

**WOMEN EMPOWERMENT IN AGRICULTURE: AGENCY & INSTITUTIONS FOR
IMPROVED MARKET ACCESS AND HOUSEHOLD FOOD SECURITY IN
LIMPOPO PROVINCE**

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ABSTRACT

Developing the smallholder agricultural sector has been proposed as a way of developing rural communities. These assertions are partly based on the results of the Asian Green Revolution. Women's contribution to agricultural development as workers and farmers is acknowledged, but, what is questioned is the extent to which agriculture will result in their empowerment. Local institutions and social norms have largely resulted in women owning and controlling very few productive assets and this is thought to contribute to their disempowerment. It is argued that unless women are empowered through transformed institutions, they may be further disempowered by any interventions to uplift smallholder farmers.

Empowering women is considered an essential part of sustainable development and agriculture offers the right platform, since it employs almost half of the rural women in the developing world. Although they are the backbone of smallholder agriculture, female smallholder farmers do not always fully benefit from their work, particularly financially. Their limited access to productive resources and their exclusion from formal markets restricts their capacity to contribute more to agriculture and household food security. Women's contribution to decision-making has long been used as a proxy measurement for empowerment. For empowerment to take place women must have access to resources and the agency required to transform their resources into livelihoods outcomes. In spite of their aspirations to increase production and access markets, prevailing institutional and social norms may limit female smallholder farmers from achieving their goals. Transformed agricultural, social and market institutions and secure access to productive resources are important to improve women's productivity and raise the numbers of women participating in formal markets.

This study was grounded in the Sustainable Livelihoods Framework and people-centred approaches to development. Research was conducted in three purposively selected irrigation schemes in Limpopo Province, to assess the current institutions and their effect on smallholder market access, to determine the level of empowerment in the study area and the determinants of market access and finally to measure the effect of women empowerment on household food security. A mixed methods approach was used in the study and data was collected in August and December 2013, using questionnaires from purposively selected

respondents, observations and focus group discussions. The December survey was conducted using an adapted Women Empowerment in Agriculture Index (WEAI) questionnaire. The quantitative data was analysed using Statistical Package Social Sciences (SPSS) for descriptive statistics and to generate the 5DE index, farmer GPI and modified WEAI. The qualitative data was analysed using content analysis.

The results show that, firstly, the current institutions restrict farmers to subsistence farming as there are few capacity building initiatives in the communities. Secondly, just over half of the respondents were empowered and were at par with their male colleagues. The women's adequacy in the access to credit and leisure satisfaction indicators contributed least to women's empowerment. Finally, the study showed that the households were predominantly food secure, although there was a relationship between women empowerment and food security.

In conclusion, the importance of institutions in defining the opportunity structure and as enablers of agency is demonstrated by the prevalence of predominantly subsistence-oriented agriculture in the study. Empowerment is a complex process that requires a combination of personal attributes and an environment which is enabling. It is recommended that the government departments and non-governmental organisations (NGO's) working in the community work to address women's secondary access to resources, capacity building needs of extension officers and smallholder farmers and to integrate the different training activities currently available to smallholder farmers.

Key words: institutions, women, empowerment, agency, agriculture, livelihoods, market access, Limpopo Province

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I, Vongai G. Murugani, declare that:

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DECLARATION 2- DRAFT PUBLICATION MANUSCRIPTS

Details of Contribution to Draft Publication Manuscripts that form part and/or include research presented in this dissertation.

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Murugani VG & Thamaga-Chitja JM. Women Empowerment in Agriculture: Female Farmer Empowerment in Rural Limpopo Province

Author contributions: VGM conceived paper with JTC. VGM collected and analysed data, and wrote the paper. JTC guided the data collection and contributed valuable comments to the manuscript.

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Murugani VG & Thamaga-Chitja JM. Women Empowerment in Agriculture and Household Food Security in Rural Limpopo Province

Author contributions: VGM conceived paper with JTC. VGM collected and analysed data, and wrote the paper. JTC guided the data collection and contributed valuable comments to the manuscript.

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TABLE OF CONTENTS

Abstract.....	i
College Of Agriculture, Engineering And Science: Declaration 1- Plagiarism.....	iii
College Of Agriculture, Engineering And Science: Declaration 2- Draft Publication Manuscripts	iv
Acknowledgements.....	vi
List Of Abbreviations And Synonyms.....	x
Chapter One – The Problem And Its Setting	1
1.2. Smallholder Farmer Agriculture In South Africa	3
1.3. Theoretical Grounding.....	5
1.4. Importance Of Study.....	6
1.5. Research Problem	8
1.6. Sub-Problems.....	9
1.8. The Study’s Delineation And Limits	10
1.9. Assumptions.....	10
1.10. Definition Of Terms.....	11
References.....	12
Chapter Two – Literature Review.....	15
2.1 Introduction.....	15
2.2 Women Empowerment In Agriculture.....	15
2.2.1 Agricultural Development And Women Empowerment.....	17
2.2.2 The Definition And Characteristics Of Empowerment.....	18
2.3 The Prerequisites To Empowerment In Agriculture – Agency And Institutions	20
2.3.1 Asset-Based Agency And Smallholder Farmer Empowerment.....	22
2.3.2 Institutions And The Opportunity Structure	23
2.3.3 Formal Institutions And Farmer Empowerment	24
2.3.4 Informal Institutions And Farmer Empowerment.....	25
2.3.5 Agency And Opportunity Structure In Female Farmer Empowerment	27
2.3.6 Empowerment And Food Security.....	29
2.4 Conclusion	30
References.....	31
Chapter Three.....	35
Methodological Approach And Data Collection	35
3.1 Introduction.....	35
3.2 Site Selection And Sampling	35
3.2.1 Research Area Description.....	37
3.2.2 Description Of The Study Sites	37

3.3	Data Collection And Analysis.....	38
	References.....	40
Chapter Four		41
4.1.	Introduction.....	42
4.2.	Background And Contextualisation.....	43
4.2.1.	The Role Of Institutions In Market Access.....	43
4.2.2.	Institutions For Production And Market Access For The South African Smallholder Irrigation Farmer.....	46
4.2.3.	Market Innovations To Increase Smallholder Farmer Market Access In South Africa.....	47
4.3.	Methodological Approach And Data Collection.....	47
4.4.	Results And Discussion	49
4.4.1.	Production Challenges	50
4.4.2.	Market Challenges	57
4.4.3.	Do The Institutions And Organisation Empower Smallholder Farmers To Access Formal Markets?.....	62
4.5.	Conclusions And Recommendations	67
	References.....	69
Chapter Five: Women Empowerment In Agriculture: Female Farmer Empowerment In Rural Limpopo Province.....		71
5.1.	Introduction.....	72
5.2.	Literature Review.....	73
5.2.1.	Empowerment.....	73
5.2.2.	Asset Based Agency.....	73
5.2.3.	Institutions-Based Opportunity Structure	75
5.2.4.	Women Empowerment In South Africa.....	76
5.3.	Methodology	77
5.3.1	Site Selection	77
5.3.2	'Measuring' Empowerment	77
5.3.3	Questionnaire Design And Data Collection.....	78
5.3.4	Data Analysis	79
5.4.	Results And Discussion	82
5.4.1	Demographic Data And 5de Scores	82
5.4.2	Demographic Properties And Empowerment Domains.....	84
5.4.3	The Contribution Of The 10 Indicators To Women's Empowerment	86
5.4.4	5de Indicators Contributing The Least To Women's Empowerment	90
5.4.5	Empowerment Indicators And Market Access	91

5.5. Conclusions And Recommendations	93
References.....	95
Chapter Six.....	99
6.1. Introduction.....	100
6.2. Literature Review.....	101
6.2.1. Women Empowerment And Food Security	101
6.2.2. Women Empowerment And Food Security In South Africa	101
6.3. Methodology	102
6.3.1. Site Selection	103
6.3.2. Measuring Empowerment	103
6.3.3. Measuring Food Security	104
6.3.4. Data Analysis	105
6.4. Results And Discussion	106
6.4.1. Demographic Data	106
6.4.2. Household Food Security In Limpopo Province.....	107
6.4.3. Investigating The Relationship Between Empowerment And Food Security.....	109
6.5. Conclusions And Recommendations	112
Chapter Seven.....	117
7.1. Introduction.....	117
7.2. Conclusions.....	118
7.2.1. Sub-Problem1: What Is The Role Of Institutions For Agency Enhancement In The Study Areas?	118
7.2.2. Subproblem 2: What Is The Level Of Empowerment Of The Female Farmers In The Study Areas Using The Women Empowerment In Agriculture Index (Weai)	119
7.2.3. Sub-Problem 3: What Is The Relationship Between Weai Indicators And Food Security In The Study?	121
7.3. Policy Recommendations.....	122
7.4. Recommendations For Further Study	123
Appendix A.....	124
Appendix B	135

LIST OF ABBREVIATIONS AND SYNONYMS

5DE	:	Five Domains of Empowerment Index
AgriBEE	:	Agricultural Black Economic Empowerment
BATAT	:	Broadening Access to Agriculture Thrust
DAFF	:	Department of Agriculture, Forestry and Fisheries
DoT	:	Department of Transport
FANTA	:	Food and Nutrition Technical Assistance
FAO	:	Food and Agricultural Organisation of the United Nations
FCS	:	Food consumption score
FGPI	:	Farmer gender parity index
FTF	:	Feed the Future
GPI	:	Gender parity index
Ha		hectare
HFIAS	:	Household Food Insecurity Access Scale
HHS	:	Household Hunger Scale
IFPRI	:	International Food Policy Research Institute
JFPM	:	Johannesburg Fresh Produce Market
MDG	:	Millennium Development goals
mWEAI		modified Women Empowerment in Agriculture Index
NGO	:	Non-governmental organisations
NIE	:	New Institutional Economics
OPHI	:	Oxford Poverty and Human Development Initiative
PTO	:	Permission to Occupy
RDP	:	Reconstruction and Development Programme
SDG	:	Sustainable Development Goals
SLA	:	Sustainable Livelihoods Approach
SLF	:	Sustainable Livelihoods Framework
SPSS	:	Statistical Package for Social Sciences
SSA	:	Sub-Saharan Africa
USAID	:	The United States Agency for International Development
WEAI	:	Women Empowerment in Agriculture Index
WFP	:	World Food Programme

CHAPTER ONE – THE PROBLEM AND ITS SETTING

1.1. Introduction

The empowerment of smallholder farmers has been on the development agenda for several decades, because they are poor, food insecure and there has been little development in their agricultural practices (Hazell et al., 2010, The World Bank, 2008). They work on about two thirds of the world's arable land, but their productivity, adoption of improved inputs and mechanisation has mostly been very low worldwide, when compared to that of commercial farmers (Jaffee et al., 2011, Hazell et al., 2010). Since most rural farmers are women, this problem takes on a gendered hue. Apart from food production for the household, most female farmers rarely accrue the same financial gains from agriculture as their male counterparts worldwide (Meinzen-Dick et al., 2014). This has largely been attributed to women holding secondary rights to most productive resources, possibly creating inequality in the household and perpetuating women's disempowerment (Meinzen-Dick et al., 2014). Furthermore, women's focus on so called food crops may contribute to their absence in markets and result in little control of agricultural income (Staritz, 2013). Given women's involvement, agricultural development has the potential to empower women to earn more income from their work (Meinzen-Dick et al., 2014, Jeckoniah et al., 2012).

In spite of the challenges that smallholder farmers face, agriculture has the potential to bring sustainable development to rural communities (Barrett, 2007). Attempts to address these challenges focused on tenure, access to irrigation water and market access, but the solution remains elusive. Some smallholder farmers have access to irrigation facilities, but still face the same challenges that other smallholder farmers face and these have been attributed to most smallholder farmers' limited agricultural training and the absence of market institutions in rural areas where they reside (Jaffee et al., 2011, Hazell et al., 2010, Barrett, 2008).

Current thinking is now focusing on institutions and how they regulate agricultural production and markets, how they could exclude women and other minority classes of farmers from markets and their possible effect on agency. Most smallholder farmers have limited access to credit, inputs and market information (The World Bank, 2008). This makes it difficult to engage in produce markets (Hazell et al., 2010). This lack of formal knowledge limits their exposure to

formal institutions and reduces the extent to which farmers can produce. This is compounded by most smallholder farmers having, at most, two hectares of land, where they practise extensive agricultural production and mixed cropping but end up having small volumes of produce to sell (Barrett, 2008, Dorward et al., 2005). Unless smallholder farmers are producing niche crops, most buyers would rather buy from large producers, as they would incur higher transaction costs with each buyer (Jaffee et al., 2011).

In spite of these hurdles, many smallholder farmers aspire to sell in established formal and informal markets because they hope that, by doing this; they will improve their income, food security and livelihoods. Partnering with other farmers to enhance market readiness through improving quality and quantity for the crops required by the markets is poised to improve market access (Obi et al., 2012). Although smallholder farmers face many disadvantages in accessing markets, some smallholder farmers have successfully penetrated informal and formal produce markets (Chitja and Mabaya, 2015, Herbel et al., 2012, Vorley et al., 2012). The determining factors of market participation were suggested to be the following: level of education, access to resources and market exposure (Chikozho, 2005). Most of the farmers who sell to formal markets were found to be better educated, having a better access to resources and have had more prior exposure to markets than those who do not (Vorley et al., 2012, Chikozho, 2005). This implies that improving smallholder farmer education may possibly lead to agency enhancement and could indirectly influence improvement of food security and livelihoods of the households. However, this study hypothesizes that the approach to farmers' education is as important.

Various governments and non-governmental organisations (NGOs) have developed many programmes and policies in their attempt to empower farmers, develop a stronger smallholder farming sector and to improve rural livelihoods. However, these programmes and policies have mostly given smallholder farmers mechanical and improved seed technology, with little training (Friis-Hansen and Duveskog, 2012). The proposed development programmes and policies have mostly concentrated on giving smallholder farmers the inputs and machinery they lack (Friis-Hansen and Duveskog, 2012). Focusing only on improving the tangible assets of their livelihoods assets is unlikely to lead to empowerment. In some instances, the programmes and policies have been implemented without establishing the farmers' needs and whether or not the response is appropriate in the proposed context. This could compromise project success and

sustainability, because essential skills were not transferred to most farmers in the projects. Hennink et al (2012) show that empowerment can only be sustainable if, communities can identify and develop their own resources. Kabeer (1995) adds that communities will not be sustainably empowered, unless they can access and process information and have access to transformed institutions.

This study purports that the further failure of agricultural development projects is linked to poor contextual understanding of the farmers, their agency and its enhancement and approaches to empowerment. Vorley *et al.* (2012) attribute this to policy-makers and donors who view smallholder farmers as victims of their own circumstances and are blinded to the different ways smallholder farmers have found to achieve their own objectives. They added that this is because the concept of agency has not been widely embraced in agricultural policy (Vorley et al., 2012). Agency is derived from Sen, who sees the human agent as ‘someone who acts and brings about change, and whose achievements can be judged in terms of her own values and objectives’ (Sen, 1999). Vorley *et al.* (2012) argued that institutions are ‘vehicles’ of agency enhancement by improving capabilities and skills through appropriate training. This may indicate a need for institutions that are involved in smallholder farmer development, to consider in their programmes and policies the smallholder farmers’ capabilities and context (if the projects are to successfully enhance agency and lead to the empowerment of farmers).

1.2. Smallholder Farmer Agriculture in South Africa

South Africa’s dual agricultural sector is a legacy of apartheid policies, which actively developed the commercial and large-scale sector at the expense of the smallholder sector, which remains largely subsistence oriented (Obi et al., 2012). Smallholder agriculture largely takes place on about 13% of the agricultural land located in the former homelands and is home to about 14 million South Africans (Vetter, 2013). The 1913 Native Land Act, which was the beginning of land appropriation and forced removals was critical to the development of smallholder agriculture (Mathis, 2007, Simkins, 1981). The result was black South Africans concentrated on 13% of South African land with marginal soils, limited access to water and small plots of agricultural land (Mathis, 2007). This environment was not conducive to continued agricultural production. In addition, this subsistence sector of agriculture received little by the way of state subsidies and the practices of these farmers remained largely similar to those of 18th century

England (Cousins and Scoones, 2010). Although many households still engage in agriculture at different levels, its importance as a source of primary food has declined (Baiphethi and Jacobs, 2009).

Agricultural production in the former homelands is largely rain-fed. About 100 000 hectares of land were found to be under the ownership of the smallholder irrigation schemes and were held by about 31 000 households (Van Averbeke et al., 2011, Van Averbeke and Mohamed, 2006). The land under irrigation has not changed significantly as shown by (Cousins, 2013) since the policy thrust of the government was to repair and revitalise old irrigation scheme infrastructure (Maepa et al., 2014, Cousins, 2013). These smallholder irrigation schemes were largely introduced in South Africa after the Tomlinson Commission of 1955 recommended that households in the former homelands be allocated 1.28 -1.71ha (1.5-2 morgen) of irrigated land for household production (Tapela, 2008, Van Averbeke and Mohamed, 2006). These schemes are largely located in the Eastern Cape, KwaZulu-Natal and Limpopo Provinces. Before 1994 these schemes were largely subsidised by the state, but the post-apartheid government significantly reduced government support (Van Averbeke and Mohamed, 2006). As a result, a small percentage remain functional (Van Averbeke et al., 2011). Although smallholder irrigation farmers have been practising agriculture for a long time and have reliable access to water all year round, they have not grown to their best potential and this is largely attributed to poor human skills (Van Averbeke and Mohamed, 2006). Where farmers are active in these schemes, agricultural production contributes to household and community livelihoods (Magingxa et al., 2009, Van Averbeke and Mohamed, 2006). However, production remains largely subsistence-oriented and the farmers remain poor. Despite this knowledge of the cause of the poor advancement of smallholder farmers, not much has been done to investigate the approach and institutions that are responsible, to transform this sector. Key interventions in South Africa have focused on improving physical assets in this sector and have included land reform, inputs supply and mechanisation (Thamaga-Chitja and Morojele, 2014). The present study purports that efforts to improving intangible assets i.e. human capital, are poor and not seen as integral to the transformation agenda.

