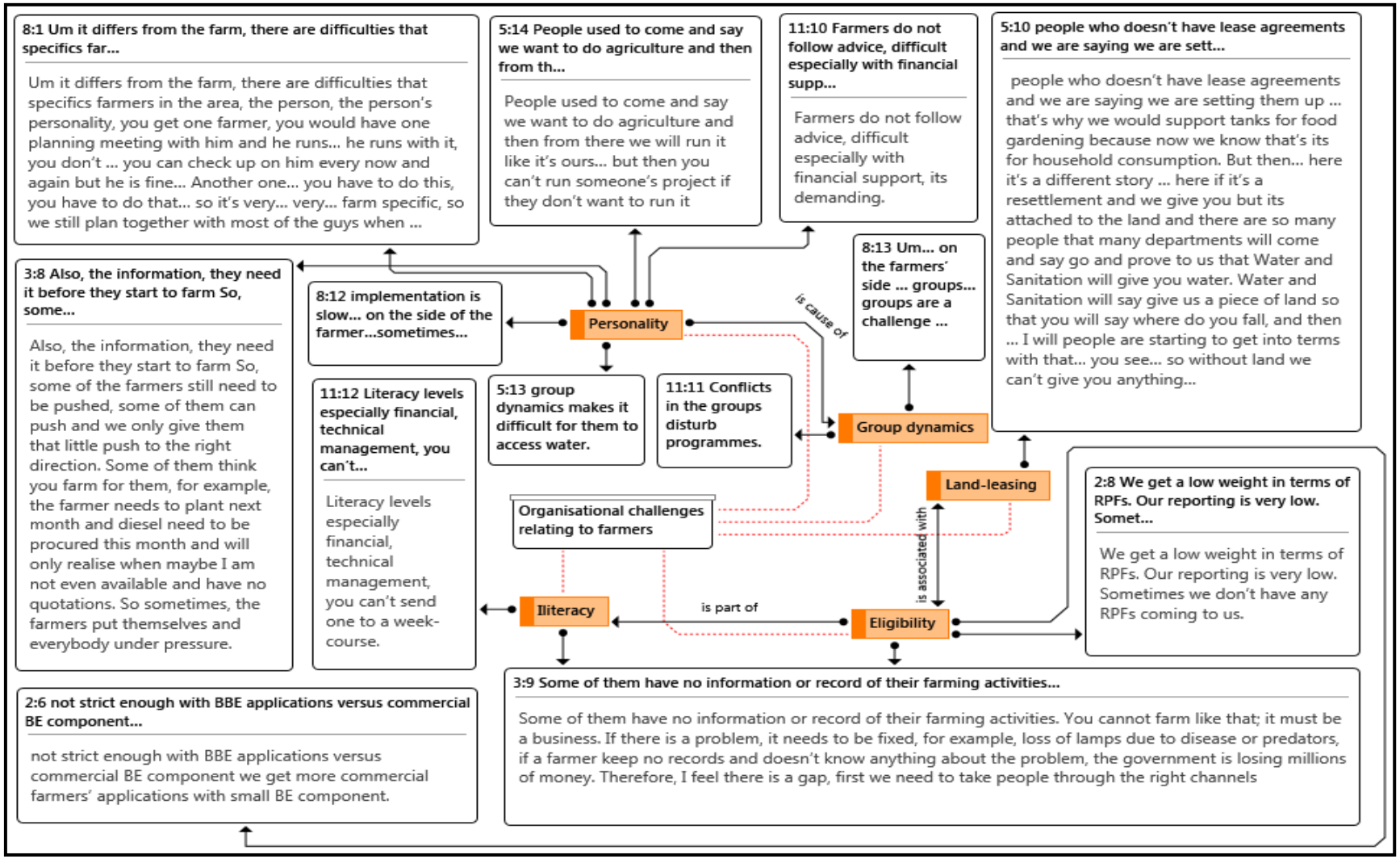


Figure 6.10: Network of challenges for organisations when working with farmers

6.4.7.4 Personalities of farmers

Different personalities of the farmers were mentioned as a setback, by WCDoA, CASIDRA, and DWS. It was explained that there were scenarios in which one farmer might be very much involved in the business and taking initiative, while the other sat back and waited to be pushed to do something. Those who waited for the push always lagged, while slowing the implementation of the programmes or initiatives by organisations. Farmers, on their side, sometimes took longer than anticipated to implement or to put to use the resources that they would have been given, for example, for planting. Others did not give feedback or update the organisations with the information when needed for accountability and planning. The BGCMA respondent highlighted that it was difficult to determine the size of the target group because some of the applications had not been fully completed or had already been abandoned. Personality issues were also associated with illiteracy and a lack of some competencies that were required to make it in farming. They contributed to the success of an individual to stay and work together in a team. During focus groups, other farmers reported that they were not able to access resources, because of operating as individuals. There were instances where criteria for applying and obtaining funding or other forms of resources were based on group farming.

6.4.7.5 Group dynamics

It was advised that some farmers were not able to work in a group, resulting in the malfunctioning of the group, divisions and conflicts. This challenge could be attributed to personalities that were difficult to work with, for example, lazy, uncooperative, and passive individuals could derail others who sought to progress.

6.4.7.6 Lack of responsibility and ownership by farmers

A respondent from CASIDRA highlighted that farmers were failing to take ownership of their businesses and account for anything because they would have not put anything meaningful in it. He said that:

> The CASP funding should take the farmer from A to B, not A, B and then A. The farmers must be responsible; they must not look at this grant as just another thing. If this grant can come as a loan or something, then they know they need to pay back. Now, because it's a grant, if they don't make it, then what? They change the name and apply again? However, if you say we give you 50%, you come with the other 50%; if you do that then we know you are prepared to take the risk. Currently the future of CASP funding, as I am saying, there are few success stories. In terms of the impact, at this stage the conditions are not about impact but compliance, while the impact is suffering.

This meant that the impact of smallholder farmer projects should be taken into account seriously when providing them with assistance. There should be a way of ensuring that the win-win principle is activated, in which if the farmer loses something then the consequences

are suffered. In this case, the Cost Sharing Extension Approach could be activated not only by the private organisations who require a membership fee, but also the government should enforce it at inception to secure a form of commitment to the programmes by the farmer. Therefore, numerous ways of improving the designing, developing, and implementation of support programmes should be explored, shared and established.

6.4.7.7 The shortage or lack of resources

Shortage of land and short leasing agreements were persistent factors limiting progress, as already presented in Chapter 4. Eventually, it resulted in no or limited access to credit or funding. An official of the DWS testified that they were helpless when it came to land and water because the major part of the work they do needed smallholder farmers to possess land legally. Land ownership by farmers was one of the criteria considered by organisations when funding or assisting smallholder farmers. It can be concluded, therefore, in this study that the land issues could be eased when all organisations play their part in ensuring the common goal of the development of smallholders in the province. This, however, would only be possible if there was effective coordination of all activities for livelihoods, coping and adaptation strategies.

Illiteracy by the farmers was also a challenge, as advised by the organisations. This challenge manifested itself when records were requested by organisations, and when completing documents for applications for various support services. This then forms part of eligibility, because some farmers simply did not know what was available for them, while others gave up during the application processes. Eligibility was also associated with land leasing, in the sense that when the lease was short, or absent, the farmer failed to access a particular service or resource, for example, water, land and funding.

6.4.7.8 Complex government systems

These were also associated with eligibility by farmers for support because the system seemed to be biased towards those that had resources and the capacity to process applications. Failure by smallholder farmers to apply for funding resulted in the low weight by departments, for example, a WCDoA official indicated that the expected annual weight to be supported was 100%. This meant that the scope in terms of the percentage of farmers assisted by the departments was that much. The official at WCDoA expressed that:

> We get a low weight in terms of RPFs (resource-poor-farmers). Our reporting is very low. Sometimes we don't have any RPFs coming to us.

At BGCMA, another respondent highlighted:

> We are not strict enough with BEE (Black Economic Empowerment) applications versus commercial BE component we get more commercial farmers' applications with small BE component.

The above principle can also facilitate the identification of the farmers who deserve the assistance at an earlier stage before they approach different departments and organisations, if applied correctly.

6.5 Conclusions and recommendations

The farmers in both districts were surrounded by various organisations who assisted them in their everyday farming activities. The main goal of supporting farmers in the two districts was summarised as helping them to graduate to large-scale commercial farming. Organisations worked together in partnerships to achieve a common goal of developing smallholder farmers, although there were overlaps in the work done. The Western Cape government had been implementing the commodity approach in the two districts, and considered various aspects of the implementation processes. Among the five main categories of services provided, information was the most prominent, and the least was finance. The commodity approach seemed to have contributed to farmers' access to resources, and services and to overcome the unavailability of markets for their produce. However, there remains a gap in farmers' interactions with the markets, which still needs to be determined. Overall, smallholder farmers continued to be on the receiving end, which meant that their livelihoods, coping and adaptation strategies were not independent of the influence of various organisations assisting them.

The government had assisted farmers to deal with the 2015-2018 drought through the provision of livestock fodder vouchers and drought-related information and advice. The private sector and civil society assisted farmers indirectly, through the provision of usual livelihoods support. The continued reactive approach to the 2015-2018 drought coping and adaptation by organisations resulted in limited impact on smallholder farmers, while the lack of consultation and cooperation by other stakeholders resulted in constrained relationships, among other challenges such as a lack of resources.

It is recommended that the implementation of the commodity approach be upheld, with relevant changes and improvements where necessary. There is a strong need for all stakeholders to be properly coordinated and to cooperate in the process to integrate all the work done and implementation processes towards developing the smallholder sector. The coordination should be extended to the designation and development of the policies and programmes by all stakeholders to promote their effectiveness. The participatory approaches to development smallholder farming sector in the Western Cape should be prioritised, in which farmers are involved whenever programmes for them are being conceived, developed and implemented. However, caution should be taken to protect each stakeholder's role; hence promoting healthy relationships and accountability.

Continuous collection of primary data during design, development and implementation of programmes and evaluations should be undertaken to determine areas where improvements are needed; to enhance the implementation process.

CHAPTER 7
EVALUATION OF A PROGRAMME ASSISTING SMALLHOLDER FARMERS IN THE WESTERN CAPE DURING THE 2015-2018 DROUGHT

7.1 Abstract

The Government of South Africa should urgently implement the smallholder sector development and drought policies to realise the set goal of developing the rural economy. To achieve their intended purpose, the implementation of programmes should be carried out systematically and coherently. To determine how the Western Cape Province drought management plan (DMP) was implemented during the 2015-2018 drought, specifically, the role played by the WCDoA, through CASIDRA, an investigation was conducted in 2019. The study focused on determining the activities of CASIDRA, Sustainable Resource Management and Farmer Support Development (FSD) in the implementation of drought relief schemes in the province. The study also investigated the nature of relationships existing among all the stakeholders, perceptions of smallholder farmers towards drought support, the achievements of the scheme and challenges faced during implementation. The 2018/2019 and 2019/2020 Drought Relief Scheme Implementation Plan, developed by WCDoA was used as a guiding document to identify the stakeholders involved in its implementation and the activities expected to be undertaken. No specific drought programme was identified from the private sector, therefore, the sub-objective fell away. The study was conducted using the qualitative research design and data was collected from CASIDRA, FSD and farmers using face-to-face interviews. Results show that CASIDRA fulfilled its role of administering the finance for the drought relief scheme. The recruitment of smallholder farmers into the programme was the responsibility of Farmer Support and Development and Sustainable Resource Management directorates. There were direct and indirect relationships between CASIDRA, Sustainable Resource Management and Farmer Support and Development directors, farmers and service providers during the implementation of the drought relief scheme. However, the nature of the indirect relationships compromised the provision of services in some instances, such as in communication, delegation and execution of duties. The challenges experienced during the implementation of the drought relief scheme were the misappropriation of support by beneficiaries, inadequate capacity in terms of human resources and finance, lack of coordination and communication among stakeholders at the level of CASIDRA, WCDoA directorates and farmers themselves.

7.2 Introduction

This study identified numerous drought policies in South Africa. However, despite the existence of such sound policies, smallholder farmers were still struggling to cope with

droughts. This was because there was rarely translation of the policies into interventions that could improve smallholders' coping and adaptation strategies in the Western Cape.

In cases where implementation took place, it was slow due to the challenges related to limited resources, such as human and financial, and at times, there was a shortage or lack of human capacity in terms of skills and knowledge as is confirmed by the findings of van Riet and Diedericks (2009). The implementation being poorly coordinated and reactive has also resulted in inefficiency and ineffectiveness of the strategies meant to improve the coping and adaptation strategies of beneficiaries for the recent drought. Additionally, the implemented policies and programmes were rarely monitored or evaluated to determine whether the implementation was according to plan and design, and has achieved the desired outcomes.

The main objectives of this study were to:

- Analyse the role of CASIDRA, the SRM and FSD programme officials in the implementation of a relief programme designed for the 2015-2018 drought in the Western Cape. The key research questions on this aspect were to identify the recruitment criteria followed in identifying the farmers who participated in the 2018/2019 and 2019/2020 DRS by the WCDoA and determine the availability of the required resources to successfully implement the scheme.
- Determine the perceptions of smallholder farmers towards the support provided to them during the 2015-2018 drought. The research question concerning this objective was to determine whether the services of the scheme were being rendered to the intended beneficiaries and their perceptions of the services. The researcher also wanted to identify and analyse the relationships between CASIDRA, SRM, FSD, service providers and smallholder farmers involved in the 2018/2019 and 2019/2020 DRS implementation in the OBD and WCD.
- Understand the relationships among CASIDRA, SRM and FSD, service providers and smallholder farmers in the OBD and WCD during the implementation of the DRS.
- Identify the challenges experienced by CASIDRA, SRM and FSD programmes personnel in implementing the 2018/2019 and 2019/2020 DRS plan during the 2015-2018 drought and the different ways in which the implementation could be improved in the future.

The initial aim was to evaluate one drought programme each from government and the private sector and compare the different approaches to implementation. However, given that no private organisation was identified to have provided specific drought relief assistance to the smallholder farmers during 2015-2018, who participated in the livelihood, coping and adaptation strategies analyses, the objective of evaluating a private drought programme was

not carried out. The evaluation of the government's drought relief programme had limitations in terms of programme implementers' participation from the SRM.[6] However, at CASIDRA and FSD, key informants who were willing to participate in the study were identified. There were also many personnel changes that took place in the management structure during the time of conducting this study, posing limitations in accessing the relevant personnel at the WCDoA.

7.3 Methodology

A desktop review and mapping of CASIDRA, SRM and FSD organisational structures were carried out mainly through their websites and published documents. A meeting was then held at the CASIDRA offices on the 9th July 2019, to present the aims of the study and to obtain approval from the programme staff. The meeting was successful, and issues were clarified, culminating in the identification of the persons who would participate in the study. Face-to-face interviews were conducted with the CASIDRA officials who were directly involved with the 2018/2019 and 2019/2020 DRS implementation. Some smallholder farmers have reported either CASIDRA or WCDoA as the source of their drought support and specifically mentioned the extension officers who assisted them. It, therefore, made sense to include the extension officers in the study to determine the extent to which they engaged with the DRS implementation process and their relationship with the beneficiaries. Two extension officers each from the OBD and the WCD were interviewed. A purely qualitative research process was utilised to carry out this study.

7.4 Results and discussion

7.4.1 Resources for 2018/2019 and 2019/2020 Drought Relief Scheme implementation

In a bid to understand the nature of resources required for a successful implementation of the DRS and determine whether they were adequate, there was a need to identify the list of inputs that were listed in the drought implementation plan of the DRS 2018/2019 and 2019/2020. These inputs were translated into activities and the immediate outputs as the results. Determining these aspects provides an understanding of how a programme is performed or operated. Table 7.1 summarises the inputs, activities, and outputs for the implementation of the 2018/2019 and 2019/2020 plans.

6 The gaps created in data, because of the unavailability of officials from the Sustainable Resource Management Directorate at WCDoA were partly filled through literature review. This means that some of the evaluation questions might have been partly answered.