Nationally, women account for a significant percentage of smallholder farmers, with estimates ranging from 60-80% (Aliber and Hart, 2009b). The same is observed in irrigation schemes

(Backeberg, 2006). This feminisation of agriculture in South Africa is a result of male outward migration to find work in factories, mines and farms (Statistics South Africa, 2014). In spite of making up a significant percentage of the adult population and therefore agricultural labour, communities are largely patriarchal (Cousins, 2007). Rights to productive resources are primarily held by the male household head and inheritance is patrilineal (Cousins, 2007). This implies women largely work on family-owned land, with possibly little control of the income generated from their labour. There are also very few economic opportunities in the rural communities. Income poverty is thus high and there is little opportunity for women to earn significant income from off-farm employment opportunities (Oberhauser and Pratt, 2004). As a result, rural women account for the poorest of the South African population and female-headed households were found to be worst affected in the period preceding the year 2012 (Statistics South Africa, 2012b).

1.3. Theoretical Grounding

The study is grounded in the Sustainable Livelihoods Framework (SLF) which was developed by The Department for International Development (DfID), the people-centred approaches of development and the concept of agency and empowerment (Alkire et al., 2012, Scoones, 1998). According to the SLF, communities and households require access to five capitals to pursue sustainable livelihoods (Scoones, 1998). In this study Scoones' (1998) definition of livelihoods as 'capabilities, assets and activities required for a means of living' is used. The SLF is considered to be a people-centred approach because understanding how poor people and their assets interact with their context to make a living is central to the framework (Cleary et al., 2003). Myers (2011) explains that for a development process to be transformative, people have to be at the centre of such a process. Vorley *et al.* (2012), indicate that in a livelihood-building process of farmer development, the intangible assets of farmers are critical for enhancing agency and transformation among smallholder farmers. Alsop *et al.* (2006) define agency as 'an actor's ability to make meaningful choices and consider and purposively choose among options'. In this concept it is recognised that farmers are already playing an active role in achieving their own goals. These authors' definition of empowerment is adopted in this study; empowerment is defined as 'a group's or individual's capacity to make effective choices, that is, to make choices and then to transform those choices into desired actions and outcomes (Alsop et al., 2006).'

Rural development and women empowerment have been the focus of international agencies, worldwide, particularly since women play a critical but often under-appreciated role in development work (Scanlan, 2004, Quisumbing et al., 2014). Women are often constrained from fully participating in the development initiatives and reaping the gains of development by prevailing institutions and social norms (The World Bank, 2012, Scanlan, 2004, Kabeer, 1995). A simplistic definition of development would consider improved access to the five capitals, income and expenditure as sufficient (Barrett, 2007). However, Sen (1999) shows that development is more than material gain, but encompasses concepts of freedom and wellbeing. He defined development as ‘a process of expanding the real freedoms people enjoy,’ not just the growth of economic measures such as the Gross Domestic Product and the Gross National Product (Sen, 1999). This author further advanced that institutions and processes which reduce poverty, poor economic opportunities and social deprivation, among others, would expand freedoms. Development should also be environmentally and socially sustainable, so that households could be protected from stresses and shocks (Chambers and Conway, 1992). Defining the concept of development in a holistic and people-centred approach, emphasizes issues of well-being and considers human capital development and the achievement of one’s aspirations as key for both the community and the individual (Barrett, 2007).

1.4. Importance of Study

This study contributes to the discourse on smallholder farmer agency development through the people-centered development of Sen (1999) and Chambers and Conway (1992). It builds on the empowerment work which produced the Women’s Empowerment in Agriculture Index (WEAI) (Alkire et al., 2013b) and considers the role and effect of institutions in empowerment for increased production and market access in smallholder irrigated agriculture.

Engaging in agriculture has been proposed as a way out of poverty for the rural poor (Namara et al., 2010). This has been a priority for the South African government since 1994 and a significant amount of resources have been set aside to achieve this objective. The National Development Plan (2013) put agricultural development, particularly the commercialisation of smallholder farmers, as a key to job creation strategy. Smallholder farming development is highly prioritised as compared to land reform (redistribute land to landless people), and this has changed

government 'focus in favour of the emerging farmers (Department of Agriculture, 2001a). Smallholder farmers engaged in dry-land agriculture and those who farmed on irrigation schemes were eligible for government grants ranging from R20 000 to R100 000, on a sliding scale, under the Land Redistribution for Agricultural Development (Department of Agriculture, 2001a, Department of Agriculture, 2001b). Input subsidy programmes such as *Ilima/Letsema* have given smallholder farmers seeds and fertilisers to encourage households to produce their own food (Taylor, 2013). These interventions have had little transformative effect and have created a class of predominantly subsistence-oriented farmers. Most of those who have gone above subsistence production have found it difficult to penetrate the market and sustain market access. This can be attributed to market liberalisation and government exiting the market as a buyer (Baiphethi and Jacobs, 2009) and has significantly curtailed the potential of agriculture to reduce poverty. The conceptual understanding of smallholder agriculture in South Africa is an evolving field. Smallholder farmers are largely perceived as subsistence farmers who are resource poor and battling to assure food security. This perception may have contributed to the non-realisation of these well-meaning goals to improve farmer livelihood, in spite of the increasing fiscal spending (Thamaga-Chitja and Morojele, 2014), hence a need for institutional reform. The institutional reform is called on to particularly locate the smallholder farmer, the human being/s at the centre of the development approach.

Agriculture can only lead to a decrease in poverty if smallholder farmers can access the markets and increase their agricultural income (Barrett, 2008). Since they have largely failed to do this alone, an external agent can facilitate market access and help farmers improve their skills and knowledge on how to successfully access markets (Herbel et al., 2012). In other countries, the private sector and NGOs have found a way of working with smallholder farmers to find markets and this has, in some instances, led to income tripling (Herbel et al., 2012). An increase in earnings of this magnitude would benefit rural communities, in general, and women, in particular, since they make up a significant number of rural farmers, provided they are significant household decision-makers. Research has shown that increases in agricultural income have a ripple effect on rural economies and that eventually this allows households to diversify their activities off-farm and earn more income (Vorley et al., 2012). Another important benefit of increased earning is that, if young unemployed rural dwellers see that smallholder farmers are successful, they may be encouraged to enter agriculture as a profession (Vorley et al., 2012).

This study contends that these developments can only be sustainable if farmers, particularly female farmers, can make productive decisions and control income. This would give them the opportunity to prepare for such a career through education and would allow the smallholder farming sector to grow.

Understanding what is needed to improve smallholder productivity in South Africa, so that better livelihoods are earned from agriculture, is important. Lessons may exist from smallholder farmer development in Asia and Latin America. Understanding what smallholder farmers need to grow their agency in the South African context is critical, due to the unique historical deprivation of livelihood assets and social and political freedoms. Agency is important, as it contributes to sustainability, specifically for farmers in irrigation schemes that have better access to water, compared to the majority who do not.

1.5. Research Problem

Most smallholder farmers in South Africa have lower capabilities, experience and skills to produce adequately for household food security. Access to markets remains a great challenge. Women who make up a significant number of smallholder farmers and household heads face additional gender challenges, which may prevent them from accessing resources and opportunities at the same level as their male counterparts. This study is guided by the question, “Can existing institutions empower smallholder farmers, particularly female farmers, on smallholder irrigation schemes in Limpopo Province to a level where they can access producer markets and improve food security?”

Institutions are said to create an enabling or disabling environment for different players (Battilana, 2006) and they are responsible for the development of well-functioning markets (Kherallah and Kirsten, 2002). Smallholder farmers in South Africa were previously excluded from formal markets, but new legislature now makes provision for their inclusion (Jari and Fraser, 2009). In spite of this, 90% of the value added agricultural produce in South Africa is sourced from commercial farmers (O’Laughlin et al., 2013). Smallholder irrigation farmers also struggle to penetrate formal markets and this study seeks to evaluate the capacity of local institutions to develop smallholder farmer agency, which is critical for market participation.

Women's active participation in smallholder irrigation schemes makes understanding the extent of their decision-making critical. Research has shown that where women do not own productive resources and are not likely to gain from their labour, their productivity is lower than when they control production (Quisumbing and Pandolfelli, 2010). This could negatively affect agricultural development and productivity and, consequently, household food security. The present study argues that empowering women farmers may lead to sustainable development outcomes at the farm and household level (Meinzen-Dick et al., 2014).

1.6. Sub-problems

1. What is the role of institutions for agency enhancement in the study areas?
2. What is the level of empowerment of the female farmers in the study areas using, the Women Empowerment in Agriculture Index (WEAI)?
3. What is the relationship between empowerment and food security in the study?

The study had three sub-problems. Investigating the role of institutions for agency enhancement in the three study areas served the function of showing the institutions that smallholder farmers had access to in their individual communities. It also allowed an examination of the extent to which the institutions created an enabling environment for farmers (particularly women) to pursue agriculture and marketing activities. Observing how the farmers operated in their prevailing institutional environment, allowed the researcher to observe the extent to which the farmers could exploit the existing institutions to access the markets they desired. The strategies the farmers employed also showed the exercise of agency by the farmers from the three communities. Against this background of existing institutions, the empowerment of women using a modified Women Empowerment in Agriculture Index was performed. This was done to show how the different indicators in the index contributed to the final empowerment score of women. Finally, the empowerment was related to food security in the study communities.

1.7. Methodology

The study was largely participatory and followed a mixed methods approach, which combines the collection of qualitative and quantitative data, allowing the problem to be studied more fully

(Ivankova et al., 2007). It was conducted in Limpopo Province, which was selected because it is one of the poorest provinces in South Africa, has significant agricultural production and about 170 irrigation schemes (Machete et al., 2004) and the number stood at 183 in 2007 (Denison and Manona, 2007) and these numbers have been quoted in other later works (Van Averbek and Kumar, 2012). The researcher conducted key informant interviews, focus group discussions and household surveys in all three communities. The data was analysed using descriptive statistics in SPSS and content analysis. An expanded methodology chapter is included in the study.

1.8. The Study's Delineation and Limits

First, the study concerned respondents located at three irrigation schemes in Limpopo Province, namely Mashushu (Capricorn), Steelpoortdrift (Sekhukhune) and Rambuda (Vhembe). Second, the study concentrated on smallholder farmers active in these schemes. Where a control was needed, dry-land farmers in the communities were considered. Third, the study focused on irrigation scheme communities that had an active extension officer located near them.

The study was conducted in rural Limpopo Province, concentrating on households in the three communities engaged in smallholder dry-land and irrigation agriculture. Given the differences in South African rural areas, the results will not be applicable to all rural households. Furthermore, the use of an adapted WEAI questionnaire and a modified methodology limits the comparability of the resulting modified WEAI to other studies which used the original questionnaire and methodology.

1.9. Assumptions

The study was based on the following assumptions: (1) most smallholder farmers are interested in and capable of producing for markets; (2) rural farmers in irrigation schemes often produce enough to sell; (3) there are markets willing to do business with smallholder farmers; and (4) trained translators will interpret the answers accurately, as the researcher is not conversant with the local languages.

1.10. Definition of terms

Agency is an actor's ability to make meaningful choices and consider and purposively choose among options (Alsop et al., 2006).

Empowerment is defined as a group's or individual's capacity to make effective choices, that is, to make choices and then to transform those choices into desired actions and outcomes (Alsop et al., 2006).

Institutions are the “formal rules, informal constraints (norms of behaviour, conventions and self-imposed codes of conduct), and the enforcement characteristics of both” (North, 1999).

Smallholder irrigation schemes are multi-farmer irrigation projects larger than 5 ha in size that were either established in the former homelands or in resource-poor areas by black people or agencies assisting their development (Van Averbek and Mohamed, 2006).

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CHAPTER TWO – LITERATURE REVIEW

2.1 Introduction

The empowerment of women in general is a topical issue on the development agenda as shown by its position in the Sustainable Development Goals (SDGs) and Millennium Development Goals (MDGs) (Sachs, 2012). The MDGs were introduced by the United Nations in a global effort to reduce poverty, hunger, gender inequality, among others between the years 2000 and 2015 (Sachs, 2012). Motivated to make further improvements on sustainable development, the United Nations introduced the SDGs which will run from 2016-2030 (Sachs, 2012). Gender inequality is pervasive and is said to hinder efforts towards development and poverty reduction (Alkire et al., 2012, Kabeer, 1999). In rural areas, gender inequality is amplified because life is governed by traditional laws, which may be based on customs and practices which disadvantage women (The World Bank, 2012). Proponents of women empowerment believe that in addition to improving women's status relative to men, it will have a multiplier effect on positive development outcomes (Alkire et al., 2012, The World Bank, 2012, Kabeer, 1999). In spite of this, being acknowledged, the institutions which govern resource and opportunity access are slow to change (Meinzen-Dick et al., 2014).

Agriculture has been proposed as a way of bringing development to rural communities in the developing world because it has the potential to ensure food security, generating income, and providing raw materials for industry (The World Bank, 2008). Agriculture as a sector which employs many rural women can also contribute to the empowerment of women if they could access the same resources as their male counterparts (Meinzen-Dick et al., 2014). This study investigates the role institutions play in governing access to assets and asset building, market opportunities, and how this affects agency development in smallholder farming communities.

2.2 Women empowerment in Agriculture

Women grow a significant amount of the food consumed worldwide (FAO, 2011). Previously it was estimated that they contributed 60-80% of the world's food, but these figures are now disputed (Quisumbing et al., 2014). Although it is difficult to quantify their total yield, it is acknowledged that 43% of them, worldwide, are agricultural workers (FAO, 2011). Regional variations exist; in Sub-Saharan Africa (SSA), the number of women involved in agriculture may

be as high as 60% (FAO, 2011). The women mostly work on family-owned plots and are often not paid for their work (FAO, 2011). Where they work on commercial farms, they usually work as seasonal labourers, with little job security and poor wages (Tallontire et al., 2005).

Women's access to productive resources for agriculture is governed by patriarchal institutions and social norms which dictate how women must live and behave (Tripp, 2004). It is probable that women who meet the requirements of a 'good' woman are respected and rewarded with access to productive resources, but those who flout social norms may lose access to productive resources (The World Bank, 2012, Kabeer, 1999). As secondary rights holders', women work on land owned by their male relatives, and where competition for arable land and irrigation water exist, women are likely to lose out. This may negatively affect productivity and efficiency. For instance, women in Nepal who wanted to join an irrigation scheme had to pay steep fees to join the scheme, while men could contribute labour (Allendorf, 2007). This made it difficult for female-headed households to access irrigation facilities, even though the benefits of smallholder agriculture are acknowledged (Domènech, 2015).

Barriers to resource access extend to intangible assets. Rural women have consistently lower literacy and numeracy levels compared to their male counterparts (Lastarria-Cornhiel, 2006). This may negatively affect learning about new techniques and productivity. For instance, it was established in agricultural training programmes in Papua New Guinea that female participants were constrained from fully benefiting in the training because they had poor numeracy and literacy skills (Cahn and Liu, 2008). Finally, rural women in SSA may have strong social networks which are good sources of information (Malapit et al., 2014), but these may not provide them with skills to assess opportunities and business contacts as was shown in Asia (Field et al., 2010).

Women's weaker access to tangible and intangible assets is blamed for their reduced efficiency and productivity (FAO, 2011). Some studies have shown that when women access the same inputs and services as their male counterparts, and have control over their own production, their yields increase by about 20% (Quisumbing et al., 2014). This increase in yield has the potential to reduce the number of hungry people worldwide and to increase the income women earn from agriculture (The World Bank, 2008). This increase in income has the potential to raise household welfare outcomes, since some studies indicate that women are likely to spend their income on

household nutrition and education (Sraboni et al., 2014, Malapit and Quisumbing, 2014). The increased access to income can lead to an increase in self-esteem in women and increase their bargaining power and agency (The World Bank, 2012). However, this can only be achieved when women's capacity to demand equality is matched by responsive and transformed institutions which value rural women. The concept of transformed institutions is guided by three principles, which are inclusion, social cohesion and accountability (The World Bank, 2005). First, transformed institutions are inclusive and would allow rural men and women similar access to resources and processes (The World Bank, 2005). Second, social cohesion would allow men and women in the community and other stakeholders to work together towards community goals. Finally, transformed institutions would be accountable to the public and respond to the public with transparent and just actions (The World Bank, 2005).

2.2.1 Agricultural Development and women empowerment

Agricultural development has the potential to improve women's status, as they own and control few of the resources necessary to play their roles. Previous interventions have involved education, training, health and family planning, but they have not succeeded in helping women overturn institutions which stifle their agency (Jeckoniah et al., 2012). Although the effects of agricultural development on women's asset endowment are difficult to predict, given the prevailing inequality, interventions without a strong gender focus may further entrench women's subordinate position in the household and community (Meinzen-Dick et al., 2014).

Gender refers to the relationship between men and women, their different roles and the identities associated with being either male or female (Quisumbing et al., 2014, Opio, 2003). These roles are often shaped by culture and context (Quisumbing et al., 2014, Croppenstedt et al., 2013). More often than not, women are allocated domestic and reproductive gender roles, while men have market and productive gender roles (Midgley, 2006). The different roles associated with being male or female also determine the resources one has access to and this has an impact on empowerment (Quisumbing et al., 2014). Gender in agricultural programmes has been overlooked for years (Meinzen-Dick et al., 2014, Kabeer, 1999), although it has a marked effect on productivity and access to markets (Quisumbing et al., 2014). Where it has been included it has largely been peripheral, mostly because it was assumed that the household is unitary (Meinzen-Dick et al., 2014). Some authors propose that the undervaluation of women's

contribution to household work, including agriculture, is a factor (Scanlan, 2004, Kabeer, 1995). However, it is now accepted that men and women as smallholder farmers have different priorities and that the household is not unitary (Meinzen-Dick et al., 2014).

Instead, households are now thought to follow a collective model, which acknowledges that resources are not pooled together and that household members may have competing priorities and disagree over resource allocation (Meinzen-Dick et al., 2014). In this model, resolving disagreements relies on a household member's bargaining power, which is, in part, a result of the assets the household member owns and controls (Meinzen-Dick et al., 2014). This has negative implications for female farmers, who in patriarchal communities are predominantly secondary rights holders to productive resources. Not only does this lower their productivity and efficiency as farmers, but it disempowers them and perpetuates inequality between men and women (Quisumbing et al., 2014). The effects of gendered access to assets also extend to the earning of individual income. Evidence shows that development which did not increase women's capacity to own their personal income improved the household's standard of living, but did not significantly empower women, unless their capacity to earn individual income increased (Ukhova, 2015, The World Bank, 2012). Where income is earned by the male household head, this can be attributed to his growing bargaining power and this contributes to growing intra-household inequality (Ukhova, 2015, The World Bank, 2012, Oberhauser and Pratt, 2004). Addressing this gendered access to assets and opportunities has been proposed as a means of empowering women (Quisumbing et al., 2014).

2.2.2 The definition and characteristics of empowerment

It is acknowledged that empowerment is a concept which is difficult to define. Ibrahim and Alkire (2007) identified 29 definitions. Although many definitions are acknowledged, this study adopts the definition of Alsop *et al.* (2006). *Empowerment is defined as a group's or individual's capacity to make effective choices, that is, to make choices and then to transform those choices into desired actions and outcomes* (Alsop et al., 2006). From the many definitions and frameworks in existence, several things emerge about empowerment; first, that it is a concept related to power (Galiè, 2013, Friis-Hansen and Duveskog, 2012). It signifies gaining power or control and empowerment would result in changing power relations between the powerful and

the disempowered, who are mostly women, lower social classes and other minority groups (Anyidoho and Manuh, 2010). It would also result in the transformation of institutions and ideologies which support inequality (Anyidoho and Manuh, 2010).

Second, that empowerment is a process an individual or group of people undergo, as they move from being disempowered to being empowered. It cannot be observed but results can be seen (Mahmud et al., 2012). Hennink *et al.* (2012) show that, it is both a process and an outcome of a process. Empowerment cannot be bestowed on the disempowered; they have to actively participate in their empowerment process (Jeckoniah et al., 2012). The empowerment process can be led by a person other than the disempowered or it can be initiated by the disempowered (self-empowerment). Self-empowered is a form of empowerment which is interactive and led by the disempowered individual in response to a stimuli (Gilat, 2015). Taking part in higher education or interacting with different individual in a variety of social groups can be the stimuli required (Gilat, 2015, de Wet and Parker, 2014). In response, women become 'self-agents' who bargain, negotiate and act to achieve what they desire and they interpret social norms in ways that contribute to the achievement of their goals (Gilat, 2015).

Kabeer (1999) shows that empowerment is a process with three interrelated components: resources, agency and achievements. Agency is defined as 'an actor's ability to make meaningful choices and consider and purposively choose among options (Alsop et al., 2006)'. Agency is central to how choices are made, it is what makes women take advantage of emerging opportunities, combine them with their resources and then use them to achieve their own goals (Kabeer, 1999). Achievements are the outcome of agency and choices for instance economic empowerment and political emancipation.

Third, empowerment is context specific. Although most rural women reside in largely patriarchal communities, they experience disempowerment and empowerment differently (Mahmud and Tasneem, 2014). Some women in Muslim countries are not permitted to move out of the residential compound or speak to men who are not related to them (Mahmud and Tasneem, 2014). Studies found that, for these women, free movement was considered empowerment in their context. In some African communities, women can move freely, but are not allowed to

speak at traditional courts and meetings (Jacobs, 2004). Empowerment for them would be gaining the ability to speak for themselves. Because empowerment is context specific, it may be difficult to find universal measures of empowerment (Mahmud and Tasneem, 2014, Alkire et al., 2012).

Empowerment is also domain specific. With the aid of literature, Alkire *et al.* (2012) identify production, resources, income, leadership and time as important domains for empowerment in agriculture. Women are often disempowered in these. Studies have shown that empowerment and disempowerment take place in different domains and that disempowerment is not equal across domains (Mahmud and Tasneem, 2014, Alkire et al., 2013b). For instance, a woman may be empowered to make small decisions with regards to production but may not be empowered to sell the produce. This means that empowerment initiatives targeting one domain may not result in empowerment in other domains (Alkire et al., 2012, Mahmud et al., 2012). Alsop *et al.* (2006) show that sometimes empowerment in one domain *does* influence empowerment in another. Finally, empowerment is relational, that is, one is empowered in relation to another or one can compare their empowerment at different times during their life cycle (Murphy-Graham, 2010). Empowerment also relates to inclusivity and the removal of barriers which may have previously prevented other individuals from accessing institutions on the basis of race, sexuality or other criteria (Malhotra and Schuler, 2005).

2.3 The prerequisites to empowerment in agriculture – Agency and Institutions

The present study is grounded in the Sustainable Livelihoods Framework (SLF) and Alsop's Empowerment Framework. The SLF identifies five capitals, which can be classified as tangible (physical, natural and financial), and these are called 'assets' and intangible (human and social) which are called 'capabilities' (Vorley et al., 2012, Scoones, 1998). The framework in Figure 2.1 shows the main factors affecting people's livelihood activities and the typical relationship between these. Its focus on people and not their assets is attributed to its people-centred approach.

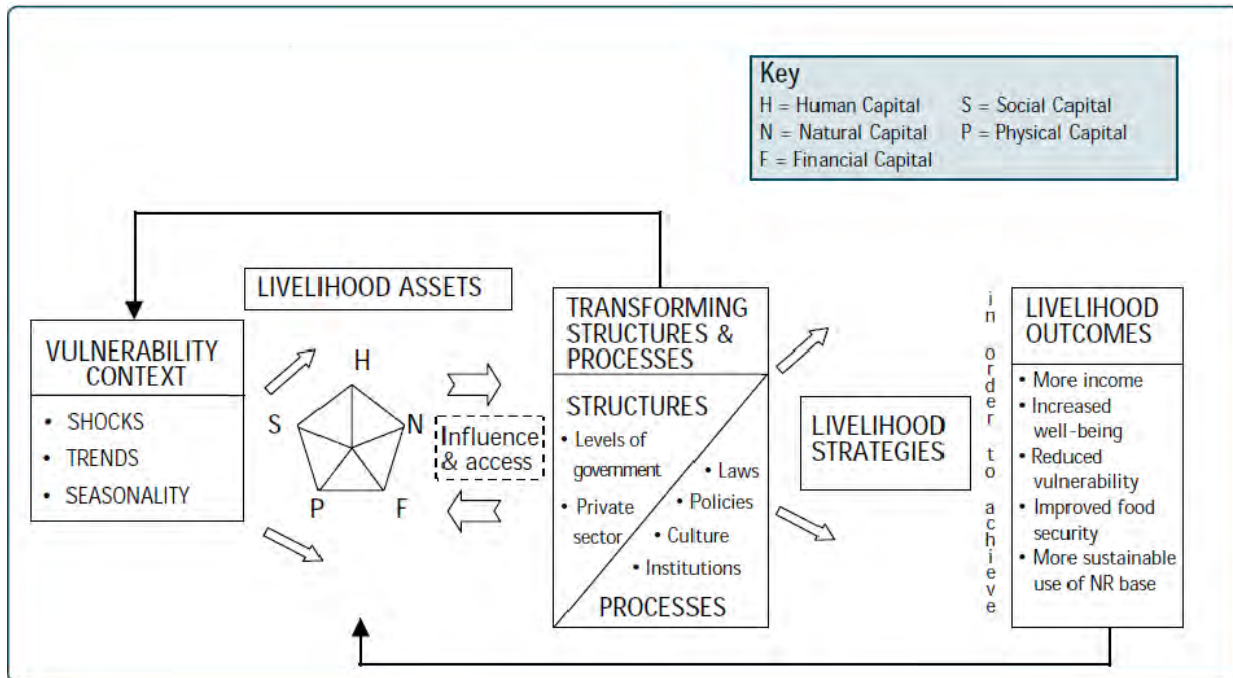


Figure 2.1: The Sustainable Livelihoods Framework (DfID, 1999)

The assets and capabilities a household possesses allow it to pursue a sustainable livelihood (Scoones, 1998), and also give it the means to be agents of change (Bebbington, 1999). The SLF also highlights that different people have different levels of access to assets and capabilities, which are determined by the institutional arrangements, power and politics (Scoones, 1998). In patriarchal communities, women and other minority groups may have a weaker asset base and may be constrained by an unfavourable environment, and are likely to be disempowered (Alsop et al., 2006). This may negatively affect women empowerment as it may suppress agency, which is based on asset ownership. Empowerment is strongly associated with asset-based agency and an institutions-based opportunity structure. The two have a ‘dynamic and iterative relationship’ (Alsop et al., 2006), as shown in Figure 2.2.

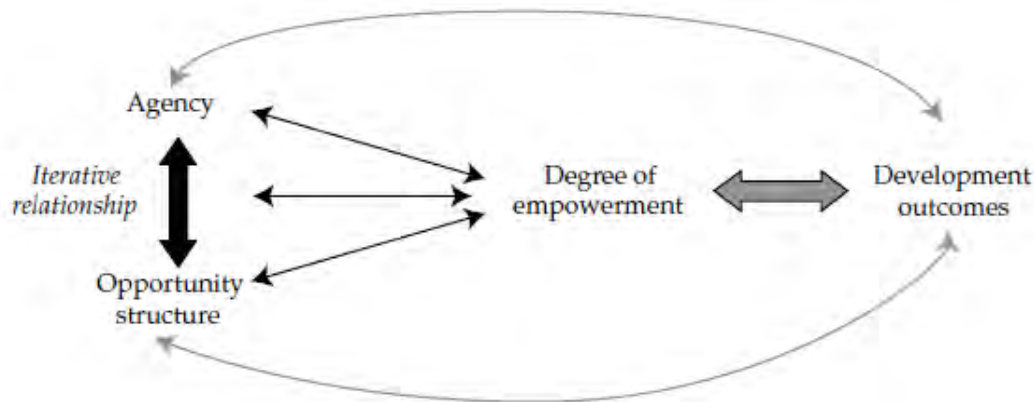


Figure 2.2: Agency and the opportunity structure (Alsop *et al.*, 2006)

2.3.1 Asset-Based Agency and Smallholder Farmer Empowerment

This framework shows that both tangible and intangible assets build agency and supports the Bebbington’s (1999) assertion that a strong asset base will result in a high degree of agency (Alsop *et al.*, 2006). The assets, acquired through different relationships in various institutional domains, enhance a farmer’s ability to choose what they desire in their individual and collective capacity (Kabeer, 1999). Resources or ‘enabling factors,’ as Malhotra and Schuler (2005) call them, are essential in the process of empowerment, as they provide the conditions under which empowerment occurs. In some instances, empowerment can be equated to gaining resources which give power, such as land, machinery and education. Malhotra and Schuler (2005). For instance, it has been observed that when women in male-headed households own property, which they either bought or brought into marriage, their bargaining power increased, even if they did not directly control the usage of the assets (Kabeer, 1999). Another study showed that when women earned income, their status in the household improved and they had more say in household decision-making (Mahmud and Tasneem, 2014).

Building human and social assets raises awareness, which builds agency in farmers. Investing in human assets through education improves a farmer’s decision-making, self-confidence and aids in the process of identifying problems and solutions (Hennink *et al.*, 2012). Bingen *et al.* (2003) and Gallacher (1999) show that returns in productivity from investing in new technology are only fully realised when comparable investments have been made in human capital development. In addition, farmers with higher human capital make more accurate technical decisions using available information than their counterparts with lower human capital achievements who may have a ‘management gap’ (Mathijs and Vranken, 2001, Gallacher, 1999). Anyidoho and Manuah

(2010) argue that education does not empower women and communities to dismantle oppressive power structures, however, Bingen et al. (2003) argue that it is transformative. They add that broad-based learning results in farmers who can demand goods and services after assessing their own needs (Bingen et al., 2003). Furthermore, the farmers internalise the leadership process, develop social and business networks and are empowered to determine their own path and can exercise agency (Bingen et al., 2003). Building human and social capital also builds the recipients' psychological assets, which enable farmers to start questioning disempowering and oppressive practices which may previously have been accepted and perpetuated as cultural (Alsop et al., 2006).

Building and extending women's social capital is thought to increase agency, by exposing women to access to information and broadening their social networks (Alkire et al., 2012, The World Bank, 2012). Women's groups have the added advantage of allowing women to access information about health and gender justice (The World Bank, 2012). More importantly, they allow women to lead, particularly in most rural patriarchal communities where there are very few women in leadership roles (The World Bank, 2012). Seeing women as leaders and being offered the opportunity to lead may get women to realise that women can make good leaders when offered the chance (The World Bank, 2012). Most smallholder farmers are embedded in their communities and their lives and activities are bound by local institutions and social norms which reinforce women's secondary status (Kabeer, 1999). Apart from their individual effect on agency, assets can also interact or influence the accumulation of other assets which are necessary for building agency (Alsop et al., 2006). For instance, farmers who have basic education can access information on a new technology and this could also increase agency. Building the intangible assets of smallholder farmers may also have the effect of helping farmers change the institutions, which disempower them.

2.3.2 Institutions and the opportunity structure

Institutions are an integral part of the SLF and Alsop's Empowerment Framework as they shape a farmer's opportunity structure and determine what he or she can do (The World Bank, 2012, Alsop et al., 2006, Scoones, 1998). This study adopts the following definition of institutions; 'formal rules, informal constraints (norms of behaviour, conventions and self-imposed codes of conduct' (North, 1999). Institutions can be formal or informal (Vorley et al., 2012, Alsop et al.,

2006), and can be divided into social, legal, political and market institutions (Scoones, 1998). Institutions are situated in the transforming structure and processes box in the SLF (Figure 2.1). These institutions, in their different forms, determine what is allowed, prohibited and the punitive measures one can expect and what is expected from different individuals (Chikozho, 2005). In addition, they structure a farmer's access to different assets and capabilities (Alsop et al., 2006, Scoones, 1998). Institutions can thus allow or exclude individual farmers, depending on their position, or their communities from essential productive resources and decision-making portfolios (Vorley et al., 2012, The World Bank, 2012, Battilana, 2006). Positions of influence are generally held by household heads, traditional leaders and the elite, who may be mostly male in patriarchal communities (Battilana, 2006). Alternatively formal and informal institutions may compete for legitimacy and this can also constrain the exercise of agency (Alsop et al., 2006). Institutions can create an environment which is not conducive to the exercise of agency by some groups (Alkire et al., 2012, Vorley et al., 2012, Alsop et al., 2006).

2.3.3 Formal institutions and farmer empowerment

Formal institutions include sets of rules, laws and regulatory frameworks which are usually deliberately formulated to include or exclude certain groups from accessing resources and institutions (Alsop et al., 2006). For instance, the apartheid laws in South Africa created a dual agricultural system, which developed a well-resourced large-scale commercial sector which had access to local and international markets (Obi et al., 2012, Sartorius and Kirsten, 2007). Conversely, black smallholder farmers were allocated small plots for subsistence agriculture with little market access (Magingxa et al., 2009). This dual agricultural policy had a lasting effect on productivity and market access in South Africa as different market institutions and infrastructure developed to service these two sectors (Magingxa et al., 2009). The commercial sector is largely serviced by formal institutions, which are well developed, while the subsistence sector has mostly absent and weak institutions (Cousins and Scoones, 2010). Even with new inclusive legislation put in place, smallholder farmers continue to struggle with market access, as supermarkets and other buyers prefer large producers (Louw et al., 2008). Apart from not having the knowledge of how formal markets work, the markets are difficult to access, because the farmers' landholdings and input access may not support commercial production (Ferris et al., 2014, Louw et al., 2008). Most smallholder farmers do not have the resources to conduct a

market search and to establish market requirements, negotiate the terms of a contract, transport produce to market and be paid through formal institutions (Chitja and Mabaya, 2015, Louw et al., 2008). This results in most smallholder farmers opting out of markets and producing a variety of crops for household consumption (Barrett, 2008).

Smallholder farmer interaction with formal financial institutions shows that they may be excluded because they do not have the minimum requirements and documentation. Smallholder farmers, like their commercial counterparts, need financial institutions to cater to their savings, seasonal loans and credit, and money transfer needs, but there are few in rural Africa (Poulton et al., 2010). Studies in other developing countries show that smallholder farmers need services tailored to their low earnings: a bank that will allow them to open an account with no minimum balance, one that allows them to borrow money with the collateral they have and accept seasonal loan payments (Poulton et al., 2010). Most banks, however, are unable to do this, and expect smallholder farmers to adhere to their standard requirements of providing collateral, business plans and servicing the loan every month (Poulton et al., 2010, Chikozho, 2005). Without formal title to land it is difficult, if not impossible for unemployed smallholder farmers to access financial and credit services; particularly if one has no job and no collateral (Poulton et al., 2010, Chikozho, 2005, Dorward et al., 2005). These formal financial institutions restrict production and make it difficult for smallholder farmers to exercise their agency. Informal financial institutions can offer some services, but they usually have little money at their disposal, constraining a farmer's agency.

2.3.4 Informal Institutions and Farmer Empowerment

Informal institutions are made up of unofficial rules that structure incentives and relationships and informal cultural practices that operate in the household among social groups and can also determine the opportunity structure for farmers (Alsop et al., 2006). In most tribal groups, land is allocated to the male-headed household or a group member (Joireman, 2008). This has negative implications for women and other groups who cannot access resources in such an environment. Land rights are important in agriculture, but few women inherit land in most patriarchal communities, worldwide (Toulmin, 2009). Women with aspirations of land ownership may have

to approach markets. However, due to their income poverty, this option may only be open to women with income (The World Bank, 2012). Thus to access land and other productive resources, most women have to depend on their male relatives and this is disempowering as security of tenure is not guaranteed.

Women's duties and responsibilities focus on the domestic realm in most communities (Midgley, 2006), whereas men are more market oriented and are risk-takers (The World Bank, 2012, Niehof, 2004). In farming communities, men are more likely to be engaged in cash crop farming, while women focus on food crops (Niehof, 2004). In addition to farm work, women are largely responsible for caregiving, which is time-consuming (The World Bank, 2012). As a result, women suffer from more time poverty than their male counterparts and often do not have the time to engage in more profitable activities. Consequently a gendered economy emerges, with women mostly positioned as secondary earners (Tallontire et al., 2005). This is reflected in the emergence of a gendered value chain (Staritz, 2013). All smallholder farmers may struggle with input and output markets, but female farmers' challenges are amplified by gender inequality (Staritz, 2013).

Since female farmers are culturally groomed to protect subsistence (Niehof, 2004), their skills and business networks may not enable them to find, assess and seize economic opportunities (Field et al., 2010). Social norms which reserve market access and activities for men may stifle market access and agency, as has been shown in communities where crops previously labelled as female-oriented were appropriated by men when they became cash crops (Meinzen-Dick et al., 2014). Where travel is required, female farmers may opt out of such markets if travelling is viewed negatively, or is seen to take women away from their caregiving duties (Cahn and Liu, 2008). In such communities, female farmers with similar assets to their male counterparts may have less opportunity to exercise agency (The World Bank, 2012).