Table 7.1: The 2018/2019 and 2019/2020 DRS Implementation Plan resources, activities, outputs and outcomes

Inputs	Activities	Outputs
a. Human resources (WCDoA) - Land Care (District Managers) - Disaster Risk Manager (Project Coordinators) -Director (Sustainable Resource Management) - CASIDRA (Senior Project Manager - Rural Infrastructure Development and Poverty Alleviation Programme) b. Finance c. Service providers for fodder d. Smallholder farmers	**SRM** a. Review of previous expenditure b. Completion of application forms by farmers (Assistance from FSD extension officers) c. Assessment and approval of new applications d. Development of beneficiaries' list e. Distribution of vouchers to beneficiaries f. Transference of money to CASIDRA **CASIDRA:** a. Sourcing and approval of quotations from fodder service providers b. Preparation of payments to service providers c. Assessment of list of signed-off vouchers d. Report writing by CASIDRA to WCDoA **Service providers:** a. Supply fodder to the farmers b. Sign-off vouchers and generate a list to CASIDRA **Farmers:** - Complete forms - Receive a voucher and take it to the supplier	**SRM** a. Copies of completed and approved application forms b. Beneficiaries' list c. Fodder vouchers d. Proof of payment to CASIDRA **CASIDRA:** a. Approved quotations for fodder b. Invoices from service providers c. Proof of payments to service providers d. Reconciliation sheet for signed off vouchers e. Report to WCDoA **Service providers:** a. Signed-off vouchers b. List of signed off vouchers **Farmers:** a. Fodder for livestock b. Signed off copies of vouchers

7.4.2 Selection of beneficiaries of the 2018/2019 and 2019/2020 Drought Relief Scheme

The process of recruiting farmers into the DRS started with the provision of the drought relief availability by extension officers during their workshops, meetings and farm visits. Farm assessments were conducted by the Land Care district managers[7] from the SRM, with the assistance of extension officers from FSD, during which the farmers were assisted to complete the application forms for drought relief. The assistance to farmers was in the aspects of calculating carrying capacity, collecting supporting documents, tax clearance certificates, lease agreements and the submission of such documents to local Land Care officials. The OBD and WCD extension officers highlighted this and one of them mentioned that:

7 The Land Care district manager was an official from the Sustainable Resource Management, who was responsible for assisting smallholder farmers to complete the application forms for drought relief, with the assistance of the Farmer Support and Development Directorate.

> I provided administrative and technical support to drought-affected farmers in the Overberg district. Administrative support is in the form of completion and collecting of documents (drought relief form, tax clearance certificate, lease agreements, etc.). Technical support is in the form of calculating the carrying capacity of the land, extension and advisory services, drought information sessions, etc.
>
> I was responsible for ensuring that the drought relief recipients were receiving their vouchers from the department (WCDoA), which allows them to access their animal feed such as drought pellets, yellow maize, energy and protein licks among others through Piketberg Kaap Agri.[8]

CASIDRA was not involved at this stage. The respondent from the organisation indicated that:

> They (the WCDoA) identify because they have got people in the field, what we call extension officers, and area managers in the whole of Western Cape. So, those people then identify people that need assistance, they will fill in the correct documentation. It's been approved at Elsenburg[9], the money is with us, we then pay for that fodder. That is on the drought relief scheme. They provide money for fodder for the animals and that's where we come in because they don't have a system to pay out the farmers, we've got.

The statement above also highlights the implementation role of CASIDRA in terms of managing the payment system for projects. Again, the process of selecting farmers into the DRS in this expression reflects and confirms the exclusion of the implementation agency in decision-making pertaining to the qualification of those farmers for drought relief.

7.4.3 Scope of 2018/2019 and 2019/2020 Drought Relief Scheme

The respondent from CASIDRA highlighted that the number of the smallholder farmers who had received drought relief for the period under review stood at about 3,000. He also highlighted that the number kept on changing as more vouchers were being redeemed because the drought was ongoing at the time when this research was conducted. The participation of all smallholder farmers in the DRS was only guaranteed when a farmer qualified for the support. The criteria to participate in the scheme was dependent on many factors, such as coming from the area that has been declared a disaster area and being able to adequately adhere to the requirements of the DRS. Some of the requirements consist of, for example, avoiding overstocking and complying with the South African Revenue Services tax requirements. The determination of the total number of participants who were supported could have been done at the level of CASIDRA, where payments for vouchers were made, or at Sustainable Resource Management directorate, where approvals for applications were made, and at the service providers where the fodder vouchers were redeemed. However, during this

8 This was one of the service providers where farmers redeemed their vouchers for fodder, inputs and medication for livestock.

9 This was the headquarters of the WCDoA, where the Sustainable Resource Management and Farmer Support and Development Directorates were based.

study, only CASIDRA supplied the estimated number of farmers supported by the time of the interviews, which kept on increasing as more vouchers were being redeemed. Smallholder farmers in the WCD confirmed having received drought relief in the form of fodder for livestock, while for the OBD it was the key respondent who indicated that the farmers from Barrydale were later provided with assistance. However, the number of farmers who failed to qualify for drought assistance and the reasons for their disqualification were not assessed since the efforts to obtain this information were unfruitful.

An FSD programme extension officer had this to say about the scope of farmer drought relief assistance:

> I would like to see more farmers being helped but unfortunately at some stage, they could not get help as they failed to submit the required documents although they had livestock. Some of the farmers could not get help based on the fact that they were keeping more animals than what is required, and thus affect natural resources such as veld condition. Such farmers were not willing to comply or reduce the number of their livestock so that they could benefit from the scheme.

These sentiments may provide an insight into the fact that the heterogeneous nature of smallholder farmers tends to distinguish their drought adaptation strategies. Similarly, the varying needs may dictate the kind of assistance required at a particular stage. Moreover, some farmers felt that they no longer fit in the category of smallholder but they still maintained the status quo to benefit from the government support. Some farmers have reduced their herd sizes but still did not get the assistance, and this was attributed to the extent to which one was in a desperate situation. A key informant from one of the focus groups in the WCD expressed that:

> Some of us didn't actually get help, because we sold some of our animals, we had to reduce the herds so I guess that was based on those that are desperately in need and others that are not so desperate except that those that are more desperately in need that they should get but they actually said that we can actually reapply now.

On the other hand, ascertaining the number of those who have failed to get assistance was not possible, as was the number of those who were assisted. The failure to do so has resulted in one extension officer not being able to access that information because it was partly outside his scope of work and beyond his control. The completed forms were handed over to the Land Care official who then submitted them to the director of SRM for approval. The same director was the last person to distribute vouchers to the qualified beneficiaries who then presented the vouchers to the feed supplier. The extension officers received no messages informing him about the number of successful beneficiaries whom he/she would have assisted in completing the forms.

What is striking is the fact that the respondent further acknowledged that government departments were typically concerned about outputs more than outcomes. This is what the CASIDRA official had to say about outputs versus outcomes when asked “Who should be responsible for outcomes?”

> Good question… CASIDRA is not responsible to do monitoring and evaluation of the project. So, we must only look at the outputs, we must assist that farmer with X, Y and Z. We give out 20 tractors for a year to farmers, now one guy from mechanization went around the provinces and saw 80% of the tractors are parked. The farmer uses a battery to fill out his tank, you see, there was an output, there was no outcome but CASIDRA when I put in a proposal, let CASIDRA put in monitoring and evaluation and go see what is happening out there. We have spent millions if not billions on farmers to capacitate or to assist them. Where are those farmers now? Yea, they are still there but what is their status? If their status is still the same as five years ago, then we have achieved nothing. Absolutely nothing.

The same view on outcomes was shared by a co-official at CASIDRA, who bemoaned the fact that the assistance to farmers was not taking them forward from point A to B. The lack of or limited change as a result of interventions by the government and private sector was persisting, being exacerbated by the fact that organisations were not cordially integrated and united in providing their services. The focus, therefore, should shift to making an impact on the coping and adaptation strategies of smallholder farmers and this should be considered as an urgent concern.

One of the extension officers added his voice on the need to conduct M&E for the DRS implemented:

> There is a need for the monitoring of relief support and continuous feedback to the government with regard to drought relief.

This points to the gap in literature concerning the M&E of developmental projects for livelihood, coping and adaptation strategies in the country. What is more important is that the reactive approach, and the poor coordination and monitoring of implemented drought management programmes need to be re-considered, strengthened, and/or improved.

The CASIDRA official shared a concern that their organisation was not making any meaningful change on the livelihoods of smallholder farmers involved in the programmes they have implemented. He emphasised the fact that the terms of reference for the WCDoA limited them to spending money on its behalf. For example, when asked what the relief scheme has achieved on the level of smallholder farmers, he explained that the WCDoA/CASIDRA has only managed to keep the livestock herds alive.

7.4.4 Relationship among stakeholders during the 2018-2019 and 2019-2020 Drought Relief Scheme implementation

7.4.4.1 Relationships between farmers and Sustainable Resource Management

There was a direct involvement and/or engagement of both farmers and the SRM district managers, throughout the process. The managers were involved in the assessment of farmers, completion of the application forms by the farmers and in the distribution of fodder vouchers for redemption at the service provider. However, it seemed that the nature of the relationship was only when there were drought and any other sustainable resource management issues to be dealt with. This may have an implication on the rapport between the officials and farmers, determining the level of mutual trust and confidence.

7.4.4.2 Relationships between Farmer Support Development extension officials and farmers

The extension officers explained that their interactions with farmers during the implementation of the DRS took place only when they provided assistance to farmers to complete their applications for support and when they conducted farmers' events, information sessions and workshops to inform farmers of the availability of support. However, DoA (2005), highlights that the extension services for handling drought disasters must be well-coordinated. This provision placed an important role on the extension services providers to up their game during drought relief management. In contrast, the extension officers' expressions implied that they were simply assisting colleagues from the SRM, contradicting the content of the national management plan (DoA, 2005). Therefore, the extension officers' role was peripheral and there was no mandate given to them to do their best in drought management.

7.4.4.3 Relationship between Farmer Support Development extension officers and Sustainable Resource Management officials

Although the FSD extension officers and the SRM district managers worked together during the implementation of the DRS, there were no formal and clear roles and responsibilities laid down for extension officers. The findings of this study should inform the clear communication of all the parties involved. The role of extension officers should be revisited and be clearly stipulated in the drought management plans and DRS in future to facilitate smooth implementation. This is so because farmers were used to seeing extension officers daily as they farm. Thus, it is understandable for the extension officers if they feel deprived of duty, because of the relationships that they would have developed between themselves and the farmers. Similarly, during the interviews with farmers, some of them could not make a clear distinction between CASIDRA and WCDoA (two directorates), as the source of their support.

The inclusion of CASIDRA within both SRM and FSD could imply duplication of work if there is poor coordination of duties. It can, therefore, be argued that there is a need for clear outlines of roles and responsibilities for the two directorates, for accountability, and prevention of

conflicting working relations among officials. Funnell and Rogers (2011) argue that the implementation of programmes should be clearly guided to facilitate transparency, openness and responsibility.

7.4.4.4 Relationships between CASIDRA and Farmer Support Development

CASIDRA, although being housed under FSD, was not directly linked to its extension officers during the implementation of the DRS. The respondent at CASIDRA confirmed that he did not work directly with the FSD extension officials but with the district coordinators from SRM. Although CASIDRA implemented all the programmes of the WCDoA, a scenario required strong coordination between the two directorates that are directly or indirectly involved in drought management. This means that when their mandates are clearly communicated, they each work hard to achieve the common goal of drought mitigation.

7.4.4.5 Relationship between the CASIDRA officials and farmers

There was no direct relationship between the CASIDRA officials and the farmers. This might be a weakness of the system in that CASIDRA was responsible for paying out the vouchers. When farmers experienced challenges related to fodder voucher redemption, CASIDRA had nothing to do with it. The extension officer bore the burden, yet their role was also peripheral.

7.4.4.6 Relationship among service providers, and Sustainable Resource Management and Farmer Support Development

The service providers had no direct relationships with both directorates. One of the FSD extension officials confirmed that:

> My involvement with the Sustainable Resource Management was minimal, as I only had to contact them for clarity of some issues that might have arisen during the implementation process. I would normally contact them if one of the applicants wants to know something which I could not help with or address. However, the role was later played by the Land Care officials in the district office, and as an official from Farmer Support and Development, I had to only handle new applications and inquiries from clients regarding either application progress. However, whenever there were any inquiries, I had to send them to Land Care officials for further clarification.

CASIDRA was responsible for sourcing quotations for fodder from various suppliers, hence it being the only stakeholder dealing directly with them.

7.4.5 Perceptions of smallholder farmers towards the 2018-2019 and 2019-2020 Drought Relief Scheme

One of the farmers in the OBD indicated that although their area was very dry, no support has been given to them in the area. He expressed that:

> Overberg do not stop in Suurbraak (one of the towns in the Overberg district), it stops in Barrydale (the town in which the farmer resides in the Overberg district, perceived as drier than other areas). We did not have anything, we received nothing from the government.

> The Overberg is not declared as drought-prone. We buy bales for R700, we have to sell our stock to buy feed.

Some farmers reported that the support remained constant, regardless of the fact that the size of their animal herds was increasing. This perception by farmers might have been caused by their lack of understanding of the conditions under which drought relief would be provided. Overstocking was one of the prerequisites which all farmers should have been aware of beforehand. Therefore, this may have required effective communication from the organisations on drought relief and other relevant information as part of preparing smallholder farmers for future adaptation. Thus, the role of smallholder farmers in the implementation of the DRS should be taken seriously to achieve the purpose. They should be educated about the design and operation of the programme.

While still on this point, some farmers from the WCD added their voice to the inadequacy of drought relief. However, it was not established whether the increase in the livestock herd sizes resulted in overstocking by the farmers or the number could still be compatible with the requirements for assistance. The farmers had this to say:

> When the drought started government gave two bales of livestock feed. I had three sheep. At the later stage, they gave me one bag, I had to buy one extra bag. Then I bought five more sheep and went to the government but they said they were going to give bales for the three sheep. So, the feed keep decreasing.

> The government gave us feed and it finished quickly, we had to go back to the co-op to purchase more feed.

The distribution system was seen as not straightforward by some farmers as was expressed in the WCD, in a focus group discussion:

> Yes… We got vouchers from the government and in terms of the bales it came through somebody which we don't know who he was from and it was distributed and we got 50 bags from there. In the meeting that we had from Landbou (referring to WCDoA) it was said that there was feed donated from the government and some other farmers from outside the Western Cape but I don't know how that was distributed.

> I think there was also a problem with the distribution, if the government can monitor. A commercial farmer, a mentor, we were just phoned to go and get … you can't take a farmer, a commercial farmer to do the job.

> You see they (referring to WCDoA) must send someone from the government side and say go nominate somewhere we can distribute from there, from a central point, the thing is they are profitable but people who come are greedy for each other.

> The government tries to help with drought relief but the distribution is skewed. There was a truck that brought feed but commercial farmers got a lot and small-scale farmers got a little.

Extension officers were asked if, in their opinion, they had assisted smallholder farmers to their satisfaction. Both respondents opted for “Maybe” as their response.

7.4.6 Challenges of implementing the 2018-2020 DRS in the West Coast and Overberg districts

7.4.6.1 Weak systems

One of the extension officers reported that he experienced farmers not being truthful in providing information during the completion of the application forms when he said:

> Some farmers cheated the system by disclosing false information regarding the number of livestock they claimed they had and it, therefore, became controversial to investigate such cases to verify whether they have such animals. Whenever you come to verify the animals, they’ll either inform you that animals are already in the veld or some of the animals were somewhere else.

The fact that farmers were able to claim the number of livestock that they did not have might suggest a loophole in the verification system and process. This should not come as a surprise, as it is a natural phenomenon for individuals to manipulate record systems to increase their likelihood of qualifying for support. Therefore, this challenge should be forcible, and plans should be put in place to tighten the monitoring system. The stakeholders could be furnished with information collected at every possible stage during the implementation of the DRS and should be updated regularly. Such information, if used effectively, has a great potential to improve the programme’s performance.

Another way in which farmers took advantage of the verification system was through re-channelling the support to other unintended users, as expressed by one of the extension officers:

> There were such allegations that some beneficiaries were selling the drought relief feed to other farmers at a reasonably cheaper price.

The same concern was raised by the CASIDRA respondent:

> We don’t have an agreement with the supplier of fodder but we have got an agreement with the farmer to get fodder depending on the number of animals they have got, the current price R854/cow. So, maybe he has got 5 herds or 10 herds of cattle but that the Department of Agriculture works out, not us. They are supposed to go and count if a farmer said I got 10 herds of cattle, then whoever said he’s got 10 and right in the beginning. When I analysed I said to our CEO the risk is when we look at the social-economic side of the country these people in the rural areas don’t have money they have got animals. If my two herds of cattle can bring in R1,700 it’s easy to defraud the department of R1,700, these two herds of cattle can go to my son or cousin, so every time the department of Agriculture comes to count, they count the same ticket but that is us, we don’t take that risk, the department takes the risk. I mean if you look at the … I think R20,000 is the biggest amount per voucher, there is R1,211, I don’t know maybe that’s a cow and a calf but they work it out, we have got nothing to do with it… we just implement the business plan.

The implied weakness of the farm verification systems was emphasized by one of the extension officers, saying:

> Compliance of some regulations should be applied across all levels of farmers and should not be selective or imposed only on black farmers, which are already in the government database. Animal verification was mostly enforced on smallholder farmers and less attention was given to commercial farmers, officials could hardly tell where those commercial farmers are farming or situated.