Finally, formal and informal institutions may co-exist and this can have negative implications for community members with weaker social assets, for instance, in land rights and market access (The World Bank, 2012). Most statutory laws in SSA accord women equal rights to property and land, but customary laws in patriarchal communities give women secondary rights (Murugani et al., 2014, O'Laughlin et al., 2013, Joireman, 2008, Boone, 2007, Tripp, 2004).

Although formal institutions govern the whole country, they may be loosely enforced in rural communities and the informal land rights may prevail (Toulmin, 2009). For instance, when a woman's husband dies, statutory law may make provision for the wife and the children, but if local norms include appropriating the property of the dead from the widow, the local norms may prevail and disadvantage the widow and orphans. Although institutions govern human agency, they are a product of human agency and can be manipulated or interpreted differently (Battilana, 2006, Scoones, 1998). As the community, including those individuals or groups some institutions seek to exclude, accumulate tangible and intangible assets they can challenge and change oppressive institutions (Alsop et al., 2006).

2.3.5 Agency and opportunity structure in female farmer empowerment

Women in male-headed households are generally thought to be less empowered in some domains than male and female household heads that may control more assets and make more decisions (Malapit et al., 2014). However, literature also shows that they have access to more productive resources than women in female-headed households (Meinzen-Dick et al., 2014). This increased access may increase their exercise of agency as the resources may be at their disposal. It is important to note, that while the household may be the locus of disempowerment for most women (Malhotra and Schuler, 2005), Kabeer (1999) reiterates that it is rare for men to make all the decisions in the household. Some decisions are made by women alone, because they fall under women's gender roles, for instance purchasing food and other household consumption items (Kabeer, 1999). While women can participate in making strategic decisions, they may not play a major role (Kabeer, 1999). Kabeer (1999) differentiates between control and management decisions and uses an example of a male household head deciding to use contraception (control) and him asking his wife to choose the type of contraception (management).

Women may make certain decisions which are usually assigned to them and they may also participate in the making of 'strategic decisions' (Kabeer, 1999). Women's empowerment could be investigated further if information on their general strategic life choices or those made in domains which they were previously disempowered, was available (Kabeer, 1999). It would be interesting to establish if increased asset access can allow women to make decisions in domains or activities previously reserved for men. Some studies have shown that where women make

decisions on which crops to grow access markets and control their income, they are likely to make decisions in domains they were previously disempowered in (Quisumbing et al., 2015, Jeckoniah et al., 2012). There is some evidence from a female group of onion smallholder farmers in Simanjiro, Tanzania, who have shown that women who make decisions on produce and its marketing are more likely to control their income and to use it as they desire (Jeckoniah et al., 2012). This ability to control income and to make decisions in what was previously a male domain has been met with resistance by some men who claim it is not cultural (Jeckoniah et al., 2012).

This negative reception to evidence of women's empowerment has been attributed to the loss of control by male-headed households who may have previously controlled most of the resources and decision-making (Bolis and Hughes, 2016). Some negative consequences from the increase in women's agency have been an increase in domestic violence, although some studies show that this is short-lived (Bolis and Hughes, 2016, Murphy-Graham, 2010). Other studies report a decrease in the amount of money men contribute to household upkeep (Jeckoniah et al., 2012). In the community, one farmer acting to challenge oppressive institutions may succeed and achieve their goal, but the effects are likely to be confined (The World Bank, 2012). Instead, if farmers come together and pursue one goal, their collective assets, agency and voice may result in permanently transformed institutions which respond to the needs of the farmers (The World Bank, 2012).

Such bottom-up approaches to transforming the institutions and the resulting opportunity structure may achieve favourable results for farmers if institutions are ready to include smallholder farmers (Alkire et al., 2012). Actors in these institutions would drive the inclusion of smallholder farmers by providing push and pull factors for the inclusion of smallholder farmer in formal production and market institutions. There are many examples of such institutional initiatives and Chitja and Mabaya (2015) list microfinance institutions to provide finance, collective action to increase produce volumes and access to inputs and training and extension as push factors. They add that pull factors such as alternative food networks, market information systems, contract farming and preferential procurement would increase market access among smallholder farmers (Chitja and Mabaya, 2015).

2.3.6 Empowerment and Food Security

According to the World Food Summit, “food security is exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO, 2003). It has four pillars, food availability, food access, utilisation and stability, which emerged as the definition of food security evolved (FAO, 2003). First, food availability deals with the food that is actually available in the market which is a total of local agricultural production, food imports and food aid (FAO, 2003). Second, food access focuses on the issues of market access, prices and affordability (Scanlan, 2004). Third, utilisation focuses on the consumption of enough food to meet micronutrient and macronutrient requirements and health, water and sanitation issues which could lead to illness (FAO, 2003). Last is the issue of stability of access, when shocks and other disasters occur (FAO, 2003). Food insecurity is associated with food shortage, poverty and deprivation (Scanlan, 2004).

Although agricultural production is a key source of food for the agricultural household, food access plays a more critical role, particularly when households depend on the markets for food (Baiphethi and Jacobs, 2009). In South Africa, markets supply a significant amount of urban and rural food. Sen’s work on famine shows that entitlements determine food access and not production (Baiphethi and Jacobs, 2009). Thus food security is embedded in markets, prices and the legal system and how well developed the system is (Baiphethi and Jacobs, 2009). This, in part, has been attributed to decreasing plot size, few household members who are willing to work on the farm and the prevalence of state pension grants (Kepe and Tessaro, 2014, Baiphethi and Jacobs, 2009). In South Africa, social grants for children and the elderly are thought to significantly contribute to household food security.

Smallholder farmer empowerment in agriculture includes opportunities to access resources and markets. For women it also means the ability to control their income and make decisions on how it will be used (Quisumbing et al., 2014). When women earn money, their agency and voice in the household often increase, as does their influence on household decisions (The World Bank, 2012, Kabeer, 1999). In addition, women invest in productive resources which they value, such as land, cattle and goats which, in turn, increase their bargaining power (The World Bank, 2012).

Their money is also used for household welfare and this includes food security (Sraboni et al., 2014, Malapit et al., 2014).

The gendered division of labour makes food provision a female responsibility. When women are empowered and have access to money, they can influence the household's diet, and as a result, food security (Sraboni et al., 2014). Women who are empowered may be able to better influence intra-household allocation of food and this may have better outcomes for girls. Sraboni *et al.* (2014) show that empowerment indicators are strongly correlated to household food security and child education and nutrition. However, some studies have shown that, when women are empowered, household food security may be compromised by male household heads that appropriate the income or reduce their contribution to the household (Jeckoniah et al., 2012). These contradictions need to be further investigated. It was also found that when women suffered from domestic violence and other forms of oppression, it may negatively affect household food security (Bhagowalia et al., 2015).

2.4 Conclusion

Women empowerment in agriculture has the potential to further the rural development agenda. However, this can only be achieved if social and market institutions are transformed to remove the barriers that hinder smallholder farmers, particularly women, from accessing productive resources, markets and other decision-making portfolios. The results would be increased productivity, market access and money in the rural household. Where women control income, this would result in increased agency and household food security. In spite of some of the emerging negative effects of empowerment, women empowerment through agriculture holds the potential to contribute significantly to household and community welfare.

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CHAPTER THREE

METHODOLOGICAL APPROACH AND DATA COLLECTION

3.1 Introduction

The purpose of this study was to investigate the role institutions and agency have on women empowerment for market access and food security in three irrigation schemes and their communities in Limpopo Province.

A mixed methods approach was used in this study. Mixed methods approaches can be defined as those which combine qualitative and quantitative approaches (Creswell, 2013). This approach was chosen for this study because of the complexity of the subject under investigation (Ivankova et al., 2007). This gave a more in-depth understanding of how institutions and agency contributed to women's empowerment through agricultural production. Using a combination of both qualitative and quantitative approaches would neutralise any potentially biases emanating from using one method (Creswell, 2013).

Data was collected using questionnaires, focus group discussions and key informant interviews. These different research methods allowed for the collection of qualitative and quantitative data (Ivankova et al., 2007). Collecting data using this mixture of methods was useful for triangulating the data collected to increase its accuracy (Ivankova et al, 2007). Data collection was sequential (Creswell, 2013); the largely qualitative data was collected before the quantitative data. This was done to give the researcher a greater understanding of the local institutions and how they affected agency in smallholder farmers. The quantitative data was then used to create an empowerment index, which could be used for measuring empowerment, and allowed the researcher to quantify the respondents' individual and group empowerment.

3.2 Site selection and sampling

Site selection and respondent selection for this study was largely purposive, as the study sought to capture empowerment in smallholder irrigation schemes. Purposive sampling is a type of non-probability sampling and is useful when the researcher targets a particular group (Cohen et al., 2013, Teddlie and Yu, 2007). The sites and respondents were selected in this manner because they possessed certain desirable characteristics which were important to this study (Cohen et al., 2013). Because the sites and respondents were chosen in this manner, the study was not

representative of smallholder farmers in irrigation schemes in South Africa. In spite of this, the researcher expected to interview farmers and key informants who were knowledgeable about the subject (Teddlie and Yu, 2007).

The study was conducted in Limpopo Province which is in the northern part of the Republic of South Africa. The province borders Zimbabwe, Mozambique and Botswana. The province was purposively selected for this research because it has been identified as one of South Africa's three poorest provinces, together with the Eastern Cape and Mpumalanga (Statistics South Africa, 2014). A significant proportion of rural households are involved in agriculture for livelihood purposes. The majority of men of working age from the province have migrated to Gauteng Province, Mpumalanga and the Western Cape for employment, leaving many *de facto* female-headed households (Statistics South Africa, 2014). Not many local employment opportunities exist and those residing in rural areas largely rely on mining, small-scale farming, remittances and government grants for livelihoods, with small-scale farming contributing significantly towards household food access (Statistics South Africa, 2012b, Hope et al., 2004). There are many irrigation schemes in the province, which were established during the apartheid era and these provide smallholder farmers with irrigation water (Tapela, 2008).

Three irrigation schemes, Mafefe (Capricorn district), Steelpoortdrift (Greater Sekhukhune district) and Rambuda (Vhembe district), were selected purposively. The communities are shown in Figure 3.1. The selection criteria (Teddlie and Yu, 2007) used to select the irrigation schemes for study were the following: rural location, their similarity in land access (communal), irrigation technology and social dynamics, including gender dynamics, the institutional and organisational analysis for linking smallholder farmers to formal markets. The respondents were selected purposively in the three irrigation schemes using the following criteria: irrigation scheme membership, active production, selling their produce in either formal or informal markets, and willingness to participate in the study. Because purposive sampling was employed in selecting respondents during the two data collection periods, the number of respondents in August and December 2013 were different.

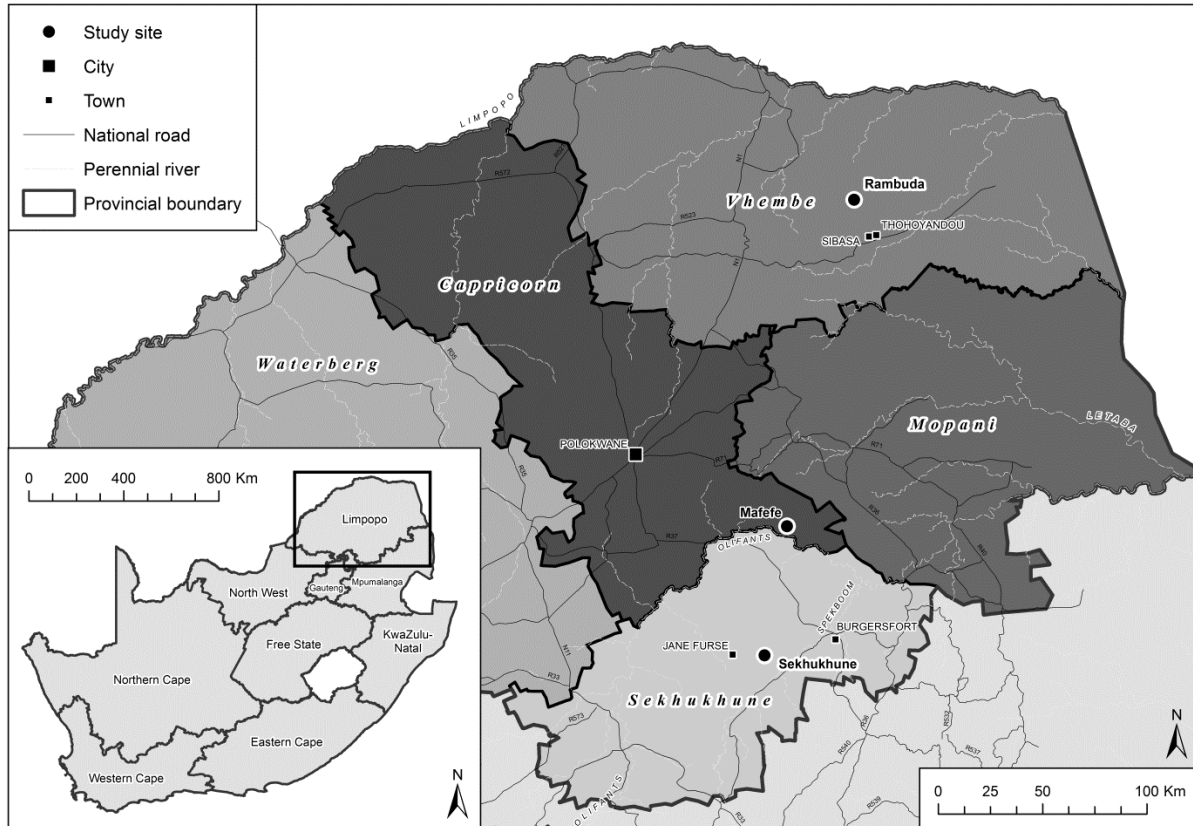


Figure 3.1: Map of Limpopo indicating study areas

3.2.1 Research area description

The study was conducted in rural Limpopo province. The province has about 5.7 million people, many of whom are based in rural communities (Statistics South Africa, 2015). The province occupies just above 10% of South Africa's total area and 60% of the land is owned by private individuals, while 25% is under traditional governance (Limpopo Provincial Government, 2009). Since a large population of South Africans dwell in rural area, it can be assumed that there may be a cultural influence on farmers' lives and decision-making (Statistics South Africa, 2014).

3.2.2 Description of the study sites

Steelpoortdrift irrigation scheme (Steelpoort) was established in the 1970s, when the government granted their chief's request for agricultural land (Stimie et al., 2001). A dam was built to supply irrigation water to the scheme. The scheme has 69ha and initially each farmer was given a hectare. However, their extension officers showed that the land size had since decreased to less than a hectare, due to continued sub-division (Murugani et al., 2014). Second, Mashushu irrigation scheme (Mafefe) was one of three irrigation schemes built for the GaMampa

community in 1959 (Masiyandima et al., 2006). It has 45 hectares. However, due to floods in 1995 and 2000, the infrastructure of the irrigation scheme was significantly damaged (Adekola et al., 2008). In response, the farmers have created earth constructed canals, but these are not very effective. Finally, Rambuda irrigation scheme (Rambuda) was established in 1952. It has the only Venda-speaking community in the study (Nethononda and Odhiambo, 2011, Adekola et al., 2008). There are a 170 ha in the scheme and most of the plots are used because most farmers are active.

3.3 Data collection and Analysis

3.3.1. Sub-problem 1

Data for this sub-problem was collected in August 2013, with the aim of understanding market access opportunities, challenges and how the local institutions mediated access to markets. A questionnaire with both open-ended and closed questions was used to interview smallholder farmers. Focus group discussions were held in each community, to establish the production and marketing strategies used and the challenges they encountered in their work. Key informant interviews and observation were used to collect data, since the research team lived in the community during the data collection period. The data was analysed using descriptive statistics in SPSS 20 and content and theme analyses. Detailed descriptions of the qualitative and quantitative data analysis are given in Chapter 4 (Section 4.3).

3.3.2. Sub-problems 2 and 3

In December 2013, household data was collected from the farmer on the field using an adapted Women's Empowerment in Agriculture Index (WEAI) questionnaire. IFPRI and the OPHI developed an index to measure empowerment in USAID projects. This measures empowerment in five domains: 1) production, 2) access and control of resources, 3) income, 4) leadership and 5) time satisfaction. This index is made up of two sub-indices, the five domains of empowerment (5DE) and the Gender Parity Index (GPI) (Alkire et al., 2012). The data collected in this questionnaire was largely quantitative. Details of the construction of the index and further analysis are presented in Chapter 5 (Section 5.3.4).

The questionnaire was modified to capture individual and household data. In addition to the demographic and empowerment sections, the questionnaire contained a section on 'Consumption

and Consumption habits' which focused on food security. The questions in this questionnaire were closed. Questions were modified for ease of translation and the time use data was largely estimated, as it was found that the farmers did not refer to time during the course of their day. The data was analysed to generate the index, using descriptive statistics in SPSS. The Five Domains of Empowerment (5DE), a modified GPI and modified WEAI were calculated to show the empowerment levels of the different communities. Ordinal Regression was carried out using STATA to establish the relationship between empowerment variables and food security. An in-depth description of the analytical processes performed is presented in Chapter 6 (Section 6.3.3).

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CHAPTER FOUR

Can smallholder irrigation farmers address existing market access challenges in the prevailing institutional environment? Exploration of experiences from irrigation schemes in Limpopo Province, Republic of South Africa?¹

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Abstract

In spite of having access to irrigation water for over 30 years, smallholder irrigation farmers in rural Limpopo Province remain subsistence-oriented, with little market participation. This has largely been attributed to past policies, which restricted smallholder farmers from market participation. Although much has been done to include smallholder farmers in markets, there has been little improvement. This study sought to establish the production, market and institutional challenges that smallholder irrigation farmers in Limpopo Province face and to investigate the extent to which existing institutions empower smallholder farmers to access markets. A mixed methods approach was used. Data was collected in three purposively selected study areas from 69 purposively selected farmers and seven key informants. Data was analysed using descriptive statistics in SPSS and content analysis. The results show that, while smallholder farmers produce enough to sell to informal traders, most could not supply formal markets individually. A minority of smallholder farmers sold their produce in supermarkets and fresh produce markets. Locally, few institutions gave farmers services which enabled them to access markets. The existing institutions need to be transformed so that they can equip smallholder farmers to pursue formal markets using different strategies.

Keywords: smallholder, market, access, institutions, transformation

¹ Manuscript has been submitted to a journal and is under review

4.1. Introduction

Institutions can create an enabling environment for smallholder farmers to access well-paying markets (Poulton et al., 2010). Smallholder farmers in the developing world (in particular South Africa) struggle to access well-paying markets because, in part, they are not equipped to produce for, and are excluded from, formal markets (Herbel et al., 2012, Vorley et al., 2012, Jaffee et al., 2011, Magingxa et al., 2009). In South Africa, policy design and the absence of well-developed rural market institutions can be blamed for their absence in markets, particularly where a dual agricultural sector prevails (Obi et al., 2012, Sartorius and Kirsten, 2007).

The majority of the poor and food insecure in South Africa are female rural dwellers who are engaged in farming (Stats SA, 2011). Some rural farmers have access to irrigation infrastructure, but their production and market access remain marginal (Van Averbeké et al., 2011, Magingxa et al., 2009). The South African government has adopted agriculture as a pathway to rural development and ending poverty (Chitja and Mabaya, 2015, van Koppen and Schreiner, 2014). Through its land reform, water sector reform and AGRIBEE policies, the government has invested significantly in smallholder farmers from 1994 to date (van Koppen and Schreiner, 2014). In spite of this, smallholder farmers continue to struggle to access formal markets, even where they produce enough to sell.

Access to markets has the potential to improve smallholder farmer earnings and possibly lift the farmers out of poverty (The World Bank, 2008). However, smallholder farmer poor market access has been attributed to low yields, which are partly a result of the limited irrigation facilities available to smallholder farmers (Namara et al., 2010). Research in these smallholder irrigation schemes in South Africa shows that farmers still struggle to access markets (Van Averbeké et al., 2011, Magingxa et al., 2009), clearly showing that access to irrigation water alone is not enough. Previous work in this field has focused on factors which limit smallholder farmers' market participation and the prevalence of weak rural market institutions. Local literature has focused on the dual nature of South African agriculture and the resulting separation of smallholder farmers from commercial agriculture and the interventions to include them. This study, however, focuses on how institutions (dis)empower smallholder farmers to access well-paying markets, an area which has not been well covered in South Africa.

This paper argues that, with supportive institutions and organisations, smallholder irrigation farmers will develop the capacity to produce for formal markets. Agency is crucial to developing capacity for increased market access, but it is dependent on the availability of appropriate local institutions and organisations that give support to smallholder farmers (Vorley et al., 2012). The objectives of this paper were to identify key production, market and institutional challenges that smallholder farmers are faced with in making linkages to formal markets. Second, the study seeks to determine if local institutions and organisations are available to empower smallholders to improve market access.

4.2. Background and Contextualisation

4.2.1. The role of institutions in market access

This study is informed by the Sustainable Livelihoods Approach (SLA) and New Institutional Economics (NIE). According to the Sustainable Livelihoods Framework, communities, households and individuals have five capitals (physical, financial, natural, human and social), which can be used to pursue a sustainable livelihood (Scoones 1998). The physical, financial and natural capitals have also been labelled as assets, because they are tangible, while human and social capitals which are intangible are called capabilities (Scoones 1998). The SLA shows that institutions regulate access to the five capitals and determine the extent to which communities, households and individuals can carry out their chosen livelihood strategies and achieve desirable outcomes (Scoones 1998). It follows that communities, households and individuals with access to more livelihood capitals have a higher probability of achieving desirable outcomes.

In the development sector, many interventions have been informed and guided by the SLA (Scoones 2009). In most developing countries, communities, households and individuals have glaringly poor access to assets, and donor agencies, NGOs and governments have focused on providing these in the form of technology transfer, inputs and microfinance schemes (Friis-Hansen and Duveskog 2012; Vorley et al. 2012). In spite of it being acknowledged that technology transfers should be matched with human capital development to ensure optimal use of technology, little investment has been made to develop the farmers' human capital (Bingen et al. 2003).

The market can be considered as technology (Chikozho 2005). Smallholder farmers thus need capacity building so that they can develop individual, collective and co-ordinated agency, which are essential if they are to meet quantity and quality requirements of markets and to negotiate with buyers (Friis-Hansen and Duveskog 2012). Agency is not restricted to decision-making, but incorporates smallholder farmers making informed decisions (Vorley et al. 2012). In spite of their limited knowledge, resources and market asymmetries, smallholder farmers already ‘analyse options, manage risk and make marketing decisions’ (Vorley et al. 2012).

New Institutional Economics (NIE) has developed as a way of explaining market failure in most developing countries. According to NIE, the cost of transacting is determined by institutions and institutional arrangements (Kherallah and Kirsten 2002). Institutions are defined as the “formal rules, informal constraints (norms of behaviour, conventions and self-imposed codes of conduct) and the enforcement characteristics of both” (North 1999), while, organisations are “structures of social relationships, social actors arranged in positions and roles and usually deliberately arranged to achieve an identified end” (Bouma 1998). In agricultural marketing, institutions facilitate access to secure tenure, credit and finance, agricultural training, extension services, market information, transport and communication infrastructure and reliable input suppliers, which offer essential services (Poulton et al. 2010; Mahdi et al. 2009; Barrett 2008; Dorward et al. 2003). Institutions governing market transactions between competing actors with imperfect knowledge have replaced the invisible hand in perfect markets (Ton 2008). The institutional matrix is context and time specific and is dynamic. Different structures have developed, over time, at different rates and these differences account for the different patterns of economic development, particularly in developing countries (Ton 2008). Efficient market institutions promote economic growth.

Markets and their institutions are embedded in social institutions and these can affect how market agents interact and react in different situations (The World Bank 2012). Rural communities in most developing countries have poorly developed and absent market institutions and market failure is common (Barrett 2008; Dorward et al. 2005). Without well-functioning rural formal institutions, smallholder farmers may resort to using external intermediaries or informal institutions to access basic services and markets (Aliber et al. 2010; Poulton et al. 2010; Butler and Mazur 2007). Possibly impeding female farmers’ market aspirations, as their

secondary status may accord them limited access to these external intermediaries and informal institutions (Battilana 2006).

Most rural communities are governed by traditional or local institutions, which are predominantly patriarchal (Joireman 2008). When gender roles are defined in these communities, women's roles are largely associated with the domestic realm and family life (Midgley 2006). Economic activities and relationships are left to men, while women focus on unpaid reproductive activities. Women's time use and activities are focused on households, resulting in gendered markets (Field et al. 2010). Although not all smallholder farmers can access formal markets because of their capacity (Ferris et al. 2014), women's constraints are amplified by gender (Staritz 2013). Women's education and business networks may focus on 'female roles' and not prepare them for entering high value markets (Field et al. 2010). Women mostly access resources through their relatives, restricting their control over resources and decision-making (Meinzen-Dick et al. 2014; Joireman 2008). The social norms governing women's behaviour may constrain women from expressing their agency (The World Bank 2012). Where women may need to travel to sell produce, consequently neglecting their gender-specified tasks, they may lack family support or risk being ostracised (Galiè 2013; Niehof 2004). Thus even when women have the same assets and capabilities as men, they may have less opportunity to express agency (The World Bank 2012). Institutions can enable agency development because they facilitate or hinder the improvement of capacities and capabilities (Vorley et al. 2012). If institutions which hinder agency are not transformed, the desired development outcome may not be realised.

The role social and market institutions play in regulating a community or household's opportunity structure and access to livelihood assets and prescribing acceptable behaviour may be a source of inequality (Phillips 2014; The World Bank 2012; Chikozho 2005). For instance, South African smallholder farmers were denied access to institutional support because of the duality of the agricultural system which relegated smallholder agriculture to subservience, which is synonymous with female gender roles (Thamaga-Chitja and Morojele 2014). Consequently, these farmers may lack some capacities and capabilities which are essential for their overall empowerment and as farmers with market aspirations (Phillips 2014). In addition to agency, resource provision, opportunity structure and sustainability, capacity building is important in empowering such communities to access markets (Hennink et al. 2012). Where empowerment is

seen as inclusion, inhibiting institutions need to be transformed and modified (Malhotra and Schuler 2005). These transformed and modified institutions and organisations would do this by building assets and capabilities and facilitating market access by providing accessible essential services to smallholder farmers (Poulton et al. 2010)..

4.2.2. Institutions for production and market access for the South African smallholder irrigation farmer

South Africa has a dual agricultural sector (Obi et al., 2012). Smallholder irrigation farmers occupy the subsistence sector, which is plagued by limited resources and market access. In the early 1990s, South Africa began adopting market liberalisation by limiting government involvement in agriculture input and marketing. The 1996 Agricultural Products Act and the deregulation of the agricultural sector in 1997 opened up the South African market to all producers (Jari and Fraser, 2009). The government has launched many programmes for instance the Reconstruction and Development Programme (RDP), Agricultural Black Economic Empowerment (AgriBEE) and Broadening Access to Agriculture Thrust (BATAT), yet smallholder farmers continue to struggle to access markets (Chitja and Mabaya, 2015, Obi et al., 2012).

The history of the establishment of smallholder irrigation schemes is discussed in Section 1.2. Land in the irrigation schemes was mostly allocated to the male household head, in observance of the predominantly patriarchal system in place in rural South Africa (Tapela, 2008). The prevailing patriarchy may negatively affect land access in the scheme for women as farmers in their own right. Although some farmers can produce an excess, they still struggle to access markets and rely on buyers of convenience (Magingxa and Kamara, 2003). This shows that producing excess is not enough, but more needs to be done to help farmers address the challenges of access resources and inputs and produce markets.

In their work, Magingxa *et al.* (2009) show that while South Africa has a well-developed road network, distance and cost still hinder smallholder farmers from accessing markets. Other challenges include low volumes, inferior and inconsistent quality, seasonal supply, costly transportation, limited value addition, lack of business culture, poor market information and limited track record are common challenges (Chitja and Mabaya, 2015).

4.2.3. Market innovations to increase smallholder farmer market access in South Africa

There have been several innovations to improve smallholder farmer market access in South Africa. These have largely been led by external agents. These initiatives have mostly taken the form of training and partnering, contract farming and mentoring. First, Johannesburg Fresh Produce Market (JFPM)'s market officials trained some Limpopo extension officers to assist farmers to improve fresh produce quality and navigate formal markets (Baiphethi and Jacobs, 2009). In another initiative, Westfalia farm in Limpopo Province trained small avocado farmers in Vhembe and partnered with them to supply avocados before their ripen (Chitja and Mabaya, 2015). Second, contract farming and out-grower schemes, particularly in the sugar cane and avocado industries, are popular (Thamaga-Chitja, 2012, Sartorius and Kirsten, 2005). These are usually initiated by external agents, but a key ingredient for sustainable market participation has been the 'agency' of the smallholder farmers involved. Finally, mentoring has been adopted as a capacity building and partnership process for some beneficiaries of the South African land reform programme, with some success (Terblanché, 2010). Successful mentorship relationships were usually initiated by a willing protégé and willing mentor, mostly resulting in improved smallholder capacity to produce and access domestic and export markets (Terblanché, 2010).

4.3. Methodological Approach and Data Collection

Chapter 3 provides the description of the province and the study sites and details of respondent selection. A mixed methodology approach was used and the data was collected concurrently (Ivankova et al., 2007). The study is largely qualitative and is complemented by quantitative data (Ivankova et al., 2007). This approach was adopted due to the complexity of the marketing strategies being studied. It also serves as a means of triangulating the data collected to increase the accuracy of the captured data (Ivankova *et al.*, 2007). Semi-structured questionnaires with open-ended and closed questions were used for farmers and key informants and focus group discussions were used to collect data with the aid of interpreters. The farmers are largely monolingual and speak Sepedi and Venda, so it was necessary to find local translators. A semi-structured interview schedule was designed for key informant interviews. A focus group discussion was held in each community and was facilitated by facilitators conversant in agricultural production and marketing and the local language.

The respondents were selected purposively in the three irrigation schemes using the following criteria: irrigation scheme membership, active production, selling their produce in either formal or informal markets, and willingness to participate in the study. Purposive selection of respondents results in a sample that is not representative of the population, but the sample is knowledgeable about the matter being discussed and can contribute meaningfully (Cohen et al., 2013). The basis for selecting the farmers was their active participation in the scheme for at least five years and currently marketing their produce in a formal or informal market. Some key informants were informal market traders and extension officers.

Data was collected in August 2013. Questionnaires were administered by the researchers and 69 farmers were interviewed in all three irrigation schemes. Seven key informants were interviewed and they were three extension officers, one from each community, and at least one scheme committee member or farmer who sold in formal markets from each community. The workshop focused on farmers' current and potential production and marketing. Additional data was collected through observation, as the researchers lived in the community during the data collection period.

The data was analysed using descriptive statistics and content and theme analyses. Descriptive statistics were generated using SPSS 20 to summarise respondent demographic data. Frequencies for quantitative data were generated so that relevant statistics could be used to complement the qualitative data used in the presentation of results and discussion section. The qualitative data was analysed using content and theme analysis using the following process. The coding and creation of a codebook follows Fonteyn et al (2008) and MacQueen et al. (1998). First, a table was created with four columns to capture the question number and the three communities. This allowed for all responses to be captured in the relevant section and in relation to other respondents from the same community. Although the researcher largely worked on this alone, writing down the steps served to capture original themes and track them as they developed (MacQueen et al., 1998). The respondent identification number was entered against the response, so that if there was need for clarification the questionnaire could be consulted. Second, similar themes were grouped together and given different labels, for ease of identification, all responses under one theme were highlighted with the same colour. The codes assigned to the themes were continuously updated as other data was analysed to refine the inclusion and exclusion criteria

(Fonteyn et al., 2008). The data and emerging themes were used to answer the research questions.

4.4. Results and Discussion

The objectives of this paper were to; firstly, identify key production, market and institutional challenges that smallholder farmers are faced with in making linkages to markets. The second was to establish what services the prevailing institutions and organisations offer and if they enable the farmers to prepare themselves for market access.

Table 4.1: Demographic data

Characteristics	Mafefe		Rambuda		Steelpoort		Total
	Count	%	Count	%	Count	%	%
Respondent							
Male	5	20	13	52	7	28	36.2
Female	6	14	22	50	16	36	63.8
Household head							
Male	5	15	18	53	11	32	51.5
Female	5	16	17	53	10	31	48.5
Age (years)							
25 - 30	2	100	0	0	0	0	3.0
31 - 40	3	33	6	67	0	0	13.0
41 - 50	1	11	5	56	3	33	13.0
Over 50	5	10	24	49	20	41	71.0
Education Level							
None	2	11	4	22	12	67	26.1
Primary	4	14	16	57	8	29	40.6
Secondary	5	23	14	64	3	14	31.9
Tertiary	0	0	1	100	0	0	1.4

Sixty-nine rural smallholder farmers participated in this phase of study. Table 4.1 summarises their demographic characteristics. Most (63.8%) were women and 51.5% came from male-headed households. Almost three quarters of the respondents had been to primary school. The majority of the farmers were over the age of 50 years. They came from three communities, each one from a different district in Limpopo Province, and they all worked in their respective irrigation schemes. The characteristics of these farmers are consistent with the literature, which shows that the majority of farmers in the developing world are women (FAO, 2011).

Apart from selling their produce locally to informal traders, only 14% of farmers sold their harvest to supermarkets or produce markets outside their communities. This shows that it was not common among the smallholder farmers interviewed in this study to sell their produce outside their communities. These findings are consistent with those of other studies on smallholder irrigation farmers in South Africa (Magingxa *et al.* 2009) and smallholder farmers in general, worldwide (Vorley *et al.*, 2012, Barrett 2008). The following sections outline the production and marketing challenges that limit these small farmers from participating in formal markets.

4.4.1. Production challenges

Low Produce Volume

Firstly, the farmers felt that their produce was limited by three main factors, the size of their plots, reliable access to inputs and the amount of irrigation water at their disposal as shown in Table 4.2. Regarding plot size, the average farmer held about 0.6 hectares of land in the scheme. The extension officers in this study highlighted the subdivision of plots among family members as the reason for diminished plot sizes, from the original one hectare initially allocated to each family. The farmers generally felt that with plots this size it was difficult to produce enough for household consumption and for sale. This could be due to the farmers' observation that successful commercial farmers have large landholdings. Some farmers had adopted the strategy of 'borrowing' plots from fellow scheme members who could not use their plots in a particular season. This strategy was not widely practised, however. The plots used by the farmers in this study are small and generally having a small plot reduces the chances of a smallholder farmer producing enough to meet market requirements individually. These findings are consistent with those of Jaffe *et al.* (2011) and Ferris *et al.* (2014), who have established that farmers with small plots find it difficult to access markets. However, some studies have shown that smallholder farmers with plots as small as 0.2ha can access markets if they focus on horticultural production and sell in a collective (Herbel *et al.*, 2012). This is an initiative which could be explored for these farmers.

Farmers said capital to invest in agriculture was difficult to come by. The data shows that the farmers financed their production activities (tractor hire, inputs and labour) with money from produce sales, government grants and other household income, because they did not have local

financial institutions which could provide them with loans. Only one bank was identified by an extension officer as offering loans to smallholder farmers: “*The Land Bank offers loans to smallholder farmers and it has reduced its interest (rate) to accommodate them.*” Yet 95.7% of the farmers in this study did not view them as a viable option. Most farmers said that without Permission to Occupy (PTO) documents in their names they could not use their land as collateral, as can be seen in the following quote:

“I could borrow money from the bank and do a lot of good work here but I have no collateral. The PTO is in my father’s name and so it won’t work. We use the money from the farming but we need to find other sources of money.”