There was no further mandate placed on the farmers as soon as they collected the vouchers of feed from the supplier. There seemed to be limited monitoring done to determine the use of the support by beneficiaries once received. Therefore, the weakness was likely to allow a lack of accountability and responsibility on the side of the beneficiaries and the programme implementers. Although the DRS implementation plan of 2018/2019 and 2019/2020 highlighted that there was a low likelihood of financial misconduct by beneficiaries and the contingency plan in place was that vouchers would be paid by CASIDRA, this does not seem to be the case.

7.4.6.2 Limitation on resources by beneficiaries and government

An extension officer reported that some of the farmers were struggling to collect their feed on time, due to a lack of transport. This points to the heterogeneity of smallholder farmers' livelihood access and the extent to which one-size-fits-all support provision was problematic. However, it can also be seen as a lack of business ownership by the farmers, and the manifestation of the dependency syndrome on the government to provide everything, while the beneficiary had no mandate to do anything for him/herself.

One extension officer indicated that the Land Care district manager was responsible for assisting farmers in the completion of their application forms throughout the entire district, which could be seen as understaffing. It was acknowledged that Land Care projects were time-consuming due to the intensive extension services required to plan and implement projects with previously disadvantaged communities, and that having enough personnel to render agricultural extension services to new farmers was a pressing issue. The expertise to perform drought management work by the indirectly involved extension officers can also be questioned since officers were not trained for the specific task and would always need assistance, as expressed by one of them:

> I had to only handle new applications and inquiries from clients regarding either application progress. However, whenever there were any inquiries, I had to send them to Land Care officials for further clarification.

Wentink and van Niekerk (2017), in a study to determine the status of the implementation of the DMA in 279 municipalities in South Africa, with the focus on the capacity of personnel, found that 73% of the respondents expressed their concern on the inadequacy of staff in the

municipality disaster management centres. In this study, one of the extension officers reiterated that there was no specific budget for drought management. Thus, provinces were expected to first use whatever was available from Land Care funds before reaching out to the National Treasury. This confirms the findings of the evaluation of the NES which highlighted as well that there was a lack of linking evaluation with budgets and planning (DPME, 2020).

The existence of CASIDRA under the FSD directorate and its involvement in implementing a drought relief scheme working directly with the SRM directorate poses challenges in understanding the line of reporting, communication and levels of accountability. Thus, for any drought relief scheme implementation to be improved or successful, one can ask her or himself the following: Does this reflect poor coordination of activities, leading to poor implementation of plans? Could it be an oversight on the WCDoA side or it is for a specific purpose? Are the roles of drought relief schemes explicitly defined anywhere? Do the implementing personnel understand the drought relief scheme and how it should be implemented?

In other words, all these questions should be considered when planning, developing and implementing a DRS to avoid exposing smallholder farmers to increased vulnerability. There should be a way of ensuring the sustainable distribution of drought relief, while farmers should be monitored with the intention of preparing them to qualify for such assistance.

7.5 Conclusions and recommendations

CASIDRA, SRM and FSD, smallholder farmers and service providers were the main stakeholders involved in the implementation of the DRS during the 2015-2018 droughts in the OBD and WCD. CASIDRA played the role of the funding administration in the implementation of the drought relief programme. The recruitment of smallholder farmers into the programme was the responsibility of FSD and SRM. There were direct and indirect relationships between CASIDRA, SRM and FSD, farmers and service providers during the implementation of the DRS. However, the nature of the indirect relationships compromised the provision of services in some instances, such as in communication, delegation and execution of duties. Some of the challenges experienced during the implementation of the DRS included the misappropriation of support by beneficiaries, the inadequate capacity in terms of human resources and finance, and lack of coordination and communication among stakeholders at the level of CASIDRA, WCDoA directorates and between farmers themselves. There is a need for the WCDoA to commission a comprehensive process and impact evaluation of the DRS to determine how implementation was done and how it affected the coping and adaptation strategies adopted by the smallholder farmers in the province. The challenges faced during the process should be identified and analysed, to provide lessons for improvements of future projects. The involvement of an independent external evaluator should be considered, to complement the expertise of internal evaluation.

CHAPTER 8
CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

The purpose of this study was to understand the livelihoods, as well as 2015-2018 drought coping and adaptation strategies adopted by smallholder farmers in the Western Cape, the role of the private and public sectors in enhancing these strategies, and to evaluate the implementation process of the drought interventions by the Western Cape government. The study sought to answer the four main objectives of:

a) Identifying and analysing the Western Cape smallholder farmers' livelihood strategies;
b) Identifying and analysing the coping and adaptation strategies adopted by smallholder farmers during the 2015-2018 drought;
c) Determining the role played by government and private organisations in enhancing the smallholder farmers' livelihoods in general, and the 2015-2018 drought coping and adaptation strategies; and
d) Conducting an implementation evaluation of one of the 2015-2018 drought programmes from the public sector.

8.2 Major findings

The first objective of the study was to understand the livelihood of smallholder farmers in the Western Cape. The major finding in the two districts was the dominance of the smallholder farming sector by males, as compared to other South African provinces. There were no major gender issues reported in the two areas.

The heterogeneity of smallholder farmers was confirmed in the two study areas, using the SLF to collect the relevant data. This was evidenced by the interchangeable use of the terms emerging, small-scale, resource-poor, new era and smallholder terms by the organisations assisting them. Hence, analysing farming styles provides insight into the real world of agriculture as it is experienced by farmers and should be considered as important for policy development.

The access to various assets varied from farmer to farmer. Regarding social capital, smallholder farmers in the two districts belonged to different farming groups. Income was derived from farming and other non-farming activities such as private businesses and employment. Savings were held in the form of cash, bank or livestock. Farmers had land ownership through municipality, church or government leases, while those who were farming as groups and a few individuals had acquired their own land. Accordingly, the access to water

was linked to land ownership, while others had boreholes. The majority of farmers in the two districts were using electricity as the main source of energy. The same applied to their access to their own bakkies or pick-up trucks as a mode of transport in the study areas.

The common challenge for smallholder farmers in the two districts was the lack of or limited access to one or more of the five types of assets. These ranged from limited finances, storage facilities for livestock and water, increasing production costs, small land size and short leases. Group dynamics challenges reported in this study, such as the lack of ownership of one's farming business matters, non-attendance of group meetings, and personality issues can be associated with a group-based approach.

Study Objective 2 determined the impact of the 2015-2018 drought, farmers' perceptions, coping and adaptation strategies to drought. Farmers mainly perceived drought as a general water scarcity. It was confirmed in the two study sites that farmers did not respond to the 2015-2018 drought on the basis of their perceptions, which confirmed the arguments by researchers in many studies.

The major 2015-2018 drought impacts were crop failure, livestock mortality and theft of livestock and crops. There was an interconnection in the impacts experienced by farmers as they were categorized into three: environmental, economic and social. However, farmers were affected in different ways which determined the type of assets to utilize for coping and adaptation. These impacts ultimately resulted in huge losses in terms of income.

The major coping and adaptation strategies adopted during the 2015-2018 drought were the transporting of water, livestock herd reductions, and buying and storage of feed. Social capital, in the form of social networks, also had a meaningful impact on the shortage of feed, water infrastructure and transportation strategies. It was concluded that social networks require regular cultivation by those who intend to utilize them in the future, as their mere existence may not guarantee success. This is because of their nature of reciprocity so a healthy relationship should be maintained.

Drought periods call for different ways of thinking and applying what is available to adapt. The extent to which the coping and adaptation strategies varied could be explained by the different access to livelihood assets. For instance, some farmers had access to physical assets such as water infrastructure and electricity, while others had access to organised markets. The way these farmers were able to adapt to various impacts varied to a certain extent. The understanding was brought to the fore by the provisions of the SLA, which allow for the determination of the reasons why people make certain decisions to adopt strategies for adaptation over the others. Additionally, the claim that the access to and flexibility in the choices of strategies enhance adaptation holds true in this study.

The livelihood challenges subtly influenced how farmers dealt with drought, as was expected. There was an additional need to deal with rising costs of production inputs such as increasing costs of electricity, water transportation and infrastructure hire, regular treatment of livestock and plants and many more associated costs. The land and water connections were also at play and this emerged as one of the major constraints.

The utilisation of the commodity approach is a move in the right direction for smallholder farmers to engage in sustainable production. The findings of this study confirm that in the Western Cape, farmers were required to operate under any one of the 11 identified commodity groups (Chapter 4). Farmers confirmed that the approach had benefitted them because they exchanged information about climate change, drought, water, land and fencing. They also mobilised themselves to access shared resources such as water tanks, skills and other assistance provided by organisations. Farmers accessed organised markets through offtake agreements facilitated by the commodity organisations through the provision of technical support, production information and inputs.

The failure to recognise the diversity of farmers when implementing the commodity approach means that though farmers were involved in the same farming enterprise, they still had varying goals for their practice and could not be treated the same. The same approach was used for assisting farmers to deal with the 2015-2018 drought. The implementation of the approach did not recognise the varying drought coping and adaptation needs of different farmers such as the increased production costs, storage facilities for water and farming equipment, stock and crop theft and up-down-stream issues, among others. Therefore, the criteria for comparing smallholder farmers was flawed. Another typical example was that while the desire to graduate to large-scale commercialisation was an objective for some farmers (reported in Chapter 6), others were reluctant to do so.

The commodity approach seemed to rob the farmers of their right to choose what to farm with and when to take certain decisions about the farming business. This is problematic because it can take away the energy and passion of a farmer, which results in difficulty working with the individual in future endeavours.

Even though the intentions of the commodity approach might have been very well thought out, the implementation seemed to fall short. The top-down approach of commodity production has also limited its effectiveness.

Having understood the fact that many organisations are working with smallholder farmers in the OBD and WCD, there is also a need to understand how their work influences that of the others. This is necessary so that it is easier to provide clarity in terms of the role played by each stakeholder and to foster accountability by all. This will also prevent the overlapping of

work. The lack of consultation and cooperation by other stakeholders resulted in constrained relationships, while the lack of resources is another challenge. There is a strong need for all stakeholders to be properly coordinated and to cooperate in the process to integrate all the work done towards developing the smallholder sector. The development of the policy for livelihood and drought mitigation needs to be well-coordinated, as well as its implementation by all the concerned stakeholders to facilitate and promote its effectiveness. The role of government remains that of coordinating all the activities of smallholder farmer development stakeholders.

Challenges experienced in implementing drought policies, were those of other stakeholders not cooperating and playing their part, resulting in constrained relationships and uncoordinated implementation of programmes. Farmers too were reported to be challenges to the implementation of projects, specifically when they did not cooperate with programme implementers. This study found that although numerous and sound drought and livelihood policies were developed, their implementation was the major problem and was lagging.

In this study, the process of evaluating the drought programme implemented by CASIDRA and WCDOA was partly successful. A complete evaluation could not be conducted because of a communication breakdown caused by the overlapping roles of the programme implementers. However, during the evaluation process, it was revealed that the criteria for recruiting smallholder farmers to participate in the DRS were done through workshops and meetings where farmers were provided with information on the available relief and were encouraged to apply. It was the responsibility of FSD and SRM, although FSD played an indirect role. There were direct and indirect relationships between CASIDRA, SRM and FSD, farmers and service providers. It is clear from the limited data collected that M&E was not being regarded as an integral process to the success of programme implementation and the utilisation of external evaluators by the WCDoA/CASIDRA was minimal. The lack of studies evaluating drought management in the past made it difficult for stakeholders to determine the processes followed during programme implementation.

8.3 Conclusions and recommendations

The implication of the small number of youths participating in farming is that the future of the farming sector is limited in its performance and function. The limited interest in farming by the youth should not be ignored by current farmers and policymakers. There should be initiatives that encourage the youths to be involved in farming, for instance, providing them with exposure to farming at an early stage and incentives like scholarships and bursaries for further education. Mentorship and coaching programmes can also work well for those who are new in the sector.

To cater to the heterogeneity of smallholder farmers, an area or enterprise-specific definition of a smallholder farmer would be more useful in any attempts to formulate adequate policy promoting the development of the sector. The need for the design, development and implementation of programmes that are effective in addressing the diverse needs of the farmers should be regarded as urgent.

While perceptions of farmers are regarded as a precondition to drought coping and adaptation, determining whether farmers can interpret information concerning rainfall variability and the vulnerability associated with it is a very subjective matter and difficult to measure. However, it still holds that for one to act upon information there is a need first to perceive and understand it. The perceptions of farmers should be acknowledged and action taken for them to utilize the information for drought planning. Part of the EWS could be to enforce the exploitation of any resource available to farmers in preparation for adaptation to any drought that may occur. Farmers should be empowered to utilise sustainable farming methods during drought periods.

To empower farmers to adapt to drought impacts including water and livestock feed, through storage, the physical capital should be adequate. However, farmers should be encouraged to own and take responsibility to protect and conserve such resources as the environment, including water. This will result in spontaneous practices that reinforce the behaviour of individuals towards such precious resources they need for farming. The water-land connection is a complex situation that needs a drastic solution to enable smallholder farmers to farm sustainably.

The commodity approach, based on farming associations and co-operatives, formed the basis on which the private and public sector organisations formed their partnership and provided assistance to smallholder farmers. The mismatch of the organisations and farmer goals demands tailored farmer assistance to suit their specific objectives of farming. Smallholder farming is a highly case-specific entity influenced by a considerable number of internal and external factors. While the diversity of farmers even with commodity groups means that a blanket approach is unlikely to be successful when developing and disseminating support services for use at the farm enterprise level, basing their groupings on their individual objectives could allow the opportunity to specialise in the enterprises of their choice. However, in the Western Cape, farmers who depended on government assistance did not have much liberty to choose preferred enterprises. The requirement for a participatory approach by researchers, policy designers and implementers, whereby farmers play an active collaborative role as one way of empowering farmers to take ownership of their farming businesses cannot be emphasised. It is an effective way of responding to the real problems, needs and opportunities as identified by farmers, and of ensuring that technical innovations are appropriate for local socio-economic and cultural contexts.

Enough evidence has been realised that the reactive approach to drought management and the insufficient coordination of activities by the government has resulted in limited impact on the adaptation strategies for smallholder farmers in the province. Drought interventions have remained largely scattered within the Western Cape government departments, private sector and civil society organisations. Challenges experienced in implementing drought schemes included the breakdown of communication and difficulty in delivering the services of the DRS to the beneficiaries. Some farmers were reported to be misappropriating the fodder support, among other challenges such as inadequate human and financial capacity and constrained relationships. There is a need for the strengthening of synergies between policies on drought adaptation by consolidating them under one unit to promote efficiency, effectiveness, reduce cost and leverage the shared capacities and knowledge. Implementation of drought policies should be prioritised for meaningful development of the smallholder sector to occur.

Evaluations should be taken as a priority and be done at all the stages of a programme cycle to ensure proper implementation and effectiveness of programmes. These evaluations should be used as a way of providing feedback to policymakers, and most importantly, smallholder farmers themselves, to encourage a continuous learning process.

8.4 Future research

The farmers themselves should be furnished with information and feedback from research and be encouraged to seize every opportunity that is presented to them. Additionally, they should learn from each other, harnessing the benefits of the commodity approach being utilised in the province.

Future research should analyse the livelihoods of smallholder farmers in the Western Cape to facilitate the availability of primary data to the wider community of researchers for easy access by those who might need it. Also, this data could be used to develop policies that address the farmers' specific needs.

The provision of drought-related feedback should be regarded as a way of strengthening the strategies that are already available, and of providing opportunities and options for future adoption. The provision of continuous monitoring and assistance of farmers to keep up-to-date records even during good years could empower farmers and cushion them against drought years. Clear communication and provision of services, such as training and advice, and workshops remain the key to the successful building of resilience.

REFERENCES

Adato, M. & Meinzen-Dick, R. 2002 *Assessing the impact of agricultural research on poverty using the sustainable livelihoods framework*. Discussion Paper 128, EPTD Discussion Paper 89. Washington DC: International Food Policy Research Institute.

Afful, D.B. & Ayisi, K. 2020. Farmers' perceptions of climate variability, their adaptation strategies and agricultural productivity: A case of Limpopo Province, South Africa. *South African Journal of Agricultural Extension*, 48(2): 36-49.

African Farmers Association South Africa (AFASA). 2020. *Who we are*. https://afasa.org.za [22 June 2020].

Agri SA. 2019. *Agricultural Drought Report 2018/2019*. Agri SA Centre of Excellence: Economic Trade. South Africa. https://www.agrisa.co.za/droughtAidFund [07 October 2020].

Agri Western Cape. 2016. Damages caused by drought and fires, the current state of agriculture and how these natural disasters impact on the industry and possible job losses. http://www.growinggreatness.co.za/wpcontent/uploads/2016/02/AgriWesKaapVoorleggingOorDroogte.pdf [07 October 2020].

Agri Western Cape. 2020. *About us*. https://awk.co.za/en/about-us/value-proposition/ [4 February 2022].

Agricultural Research Council (ARC). 2020. *ARC Mission*. https://www.arc.agric.za/Pages/Home.aspx [22 June 2020].

Alase, A. 2017. The Interpretative Phenomenological Analysis (IPA): A guide to a good qualitative research approach. International Journal of Education and Literacy Studies, 5(2): 9-19.

Aliber, M. & Hall, R. 2012. Support for smallholder farmers in South Africa: Challenges of scale and strategy. *Development Southern Africa*, 29(4): 548-562.

Alinovi, L., D'Errico, M., Mane, E. & Romano, D. 2010. Livelihoods strategies and household resilience to food insecurity: An empirical analysis to Kenya. Paper prepared for the Conference on "Promoting Resilience through Social Protection in Sub-Saharan Africa", organised by the European Report of Development in Dakar, Senegal, 28-30 June, 2010.

Allison, E.H. & Ellis, F. 2001. The livelihoods approach and management of small-scale fisheries. *Marine Policy*, 25(5): 377-388.

Almeida, F., Faria, D. & Queirós, A. 2017. Strengths and limitations of qualitative and quantitative research methods. *European Journal of Education Studies,* 3(9). http://dx.doi.org/10.5281/zenodo.887089

Antwi-Agyei, P. & Nyantakyi-Frimpong, H. 2021. Evidence of climate change coping and adaptation practices by smallholder farmers in northern Ghana*. Sustainability,* 13(3): 1308.

Apata, T.G., Samuel, K.D. & Adeola, A.O. 2009. Analysis of climate change perception and adaptation among arable food crop farmers in South Western Nigeria. Contributed Paper presented at International Association of Agricultural Economists' 2009 Conference, August 16-22, 2009: 1-15. Beijing, China.

Archer, E., du Toit, J., Engelbrecht, C., Hoffman, M.T., Landman, W., Malherbe, J. & Stern M. 2021. The 2015-19 multi-year drought in the Eastern Cape, South Africa: It's evolution and impacts on agriculture. *Journal of Arid Environments*, 196(2021): 104630

Archer, E.R.M. 2004. Beyond the 'climate versus grazing' impasse: Using remote sensing to investigate the effects of grazing system choice on vegetation cover in the eastern Karoo. *Journal of Arid Environments*, 57(2004): 381- 401.

Archer, L.C., Sohlström, E.H., Gallo, B., Jochum, M., Woodward, G., Kordas, R.L., Rall, B.C. & O'Gorman E.J. 2019. Consistent temperature dependence of functional response parameters and their use in predicting population abundance. *Journal of Animal Ecology,* 88:1670–1683.

Ashley, C. & Hussein, K. 2000. *Developing methodologies for livelihood impact assessment: Experience of the African Wildlife Foundation in East Africa*. Working Paper 129. Overseas Development Institute, London, UK.

Austin, W.D. 2008. Drought in South Africa: Lessons lost and/or learnt from 1990 to 2005. MSc dissertation (Unpublished), Faculty of Science, University of Witwatersrand, Johannesburg. https://core.ac.uk/download/pdf/39665663.pdf [7 October 2020].

Backeberg, G.R. & Viljoen, M.F. 2003. *Drought management in South Africa*. SANCID: 1-17. Paper presented at a Workshop of the ICID Working Group on Irrigation under Drought and Water Scarcity, Tehran, I.R. of Iran.

Bahta, Y.T. 2020. Smallholder livestock farmers coping and adaptation strategies to agricultural drought. *AIMS Agriculture and Food*, 5(4): 964-982.

Bahta, Y.T., Jordaan, A. & Muyambo, F. 2016. Communal farmers' perception of drought in South Africa: Policy implication for drought risk reduction. *International Journal of Disaster Risk Reduction*, 20(2016):39-50.

Baig, M.B.& Aldosari, F. 2013. Agricultural Extension in Asia: Constraints and Options for Improvement. *Journal of Animal and Plant Science,* 23: 619–632.

Basson, L., Bronkhorst, S., Pineo, C. & Fordyce, N. 2018. *Sustainable Agriculture: 2018 Market Intelligence Report*. Green Cape. Cape Town, South Africa. https://www.greencape.co.za/assets/Uploads/GreenCape-Sustainable-Agriculture-MIR-FINAL-WEB-24-5-2018.pdf [28 May 2020].

Baudoin, M.A., Vogel, C., Nortjea, K. & Naika, M. 2017. Living with drought in South Africa: Lessons learnt from the recent El Niño drought period. *International Journal of Disaster Risk Reduction*, 23(2017): 128-137.

Baugh, J.B., Hallcom, A.S. & Harris, M.E. 2010. Computer assisted qualitative data analysis software: A practical perspective for applied research. *Revista Digital del Instituto Internacional de Costo*s, 6: 69-81. ISSN 1646-6896.

Bembridge, T. 2000. *Guidelines for rehabilitation of small-scale farmer irrigation schemes in South Africa*. WRC Report Number 891/1/00, Pretoria, South Africa.

Bhattacherjee, A. 2012. Social science research: Principles, methods & practices. USF Tampa Bay Open Access Textbooks Collection. Book 3. http://scholarcommons.usf.edu/oa_textbook [22 July 2020].

Bingen, J.& Gibbon, D. *Early Farming Systems Research and Extension Experience in Africa and Possible Relevance for FSR in Europe*. In *Farming Systems Research in the 21st Century*; Donhofer, I., Gibbon, D., Dedieu, B., Eds.; Springer: New York, NY, USA, 2012; pp. 49–71. ISBN 9789400745032.

Bio Watch South Africa. 2016. *Fact Sheet: Drought crisis*. https://biowatch.org.za/download/fact-sheet-drought-crisis [07 October 2020].

BKB Wool. 2021. *Vision & values.* https://www.bkb.co.za/about-us/#VisionMission [18 June 2021].

Black Farmers Association South Africa (BFASA). 2020. *Land is power*. https://bfasa.co.za/about-us/ [22 June 2020].

Bohle, H.G. 2001. Vulnerability and criticality: Perspectives from social geography. *IHDP Update*, 2(1): 3-5.

Botai C.M., Botai, J.O., Dlamini, L.C., Zwane, N.S. & Phaduli, E. 2016. Characteristics of droughts in South Africa: A case study of Free State and North-West Provinces. *Water,* 8(439): 1-23.

Botai, C.M., Botai, J.O., De Wit, J.P., Ncongwane, K.P. & Adeola, A.M. 2017. Drought characteristics over the Western Cape Province, South Africa. *Water,* 9(876): 1-16.

Breede-Gouritz Catchment Management Agency (BGCMA). 2017. *Annual Report 2016/17*. http://breedegouritzcma.co.za/pdfs/annual_reports/bgcma_gov_annual-report-2017.pdf [07 October 2020].

Brikci, N. & Green, J. 2007. *A guide to using qualitative research methodology.* Medecins Sans Frontieres. https://fieldresearch.msf.org/bitstream/handle/10144/84230/?sequence=1 [22 July 2020].

Bryan, E., Deressa, T.T., Gbetibouo, G.A. & Ringler, C. 2009. Adaptation to climate change in Ethiopia and South Africa: Options and constraints. *Environmental Science and Policy*, 12(4): 413-46.

Bureau for Food and Agricultural Policy (BFAP). 2015. *BFAP Baseline Agricultural Outlook 2015-2024*. https://www.bfap.co.za/agricultural-outlook-3/ [07 October 2020].

Canales, N., Klein, R. & Davis, M. 2017. *What roles could private actors play in agricultural adaptation in sub-Saharan Africa? Insights from publicly funded projects.* SEI Brief. Stockholm Environment Institute. https://www.researchgate.net/publication/343746074_What_roles_could_private_actors_play_in_agricultural_adaptation_in_sub-Saharan_Africa_Insights_from_publicly_funded_projects

Cape Agency for Sustainable Integrated Development in the Rural Areas (CASIDRA). 2020. *CASIDRA Profile*. Cape Town, South Africa. https://casidra.co.za/company-profile/ [07 October 2020].

Cape Mohair Wool. 2020. *Mission*. http://www.mohair.co.za/listing/cape_mohair_and_wool_cmw [22 June 2020].

Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J. & Neville, A., J. 2014. The use of triangulation in qualitative research. *Oncology Nursing Forum*, 41(5): 545-547.

Chambers, R. & Conway, G.R. 1992. *Sustainable rural livelihoods: Practical concepts for the 21st Century*. Institute of Development Studies, Brighton, UK.

Chauke, P.K. & Pfumayaramba, T. 2013. Factors influencing access to credit: A case study of smallholder farmers in the Capricorn District of South Africa. African *Journal of Agricultural Research,* 8(7): 582-585.

Chikazunga, D. & Paradza, G. 2013. *Smallholder farming: A panacea for employment creation and enterprise development in South Africa? Lessons from the pro-poor value chain governance project in Limpopo Province*. PLAAS Working Paper, Volume 27. https://www.plaas.org.za/publication-categories/wp [22 May 2020].

Chingala, G., Mapiye, C., Raffrenato, E., Hoffman, L. & Dzama, K. 2017. Determinants of smallholder farmers' perceptions of impact of climate change on beef production in Malawi. *Climatic Change*, 142(1-2): 129-141.

Chisasa, J. & Makina D. 2012. Trends in credit to smallholder farmers in South Africa. *International Business and Economics Research Journal*, 11(7): 771-784.

Chowdhury, M.F. 2015. Coding, sorting and sifting of qualitative data analysis: debates and discussion. *Quality and Quantity,* 49(3): 1135-1143.

Choy, L.T. 2014. The strengths and weaknesses of research methodology: Comparison and complimentary between qualitative and quantitative approaches. *Journal of Humanities and Social Science*, 19(4): 99-104.

Clark, J. & Carney, D. 2008. *Sustainable livelihoods approaches: What have we learnt?* A review of DFID's experience with Sustainable Livelihoods. ESRC Research Seminar Paper. ESRC, London.

Cooper, P.J.M., Dimes, J., Rao, K.P.C, Shapiro, B., Shiferaw, B. & Twomlow, S. 2008. Coping better with current climatic variability in the rainfed farming systems of sub-Saharan Africa: An essential first step in adapting to future climate change? *Agriculture, Ecosystems and Environment*, 126 (1-2): 24-35.

Cousins, B. 2014. Framing Paper. In *Proceedings of the Third Carnegie Enquiry Action Dialogue. Constraints and innovative approaches in small-scale agriculture in South Africa*, held at the University of Stellenbosch, Goedverwacht, 6-8 August 2014. Cape Town, South Africa. https://www.mandelainitiative.org.za/ images/docs/Small-scale-Agriculture-Action-dialogue.pdf [18 June 2021.

Creswell, J. 2015. *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. New York: Pearson.

De Haan, L.J. 2012. The livelihood approach: A critical exploration. *Erdkunde*, 66(4): 345-357.

De Waal, A. 2004. *Famine that kills: Darfur, Sudan (Oxford Studies in African Affairs).* Oxford: Oxford University Press.

Denzin, N.K. 2009. The elephant in the living room: Or extending the conversation about the politics of evidence. *Qualitative Research*, 9(2): 139-160. https://doi.org/10.1177%2F1468794108098034

Department for International Development (DFID). 2000. *Sustainable livelihoods guidance sheets.* http://www.livelihoods.org/info/info_guidancesheets.html [04 April 2021].

Department of Agriculture (DoA). 2005*. Drought management plan. A discussion document for public comment.* Pretoria, South Africa. https://www.gov.za/sites/default/files/gcis_document /201409/2005dmp.pdf [22 June 2020].

Department of Agriculture, Forestry and Fisheries (DAFF). 2012a. *A framework for the development of smallholder farmers through cooperative development*. Pretoria, South Africa. http://www.nda.agric.za/doaDev/sideMenu/cooperativeandenterprisedevelopment/docs/framework-%20of%20small%20farmers%20(2).pdf [22 June 2020].

Department of Agriculture, Forestry and Fisheries (DAFF). 2012b. *Integrated Growth and Development Plan*. Pretoria, South Africa. https://www.gov.za/sites/default/files/gcis_document/201409/daffigdp2012.pdf [07 October 2020].

Department of Agriculture, Forestry and Fisheries (DAFF). 2013. *Strategic Plan for Smallholder Support*. Pretoria, South Africa. http://www.nda.agric.za/doaDev/sideMenu/SmallHolder/docs/Strategic%20Plan%20fr%20Smallholder%20Support.pdf [22 June 2020].

Department of Agriculture, Forestry and Fisheries (DAFF). 2014. *Agricultural Policy Action Plan (Apap).* Pretoria, South Africa. https://www.tralac.org/images/docs/8095/south-africa-agricultural-policy-action-plan-november-2014.pdf [22 June 2020].

Department of Agriculture, Forestry and Fisheries (DAFF). 2015. *Catalogue for producer support and development.* June 2015. Pretoria, South Africa. https://www.daff.gov.za/doaDev/sideMenu/SmallHolder/docs/Catalogue%20for%20smallholder%20producer%20support%20and%20development%20-%20July%202015.pdf [22 June 2020].

Department of Agriculture, Forestry and Fisheries (DAFF). 2016. *Annual Report 2015/16*. Pretoria: South Africa. https://www.gov.za/sites/default/files/gcis_document/201610/daff-annual-report-2015-2016a.pdf [04 February 2022].

Department of Agriculture, Forestry and Fisheries (DAFF). 2018. *Drought status in the agriculture sector.* Pretoria, South Africa. https://slideplayer.com/slide/13938691/85/images/1/DROUGHT+STATUS+IN+THE+AGRICULTURE+SECTOR.jpg [18 June 2021.

Department of Agriculture, Forestry and Fisheries (DAFF). 2021. *Agribee Fund Criteria for Funding*. https://www.dalrrd.gov.za/Portals/0/AgriBEE%20Fund/CRITERIA%20FOR%20FUNDING%20-%20THE %20AGRIBEE%20FUND.pdf [16 June 2021.

Department of Land Affairs (DLA). 2007. *Manual for the implementation of the Proactive Land Acquisition Strategy Version 2.* Pretoria, South Africa. http://www.ruraldevelopment.gov.za/phocadownload/Land_AcquisitionWarehouse/manual%20for%20the%20implementation%20of%20the%20proactive%20land%20 acquisition%20strategy.pdf [10 July 2020].

Department of Planning, Monitoring and Evaluation (DPME). 2020. *Evaluations.* Pretoria, South Africa. https://www.dpme.gov.za/keyfocusareas/evaluationsSite/Pages/default.aspx [23 June 2020].

Department of Planning, Monitoring and Evaluation (DPME). 2020. *Policy brief.* Pretoria, South Africa. https://www.dpme.gov.za/publications/Policy%20Framework/Review%20of%20South%20Africa's%20Evaluation%20System%20(2020).pdf [23 June 2020].

Department of Water and Sanitation (DWS). 2017. *Water quality management policies and strategies for South Africa.* Report No. 3.2. Integrated Water Quality Management Strategy. Water Resource Planning Systems Series, DWS Report No.: 000/00/21715/16. Pretoria, South Africa. https://www.dws.gov.za/iwrp/iwqms/Documents/Report%203.2%20IWQM%20Strategy%20Edition%202_Final.pdf [04 April 2021].

Department of Water and Sanitation (DWS). 2020. *Vision.* http://www.dwa.gov.za/about.aspx#vision [24 June 2020].

Drimie, S. 2016. *Understanding South African food and agricultural policy: Implications for agri-food value chains, regulation & formal and informal livelihoods*. Working Paper 39. PLAAS, Cape Town, South Africa. https://foodsecurity.ac.za/wp-content/uploads/2018/07/PlaasWP39Drimie_0.pdf [07 October 2020].

Du Plessis, J.A. & Schloms, B. 2017. An investigation into the evidence of seasonal rainfall pattern shifts in the Western Cape, South Africa. *Journal of the South African Institution of Civil Engineering*, 59(4): 47-55.

Dubihlela, J. & Park, C. 2016. Transactional costs inhibiting sustainable entrepreneurial agrarian growth: reflective evidence from small scale farmers (SSFs) in South Africa. *Journal of Human Ecology*, 54(2): 87-100.

Duvel, G.H. 2000. Towards an Appropriate Extension Approach for Agricultural and Rural Development in South Africa. *South African Journal of Agricultural Extension*, 29: 10–23.

Eckstein, D., Hutfils, M.L. & Winges, M. 2018. *Global Climate Risk Index 2019: Who Suffers Most from Extreme Weather Events? Weather-Related Loss Events in 2017 and 1998 to 2017. Briefing Paper*. Germanwatch, Berlin, Germany.