Table 4.2: Production challenges experienced by the irrigation farmers

Challenge	Description
Produce volume	
Small plots	Less than 1ha irrigation plots, with multiple crops
Access to seeds and agro-chemicals	Farmers purchase inputs at market price
Water amount	Old and inefficient irrigation infrastructure Access to irrigation water all year round although water not always enough
Produce Quality	
Market preferred varieties	Limited knowledge and access
Grading and standards	Local standards not comparable to market standards
Pack houses/ cold storage facilities	None available locally, use private ones
Processing and value addition	Basic value addition (wash , trim produce)
Food safety and traceability	No use of labelled packaging material
Agro-chemicals	Limited access to appropriate chemicals, use of substitute

Source: Research results

The rest said they feared losing their land, since they had little and inconsistent income. Regarding the issue of input access, the farmers and extension officers spoke about a government input programme (*Letsema*), which gave the farmers seeds, fertiliser and pesticides in some years. These inputs were distributed as part of a household food security initiative in rural communities. Poor access to capital and inputs were the most significant challenges these farmers faced and, in response, the farmers reduced production or used retained seed. Reducing production or using retained seed will reduce yield and possibly compromise produce quality as

well. The government programme was helpful for those households which would otherwise not produce due to lack of inputs, but this would not assist in smallholder farmers meeting the markets, given the project's food security thrust. The absence of local financial institutions was consistent in all study sites and the farmers used household income which may not always be sufficient as farming capital. This struggle to access capital and the absence of formal financial institutions in rural Limpopo province is consistent with literature on smallholder farmers in rural Africa (Poulton et al., 2010). This gap could be addressed by either engaging in contract growing or out-grower projects, where companies supply inputs to farmers, as has been done in the South African sugar industry (Sartorius and Kirsten, 2007).

Third, the farmers accessed water through the irrigation scheme all year round, except in Mafefe, where their canals had been washed away by floods and therefore were not fully functional. In spite of accessing water from the irrigation schemes, the farmers felt that the water was not enough to sustain commercial production, particularly just before the rainy season, when water levels in the rivers were low. Although the farmers in Steelpoort and Rambuda said the water limited their production capacity, most farmers could produce enough to eat and had excess produce throughout the year. This was in contrast to the farmers in Mafefe, who relied on rainfall for production. This limited their planting choices to staples and it was difficult to produce anything in winter. These two different cases in water access reinforce the importance of access to irrigation water for consistent production among smallholder farmers, as has been shown in the literature (Thamaga-Chitja *et al.* 2010).

Finally, the extension officers attributed the subsistence orientation of the farmers as a factor which contributes to low produce volume. According to the extension officers, the farmers grew many crops on their fields, sometimes choosing to grow crops for consumption instead of responding to market demands. Low produce volumes negatively affected the smallholder farmers' chances of accessing formal markets since their buyers only accepted a certain volume of produce. One farmer said:

"I went to a local supermarket and told them I wanted to sell my produce; they said they want at least a 100kg of produce. So I harvest and take it to them."

Growing many crops to meet household needs is a strategy adopted by many households with poor market access, to improve dietary diversity (Niehof 2004; Barrett 2001). However, while improving household dietary diversity, it reduces the yield of the farmer across the crops grown. Where farmers are required to deliver crops above a given minimum, as shown above, this negatively affects smallholder farmers, particularly when they try to access markets as individuals. Jaffe *et al.* (2011) have shown this to be the one most significant factor which now excludes smallholder farmers from markets. Barrett (2008) says this could be addressed if the farmers focused on crops where they have comparative advantage. Alternatively, they could approach markets as a collective.

Given their current production strategy and the factors listed above, it would be difficult for the farmers to produce enough to supply to formal markets such as supermarkets, as individuals. Their low produce volumes mean buying from many producers to meet the buyers' demand and it would increase the transaction costs incurred. In markets where buyers may need to purchase a tonne of produce at a time, smallholder farmers as individual producers are not an attractive option. Some researchers in this instance have proposed that smallholder farmers approaching markets as part of a collective unit could increase their produce volume and strengthen their voice (Herbel *et al.*, 2012). Although not widespread in the communities, this strategy was being employed by a group of farmers in Mafefe, who grow seed maize under the guidance of their extension officer.

Poor produce quality

The farmers identified different constraints to achieving the required produce quality in Table 4.2 as follows: limited knowledge of market preferred varieties, formal grades and standards, processing and value addition, food safety and traceability issues and the absence of pack-houses and other infrastructure. The farmers said they did not know which varieties the market preferred. They added that they had observed that the vegetables they grew differed from those available in supermarkets. They were not aware which variety of tomato or onion markets preferred and grew what they preferred to eat. This presents a challenge for the farmers if they want to supply formal markets which may demand certain varieties of produce because of their experience characteristics and market demand. Jaffee *et al.* (2011) discusses how buyers and their demands now drive markets. Consequently, smallholder farmers may be excluded from

formal and more stringent markets. Alternatively, the smallholder farmers can focus on markets where their produce would be acceptable. If smallholder farmers could locate these markets, they could market their produce. Vorley *et al.* (2012) and Jaffee *et al.* (2011) show that high-end formal markets are not always the best solution for smallholder farmers (Vorley *et al.*, 2012, Jaffee *et al.*, 2011).

Most farmers said they had little knowledge regarding the grades and standards which markets preferred when purchasing produce. Only those farmers growing seed maize spoke about the criteria for selecting maize kernels for processing, since they had been trained by Cimmyt. When the rest of the farmers were asked about grades and standards, most spoke about how they knew the crop was mature and ready for harvest, as shown in the quote: *“Good quality peas are those which you harvest when the leaves which become brown and start falling off.”* When probed further, the farmers said they assumed that when the produce was ready for harvesting, it was of a good quality, adding that they also checked its size and appearance. Their knowledge was informed by their experience and the requirements of their local buyers. This confirms Chitja and Mabaya’s (2015) assertion that smallholder grades and standards may not match formal market grades and standards.

Their extension officers mentioned that, although they discouraged the farmers from using non-food grade pesticides on produce, some farmers continued using them, possibly because the farmers were not aware that their produce might be subjected to rigorous physical, chemical and microbial quality checks to ensure the produce met government safety requirements. The differences in the responses of the trained vs untrained farmers showed that the farmers had a different understanding of what grades and standards meant when it came to produce quality. Without training, farmers will remain unaware of the requirements of formal markets and what constitutes top-quality produce, more so, given the different grades and standards applied in the informal markets smallholder farmers currently sell in and the formal markets they aspire to sell in. These findings are consistent with the literature (Chitja and Mabaya, 2015, Jaffee *et al.*, 2011). However, when farmers have received training on the grades and standards of produce accepted in formal markets, their produce quality improved and so did market access, as shown

from several South African studies (Chitja and Mabaya, 2015, Baiphethi and Jacobs, 2009, Sartorius and Kirsten, 2007) and international examples (Herbel et al., 2012).

The farmers and extension officers disclosed that there were no locally available pack-houses or cold storage facilities to control produce ripening. According to the extension officers, one was under construction in Mafefe, while the one in Rambuda had been constructed but was not yet operating. In Steelpoort there had been plans to build one, but these were abandoned when in-fighting arose. If these farmers needed to use one, they had to pay to store their produce in privately owned facilities. The farmers in Rambuda used one in Levubu, while a key informant in Mafefe said, *“they are there in Lydenburg and Burgerfort, but it was expensive transporting our coriander there.”* While the farmers in Rambuda were still transporting their produce to Levubu, the farmers in Mafefe had since stopped growing coriander because of the low market price and other costs. Other farmers said they kept produce such as spinach and sweet potatoes in the fields awaiting harvest; those who grew produce such as tomatoes harvested the produce and stored it at their houses.

The absence of pack-houses and cold storage facilities in communities which grow horticultural produce is a significant disadvantage, as the produce is temperature sensitive and perishable. Storing such produce at room temperature would accelerate ripening and spoilage, leading to losses in produce between the farm and the market, where one exists. Where cash-strapped smallholder farmers are required to pay market rates for using private pack-houses and cold storage facilities, this could act as a deterrent to storing the produce, particularly where sales are not guaranteed. The absence of such infrastructure in smallholder farming communities is well documented (Herbel et al., 2012). This calls for the development of functional pack-houses and innovative post-harvest processing to prevent produce losses due to spoilage.

The farmers said that, apart from trimming and washing the produce to remove soil, there was no further value addition to produce before it was sold. This can be attributed to the demands of the informal buyers and the neighbouring community, who bought most of the small farmer produce. If this market did not demand value added produce from the farmers, the farmers would not need to develop any products from their harvest. Another deterrent could have been the absence of facilities for further value addition in the community. Yet there are many simple processes such as drying leafy vegetables which could be performed using the technology that they have locally.

These vegetables could then be sold to informal traders and other community members during dry months. Finally, the smallholder farmers packed their produce in plastic and mesh bags and used no labels. Labelling is an important aspect of trading in formal markets to ensure traceability of the produce.

Table 4.3: Marketing challenges experienced by the irrigation farmers

CHALLENGE	DESCRIPTION
Transport	
Road quality	Gravel road in Mafefe and Rambuda
Car hire	Transport produce at market rates
Market information	
Finding a market	Farmers contact formal and informal buyers when harvest approaches Informal traders do not have capacity to buy all the produce in season
Price determination	Prices fluctuate as determined by forces of demand and supply causing uncertainty Informal trader prices lower than set price
Business management	
Orientation	Non-existent
Contracts	Limited application to those farmers who trade formally
Tax, etc	Farmers expected to pay income tax when trading in formal markets (deterrent)
Track record	Farmers have largely no track record of reliability and produce quality consistency
Financial services	No suitable loans

4.4.2. Market challenges

For the individual farmer, accessing formal markets was limited to only 14.1% of the respondents, as shown in Table 4.1 and of those respondents only one farmer was female. She was based in Steelpoort; the other individual farmers were based in Rambuda. Table 4.3 shows the different market-related challenges the farmers experienced and these were related to transport costs, market information and their business culture.

Transport costs

Firstly, the farmers who sold their produce in Jane Furse and in Johannesburg said that securing affordable transport was very difficult, particularly if the transporter also provided refrigeration. The farmer transporting produce from Steelpoort to a supermarket in Jane Furse said, *“I hire private cars and it costs R200 to Jane Furse....”* A key informant in Rambuda said, *“I transport 2-3 pallets a week from here to Levubu for R500 and I pay an extra R50 for a net to cover each pallet.”* The farmers from Rambuda were serviced by a gravel road and said that the transporter complained about the state of their road, implying that if the road further deteriorated the service

would be discontinued. The farmer who sends at least two pallets a week pays at least R600 a week, which adds up to R2 400 a month, to send his produce to the market. Most farmers in this community do not earn this much a month from agriculture and even if they do, they have other household expenses to take care of.

Those transporting their produce to the Johannesburg Fresh Produce Market revealed that the transporters were reluctant to travel from the pack-house to pick up one load. In response, the farmers waited until they had a sizeable harvest or co-ordinated pick-up dates with other farmers. The absence of parastals or other partners who could subsidise transport costs is apparent from these two quotes. The smallholder farmers in these communities have to find their own transporter and make their own arrangements to pay these drivers, who charge commercial rates. Without access to financial loans and credit to cover transport of produce to markets, the cash-strapped smallholder farmers will most likely decide to opt out of formal markets and rely on informal traders who come to the farm gate. The literature has shown that transport costs to produce markets are prohibitive (Vorley et al., 2012, Magingxa et al., 2009) and that most smallholder farmers sell mainly to informal traders (Shiferaw et al., 2008, Baiphethi and Jacobs, 2009). There is need for innovative ways to be developed of transporting farmer produce. The emerging collective action exhibited by the farmers in assembling produce and having it picked up on one day is something that could be scaled up.

Market information: identifying markets

Access to market information was identified as a significant problem by the smallholder farmers in this study. Most smallholder farmers in this study felt that they had poor market access because no markets around them could absorb all their produce. During data collection, local community members and informal traders formed the bulk of their market and could be seen trickling in to buy produce in the late afternoon. The farmers' understanding of markets was a physical structure, as shown by this quote, "*We do not have a market here, and there is nowhere to sell.*" How farmers understood markets could have influenced their strategies to improve market access, because it meant the farmers could be searching for a physical location at which to sell their produce. It is possible that the farmers could have excluded potential markets in their communities and surrounding areas, as a result.

Some farmers did not believe there were markets for their produce, as shown by one farmer in Mafefe, who said in the focus group discussion, *“Increasing produce is good but we want to see the market first before so we don’t take unnecessary risks.”* These sentiments were echoed by another farmer, who asked, *“How can we plant more when there is nowhere to sell?”* However, their extension officers disagreed. The extension officers felt that as long as the farmers produced in bulk, by either adopting the block method or selling as a collective, they would be able to find a market.

Another factor which limits farmer market access was their reluctance to try and access new markets, as suggested by their extension officers. This is understandable, given that Table 4.1 shows that most of these farmers were over 50 years old and female. These characteristics are associated with being risk averse. Their responses indicate that the farmers have possibly tried to grow more produce, but have not succeeded in accessing markets until now. The challenges that these farmers face are consistent with those of other farmers, as shown in other studies (Herbel et al., 2012, Chikozho, 2005). Initiatives to introduce younger farmers into these groups may encourage the farmers to broaden their definition of markets and to diversify their marketing strategies.

Their extension officers mentioned the following opportunities.

One said, *“World Food Programme wants maize and dry beans, sweet potatoes at least 50T, but we will wait and see if we can find other partners to work with because right now the farmers get about 3T / hectare.”*

He added, *“There is an Ofcalaco collection point for the JFPM nearby, but the farmers don’t service that point. They are reluctant to take advantage of that and the Food Bank opportunity in Lebowakgomo. The farmers are far away from everywhere so they must pay for transport.”*

Another extension officer said, *“The department (DAFF)’s marketing division requests for produce, internationally Mozambique is buying jam tomatoes from Messina.”*

From these three quotes it is clear that the extension officers are aware of marketing opportunities which could benefit the smallholder farmers at possibly competitive prices, but the farmers remain uninterested in them. Transport costs and the farmers’ reluctance to pursue

opportunities that would remove them from their comfort zones could be attributed to this. The farmers' perceptions of markets and how they responded to smallholder farmers could be the reasons why the farmers did not pursue different opportunities which were presented to them by the DAFF. This reluctance could possibly be explained by Van Averberke *et al.* (2011), who found that their production was their source of livelihood and assured household food security. Using a leader group of farmers to test the approach and demonstrate that this strategy works could be a way of convincing the smallholder farmers of the merits of complying with these three requests. This approach is discussed in detail in a study on smallholder farmers in South Africa and Tanzania (Chikozho, 2005).

Market information: prices

Local produce prices were set by scheme committees who set new produce prices based on changes in input price, tractor services, fuel and labourers. They also took into account the information they gathered from radio and TV programmes. A key informant said, "*There is also a radio programme at 4.30pm on Tuesday called Zwavhulimi on Palapala FM it helps.*" An extension officer felt that the radio programme was helpful, but the information was not always up-to-date. Another extension officer said, "*Every Friday I get information on produce prices/kg from DAFF which is accurate. The DAFF, has a contract with JFPM to give us their prices.*" These quotes demonstrate that the farmers have different resources at their disposal and the use of the media to access market information shows agency. However, this station only broadcasts in *Tshivenda*, the *Northern Sotho*-speaking respondents did not mention any radio programmes which informed their decision-making. It is interesting to note that, although the farmers interacted with their extension officers, they seemed to be unaware of the existence of this price list. This either signals poor transmission of information among farmers and extension personnel, or it signifies a lack of trust in the information relayed to them. Either way this calls for further investigation.

The farmers expressed dissatisfaction with their position price takers; when informal traders arrived with a predetermined price, which was lower than the scheme price. Most farmers were forced to sell at these prices, which they felt were not competitive, because they had no other buyers. The literature shows that smallholder farmers do not normally set their prices with informal traders (Magingxa *et al.*, 2009). In the present study the discrepancy in prices between

what farmers expected and what informal traders offered could be attributed to either the farmers' prices not reflecting market trends or the informal traders underpaid the farmers, since they had to pay for transporting the produce. To address this, it would be ideal to come up with other strategies for selling produce, which do not result in farmers earning less for their produce.

The issue of dissatisfaction with price also affected those farmers who sold their produce in formal markets. The farmers said that it was difficult to tell if one would make a profit from sending their produce to formal markets, since there were good and bad days. They did not understand why produce prices were high one day and low the next and some felt that they were being short-changed. This could have affected the desire of most smallholder farmers in this study sending their produce to markets outside their community and the costs one had to incur before knowing if they were making a profit or a loss. These sentiments are echoed by Vorley *et al.* (2012), who found that in some instances, formal market prices are lower than prices offered in informal markets. Smallholder farmers therefore need to assess the markets and establish which one is best suited to their needs. An alternative would be to find a market which guarantees smallholder farmers a minimum price, to encourage their participation in markets.

Market information: Charges and Payment

The farmers who sold in formal markets spoke of the additional costs they incurred to transport their produce to the market and also to sell in formal markets. One farmer exclaimed:

“Do you know that to get your product from here to the packing house it’s money, from the packing house to Johannesburg it’s money, you also pay for the pallet, the net to protect and cover your produce, you then pay for your produce to be sold at the market, you pay the agent and you pay tax! All that money going to other people- you will only work for them.”

These additional costs were new to smallholder farmers, who did not pay them in informal or spot markets, and this could have deterred some smallholder farmers from selling in formal markets. Vorley *et al.* (2012) noted that the cost of regulation sometimes deterred smallholder farmers from accessing formal markets. Further research is needed to establish if this applies to smallholder farmers in South Africa. In the interim, there is a need for farmers to be shown how formal markets operate and to show farmers how they can reduce the costs they incur in

accessing formal markets. Such strategies include selling as a collective or using one agent. These strategies were successfully employed in Kenya, as shown by Herbel *et al.* (2012).

The payment mechanisms that are employed by formal markets could have acted as a deterrent to smallholder farmers selling in formal markets. Most of these farmers were used to cash payments, which are the norm in informal markets. Most did not have bank accounts, since there were few banking institutions around them. The farmers who sold in the formal markets said the money for produce sales was deposited directly into their accounts through an electronic payment system. This would have made it difficult for those farmers who do not have accounts to get paid. Where this challenge has appeared in other studies, NGOs have bridged the gap by paying farmers cash when presented with a supermarket “goods received” note and then receiving their payment when the supermarket finally pays (Herbel *et al.* 2012). This innovation calls for partnerships between formal markets and NGOs.

4.4.3. Do the institutions and organisation empower smallholder farmers to access formal markets?

In spite of many farmers in this sample producing enough to sell, only 14% of the farmers sold their produce to formal markets. The theoretical grounding of this study requires that institutions and organisations in the three irrigation schemes empower farmers by building assets and capabilities and facilitating market access by providing the services the farmers need, at reasonable prices. Table 4.4 shows an assessment of the services offered by the institutions and organisations at the farmers’ disposal.