Eckstein, D., Künzel, V., Schäfer, L. & Winges, M. 2018. *Global Climate Risk Index 2020. Who suffers most from extreme weather events? weather-related loss events in 2018 and 1999 to 2018*. Briefing Paper. Berlin: Germanwatch.

Ellis, F. 2000. *Rural livelihoods and diversity in developing countries*. Oxford: Oxford University Press.

Ellis, F. 2003. *A livelihoods approach to migration and poverty reduction.* Paper Commissioned by the Department for International Development, London, UK. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.553. 5678&rep=rep1&type=pdf [07 October 2020].

Elum, A.Z., Modise, D.M. & Marr, A. 2017. Farmers' perception of climate change and responsive strategies in three selected provinces of South Africa. *Climate Risk Management*, 16(2017): 246-257.

Etikan, I. & Bala, K. 2017. Sampling and sampling methods. Biometrics and biostatistics *International Journal Sampling*, 5(6): 215–217.

Evers, J.E. 2016. Elaborating on thick analysis: About thoroughness and creativity in qualitative analysis. *Forum: Qualitative Social Research*, 17(1): 1-21.

Ewert, J. & du Toit, A. 2005. A deepening divide in the countryside: Restructuring and rural livelihoods in the South African wine industry. *Journal of Southern African Studies* 31(2): 315-332.

Fadairo, O., Williams, P.A. & Nalwanga, F.S. 2020. Perceived livelihood impacts and adaptation of vegetable farmers to climate variability and change in selected sites from Ghana, Uganda and Nigeria. *Environment, Development and Sustainability*, 22:6831-6849.

Falayi, M., Gambiza, J. & Schoon, M. 2020. Unpacking changing multi-actor and multi-level actor ties in transformative spaces: Insights from a degraded landscape, Machubeni, South Africa. *Land,* 9(7): 227.

Fanadzo, M., Chiduza, C. & Mnkeni, P.N.S. 2010. Overview of smallholder irrigation schemes in South Africa: Relationship between farmer crop management practices and performance. *African Journal of Agricultural Research*, 5(25): 3514-3523.

Folke, C. 2006. Resilience: The emergence of a perspective for social-ecological systems analyses. *Global Environmental Change,* 16(3): 253-267.

Food and Agriculture Organization of the United Nations (FAO). 2002. *World agriculture: Towards 2015–2030*. Summary report. FAO, Rome. ISBN 92-5-104761-8. https://www.cbd.int/financial/mainstream/fao-report2030.pdf [04 February 2022].

Food and Agriculture Organization of the United Nations (FAO). 2007. *Food Security Information for Action: Livelihoods Assessment and Analysis Lesson 2 Assessing Livelihoods Learner Notes*. http://www.fao.org/elearning/Course/FL/en/pdf/trainerresources/learnernotes0358.pdf [07 October 2020].

Food and Agriculture Organization of the United Nations (FAO). 2014. *Youths and Agriculture: Key challenges and concrete solutions, food and concrete solutions*. http://www.fao.org/3/a-i3947e.pdf [18 June 2021].

Funnell, S.C. & Rogers P.J. 2011. *Purposeful program theory: Effective use of theories of change and logic models*. San Francisco, CA: Jossey Bass.

Fusch P., Fusch, P.G.E. & Ness, L.R. 2018. Denzin's paradigm shift: Revisiting triangulation in qualitative research. *Journal of Social Change,* 10(1): 19-32.

Future of Agriculture and the Rural Economy in the Western Cape (FARE). 2013. *FARE Panel Report*, October 2013. https://wcedp.co.za/wp-content/uploads/2020/01/The-Future-of-Agriculture-and-the-Rural-Economy.pdf [07 October 2020].

Gadzikwa, L., Lyne, M.C. & Hendriks, S. 2006. Collective action in smallholder organic farming: A study of the Ezemvelo farmers' organization in KwaZulu-Natal. *The South African Journal of Economics*, 74(2006): 344-358.

Gandure, S., Walker, S. & Botha, J.J. 2013. Farmers' perceptions of adaptation to climate change and water stress in a South African rural community. *Environmental Development,* 5(2013): 39-53.

Gary, A. & Willem, Z.D.B. 2002. *Rural Extension and Advisory Services: New Directions.* World Bank: Washington, DC, USA.

Gbetibouo, G.A. & Ringler, C. 2009. *Mapping South African farming sector vulnerability to climate change and variability: A subnational assessment.* A paper presented at the 2009 Amsterdam Conference on the Human Dimensions of Global Environmental Change 'Earth System Governance: People, Places and the Planet' on 2-4 December 2009.

Gbetibouo, G.A. 2009. *Understanding farmers' perceptions and adaptations to climate change and variability: The case of the Limpopo Basin, South Africa.* Environment and Production Technology Division, IFPRI Discussion Paper 00849, February 2009. http://www.fao.org/fileadmin/user_upload/rome2007/docs/ifpri_limpopo_dp00849.pdf [22 July 2020].

Gebru, G.W., Ichoku, H.E. & Phil-Eze, P.O. 2018. Determinants of livelihood diversification strategies in Eastern Tigray Region of Ethiopia. *Agriculture and Food Security*, 7(62): 1-9.

Gibbs, G.R. 2007. Atlas.ti software to assist with the qualitative analysis of data. *Journal of Mixed Methods Research*, 1(1): 103-104.

Goertzen, M.J. 2017. *Introduction to quantitative research and data library*. Chapter 3:21-28. Library Technology Reports May/June 2017. https://journalsala.org/index.php/ltr/article/view/6325/8274 [18 June 2021.

Gollin, D. 2014. *Smallholder agriculture in Africa: An overview and implications for policy.* Working Paper. International Institute for Environment and Development. London. UK. https://pubs.iied.org/sites/default/files/pdfs/migrate/14640IIED.pdf [18 June 2021.

Grain SA. 2016. *South African wheat market overview for the 2016/2017 season.* https://www.grainsa.co.za/south-african-wheat-market-overview-for-the-20162017-season [04 February 2022].

Grain SA. 2020. *Overview*. https://www.grainsa.co.za/pages/about-grain-sa/overview [22 June 2020].

GreenAgri. 2022. *Water resilience.* https://www.greenagri.org.za/tips-and-tools/water-management/water-resilience/ [04 February 2022].

Goudriaan, R., Jarmain, C., Andriessen, M., Abraham, K., Naudé, R., & Keuck, P. *Drought impact: What was the impact of the Western Cape's 2017-18 drought?* SABI: April/May 2019.

Hammill, A., Leclerc, L., Myatt-Hirvonen, O. & Salinas, Z. 2005. Using the sustainable livelihoods approach to reduce vulnerability to climate change: In E. C. R. M. K. L. P. (ed.), *Tropical forests and adaptation to climate change: In search of synergies*. Center for International Forestry Research: 71-96. http://www.cifor.cgiar.org/publications/pdffiles/Books/BCarmenza0501.pdf [18 June 2021.

Hartebeest, C. 2019. *Commodity groups team up with Western Cape government to boost new farmers*. Food for Mzansi, South Africa. https://www.foodformzansi.co.za/ [08 July 2020].

Hassan R. 2013. Drought management strategies in South Africa and the potential for economic policy instruments. In Schwabe K., Albiac J., Connor J., Hassan R. & Meza González, L. (eds.). *Drought in arid and semi-arid regions.* Dordrecht: Springer: 1-20.

Hautala, K.R. 2013. *A sustainable livelihood analysis of small-scale farmers in M'muock, Cameroon: Local realities and structural constraints.* Master thesis in Human Geography, University of Oslo, Cameroon. https://core.ac.uk/download/pdf/30892554.pdf [05 October 2020].

Hawe, P. & Ghali. L. 2008. Use of social network analysis to map the social relationships of staff and teachers at school. *Health Education Research,* 23(1): 62-69.

Hellmuth, M.E., Moorhead, A., Thomson, M.C. & Williams, J. 2007. Climate risk management in Africa: Learning from practice*. International Research Institute for Climate and Society (IRI)*, 1(2007): 1-116. Columbia University. New York.

Hlalele, B.M., Mokhatle, I.M. & Motlogelo, R.T. 2016. Assessing economic impacts of agricultural drought: A case of Thaba Nchu, South Africa. *Journal of Earth Science and Climate Change,* 7(1): 1-4.

Holloway, A. 2003. Disaster risk reduction in southern Africa: Hot rhetoric—cold reality. *African Security Studies,* 12(2003): 29-38.

Homann-Kee Tui, S., Adekunle, A., Lundy, M., Tucker, J., Birachi, E., Schut, M., Klerk, L., Ballantyne, P., Duncan, A., Cadilhon, J. & Mundy, P. 2013. *What are innovation platforms*? Innovation Platforms Practice Brief 1. ILRI: Nairobi, Kenya.

Hornby, D., Vanderhaeghen, Y., Versfeld, D. & Ngubane, M. 2016. *A harvest of dysfunction: Rethinking the approach to drought, its causes and impacts in South Afric*a. Report for Oxfam South Africa, Johannesburg, South Africa. https://www.oxfam.org.za/wp-content/uploads/2017/03/Final-Final-OZA-Oxfam-Drought-Report.pdf [05 October 2020].

Hudson, J.W. 2002. Response to climate variability of the livestock sector in the North-West Province, South Africa. Master's Thesis (Unpublished). Colorado State University. Colorado. https://mountainscholar.org/bitstream/handle/10217/280/2002_summer_Hudson.pdf?sequence=1&isAllowed=y [05 October 2020].

Ishmail, Z. & Tully, V.L. 2020. An overview of the provincial evaluation system of the Western Cape Government of South Africa as a response to the evaluation of the National Evaluation System. *African Evaluation Journal,* 8(1): 425-435.

Jacobs, P. & Makaudze, E.M. 2012. Understanding rural livelihoods in the West Coast District, South Africa. *Development Southern Africa,* 29(4): 574-587. https://doi.org/10.1080/0376835X.2012.715443

Jordaan, A.J. 2011. *Drought risk reduction in the Northern Cape.* PhD Thesis, University of the Free State, Bloemfontein, South Africa.

Jordaan, A.J. 2014. *Vulnerability, adaptation to & coping with drought: The case of commercial and subsistence rainfed farming in the Eastern Cape.* Water Research Commission KSA 4/Thrust 4/P2, Pretoria, South Africa.

Jütting, J. 2003. *Institutions and development: A critical review. Working* Paper No. 210. OECD Development Centre. https://www.oecd-ilibrary.org/docserver/341346131416.pdf?expires=1602110583&id=id&accname=guest&checksum=031DDE1833036D8C35C5BC57E71D68A1 [07 October 2020].

Kaap Agri. 2020. *We are the place where people still count*. https://www.kaapagri.co.za/ [22 June 2020].

Kabunga, N. 2014. Adoption and impact of improved cow breeds on household welfare and child nutrition outcomes: Empirical evidence from Uganda. In *Proceedings of 88th Annual Conference: Agricultural Economics Society*, 9-11 April 2014, Paris.

Kallis, G. 2008. Droughts. *Annual Review of Environment and Resources*, 33(2008): 85-118.

Kamara, A., Conteh, A.H., Rhodes, E.R. & Cooke, R.A. 2019. The relevance of smallholder farming to African agricultural growth and development. *African Journal of Food, Agriculture, Nutrition and Development,* 19(01): 14043-14065.

Kaur, K.& Kaur, P. 2018. Agricultural Extension Approaches to Enhance the Knowledge of Farmers. *International Journal of Current Microbiology and Applied Sciences*, 7(2): 2367-2376.

Keshavarz, M., Karami, E. & Vanclay, F. 2013. The social experience of drought in rural Iran. *Land Use Policy*, 30(1): 120-129.

Keyantash, J. & Dracup, J.A. 2002. The quantification of drought: An evaluation of drought indices. *American Meteorological Society*, 83(8): 1167-1180.

Khapayi, M. & Celliers, P.R. 2016. Issues and constraints for emerging farmers in the Eastern Cape Province, South Africa. *African Journal of Agricultural Research*, 10(41): 3860-3869.

Khatiwada, S.P., Wei, D., Paudel, B., Khatiwada, J.R., Zhang, J. & Su, Y. 2017. Household livelihood strategies and implication for poverty reduction in rural areas of Central Nepal. *Sustainability*, 2017(9): 612.

Kichamu, E., Ziro, J.S., Palaniappan, G. & Ross, H. 2018. Climate change perceptions and adaptations of smallholder farmers in eastern Kenya. *Environment, Development and Sustainability,* 20(4): 2663-2680.

Kotze, I. & Rose, M. 2015. *Farming facts and futures: Reconnecting South Africa's food systems to its ecosystems*. WWF-SA. Cape Town, South Africa.

Krantz, L. 2001. *The sustainable livelihood approach to poverty reduction: An introduction.* Swedish International Development Cooperation Agency: Division for Policy and Socio-Economic Analysis.

Kromah, A.T. 2016. *Extension Approaches for Agricultural Extension: Modernizing Agricultural Extension Systems*; IL, USA. Available online at: https://meas.illinois.edu/wp-

content/uploads/2016/03/Kromah-Abibatu-2016-Extension-Approaches-in-Agricultural-Extension.pdf (Accessed on 18 February 2021).

Kwela, N.G. 2018. *The Western Cape Drought Disaster: Preventing Day Zero*. Western Cape Government: Provincial Disaster Management Centre. 15 –16 November 2018.

Lahiff, E. & Cousins, B. 2005. Smallholder agriculture and land reform in South Africa*. IDS Bulletin,* 36(2): 127-131.

Lambert, S.D. & Loiselle, C.G. 2008. Combining individual interviews and focus groups to enhance data richness. *Journal of Advanced Nursing*, 62(2): 228-23.

Latham, D. 2016. Newly empowered black farmers ruined by South Africa's drought. Inter Press Service News Agency. http://www.ipsnews.net/2016/07/newly-empowered-black-farmers-ruined-by-southafricas-drought/ [07 October 2020].

Levine, S. 2014. *How to study livelihoods: Bringing a sustainable livelihoods framework to life.* Working Paper 22. London: Secure Livelihoods Research Consortium.

Levitt, H.M., Bamberg, M., Creswell, J.W., Frost, D.M., Josselson, R. & Sua´rez-Orozco, C. 2018. Journal article reporting standards for qualitative primary, qualitative meta-analytic & mixed methods research in psychology: the APA Publications and Communications Board Task Force Report. *American Psychologist*, 73(1): 26-46.

Lionel's Veterinary Supplies. 2020. *Vision*. https://www.snupit.coza/port-elizabeth/ferguson/lionels-veterinary-supplies-pty-ltd/178191 [22 June 2020].

Lunga, W. & Musarurwa, C. 2015. From reaction to pro-action in Zimbabwe: The Bulilima-Mangwe Districts drought coping and reduction experience. *Academic Research International*, 6(4): 157-164.

Mabuku, M.P. 2019. Flood disaster preparedness and impacts on rural households: A comparative study of Mwandi District of Zambia and Eastern Zambezi Region of Namibia. Unpublished Doctor of Philosophy Thesis. University of KwaZulu-Natal, Pietermaritzburg South Africa. https://researchspace.ukzn.ac.za/xmlui/bitstream/handle/10413/18858/Mabuku_Monde_Patrina_2019.pdf?sequence=1&isAllowed=y [4 February 2022].

Machethe, C.L. 2004. *Agriculture and poverty in South Africa: Can agriculture reduce poverty?* Paper presented at the Overcoming Underdevelopment Conference held in Pretoria, 28-29 October 2004. University of Pretoria, South Africa.

Makate, C., Makate, M. & Mango, N. 2017. Sustainable agriculture practices and livelihoods in pro-poor smallholder farming systems in southern Africa. *African Journal of Science, Technology, Innovation and Development*, 9(2017): 269-279.

Makate, C., Makate, M., Mango, N. & Siziba, S. 2019. Increasing resilience of smallholder farmers to climate change through multiple adoption of proven climate-smart agriculture innovations. Lessons from Southern Africa. *Journal of Environmental Management*, 231(2019): 858-868.

Makova, R., Mapira, J. & Shambira, L. 2019. The effectiveness of drought mitigation strategies in Chegutu District, Mashonaland West Province, Zimbabwe. *European Journal of Social Sciences Studies,* 4(1): 1-18.

Makube, P. 2016. The impact of the current drought on the South African economy. *Business Leadership South Africa Newsletter*. www.businessleadership.org.za/news [29 September 2020].

Malagon-Maldonado, G. 2014. Qualitative research in health design. *Research Methods,* 7(4): 120-134.

Maltou, R. & Bahta, Y.T. 2019. Factors influencing the resilience of smallholder livestock farmers to agricultural drought in South Africa: Implication for adaptive capabilities. *Jàmbá: Journal of Disaster Risk Studies*, 11(1): a805.