Capacity building

Firstly, the government, through its Department of Agriculture, Forestry and Fisheries, and the resident extension officers provided extension services to farmers in the three communities. Eighty-four per cent (84%) of the respondents had asked their extension officer for agricultural advice in the preceding month. Most (73.5%) of the farmers asked about how to grow a variety of crops, 8.7% asked about other crops suitable for their area, 7.2% asked general questions to do with agriculture, 5.9% asked about exploiting new markets and 5.7% asked for other information. Accessing extension services enables farmers who are largely without formal agricultural knowledge to access professional advice and could improve the farmers’

performance and productivity. The benefits of extension services to farmers with little training are well documented (Ferris et al., 2014, Manfre et al., 2013, Aliber et al., 2010).

Table 4.4: An assessment of the services smallholder farmers have access to.

	Capabilities	Assets	Services	Cost
DAFF ¹	√	√	√	-
DoT ²	x	√	√	-
Irrigation scheme	√	√	√	-
Traditional authority	x	√	√	√
Financial institutions	x	x	x	x
Formal markets	x	x	√	√
Media	x	x	√	√
Private companies	x	x	√	x
State Colleges	√	x	x	x
Other organisations	√	x	√	-

Key:
 DAFF¹ – Department of Agriculture, Forestry and Fisheries
 DoT² - Department of Transport
 √ Service offered
 X no services
 - No charge

Source: Research Results

Secondly, agricultural training at state colleges was availed to farmers who were members of irrigation schemes. The training was offered at either Tompi Seleka or Madzivhandila colleges. Training programmes could last for a year, as they were quite extensive and these were only available to literate participants. Given that most of the farmers are women, staying away from

home for more than a year to attend training may not be feasible, as they have caregiving and other household responsibilities. In addition, other social norms may prevent them from staying away from home. A study in Papua New Guinea showed that female participants found it more difficult to attend training outside the community, as they had other household duties (Cahn and Liu, 2008). However, none of the farmers who had benefited from training amongst the respondents was currently accessing formal markets. This shows that agricultural training alone is not enough to increase market access. Further market training and possibly mentorship on market requirements would also help farmers increase market access. This has been done in several projects with individuals and farmer groups (Herbel *et al.* 2012; Terblanché, 2010).

Finally, 30.4% of the farmers said they had attended some short courses held by local NGOs and churches and these mostly lasted either a day or a week. The training covered subjects such as chicken farming and water-harvesting. The farmers felt that these courses were not very effective, because they were not staggered and the information was not delivered appropriately. Consequently they felt unchanged by the training. The added challenge of teaching elderly participants with poor literacy and numeracy skills would have limited the success of the programme if appropriate materials were not used by the facilitators. Cahn and Liu (2008) also observed this in their study. These challenges show that specially trained facilitators and specially designed training materials are needed if the target participants are to benefit. Initiatives such as the farmer field school approach have been successful, as they are modified to suit the needs of smallholder farmers (Friis-Hansen & Duveskog, 2012). The attempt by these NGOs and churches to fill the capacity building gap in rural communities is commended, but it seems there is a need to harmonise the teaching content and materials with the extension officers. This could also improve the quality of training and its reception by participants.

Assets

Table 4.4 shows that the Department of Transport built and maintained the roads which linked the three communities to different towns and cities. The three communities have different types of roads: Steelpoort (tarred road), Rambuda (a good gravel road) and Mafefe (a gravel road in need of repair), which provide the farmers with different opportunities and challenges. Only 36.2% of the respondents felt their road was of a good quality. The farmers in Steelpoort have the best road, which connects them to different mines and towns, but very few of them have

taken advantage of this to access the potential markets in the mines and towns. Some farmers in Rambuda have taken their produce to Johannesburg, in spite of their complaints. Those in Mafefe have completely abandoned accessing formal markets individually because of transport costs, only doing so in the maize seed project initiated by their extension officer. These three communities demonstrate the importance of a good road network in facilitating market access, since those with a bad road opted out of markets. They also show that infrastructure alone is not enough to empower farmers to access markets. Factors such as availability of transport and transport costs could be additional challenges, as discussed by Magingxa *et al.* (2009).

According to Table 4.4, the local tribal council gave the farmers access to land which was secure; however, not many farmers had PTOs. In addition, irrigation scheme membership guaranteed tenure to plots in the scheme, since plots were registered in the names of the users. Farmers felt they were unable to access loans on the basis of their current documentation, thus their most valuable asset could not facilitate access to credit which they needed for production. This can negatively affect the views which the farmers hold of their assets and the possible high or low value they assign to them. It also constrains farmers to informality and forces them to operate at the edges of formal lending markets. This is largely consistent with the literature and reflects what De Soto (2000) terms ‘dead capital’.

Services and cost

There were private companies which supplied farmers in the three communities with the following production and marketing services: communication, inputs, transport and marketing information. Regarding communication infrastructure and devices, 97% of farmers said they owned a cell phone and the researchers saw that most farmers possessed radios and TVs as during data collection. Radios were a source of information and cell phones which were used to call informal traders helped farmers to inform their buyers that produce was ready for collection. Since most farmers had access to cell phones and radios, more agricultural information could be relayed this way. Such initiatives have been attempted with other smallholder farmers in Kenya (Herbel *et al.*, 2012).

Inputs, transport and market information were accessed by the farmers at a price which some may not have been willing or able to pay. Farmers in the discussion above mentioned paying for

transport and transactions and this may prevent those farmers who have no ready cash from participating in these formal markets outside their communities. The farmers who have no money may analyse their options and see that selling in formal markets is too expensive for them and opt to sell in informal markets. This agency which smallholder farmers show by finding themselves markets which match their assets and capabilities has been discussed by Vorley *et al.* (2012).

The provision of inputs to farmers can be seen as beneficial to those who could not afford store-bought inputs since it would guarantee them access to quality seed and therefore largely guarantee a good harvest. However, it could instil a sense of dependence in the farmers which could limit their sense of agency, as it limited their crop choice and possibly market participation. This type of intervention could be wrongly informed by government viewing farmers as helpless, an assessment which Vorley *et al.* (2012) disagree with, since farmers show their agency in how they navigate production and marketing with limited assets.

What is glaringly absent are formal institutions which farmers could approach for credit and finance. The absence of local institutions was compounded by their inability to use their assets and collateral. The absence of appropriate financial institutions in rural African communities is well documented (Poulton *et al.* 2010; Chikozho 2005). This makes it difficult for smallholder farmers to invest in agricultural and postharvest processing technology. The result is that the farmers' yield is sub-optimal and produce is sold with little or very basic value addition done to it. This is consistent with the literature (Fischer *et al.*, 2015, Ferris *et al.*, 2014, Tittonell and Giller, 2013)

The different institutions which farmers have access to in these three communities provide some of the services which could help smallholder farmers access markets. However, these institutions largely focus on production for subsistence and produce marketing in informal markets, even if these markets cannot absorb all their produce. Where farmers aspire to sell in formal markets, they have to search for service providers and potential markets who can provide the services they need but are not adapted to working with emerging farmers. Some farmers have the capabilities to achieve this, but the majority are seemingly unable to.

4.5. Conclusions and Recommendations

The challenges smallholder farmers, worldwide, and in South Africa face in accessing formal markets which could improve their income and livelihoods are well documented. It was previously thought that access to irrigation would increase smallholder farmer market participation, but the results from studies among smallholder irrigation farmers in South Africa contradict this. Instead, these studies show that access to irrigation facilities will result in an increase in production frequency and yields, but not market access. This implies that there are other factors which prevent smallholder farmers from accessing markets. This study established the production and marketing challenges faced by these irrigation farmers and questioned prevailing institutions to determine their capacity to enable smallholder farmers to access formal markets.

The SLA and NIE informed the theoretical grounding of this study with emphasis placed on the possible role capacity-building to strengthen the farmers' capabilities could play in helping farmers navigate formal markets, in addition to establishing if prevailing institutions created an enabling environment which made formal markets accessible for smallholder farmers. The farmers in the study were mostly women over the age of 50 years old. The smallholder irrigation farmers are constrained in accessing markets by their low produce volumes, poor produce quality, the cost of transport, poor access to market information and the differences in how informal and formal markets operate.

The findings show that, firstly, since smallholder farmers have small plots and poor access to credit they find it difficult to increase produce. This is exacerbated by their strategy of planting many crops in their plots. Secondly, the observed poor produce quality is a result of limited knowledge about market-preferred varieties, grades and standards and the absence of pack-houses and cold storage infrastructure in the communities. Little value adding and labelling were used in the three communities. Fourthly, transport costs were high and, in some instances, prohibitive for the smallholder farmers in the study. Market information seemed to be difficult for farmers to access alone, although they used radio programmes to guide them. Interestingly, none of the farmers interviewed in all three communities had asked their extension officers about market information or taken advantage of mentioned opportunities. Finally, the different costs

associated with selling in formal markets and the payment systems in place may have deterred some farmers from accessing formal markets.

The findings show that, in spite of some institutions providing the different services the farmers required being present in the communities, the farmers found it difficult to access credit and finance and training opportunities which could have improved their livelihoods. As a result the farmers were unable to move from subsistence farming and informal markets.

To address their production and marketing challenges, they could form a collective in which to market their produce, as has been pioneered in Mafefe. This would instantly improve the volume of produce they would sell in a transaction. It could also improve their ability to negotiate with service providers for a group fee, so that transport costs and pack-house costs would be manageable for the individual farmers. Being in a collective would also make it easier for the farmers to access training and other capacity-building opportunities, which could improve their production and market access. The re-orientation of extension services to human, social and individual farmer development is critical. Targeted training of smallholder farmers with this approach of agency enhancement is important to build capacity for market development and marketing. Capacitated farmers with capabilities to engage with markets and their requirements would be a good starting point, but it will take a transformed extension service. When farmers organise themselves into a formal collective and focus on producing specific crops, it would be a testament of agency and capacity informed by markets. A transformed external party could then mentor the farmers to improve their basic literacy and numeracy skills, before developing their production, marketing, managerial and other skills necessary for market access.

Further studies can focus on the reluctance of the farmers to pursue opportunities suggested by their extension officers and the strategies that could be employed to encourage younger family members to actively participate in agriculture.

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CHAPTER FIVE: WOMEN EMPOWERMENT IN AGRICULTURE: FEMALE FARMER EMPOWERMENT IN RURAL LIMPOPO PROVINCE

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Abstract

Understanding the factors that influence women empowerment and disempowerment is thought to be essential if interventions that seek to empower women in agriculture will succeed. Disparity in access to, and the control of, productive assets and markets and market activities is thought to disempower women. Although this is acknowledged, it is difficult to measure women empowerment in a way which could be applicable across continents. This paper aims to measure women empowerment in agriculture, using a modified Women Empowerment in Agriculture Index (WEAI) and to establish the relationships between empowerment and market access. Data was collected in the irrigation schemes from respondents in three purposively selected irrigation scheme communities in Limpopo Province, using a modified WEAI questionnaire. The data was analysed to generate the 5DE and a farmer gender parity index (FGPI) and the modified WEAI was computed. The results show that just over half the population of female farmers in this study were empowered and at par with their male counterparts. Factors that had a negligible influence on empowerment were credit access and leisure time. Women's market access was significantly associated with input in productive decisions, speaking in public and autonomy. It was concluded that women in this community were empowered in about three domains and that, with interventions to address the disempowering indicators, empowerment could improve. It was recommended that interventions which strengthen adequacy in the indicators which contributed the least to empowerment be considered.

Key words: women, irrigation farmers, empowerment, Limpopo Province

5.1. Introduction

Determining women empowerment in agriculture is important if agriculture is to contribute to sustainable rural development (Meinzen-Dick et al., 2014). Women in most rural, developing communities engage in agriculture as a livelihood activity, but may not always enjoy the proceeds of their work (Jeckoniah et al., 2012). Patriarchal attitudes at community level and intra-household gender relations may limit the extent to which women decide how their produce and the income it generates are used (Mahmud et al., 2012, Malhotra and Schuler, 2005). This may prevail when women as secondary rights holders are viewed as an extension of the household head, only implementing his ideas (Ambunda and de Klerk, 2008). Productive resources are often allocated to men, while women are accorded mostly secondary rights to these. Having secondary rights implies that women have a subordinate role, which negatively affects their ability to negotiate access and influence decisions in the household. This has largely led to their role as active farmers with the potential to contribute significantly in improving smallholder agriculture in South Africa and much of the developing world being overlooked (Alkire et al., 2012). In spite of gaining some empowerment in society, the household remains the locus of disempowerment for women (Murphy-Graham, 2010).

Although female farmers account for 43% of the agricultural workforce, they own about 1% of the agricultural land, worldwide, and may not control the income earned from their work (Meinzen-Dick et al., 2014). Women's disempowerment in agriculture is mirrored in other sectors and has been attributed to women having less opportunity to exercise agency than men (The World Bank, 2012). Although women are a heterogeneous group, belonging to different wealth, education, occupation and marital classes, they experience similar gendered hurdles to empowerment (Mahmud et al., 2012).

Women empowerment was brought to the fore of the development agenda under Millennium Development Goal (MDG) 3, which views empowerment as a step towards equality (Alkire et al., 2012). Previously, empowerment initiatives in the developing world were largely focused on education and skills development, improved access to health, family planning services and microfinance initiatives, but excluded the agricultural sector (Jeckoniah et al., 2012, Mahmud et al., 2012). Now there is increasing attention being paid to the empowerment of women through agriculture, as it employs a significant percentage of rural women (Alkire et al., 2012).

Globalisation and an agricultural industry evolving towards more efficient and better paying value chains offer different opportunities to farmers, worldwide (Jaffee et al., 2011). However, most female smallholder farmers may not have the necessary skills to compete effectively with their male and commercial counterparts. Current farmer empowerment programmes largely focus on supplying farmers with resources, credit and marketing schemes, but this has had mixed results (Chitja and Mabaya, 2015, Friis-Hansen and Duveskog, 2012, Chikozho, 2005, Bingen et al., 2003). Establishing the female farmers' level of empowerment and the domains requiring work could help in the quest to enhance agency sustainably (Meinzen-Dick et al., 2014). To the authors' present knowledge this approach has not yet been attempted in rural irrigation scheme communities in Limpopo Province. The objectives of this paper are: 1) to determine the level of empowerment among female farmers in Limpopo smallholder irrigation schemes, using a modified Women Empowerment in Agriculture index (mWEAI) and its two sub-indexes (Five Domains of Empowerment (5DE) index and the Farmer Gender Parity Index (FGPI); and 2) to establish the empowerment indicators which contribute to female farmer market access.

5.2. Literature Review

5.2.1. Empowerment

Empowerment has many definitions. Ibrahim and Alkire (2007) identified 29 working definitions of the concept of empowerment. This study adopts the Alsop *et al.* (2006) definition: which defined empowerment "as a group's or individual's capacity to make effective choices, that is, to make choices and then to transform those choices into desired actions and outcomes." Recurring themes in most definitions are the importance of exercising agency, control and access to resources. This study adopts Alsop's empowerment framework which emphasizes the role of asset-based agency and institutions-based opportunity structure in shaping empowerment (Alsop et al., 2006).

5.2.2. Asset based agency

Many authors stress the importance of agency in the empowerment discourse (Meinzen-Dick et al., 2014, Alkire et al., 2012, Hennink et al., 2012, Ibrahim and Alkire, 2007, Malhotra and Schuler, 2005, Kabeer, 1999). Agency can be defined as 'an actor's ability to make meaningful choices and consider and purposively choose among options (Alsop et al., 2006)'. Although decision-making is a core component of agency, it also includes self-identity (Hennink et al., 2012) and the ability to transform decisions into actions (Hennink et al., 2012, The World Bank,

2012). This concept is derived from Sen's human agent 'who acts and brings change, and whose achievements can be achieved in terms of her own values and objectives' and demonstrates that the disempowered have a critical role to play in their empowerment (Malhotra and Schuler, 2005). Empowerment is synonymous with the expansion of agency (Ibrahim and Alkire, 2007). As with empowerment, women experience agency differently across domains; thus an increase in agency in one domain will not automatically result in an increase in another (Alkire et al., 2012, Ibrahim and Alkire, 2007).

Having access to, or owning, resources is a prerequisite to exercising agency for smallholder farmers (Alkire et al., 2012, Mahmud et al., 2012), although it does not guarantee agency. Women who own or control resources have more economic opportunities, bargaining power, a voice and options during shocks or if they need to leave a bad marriage (The World Bank, 2012). Without secure access to productive resources, women become dependent and may lose their ability to make independent decisions (Tripathi et al., 2012). Secondary access to land and water, and insecure tenure, may limit the women's planting and investment options in the land they use (Agarwal, 2003). It may be for this reason that when women earn their own income, they purchase their own assets (Meinzen-Dick et al., 2014, The World Bank, 2012).

It has been shown that capabilities can influence agency. Cauce (2012) states that everyone has capabilities which, when realised increase agency. Education is shown as a basic capability which promotes agency and freedom (Cauce and Gordon, 2012). It has been shown that activities which improve knowledge and skills to earn income cultivate agency (Hennink et al., 2012). Education and increased access to knowledge have also been shown by Alsop *et al.* (2006) to build one's ability to envision a better life. Building these psychological assets may increase the capacity of an actor to challenge inequalities and injustices which may be accepted as cultural, or even, normal (Alsop et al., 2006). Although education is important, it does not always result in empowerment because it does not always lead to changes in power structures (Anyidoho and Manuh, 2010) but it is a necessary ingredient. Alsop *et al.* (2006) also show that while assets can built agency individually, they can also interact to strengthen the acquisition of other assets which are also critical for agency building. Studies have shown that when women are educated beyond secondary school level, are more likely to be empowered than those who are not (Hanmer and Klugman, 2016). Women who are more educated are likely to be able to access

more information, work outside and have increased bargaining power in the household (Meinzen-Dick et al., 2014).

Women's ability to exercise agency can be constrained by time. In most cultures, caregiving is a female domain and reduces women's time and physical mobility (The World Bank, 2012). The time and labour devoted to reproductive work may restrict women from engaging in more profitable enterprises, thus limiting their agency (Tripathi et al., 2012). For instance, some women in a Papua New Guinea case study could not attend training sessions because of caregiving and household duty commitments (Cahn and Liu, 2008).