Mandleni, B. & Anim, F. D. K. 2011. Perceptions of cattle and sheep farmers on climate change and adaptation in the Eastern Cape Province of South Africa. *Journal of Human Ecology*, 34(2): 107-112.

Mandondo, S. & Troskie, D. 2019. *(Western Cape Department of Agriculture). Departmental Evaluation Plan 2019/20.* https://www.elsenburg.com/sites/default/files/WCDoA%20Evaluation%20Plan%202019-2020pdf_0.pdf [05 October 2020].

Mapiye, C., Chimonyo, M., Dzama, K., Raats, J.G. & Mapekula, M. 2009. Opportunities for improving Nguni cattle production in the smallholder farming systems of South Africa. *Livestock Science,* 124(1-3): 196-204.

Mapiye, O., Makombe, G., Mapiye, C. & Dzama, K. 2018. Limitations and prospects of improving beef cattle production in the smallholder sector: A case of Limpopo Province, South Africa. *Tropical Animal Health and Production,* 50(7): 1711-1725.

Mapiye, O.; Makombe, G.; Molotsi, A.; Dzama, K.& Mapiye, C. 2021. Towards a Revolutionized Agricultural Extension System for the Sustainability of Smallholder Livestock Production in Developing Countries: The Potential Role of ICTs. *Sustainability*, 13: 5868.

Mark, M.M. 2015. Mixed and multimethods in predominantly quantitative studies, especially experiments and quasi-experiments. In Hesse-Biber, S.N., Johnson, R.B. (eds.). *The Oxford Handbook of Multimethod and Mixed Methods Research Inquiry*. Oxford University Press: 21-41.

Marrelli, A.F. 2008. Collecting data through focus groups. *Performance Improvement*, 47(4): 39-45.

Mason, S.A. 2013. Qualitative versus quantitative approaches. In Volkmar, F.R. (ed.). *Encyclopedia of autism spectrum disorders*. New York: Springer. https://doi.org/10.1007/978-1-4419-1698-3_167

McCarthy, J.J., Canziani, O.F., Leary, N.A., Dokken, D.J. & White, K.S. (eds.). 2007. *Climate change: Impacts, adaptation & vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, UK: Cambridge University Press.

Meissner, R. & Jacobs-Mata, I. 2016. *South Africa's drought preparedness in the water sector: Too little too late?* Policy Briefing 155. South African Institute of International Affairs. https://saiia.org.za/research/south-africas-drought-preparedness-in-the-water-sector-too-little-too-late/ [22 July 2020].

Midgley, S. & Methner, N. 2016. *Climate adaptation readiness for agriculture: Drought lessons from the Western Cape, South Africa*. Policy Briefing 154. South African Institute of International Affairs. https://saiia.org.za/research/climate-adaptation-readiness-for-agriculture-drought-lessons-from-the-western-cape-south-africa/# [22 July 2020].

Molotsi, A. H., Oosting, S., Cloete, S. W. P. & Dzama, K. 2019. Factors influencing off-take rates of smallholder sheep farming systems in the Western Cape Province of South Africa. *South African Journal of Agricultural Extension*, 47(3): 83 – 91.

Morse, J.M. 2015. Issues in qualitatively-driven mixed-method designs: Walking through a mixed-method project. In Hesse-Biber, S.N. & Johnson, R.B. (eds.) *The Oxford handbook of multimethod and mixed methods research inquiry*. Oxford: Oxford University Press: 206-222.

Morse, S. & McNamara, N. 2013. *Sustainable livelihood analysis: A critique of theory and practice*. https://www.semanticscholar.org/paper/Sustainable-Livelihood-Approach%3A-A-Critique-of-and-Morse-Mcnamara/ea53733fbd5e011a03f879a6b8d1da0eae453239 [12 September 2020].

Morse, S., McNamara, N. & Acholo, M. 2009. *Sustainable livelihood approach: A critical analysis of theory and practice*. Geographical Paper No. 189. https://www.reading.ac.uk/web/files/geographyandenvironmentalscience/GP189.pdf [13 July 2020].

Mpandeli, S., Nesamvuni, E. & Maponya, P. 2015. Adapting to the impacts of drought by smallholder farmers in Sekhukhune District in Limpopo Province, South Africa. *Journal of Agricultural Science,* 7(2): 115-124.

Mthembu, N. & Zwane, E. 2017. The adaptive capacity of smallholder mixed-farming systems to the impact of climate change: The case of KwaZulu-Natal in South Africa. *Journal of Disaster Risk Studies*, 9(1): a469.

Mthembu, N.N. 2013. An investigation of characteristics of mixed farming systems: The case of labour tenant communities of Ncunjane and Nkaseni in Msinga, KwaZulu-Natal. Master's Degree Thesis (Unpublished). Institute for Land and Agrarian Studies (PLAAS), Bellville. Cape Town, South Africa.

Mukheibir, P. & Sparks, D. 2003. *Water resource management and climate change in South Africa: Visions, driving factors and sustainable development indicators.* Energy and Development Research Centre. University of Cape Town, South Africa.

Mukheibir, P. 2008. Water resources management strategies for adaptation to climate-induced impacts in South Africa. *Water Resources Management,* 22(9): 1259-1276.

Mulinya, C. 2017. Factors affecting small scale farmers coping strategies to climate change in Kakamega County in Kenya*. Journal of Humanities and Social Science*, 22(2): 100-109.

Muller, M. 2018. Lessons from Cape Town's drought. Don't blame climate change. *Nature: London***,** 559(7713): 174-176. https://doi.org/10.1038/d41586-018-05649-1

Muthelo, D., Owusu-Sekyere, E. & Ogundeji, A.A. 2019. Smallholder farmers' adaptation to drought: identifying effective adaptive strategies and measures. *Water*, 11(2019): 2069.

Muumbe, K.L., Baohong, L., Meng, W., Zhang, H. & Wei, X. 2017. Characterization of droughts in humid subtropical region, Upper Kafue River Basin (Southern Africa). *Water*, 9(242): 1-18.

Naik, M. & Abiodun, B.J. 2019. Projected changes in drought characteristics over the Western Cape, South Africa. *Meteorological Applications,* 2020(27): e1802.

Nalubwama, S., Vaarst, M., Kabi, F. & Kiggundu, M. 2014. Animal husbandry practices of smallholder organic farmers in Uganda: Challenges and future prospects. In Rahmann, G. & Aksoy, U. (eds.). *Proceedings of the 4th ISOFAR Scientific Conference Building Organic Bridges*: 1123-1126. Organic World Congress 2014, 13-15 October, Istanbul, Turkey.

National Agricultural Marketing Council (NAMC). 2020. *SIP 11*. https://www.namc.co.za/sip11/ [10 July 2020].

National Drought Mitigation Center (NDMC). 2020. *Types of drought.* https://drought.unl.edu/Education/DroughtIn-depth/TypesofDrought.aspx [06 October 2020].

National Planning Commission (NPC). 2011. *Our future - make it work. Executive summary.* https://www.gov.za/sites/default/files/Executive%20Summary-NDP%202030%20-%20Our%20future%20-%20make%20it%20work.pdf [06 June 2020].

National Science and Technology Forum (NSTF). 2018. *The National Development Plan.* http://www.nstf.org.za/wp-content/uploads/2018/04/All-The-NDP.pdf [09 June 2020].

National Wool Growers Association (NWGA). 2020. *The NWGA and the wool industry*. https://www.nwga.co.za [22 June 2020].

Ncube, B. & Lagardien, A. 2015. *Insights into indigenous coping strategies to drought for adaptation in agriculture: A Karoo Scenario.* WRC Report No 2084/1/15. Water Research Commission, Pretoria.

Ncube, B. 2018. Insights into indigenous knowledge strategies for coping and adapting to drought in agriculture: A Karoo scenario, South Africa. *Indilinga - African Journal of Indigenous Knowledge Systems*, 17(1): 92-108.

Ncube, B. 2020. *Smallholder farmer drought coping and adaptation strategies in Limpopo and Western Cape provinces.* WRC Report No. 2716/1/20. Water Research Commission. Pretoria, South Africa.

Ndoro, J.T., Mudhara, M. & Chimonyo, M. 2014. Cattle commercialization in rural South Africa: Livelihood drivers and implications for livestock marketing extension 2014. *Journal of Human Ecology*, 45(3): 207-221

Ngaka, M.J. 2012. Drought preparedness, impact and response: A case of the Eastern Cape and Free State provinces of South Africa. *Journal of Disaster Risk Studies*, 4(1):1-10.

O'Farrell, P.J., Anderson, P.M.L., Milton, S.J. & Dean, W.R.J. 2009. Human response and adaptation to drought in the arid zone: Lessons from southern Africa. *South African Journal of Science,* 105(1-2): 34-39.

Oduniyi, O.S. & Tekana, S.S. 2019. Adoption of agroforestry practices and climate change mitigation strategies in North West Province of South Africa. *International Journal of Climate Change Strategies and Management*, 11(5): 716-729.

Office for the Coordination of Humanitarian Affairs (OCHA). 2016. *South Africa Vulnerability Assessment Committee Results*. http://reliefweb.int/sites/reliefweb.int/files/resources/Southern%20Africa%20Situation%20Report_September%202016.pdf [10 August 2019.

Ogenga, J.O., Mugalavai, E.M. & Nyandiko, N.O. 2018. Impact of rainfall variability on food production under rainfed agriculture in Homa Bay County, Kenya. *International Journal of Scientific and Research Publications*, 8(8): 857.

Ojo, T.O., Adetoro, A.A., Ogundeji, A.A. & Belle, J.A. 2021. Quantifying the determinants of climate change adaptation strategies and farmers' access to credit in South Africa. *Science of the Total Environment*, 792: 148499.

Okonya, K.S., Syndikus, K. & Kroschel, J. 2013. Farmers' perception of and coping strategies to climate change: Evidence from six agro-ecological zones of Uganda. *Journal of Agricultural Science,* 5(8). https://doi.org/10.5539/jas.v5n8p252

Okunlola, A., Ngubane M., Cousins, B. & du Toit, A. 2016. *Challenging the stereotypes: Small-scale black farmers and private sector support programmes in South Africa*. Research report 53. University of the Western Cape, Cape Town, South Africa. https://media.africaportal.org/documents/PLAAS_RR53_web_ssca.pdf [05 October 2020].

Olaleye, O.L. 2010. Drought coping mechanisms: A case study of small-scale farmers in Motheo District of the Free State Province. Master's Degree Thesis (Unpublished). University of South Africa. http://hdl.handle.net/10500/4032

Olsson, L.M., Opondo, P., Tschakert, A., Agrawal, S.H., Eriksen, S.M, Perch, L.N. & Zakieldeen, S.A. 2014*. Climate change: Impacts, adaptation and vulnerability: Part A: Global and sectoral aspects*. Working Group II Contribution to the IPCC Fifth Assessment Report. https://doi.org/10.1017/CBO9781107415379

Overberg Agri. 2020. *About us.* http://www.overbergagri.co.za/index.php? lang=en [22 June 2020].

Overberg District Municipality. 2017. *Annual Report 2016/17.* http://mfma.treasury.gov.za/Documents/06.%20Annual%20Reports/2016-17/03.%20District%20municipalities/DC3%20Overberg/DC3%20Overberg%20Annual%20report%202016-17.pdf [17 June 2020].

Overberg District Municipality. 2020. *Overview*. https://www.odm.org.za [19 July 2020].

OVK. 2020. *Our mission-vision*. https://www.ovk.co.za/Pages/Page/3/our-mission-vision [15 May 2020].

Pallant, J. 2013. *A step by step guide to data analysis using IBM SPSS. SPSS survival manual.* 5th ed. Open University Press. Berkshire, UK: McGraw-Hill.

Pandey, S. & Bhandari, H. 2009. Drought: Economic costs and research implications. In *Drought frontiers in rice: Crop improvement for increased rainfed production.* Singapore: World Scientific Publishing Co. Pte. Ltd.: 3-17. http://dx.doi.org/10.1142/9789814280013_0001

Parks, R., Mclaren, M., Toumi, R. & Rivett, U. 2019. *Experiences and lessons in managing water from Cape Town*. Briefing paper No 29. Grantham Institute: Imperial College, London.

Patel, L., Knijn, T. & van Wel, F.W. 2015. Child support grants in South Africa: A pathway to women's empowerment and child wellbeing? *Journal of Social Policy,* 44(02): 377-397

Pickens, J. 2005. Attitudes and perceptions. In Borkowski, N. (ed.). *Organizational behaviour in health care*. Sudbury, UK: Jones and Bartlett Publishers: 43-75.

Pienaar, L. & Boonzaaier, J. 2018. *Drought Policy Brief, Western Cape Agriculture*. Bureau for Food and Agricultural Policy and Western Cape Department of Agriculture, Cape Town. http://www.bfap.co.za/wp-content/uploads/2018/08/DroughtPolicyBrief_2018.pdf [05 October, 2020].

Pienaar, L. & Traub, L.N. 2015. Understanding the smallholder farmer in South Africa: Towards a sustainable livelihood classification. In *Proceedings of 29th International Conference on Agricultural Economics*, 36: 8-14. International Association of Agricultural Economists. Milan, Italy.

Pienaar, P.L. 2013. Typology of smallholder farming in South Africa's former homelands: Towards an appropriate classification system. Unpublished Master's Thesis. Stellenbosch University, South Africa. https://core.ac.uk/ download/pdf/37420343.pdf [05 October 2020].

Pioneer Foods. 2020. *Company profile*. http://www.pioneerfoods.co.za/about/companyprofile/ [22 June 2020].

Polit, D.F. & Beck, C.T. 2012. *Nursing research: Principles and methods.* Philadelphia, PA: Wolters Kluwer.

Popoola, O.O., Monde, N. & Yusuf, S.F.G. 2018. Perceptions of climate change impacts and adaptation measures used by crop smallholder farmers in Amathole District Municipality, Eastern Cape Province, South Africa. *GeoJourna*l, 83(6): 1205-1221.

Potato SA. 2020. *What we do*. http://www.potatoes.co.za/about-us/what-we-do.aspx [22 June 2020].

Puttergill, C., Bomela, N., Grobbelaar, J. & Moguerane, K. 2011. The limits of land restitution: Livelihoods in three rural communities in South Africa. *Development Southern Africa, 28*(5), 597-611.

Quandt, A. 2021. Coping with drought: Narratives from smallholder farmers in semi-arid Kenya. *International Journal of Disaster Risk Reduction,* 51(2021): 102168. https://doi.org/10.1016/j.ijdrr.2021102168

Rakgase, M. & Norris, D. 2014. Factors that Influence Choice of Drought Coping Strategies in Limpopo Province, South Africa. *Journal of Human Ecology*, 47(2): 111-116.

Ranganathan, C.R. Palanisami, K., Kakumanu, K.R. & Baulraj, A. 2011. *Mainstreaming the adaptations and reducing the vulnerability of the poor due to climate Change*. ADBI Working Paper No. 333. Asian Development Bank Institute (ADBI), Tokyo.

Red Meat Producers' Organisation (RPO). 2020. *About RPO*. https://rpo.co.za [22 June 2020].

Reid, P. & Vogel, C. 2006. Living and responding to multiple stressors in South Africa - glimpses from KwaZulu-Natal. *Global Environmental Change*, 16(2): 195-206.

Ribot, J.C. & Peluso, N.L. 2003. A theory of access. *Rural Sociology*, 68(2): 153-181.

Rossi, P.H., Lipsey, M.W. & Freeman, H.E. 2004. *Evaluation. A systematic approach.* 7th ed. Thousand Oaks, CA: SAGE

Rouault, A. & Richard, Y. 2003. Intensity and spatial extension of drought in South Africa at different time scales. *Water SA*, 29(4): 489-500.

Rukema, J.R. 2013. Recommendation by indigenous knowledge systems, drought and people's resilience and responses: The case of Msinga community in KwaZulu-Natal. *Indilinga African Journal of Indigenous Knowledge Systems: Revisiting the Research Paradigm* 12(1): 108-125.

Russell, C.K. & Gregory, D.M. 2003. Evaluation of qualitative research studies. *Evidence-Based Nursing*, 6: 36-40.

Rutberg, S. & Bouikidis, C.D. 2018. Focusing on the fundamentals: A simplistic differentiation between qualitative and quantitative research. *Nephrology Nursing Journal*, 45(2): 209- 212.

Sadiki, A. & Ncube, B. 2020. Challenges of accessing water for agricultural use in the Breede-Gouritz Catchment Management Agency, South Africa. *Water Alternatives*, 13(2): 324-346.

Sakdapolrak, P. 2014. Livelihoods as social practices. Re-energizing life research on Bourdieu's theory of practice. *Geographica Helvetica*, 69(1): 19-28.

Salmons, J.E. 2015. Conducting multimethod and mixed methods research online. In Hesse-Biber, S.N. & Johnson, R.B. (eds.). *The Oxford Handbook of Multimethod and Mixed Methods Research Inquiry*. Oxford: Oxford University Press: 522-547.

Salzmann, N., Hugge, l.C., Nussbaumer, S.U. & Ziervogel, G. 2016*. Climate change adaptation strategies: An up-stream down-stream perspective*. Cham, Switzerland: Springer International.

Schiffer, E. 2007. Network analysis case study: Multi-stakeholder water governance in Ghana. In Holland, J. (ed.). *Tools for institutional, political & social analysis of policy reform. A source book for development practitioners*. 43-45. Washington DC: World Bank: 143-145.

Schreiner, B.G., Mungatana, E.D. & Baleta, H. 2018. Impacts of Drought Induced Water Shortages in South Africa: Sector Policy Briefs Report. WRC Report No. 2604/2/18. Water Research Commission. Pretoria, South Africa. http://www.wrc.org.za/wp-content/uploads/mdocs/2604%20Vol%202.pdf [06 October 2020].

Schulze, R.E. 2016. On observations, climate challenges, the South African agriculture sector and considerations for an adaptation handbook. In Schulze, R.E. (ed.), *Handbook for farmers, officials and other stakeholders on adaptation to climate change in the agriculture sector within South Africa*. Pretoria: Department of Agriculture, Forestry and Fisheries.

Scoones, I. & Wolmer, W. 2003. Livelihoods in crisis? New perspectives on governance and rural development in Southern Africa. *IDS Bulletin*, 34(3). https://bulletin.ids.ac.uk/index.php/idsbo/issue/view/79 [18 May 2020].

Scoones, I. 1998. *Sustainable rural livelihoods: A framework for analysis.* IDS Working Paper, 72. https://www.ids.ac.uk/publications/sustainable-rural-livelihoods-a-framework-for-analysis/ [12 May 2020].

Scoones, I. 2009. Livelihoods perspectives and rural development. *Journal of Peasant Studies*, 36(1): 171-96.

Sentraal-Suid Cooperative. 2020. *About SSK*. http://www.ssk.co.za/en/about.html [22 June 2020].

Serrat, O. 2017. Proposition 5: The sustainable livelihoods approach. *Knowledge Solutions,* 21-26. https://link.springer.com/content/pdf/10.1007%2F978-981-10-0983-9_5.pdf [04 February 2022].

Shinbrot, X.A., Wilkins, A., Gretzel, U. & Browser, G. 2019. Unlocking women's sustainability leadership potential: Perceptions of contributions and challenges for women in sustainable development. *World Development,* 119(2): 120-132.

Sikwela, M.M. & Mushunje, A. 2013. The impact of farmer support programmes on household income and sustainability in smallholder production: A case study of the Eastern Cape and KwaZulu-Natal farmers, South Africa. *African Journal of Agricultural Research*, 8: 2502-2511.

Simpson, N.P., Shearing, C.D. & Dupont, B. 2020. Gated adaptation during the Cape Town drought: Mentalities, transitions and pathways to partial nodes of water security. *Society and Natural Resources*, 33(8): 1041-1049.

Smit, B. & Wandel, J. 2006. Adaptation, adaptive capacity and vulnerability. *Global Environmental Change*, 16(3): 282-292.

Smucker, T.A. & Wisner, B. 2007. Changing household responses to drought in Tharaka, Kenya: Vulnerability, persistence and challenges. *Disasters*, 32: 190-215.

Solh, M. & Van Ginkel, M. 2014. Drought preparedness and drought mitigation in the developing world's drylands. *Weather and Climate Extremes*, 3: 62-66.

South Africa. 1995. *White Paper on Agriculture 1995*. Department of Agriculture. Pretoria: Government Printer. https://www.gov.za/sites/default/files/gcis_document/201411/white-paper-agriculture-1995.pdf [18 June 2021].

South Africa. 1996. *The* Constitution *of the Republic of South Africa*. https://www.gov.za/documents/constitution-republic-south-africa-1996

South Africa. 1999. *White Paper on Disaster Management.* Department of Constitutional Development. Pretoria: Government Printer. https://www.preventionweb.net/files/31456_whitepapersouthafrica.pdf [4 February 2022].

South Africa. 2003. *Disaster Management Act no. 57 of 2002.* Pretoria: Government Printer. http://www.cogta.gov.za/cgta_2016/wp-content/uploads/2016/06/DISASTER-MANAGEMENT-ACT.pdf [06 October 2020].

South Africa. 2016. *The National Development Plan 2030*. https://www.gov.za/NationalDevelopmentPlan2030 [16 June 2021].

South Africa. 2020. *National Infrastructure Plan.* https://www.gov.za/issues/national-infrastructure-plan [10 July 2020].

South Africa. National Treasury. 2007*. Framework for managing programme performance information*. Pretoria, South Africa. https://www.dpme.gov.za/publications/Policy%20Framework/Framework%20for%20Managing%20Programme%20Performance%20Information.pdf [23 June 2020].

South Africa. The Presidency. 2007. *Policy Framework for the Government-wide Monitoring and Evaluation System*. Pretoria, South Africa. https://www.dpme.gov.za/publications/Policy%20Framework/Policy%20Framework%20for%20the%20GWME%20system.pdf [07 October 2020].

South Africa. The Presidency. 2011. *National Evaluation Policy Framework*. https://www.dpme.gov.za/publications/Policy%20Framework/National%20Evaluation%20Policy%20Framework.pdf [07 October 2020].

South African Breweries (SAB). 2020. *Vision and values*. http://www.sab.co.za/ vision-and-values [22 June 2020].

South African Broadcasting Corporation (SABC). 2019. *Full View News*. 13 November 2019. Pretoria, South Africa.

South African Pork Producers Organisations (SAPPO). 2020. *About SAPPO.* http://www.rmaa.co.za/sappo/ [22 June 2020].

Statistics South Africa (StatsSA). 2021. *Statistical Release P0302: Mid-year population estimates*. Pretoria, South Africa. http://www.statssa.gov.za/publications/P0302/P03022021.pdf [14 January 2022.

Stone, W. 2001. *Measuring social capital: Towards a theoretically informed measurement framework for researching social capital in family and community life*. Research Paper No. 24. Australian Institute of Family Studies.

Stufflebeam, D.L. 2001. *Evaluation Models. New directions for evaluation.* San Francisco, CA: Jossey Bass. https://scholarworks.wmich.edu/books/505/ [23 May 2020].

Surplus People's Project. 2017. *Annual Report 2017*. https://spp.org.za/wp-content/uploads/2018/09/2017-SPP-ANNUAL-REPORT.pdf [05 October 2020].

Sutton, J. & Austin, Z. 2015. Qualitative research: Data collection, analysis & management. *Canadian Journal of Hospital Pharmacy,* 68(3): 226-231. https://dx.doi.org/10.4212%2Fcjhp.v68i3.1456

Swanson, B.E.& Rajalahti, R. 2010.*Strengthening Agricultural Extension and Advisory Systems: Procedures for Assessing, Transforming, and Evaluating Extension Systems*. World Bank: Washington, DC, USA.

Swift, J. & Hamilton, K. 2001. Household food and livelihood Security. In Devereux, S. & Maxwell, S. (eds.). Food security in sub-Saharan Africa. London: ITDG Publishing: 67-92.

Syngenta. 2020. *Syngenta Global.* https://www.syngenta.com/ [07 October 2020].

Tadesse, T., Haile, M., Senay, G., Wardlow, B.D. & Knutson, C.L. 2008. The need for integration of drought monitoring tools for proactive food security management in sub-Saharan Africa. *Natural Resources Forum*, (32): 265-279.

Thamaga-Chitja, J.M. & Morojele, P. 2014. The context of smallholder farming in South Africa: Towards a livelihood asset building framework. *Journal of Human Ecology,* 45(2): 147-155.

Theron, S.N., Archer, E., Midgley S.J.E. & Walker, S. 2021. Agricultural perspectives on the 2015-2018 Western Cape drought, South Africa: Characteristics and spatial variability in the core wheat growing regions. *Agricultural and Forest Meteorology*, 304: 108405.

Tibesigwa, B. & Visser, M. 2015. Small-scale subsistence farming, food security, climate change and adaptation in South Africa: Male-Female headed households and urban-rural nexus. ERSA Working Paper 527. https://www.econrsa.org/system/files/publications/working_papers/working_paper_527.pdf [23 May 2020].

Tiger Brands. 2020. *About us.* https://www.tigerbrands.com [22 June 2020].

Tittonell, P. 2014. Livelihood strategies, resilience and transformability in African agroecosystems. *Agricultural Systems*, 126(2014): 3-14.

Tobin, G.A. & Begley, C.M. 2004. Methodological rigour within a qualitative framework. *Journal of Advanced Nursing*, 48(4): 388-396.

Toner, A. & Franks, T. 2006. Putting livelihoods thinking into practice: Implications for development management. *Public Administration and Development*, 26: 81-92.

Tshoni, S. 2015. Analysis of smallholders' farm diversity and risk attitudes in the Stellenbosch local municipal area. Masters' thesis (Unpublished). Stellenbosch University, South Africa. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.915.5754&rep=rep1&type=pdf [06 October 2020].

Tung, C.P., Tsao, J.H., Tien, Y.C., Lin, C.Y. & Jhong, B.C. 2019. Development of a novel climate adaptation algorithm for climate risk assessment. *Water,* 11: 497.

Ubisi, N.R., Mafongoya, P. L., Kolanisi, U. & Jiri, O. 2017. Smallholder farmer's perceived effects of climate change on crop production and household livelihoods in rural Limpopo Province, South Africa. *Change and Adaptation in Socio-Ecological Systems*, 3(1): 27-38.

Van Averbeke, W. & Khosa, T.B. 2004. *The triple-A framework for the analysis of smallholder food commodity chains*. 3rd International Conference on Entrepreneurship: Sustainable Globalisation, 3-4 November, Pretoria: Tshwane University of Technology. *Proceedings*. Pretoria: Tshwane University of Technology: 292-299.

Van Averbeke, W. & Mohamed, S.S. 2006. Smallholder farming styles and development policy in South Africa: The case of Dzindi Irrigation Scheme. *Agrekon*, 45(2): 136-157.

Van Averbeke, W. 2008. *Best management practices for small-scale subsistence farming on selected irrigation schemes and surrounding areas through participatory adaptive research in Limpopo Province*. WRC report TT 344/08. Water Research Commission, Pretoria, South Africa. https://silo.tips/download/wim-van-averbeke-wrc-report-no-tt-344-08-march-centre-for-organic-and-smallholder [07 October 2020].

Van Duinen, R., Filatova, T. & Jager, W. 2016. Going beyond perfect rationality: Drought risk, economic choices and the influence of social networks. *The Annals of Regional Science*, 57: 335–369.

Van Koppen, B. & Schreiner, B. 2014. Priority General Authorisations in rights-based water use authorisations in South Africa. *Water Policy,* 16(S2):59-77. http://dx.doi.org/10.2166/wp.2014.110

Van Niekerk, D. 2014. A critical analysis of the South African Disaster Risk Management policy and legislation. *Disasters*, 38(4): 858-877.

Van Riet, G. & Diedericks, M. 2009. *An investigation into the 'optimal' location of the disaster management function, within district, metropolitan and provincial government in South Africa.* ACDS, Potchefstroom, South Africa.

Van Zyl, K. 2006. *A study on a disaster risk management plan for the South African agricultural sector*. Pretoria, South Africa. http://docshare02.Docshare.tips/files/21188/211883192.pdf [07 October 2020].

Vermaak, J. & van Niekerk, D. 2004. Disaster risk reduction initiatives in South Africa. *Development Southern Africa*, 21(3): 555-574.

Vetter, S. 2009. Drought, change and resilience in South Africa's arid and semi-arid rangelands. *South African Journal of Science*, 105: 29-33.

Vinpro. 2020. *About us*. http://vinpro.co.za. [22 June 2020].

Virbac. 2020. *About Virbac South Africa*. https://za.virbac.com/home/ about-us/about-virbac-south-africa.html [22 June 2020].

Vogel, C. & Olivier, D. 2019. Re-imagining the potential of effective drought responses in South Africa. *Regional Environmental Change*, 19: 1561–1570.

Wentink, G.J. & van Niekerk, D. 2017. The capacity of personnel in disaster risk management in South African municipalities. *The Journal for Transdisciplinary Research in Southern Africa*, 13(1): 1-10.

West Coast District Municipality. 2015*. West Coast District Municipality Annual Report 2015-2016*. http://westcoastdm.co.za/wp-content/uploads/2017/01/Annual-Report-2015-2016-final-3.pdf [15 June 2020].

West Coast District Municipality. 2019. *Annual Report 2018/2019.* http://westcoastdm.co.za/wp-content/uploads/2019/12/09-December-2019-Annual-Report-2018-2019-1.pdf [17 June 2020].

Western Cape Department of Agriculture (WCDoA). 2016a. *Provincial Drought and Water Scarcity Management Plan*, Cape Town.

Western Cape Department of Agriculture (WCDoA). 2016b. *Rationale for the five priority areas identified at the provincial drought dialogue. With alignment to the SmartAgri Plan.* https://www.greenagri.org.za/assets/documents-/SmartAgri/2017-uploads-of-SmartAgri/Drought-Dialogue- /Rationale-for-Drought-Action-Plan.pdf [05 October 2020].

Western Cape Department of Agriculture (WCDoA). 2017. *Informing the Western Cape agricultural sector on the 2015-2017 drought. A Drought Fact Sheet*. https://www.elsenburg.com/sites/default/files/services-at-a-glance-forms/2017-12-13/drought-fact-sheet-final.pdf [07 October 2020].

Western Cape Department of Agriculture (WCDoA). 2018. *Western Cape Sustainable Water Management Plan 2017 – 2022*. Cape Town, South Africa.

https://www.westerncape.gov.za/eadp/files/atoms/files/WC%20Sustainable%20Water%20Management%20Plan%202018_1.pdf

Western Cape Department of Agriculture (WCDoA). 2019. *Content.* http://www.elsenburg.com/content/western-cape-department-agriculture [06 August 2019].

Western Cape Department of Agriculture (WCDoA). 2020a. *Departmental Strategic Goals.* http://www.elsenburg.com/about-us/departmental-strategic-goals [26 May 2020].

Western Cape Department of Agriculture (WCDoA). 2020b. *Landcare services.* http://www.elsenburg.com/services-and-programmes/landcare-services [07 October 2020].

Western Cape Department of Environmental Affairs and Development Planning (WCDEA&DP). 2018. *Western Cape Sustainable Water Management Plan 2017-2022: Towards a new norm for water resilience.* https://www.westerncape.gov.za/eadp/files/atoms/files/WC%20Sustainable%20Water%20Management%20Plan%202018_0.pdf [07 October 2020].

Western Cape Government (WCG). 2016. *Western Cape climate change response framework and implementation plan for the agricultural sector - 2016*. https://www.greenagri.org.za/assets/documents-/SmartAgri/Western-Cape-Climate-Change-Response-Framework-2016-FINAL-Online-V2.pdf [14 June 2020].

Western Cape Government. 2017. *Overberg District Municipality, 2017: Socio-Economic Profile*. https://www.westerncape.gov.za/assets/departments/treasury/Documents/Socio-economic-profiles/2017/dc03_overberg_district_2017_socio-economic_profile_sep-lg_-_17_january_2018.pdf [04 February 2022].

Western Cape Government. 2018. *Overberg District Municipality, 2018: Socio-Economic Profile*. https://www.westerncape.gov.za/provincial-treasury/files/atoms/files/DC03%20Overberg%20District%202018%20Socio-economic%20Profile%20%28SEP-LG%29%20-%20%28CB%29%20F.pdf [04 February 2022].

Wilhite, D.A. & Pulwarty, R.S. 2005. Drought and water crises: Lessons learned and the road ahead. In Wilhite, D.A. (ed.). *Drought and water crises: Science, technology & management issues.* Boca Raton, FA: CRC Press: 389-398.

Wilhite, D.A. 2002. Combating drought through preparedness. *Natural Resources Forum*, 26: 275-285.

Wilhite, D.A., Hayes, M.J., Knutson, C. & Smith, K.H. 2000. Planning for drought: Moving from crisis to risk management. *Journal of the American Water Resources Association (JAWRA),* 36: 697–710.

Wilhite, D.A., Sivakumar, M.V.K. & Pulwarty, R. 2014. Managing drought risk in a changing climate: The role of national drought policy. *Weather and Climate Extremes*, 3: 4-13.

Wilk, J., Andersson, L. & Warburton, M. 2013. Adaptation to climate change and other stressors among commercial and small-scale South African farmers. *Regional Environmental Change*, 13:273-286.

Williams, C. 2007. Research methods. *Journal of Business and Economic Research*, 5: 65-72.

Wilson, V. 2014. Research methods: Triangulation. *Evidence Based Library and Information Practice*, 9, 74-75.

Wolski, P., Conradie, S., Jack, C. & Tadross, M. 2021. Spatio-temporal patterns of rainfall trends and the 2015-2017 drought over the winter rainfall region of South Africa. *International Journal of Climatology,* 41(11). https://doi.org/10.1002/joc.6768

World Wildlife Fund (WWF). 2018. *Agricultural water file: Farming for a drier future*. https://www.wwf.org.za/water/?25441/Agricultural-water-file-Farming-for-a-drier-future [05 October 2020].

Xaba, T. & Dlamini, C.S. 2015. The Comprehensive Support Programme's (CASP) Training and Capacity building: An impact analysis on income levels of emerging farmers in Limpopo Province (South Africa). *American Journal of Economics, Finance and Management*, 3(1): 153-163.

Xianfeng, L., Xiufang, Z., Yaozhong, P., Shuangshuang, L., Yanxu, L. & Yuqi, M. 2016. Agricultural drought monitoring: Progress, challenges, and prospects. *Journal of Geographical Sciences*, 26(6):750-767. http://dx.doi.org/10.1007/s11442-016-1297-9

Yilmaz, K. 2013. Comparison of quantitative and qualitative research traditions: Epistemological, theoretical & methodological differences. *European Journal of Education*, 48(2): 311-325.

Zamasiya, B., Nyikahadzoi, K. & Mukamuri, B.B. 2017. Factors influencing smallholder farmers' behavioural intention towards adaptation to climate change in transitional climatic zones: A case study of Hwedza District in Zimbabwe. *Journal of Environmental Management*, 198: 233-239.

Ziervogel, G., Johnston, P., Matthew, M. & Mukheibir, P. 2010. Using climate information for supporting climate change adaptation in water resource management in South Africa. *Climatic Change,* 103:537-554.

Ziervogel, G., New, M. & Liu, W. 2019. Making cities water-wise and climate-resilient: Lessons and experience from the Cape Town drought. *Landscape Architecture Frontiers*, 7(3): 94-99.

Ziervogel, G., New, M., Archer van Garderen, E., Midgley, G., Taylor, A., Hamann, R., Stuart-Hill, S., Myers, J., & Warburton, M. 2014. Climate change impacts and adaptation in South Africa. *WIREs Climate Change*, 5:605–620.

APPENDIX A: SMALLHOLDER FARMER LIVELIHOODS ANALYSIS QUESTIONNAIRE

FACULTY OF APPLIED SCIENCES

DEPARTMENT OF ENVIRONMENTAL HEALTH AND OCCUPATIONAL STUDIES

OBJECTIVE: To conduct an analysis of smallholder farmer livelihood in the Overberg and West Coast districts in the Western Cape

IDENTIFICATION DETAILS	
QUESTIONNAIRE NO.	
RESPONDENT NAME	
DISTRICT NAME	
TOWN NAME	
FARM NAME/NO.	
DATE OF INTERVIEW	
START TIME	
END TIME	
INTERVIEWER	

SECTION A: BACKGROUND INFORMATION

A1 Please give a brief background of yourself. ----------

A2 Do you consider yourself as a farmer?

1	Yes
2	No
3	Not sure

A3 When did you start farming? ----------

A4 Are you involved in any farming type below? (Select all options that apply to you)

1	Grain Production (Specify type of grain)
2	Cattle Production (Specify dairy/beef and number)
3	Sheep Production (Specify wool, lamb/mutton and number)
4	Pig Production (Specify number)
5	Vegetable Production (Specify type)
6	Poultry
7	Vineyards
8	Goats
9	Other

A5 Do you consider yourself a smallholder farmer?

1	Yes
2	No
3	Not sure

A6 Please explain your answer? ----------

A7 Do you aspire to become a commercial farmer?

1	Yes
2	No
3	Maybe

A8 Please explain your answer above ----------

A9 Do you consider your farming as a business?

1	Yes
2	No

SECTION B: CAPITALS

B1. Human capitals

B1.1 Which age group do you belong to? (Specify number of years, if comfortable)

1	18-24
2	25-31
3	32-38
4	39-45
5	46-52
6	53-59
7	60-66
8	67-73
9	74+

B1.2 Gender of the participant/ farmer (Please tick the applicable box)

1	Male
2	Female

B1.3 What is the size of your family? (Specify the number)

1	1-3
2	4-6
3	7 and above

B1.4 Are your family members involved in your farming activities?

1	Yes
2	No

B1.5 What farming activities do the other family members involve themselves in? ----------
---

B1.6 When do you involve the other family members in farming? ----------
---

B1.7 Do you sometimes hire casual labour?

1	Yes
2	No

B1.8 If yes how many? (Specify) ----------

B1.9 How often do you hire casual workers?

1	Weekly
2	Monthly
3	Yearly
4	Seasonally (Specify)

B1.10 Do you have permanent workers?

1	Yes
2	No

B1.11 If yes, how many permanent workers do you have? ----------
---

B1.12 What is your highest level of education? (Specify)

1	Never been to school
2	Grade R to grade 8
3	Grade 9 to grade 12
4	Matriculated
5	National certificate
6	Tertiary qualification

B1.13 Did you receive any farm-related training?

1	Yes
2	No

B1.14 If yes, what farm related training did you receive? ----------
---

B1.15 Besides farm-related training, did you receive any other skills training?

1	Yes
2	No

B1.16 If yes, what other training did you receive? ----------
---

B1.17 Do you need any skills development training?

1	Yes
2	No
3	Maybe

B1.18 If yes, what skills training do you need?

_____

B1.19 Which of the following farm-related events have you ever attended? (Please tick all the relevant options)

1	Farmers' days
2	Information sessions
3	Demonstration sessions
4	Training
5	Workshops
6	Other (Please specify)

B1.20 If none of the above, please explain your answer ----------

B2. Financial Capital

B2.1 Are you employed?

1	Yes
2	No

B2.2 If yes, what type of employment is it?

1	Self-employment
2	Part-time
3	Full-time

B2.3 Which of the following income sources apply to you (Please tick all the applicable options)

1	Pension
2	Farming
3	Social grant
4	Remittances
5	Salary

6	Private business
7	Other

B2.4 If remittances are one of the sources of income selected, please indicate where they come from? (Tick all applicable options)

1	Son
2	Daughter
3	Mother
4	Father
5	Other (Specify)

B2.5 Do you have access to any credit providers?

1	Yes
2	No

B2.6 If yes to the above question, which of the following organisations provide credit to you? (Tick all the applicable options)

1	Co-operatives
2	Commercial Bank
3	Land Bank
4	Other (Please specify)

B2.7 Which of the following credit conditions apply to you? (Please tick all relevant options)

1	Interest rates
2	Contract farming
3	Collateral
4	Other

B2.8 Which of the following ways do you use to save money? (Select all applicable options)

1	Livestock/grain
2	Cash at hand
3	Bank savings
4	Other (Please specify)

B3. Natural capital

B3.1 How many hectares of land do you own? (Specify) ----------

B3.2 How much of your total land do you cultivate? (Specify) ----------

B3.3 Which of the following land ownership apply to you? (Tick all relevant options)

1	Government leased
2	Municipality-leased
3	Inherited
4	Privately rented
5	Purchased
6	Other (specify)

B3.4 Is your land enough for use?

1	Yes
2	No

B3.5 If no, have you tried to secure more land?

1	Yes
2	No

B3.6 If yes, from where have you tried to secure it? ----------

B3.7 Which of the following water sources for agricultural purposes apply to you? (Please tick all relevant options)

1	Well
2	Borehole
3	Dam
4	Tap
5	River
6	Other (Specify)

B3.8 Which of the following water authorisation(s) apply to you? (Please tick all relevant options)

1	Through municipality
2	Through general authorisation
3	Through water rights
4	Other (Please specify)

B3.9 What type of infrastructure do you use to transport water from the source? ----------
---

B4. Physical capital

B4.1 Which of the following transport mode(s) do you own? (Please tick all applicable options)

1	Car
2	Bicycle
3	Pick-up truck/bakkie
4	Lorry
5	Motor bike
6	Other (Specify)

B4.2 Do you market your produce?

1	Yes
2	No

B4.3 If yes, please explain how you market your produce? ----------
---

B4.4 Who buys your produce? (Please mention them) ----------

B4.5 Do you use public transport to take your produce to the markets?

1	Yes
2	No

B4.6 What is the distance from your farm to your markets for the produce (km)? ----------
---

B4.7 How much do you pay to transport your produce to the market per one-way trip? ---------
---

B4.8 Do you experience any challenges when taking your produce to the market?

1	Yes
2	No

B4.9 If yes, what challenges do you experience? ----------

B4.10 Do you own a house?

1	Yes
2	No

B4.11 Do you own any other buildings in addition to your house?

1	Yes
2	No

B4.12 If yes, which of the following additional buildings/facilities do you own (Tick all the answers that apply to you)

1	Storage facility
2	Labour houses
3	Animal housing
4	Other (Please specify)

B4.13 Which of the following forms of energy do you use for agricultural and domestic purposes? (Tick all that apply to you)

1	Solar
2	Electricity
3	Gas
4	Wood
5	Generator
6	Other (Specify)

B4.14 Which of the following modes of communication do you use? (Tick all that apply to you)

1	Cell phone
2	Home phone
3	Email
4	Postal
5	Fax
6	Two-way mobile radio
7	Other (Please specify)

B5 Social assets (connections, networks, formal groups)

B5.1 Do you belong to any farming group in your community?

1	Yes
2	No

B5.2 If no, what is the reason for not belonging to any group? ----------
---

B5.3 Do you pay membership fees to the group?

1	Yes
2	No

B5.4 Do you attend the meetings held by your group?

1	Yes
2	No

B5.5 If no, what are your reasons for not attending the group meetings? ----------
---

B5.6 How often do you attend the meetings held by your group?

1	Always
2	Most of the times
3	Rarely
4	Other

B5.7 What activities take place in your meetings? ----------

B5.8 How often do you meet as a group?

1	Once a week
2	Once a month
3	Once a year
4	Other (Please specify)

B5.9 In your own opinion, does your membership in the group benefit you?

1	Yes

2	No
3	Maybe

B5.10 According to your view, is your group functioning well?

1	Yes
2	No
3	Maybe

B5.11 If no to the above, please explain why you say so ----------
---

Do you have any comment or question? ----------

Thank you very much for your time and contribution!

APPENDIX B: INTERVIEW GUIDE FOR FOCUS GROUP DISCUSSIONS WITH SMALLHOLDER FARMERS

GROUP NUMBER: _____

DATE: _____

TOWN(s): _____

DISTRICT: _____

VENUE: _____

OBJECTIVE: Determining smallholder farmer livelihoods, coping and adapting strategies during drought periods

FACILITATOR: _____

PARTICIPANT NAMES: _____

1. Characteristics / background of participants

2. Contextual and background information

What other activities for living are you involved in besides farming?

3. In-depth questions

A. ASSETS

What do you think is the future of farming 20 years from now? (Youths participation, role of elderly in promoting farming)

What is your opinion on the farm-related events offered in your area? (Challenges when attending the events, benefits)

How has the current drought shaped your perception on farming as the only source of income?

What is your opinion on borrowing as an option of running your farming business? (Access, challenges, consequences for borrowing etc.)

Please share your experiences of farming on a leased/rented land

What are your experiences with your current water authorisation type? (challenges according to type)

How do you feel about the water infrastructure in your community or on your farm? (Adequacy, access, condition etc.)

What storage facilities do you have? (Storage for feed, cold storage, vegetables etc.)

How do you feel about farming groups in your community?

B. DROUGHT COPING STRATEGIES

What is your view on the current drought in your area and how are you surviving it?

C. DROUGHT ADAPTING STRATEGIES

Given your own experience with the current drought, what is your plan for any future droughts?

D. ROLE OF ORGANISATIONS IN SMALLHOLDER FARMER LIVELIHOODS STRATEGIES

D1. Early warning systems and indigenous knowledge systems

What sources of drought warning information are available in your area? (existence of formal and informal drought warning systems; adequacy, relevance and use of information, challenges with ways used to disseminate information, perceptions on indigenous knowledge systems value and suggestions for uptake of indigenous knowledge systems by organisations)

D2. Support provided by organisations and individuals

List the organisations that support you in your farming (Net-mapping)

What kind of support do they give you? (Net-mapping)

How does the involvement of these organisations in your farming affect your decision-making? (Net-mapping)

Which among the organisations that support you are the most important? (Net-mapping)

4. Conclusions

Is there anything else about yourself that you may want to share with us in conclusion?

APPENDIX C: ATTENDANCE REGISTER FOR SMALLHOLDER FARMERS' FOCUS GROUP DISCUSSIONS

Project No: K5/2716/4 Date of meeting: _____

Venue: _____ Facilitator: _____

TITLE	SURNAME & INITIAL	TOWN	CELL NUMBER
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10			
11.			

12.			
13.			
14.			
15.			

APPENDIX D: CONSENT LETTER FOR SMALLHOLDER FARMERS' FOCUS GROUP DISCUSSIONS

TO WHOM IT MAY CONCERN

RE: CONSENT LETTER TO PARTICIPATE IN FOCUS GROUP DISCUSSIONS IN A STUDY SEEKING TO ANALYSE STRATEGIES EMPLOYED DURING THE CURRENT DROUGHT

Dear Prospective Participant

As you may recall, you recently participated in a study in which the researchers sought to understand the different ways in which you make a living and how you have managed to survive during the current drought. You provided very useful information and have to be commended for that. However, the study is on-going, and at this point, your participation once again, is being sought. There will be focus group meetings held in your area in the few coming weeks, in which you are being invited to make your contribution.

If you agree to participate, please be assured that the information you provide will only be used for research purposes. Your name will not be included in any report and the information will be treated confidentially. The group discussion may require 2-3 hours of your time. Please be advised that to allow the researcher to capture everything that all of group members will say during this discussion, and to give quality time to follow the discussion, a recording device will be used. If there is any information that you are not comfortable to provide during the discussion, you are free to remain silent. If, at any point, you feel that you no longer want to continue with the discussion, you may excuse yourself.

Thank you very much for your continuous support and assistance throughout the duration of this study. If agreeable to the conditions of the study, please sign in the space below.

Yours sincerely,

Mercy Fanadzo

Cape Peninsula University of Technology

Email: merfanadzo@gmail.com

Tel: 074 017 9075

I, ---------- willingly give my consent to participate in the focus group discussion under conditions provided above.

Signature: _____ Date: _____

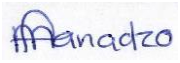
APPENDIX E: CONSENT LETTER: SMALLHOLDER FARMER INDIVIDUAL INTERVIEWS

TO WHOM IT MAY CONCERN

The following questionnaire is aimed at assessing the different ways in which you make a living and how you have managed to survive during the current drought. You have been selected to complete this questionnaire because the researcher wants to learn and put to record your experiences in order to share with a wider community. This information will assist in other farmers improving the ways in which they deal with drought in the near future.

Please be assured that the information you provide will only be used for research purposes. Your name will not be included in any report and the information will be treated confidentially. Completing this questionnaire may take 45-50 minutes of your time and you will be assisted by one or two people to complete it. Please be advised that, to allow the researcher to capture everything that you say and to give quality time to follow the discussion, an audio recording device will be used. If you feel that you cannot answer certain questions and that you no longer want to continue with the interview at any point, please be comfortable to share with the facilitators and the interview will be terminated immediately.

Please note that your participation in this discussion should be voluntary. You are therefore, being requested to give permission for the discussion to continue as scheduled, if you agree to participate.

Signed:  Date----------

Researcher (Cape Peninsula University of Technology)

I, (full name and surname) ---------- am willing to take part in the discussion mentioned above.

Signature of participant ---------- Date ----------

APPENDIX F: GRAMMARIAN LETTER

Krag Street
Napier
7270
Overberg
Western Cape

10 February 2022

LANGUAGE & TECHNICAL EDITING

Cheryl M. Thomson

Analysis of smallholder farmer livelihood strategies for coping and adapting to drought in the Western Cape Province, South Africa

Supervisor: Dr B. Ncube

Co-supervisors: Dr A. French and Prof A. Belete

This is to confirm that I, Cheryl Thomson, executed the language and technical editing of the above-titled Doctoral thesis of **MERCY FANADZO,** student number 217302572, at the CAPE PENINSULA UNIVERSITY OF TECHNOLOGY in preparation for submission of this thesis for assessment.

Yours faithfully

CHERYL M. THOMSON

Email: cherylthomson2@gmail.com

Cell: 0826859545