Finally, collective action is an important asset which can grow women's agency and transform society (The World Bank, 2012). Women can influence their communities through informal groups and collective action (The World Bank, 2012). This platform gives them an opportunity to access resources, share information and knowledge, market produce, and increases their bargaining power. More importantly, it gives them the opportunity to lead and make decisions (The World Bank, 2012). This is important because it shows them and the community that women can be good and effective leaders.

5.2.3. Institutions-based opportunity structure

In addition to agency, the institutional environment is a key component of empowerment (Ibrahim and Alkire, 2007). Ideally, the institutional environment offers an opportunity structure which allows one to exert agency fruitfully (Alsop et al., 2006). The opportunity structure is made up of a mixture of formal and informal institutions which govern and regulate the interactions of different actors (Alsop et al., 2006). However, not all institutions are the same, as some can hinder the exercise of agency (Ton, 2008). The institutional environment is a product of local institutions and social norms which may enhance or hinder empowerment (The World Bank, 2012). Markets, institutions and norms are said to determine the 'endowments and opportunities individuals have' and the extent to which they can use these (The World Bank, 2012). Farmers' social positions give them different functions and access to resources (Battilana, 2006); therefore different opportunities to make decisions and exercise agency. Due to women's largely secondary position in patriarchal communities, they may have fewer opportunities to exercise agency (The World Bank, 2012). Prevailing norms which govern

women's knowledge and behaviour may also limit women's aspirations (Field et al., 2010) and, in turn, their exercise of agency. Women who defy the norm, and in some instances the men who enable them to do so, may face penalties which may deter women's expression of agency (The World Bank, 2012, Ibrahim and Alkire, 2007). The arena for exercising agency can be defined by showing women how they cannot engage in some business activities (The World Bank, 2012, Ibrahim and Alkire, 2007). This may have negative implications for rural female farmers who reside in patriarchal communities.

5.2.4. Women empowerment in South Africa

Women empowerment in South Africa has largely focused on urban, professional women and the general economic empowerment of women (Patel et al., 2015, Fultz and Francis, 2013, Kongolo and Bamgose, 2013, Bentley, 2004, Oberhauser and Pratt, 2004) but studies in agricultural empowerment are now emerging (Sharaunga et al., 2016, Sharaunga et al., 2015, Kehler, 2013). Although the South African Constitution includes a section on gender equality (Republic of South Africa, 1996), rural South Africa is largely under traditional authority where patriarchal culture and social norms prevail (Murugani et al., 2014). Certain cultural practices and social norms have significantly contributed to the poverty and disempowerment of women. It is acknowledged that rural South African women are worst affected by poverty (O'Laughlin et al., 2013). This is a result of predominantly male migration, which left women responsible for community and social services and the informal and agricultural sectors, with only remittances as a source of income (Oberhauser and Pratt, 2004). Consequently rural women perform predominantly non-market reproductive duties with only 35% of their activities falling in the market category (Bentley, 2004). Although rural women could earn some money from their informal work (Moyo and Francis, 2012) and state grants (Patel et al., 2015, Neves and Toit, 2013), they largely remain dependent on their male relatives. This has created tension between the male worker and his dependent wife or female relative (Oberhauser and Pratt, 2004).

Recognising this inequality, the South African government launched policies and projects such as the 1997 Declaration of Gender and Development, the 1998 Agricultural Policy in South Africa, among others (Moyo and Francis, 2012, Thabethe and Mathe, 2010). However, such policies and strategies have resulted in little transformation and improvement in women's livelihood activities (Thabethe and Mathe, 2010). These limited successes were attributed to

nominal female membership in projects with little transformation at collective and social levels. Other factors include high levels of illiteracy among female group members, little decision-making power and autonomy, gendered division of labour and poor access to basic services which disadvantage women (Kehler, 2013, Thabethe and Mathe, 2010, Oberhauser and Pratt, 2004).

5.3. Methodology

5.3.1 Site selection

Limpopo Province is in the north of South Africa and borders Botswana, Mozambique and Zimbabwe. It has five districts, Capricorn, Mopani, Sekhukhune, Vhembe and Waterberg. The Province occupies an area of 125 754km², has a population of 5.4 million and has the lowest annual average household income in South Africa (Statistics South Africa, 2012a). Limpopo Province is also home to some of the poorest people in South Africa, together with the Eastern Cape and KwaZulu-Natal (Statistics South Africa, 2014). The province is largely rural, with the majority of households based in rural areas (Statistics South Africa, 2012a). Agriculture thus plays an important role in rural livelihoods. This is further demonstrated by the abundance of irrigation schemes in the province (Van Averbek et al., 2011) and the high number of extension personnel active in the province (Aliber et al., 2010). The three irrigation schemes were selected purposively from three different districts, on the basis of having similar irrigation technology and consistent production. The communities were also located in rural communities under Tribal Authority and female farmers made up a significant number of the farmers in all schemes.

5.3.2 ‘Measuring’ empowerment

Due to its complexity and bearing different meanings for different people, empowerment has traditionally been difficult to measure (Alkire et al., 2012, Alsop et al., 2006, Malhotra and Schuler, 2005, Kabeer, 1999). The World Bank developed a framework to guide the measurement of empowerment in 2006. This was centred on the importance of agency and the opportunity structure (Alsop et al., 2006). However, this framework only measured general empowerment. In 2012, IFPRI and the OPHI announced an index to measure empowerment in The United States Agency for International Development (USAID) projects. This measures empowerment in five domains: production, access and control of resources, income, leadership

and time satisfaction (Alkire et al., 2012). This index is made up of two sub-indices, the Five Domains of Empowerment (5DE) and the Gender Parity Index (GPI) (Alkire et al., 2012). It can be broken down into age, region and level of education, among other variables (Alkire et al., 2012).

Although the WEAI is useful for determining empowerment, it has some limitations. Firstly, the index focuses only on women who are decision-makers in the household and their empowerment levels may not reflect those of the other women in the household (Malapit et al., 2014). Secondly, some women may not be involved in agricultural decision-making, but may make decisions in other domains. This would give a false indication of disempowerment (Malapit et al., 2014). Third, women residing in female-headed households may display empowerment when decisions are considered, yet this may not be true (Malapit et al., 2014). Other domains which are not captured in the WEAI may be more important for other outcomes of interest. The index also does not factor in the size of plots and the value of agricultural assets; neither does it factor in the effect of having agricultural skills in production (Sharaunga et al., 2015).

5.3.3 Questionnaire design and data collection

A single questionnaire was designed by combining individual and household modules from the original WEAI questionnaires into one questionnaire, to allow for the simultaneous collection of both household and individual data. Some modules which focused on health and gender-based violence were omitted as they did not fit in with the general focus of the study. Some questions were modified for ease of translation and the time use data was largely estimated, as it was found that the farmers did not refer to time during the course of their day.

The data was collected in December 2013 from the farmer working on the field. Due to the prevalence of male migration out of the communities, most households are *de facto* female-headed households (Statistics South Africa, 2014). The nature of smallholder agriculture in rural South Africa resulted in most respondents being female (Baiphethi and Jacobs, 2009). The male respondents were interviewed and their data included in the analysis to provide a comparison of the empowerment scores of male and female farmers in the study and to allow for the construction of a gender parity index of female and male farmers (the methodology is explained below).

5.3.4 Data Analysis

Calculation of individual scores

The index was constructed using the manual and the processes were adapted for SPSS. Five domains (production, control and ability to make decisions on assets, control and decision-making over income, leadership and time use satisfaction), each with equal weight, and their indicators were used to generate the Five Domains of Empowerment (5DE) scores. Table 5.1 shows the 5DE and their weights following the WEAI.

Table 5.1: The Five Domains of Empowerment (5DE) Index

Domain	Indicator	Weight
Production	Input in productive decisions	1/10
	Autonomy in production	1/10
Resources	Ownership of assets	1/15
	Purchase, sale or transfer of assets	1/15
	Access to and income on credit decisions	1/15
Income	Control over use of income	1/5
Leadership	Group membership	1/10
	Speaking in public	1/10
Time	Workload	1/10
	Leisure	1/10

(Source: Alkire *et al.*, 2012)

For these indicators a respondent was considered adequately empowered if they could make a sole decision or were part of the joint decision-making process. For the production domain, two indicators were used: 1) input into productive decisions; and 2) relative autonomy (Alkire *et al.*, 2012). To determine if a respondent was adequately empowered, their input into the sub-indicators, food crop production, cash crop production and livestock farming, was considered (Alkire *et al.*, 2012). If the respondent had input in at least two of the sub-indicators they were considered adequately empowered (Alkire *et al.*, 2012). With respect to autonomy in production, the respondents were deemed adequately empowered if they were empowered in at least one of the areas (Alkire *et al.*, 2012).

To determine control over productive resources, three indicators were used: 1) ownership of assets; 2) decision-making about productive resources; and 3) access to, and decision-making about credit (Alkire *et al.*, 2013a). For ownership of assets a respondent was considered

adequately empowered if they had sole or joint ownership of a major asset (Alkire et al., 2013a). Individuals who lived in a household without any assets were considered inadequate for the indicator (Alkire et al., 2013a). For the ‘purchase, sale or transfer of (agricultural productive) assets’ a respondent was considered to be empowered if they could make sole or joint decisions (Alkire et al., 2013a). For all assets, the sub-indicators were aggregated and a respondent was adequately empowered if they had rights over two assets (Alkire et al., 2013a). Finally, for access, to and decision over, credit, a respondent was deemed adequately empowered if they had had participated in at least one decision (Alkire et al., 2013a).

Thirdly, to determine the respondent’s control over income, two sub-indicators were used to determine one’s empowerment adequacy. These were the input a respondent made into decisions about income generated from food crops farming, cash crops and livestock farming and the extent to which a respondent felt they could make decisions about their wage/salary employment and major and minor household expenses (Alkire et al., 2013a). The respondent was deemed adequately empowered if they were empowered in at least one of the sub-indicators, excluding minor household expenses (Alkire et al., 2013a).

Fourth, to establish a respondent’s leadership and influence in the community, two indicators were used as proxies: 1) active membership in community groups; and 2) comfort with speaking in public (Alkire et al., 2013a). For the group membership indicator, a respondent had adequacy if they were a member of at least one organisation (Alkire et al., 2012). For the ease to speak in public indicator, respondents were considered adequately empowered if they felt comfortable speaking for one of the questions (Alkire et al., 2013a).

Finally, regarding the time domain, workload and leisure were the two indicators used. To establish the amount of time the women spent at work, they were asked to recount their activities and estimate the amount of time they spent carrying them out (Alkire et al., 2013a). A respondent was considered adequately empowered if they had spent at most 10.5 hours working on a normal day (Alkire et al., 2013a). For the second indicator, the respondents were asked if they were satisfied with their leisure time. A respondent was deemed adequately empowered if they were satisfied (Alkire et al., 2013a).

Compiling individual scores

Each indicator was assigned a value of 1 if the respondent’s achievement was adequate (Alkire et al., 2013a). The empowerment or adequacy score for each respondent was created with the weighted average of the score using the weights in Table 5.1. A woman was considered empowered if she had adequate achievement in four of the five domains, or scored 80% adequacy in some combination of her weighed indicators (Alkire et al., 2012).

Calculating the 5DE index

To determine the 5DE index of a community, the following formula was used:

$$5DE = \% \text{ of empowered women} + (\% \text{ of disempowered women} \times \% \text{ adequacy of disempowered women})$$

i.e. $5DE = (1-H) + [H \times (1-A)]$ (1)

Calculating the Farmer Gender Parity Index (FGPI)

The method used to calculate the FGPI was modified from the one used to calculate GPI at household level in the WEAI manual. This modification was proposed due to the prevalent male migration from the study areas, which made it impossible to collect the data of the primary male in most households. First the researcher determined which respondents were adequately empowered (achieved 80%), based on their 5DE scores. Second the 5DE score for men in each community was averaged (mean) to provide an empowerment score to compare with the individual 5DE score of female farmers in the respective community. While it is acknowledge that the mean is sensitive to outliers, the mean was chosen over the median because it would factor in the scores of all the male respondents. Third, SPSS was used to compute the difference between individual female farmers and the average male farmer in their community. The WEAI manual computed the difference between the primary male and female in the household (Alkire et al., 2013a) The differences were compared and those farmers who had the same 5DE score as the average male farmer or higher were considered at par with their male counterparts (Alkire et al., 2013a). The percentage of these women was determined to be 51.2%. In addition, for women who were not at par with their male colleagues, the differences between their score and the mean score of the average male farmer in their communities and a ‘farmer gender gap’ was computed for all three communities. These three figures were recorded and their mean was computed, to

allow for the average gender gap in the study area to be determined. This mean was used to calculate the gender parity index for the three study sites, while the three community-specific gender gaps were used to calculate the FGPI for the respective communities.

2. Farmer GPI = 1 - (% of female farmers without gender parity x % average farmer empowerment gap)

i.e. FGPI = 1 - (HFGPI x IFGPI) (2)

The overall modified WEAI and the WEAI for the different communities was calculated by following the formula given below, as shown in the manual:

3. WEAI = (0.9 x 5DE) + (0.1 x FGPI) (3)

To determine which empowerment indicators were associated with female farmers who sold their produce, the indicators of empowerment were cross-tabulated with market access and the chi-square statistic was selected.

5.4. Results And Discussion

This study was conducted to determine the level of empowerment among smallholder farmers in three communities in Limpopo Province. The objectives of this paper were to: 1) use the WEAI and its two sub-indexes to measure the empowerment of rural Limpopo women involved in agriculture as at December 2013; and 2) to identify indicators which are linked to female farmer market access.

5.4.1 Demographic data and 5DE scores

Two hundred and twenty-six respondents were interviewed from three communities. Table 5.2 shows that 71.7% of the respondents were female. The farmers in this survey were mostly over the age of 45 years and more than half of the farmers in this range were over the age of 60 years. In contrast, a very small percentage of the farmers in the study were younger than 25 years. These findings are consistent with the literature on South African smallholder agriculture, which shows that it is largely pursued by elderly women (Aliber and Hall, 2012). The absence of the youth could indicate that in these communities smallholder agriculture is not a preferred livelihood activity for that age group.

Table 5.2: Smallholder Respondent Characteristics

Smallholder Characteristics	Mafefe (%)		Steelpoort (%)		Rambuda (%)		Total (%)	
	Women	Men	Women	Men	Women	Men	Women	Men
Sex Respondent	77.2	22.8	80.7	19.3	64.3	35.7	71.7	28.3
Irrigation scheme membership								
Yes	72.7	61.5	89.1	81.8	73.6	67.5	77.8	68.8
No	27.3	38.5	10.9	18.2	26.4	32.5	22.2	31.3
Age								
≥25 years	4.5	0	0	0	1.4	2.5	1.9	1.6
26 - 45	20.5	7.7	13.0	0	28.2	22.5	21.7	15.6
46 – 60	31.8	23.1	26.1	27.3	39.4	17.5	33.5	20.3
< 60	43.2	69.2	60.9	72.7	31.0	57.5	42.9	62.5
Education Level								
None	25	7.7	56.5	36.4	26.8	10	34.8	14.1
Primary	52.3	53.8	30.4	36.4	18.3	12.5	31.1	25
Secondary	22.7	38.5	13.0	27.3	53.5	77.5	33.5	60.9
Tertiary	0	0	0	0	1.4	0	0.6	0
Marital Status								
Single	27.3	7.7	23.9	0	17.9	17.6	19.5	12.1
Married	40.9	84.6	52.2	90.9	46.3	73.5	55.3	79.3
Widowed	29.5	7.7	21.7	9.1	34.3	5.9	23.3	6.9
Divorced	2.3	0	2.2	0	1.5	2.9	1.9	1.7
Literate								
Yes	52.3	84.6	41.3	54.5	56.9	82.5	51.2	78.1
No	47.7	15.4	58.7	45.5	43.1	17.5	48.8	21.9
Market Access								
Yes	68.2	76.9	82.6	100	72.7	70	74.1	76.6
No	31.8	23.1	17.4	0	27.8	30	25.9	23.4

Although 65.2% of the women had attained at least some level of primary education, only 51.2% of the female farmers were literate. Of the males 85.9% had attained primary education and 78.1% were literate. The higher percentage of educated men implies lower access to educational resources and opportunities by women in general. Most of the respondents were married and belonged to the irrigation scheme. Finally, about three-quarters of the sample sold their produce in formal and informal markets.

Table 5.3 shows that 56.5% of the women were adequately empowered, since they had scored at least 80% in the Five Domains of Empowerment (5DE). Mafefe had the highest number of empowered women followed by Rambuda. Steelpoort was the only community where fewer than 50% of the women were empowered. Only half of the male respondents had achieved a score of 80% or more in the 5DE. The highest proportion of empowered men resided in Mafefe. Interestingly, the proportion of empowered women in Rambuda and Steelpoort was higher than that of the males. This seems to contradict the arguments in literature which views men as more empowered than women because of their higher access to productive assets and social capital (Meinzen-Dick et al., 2014). This can be partly explained by an evolution of land access and agricultural institutions in South Africa which recognise women as farmers and household heads (Claassens, 2013). More research, with a larger sample, is needed to explore the robustness of the findings.

Table 5.3 also shows that 51.2% of the female farmers had parity with the average male farmer in their community. The Farmer GPI index was high, which shows that there was not much difference between male and female farmers in the sample. The modified WEAI for all three communities was above 0.8, which is considered high according to a WEAI report comparing findings across different Feed the Future (FTF) zones in Asia, Africa and Central America (Malapit et al., 2014).

5.4.2 Demographic properties and Empowerment domains

Although Table 5.3 shows the differing levels of empowerment in the communities, these differences were not significant, suggesting that, while there may have been factors in the communities which could have promoted or hindered empowerment, these were not statistically significant. Another interesting observation was that men and women working in the irrigation schemes had lower empowerment scores than their dry-land colleagues. This is surprising, since

Table 5.3: Women empowerment head count and Five Domains of Empowerment (5DE)

Indexes	Overall		Mafefe		Steelpoort		Rambuda	
	Women	Men	Women	Men	Women	Men	Women	Men
Disempowered headcount (H)								
Empowered headcount (1-H)	56.5%	50%	63.6%	92.3%	43.5%	36.4%	58.3%	40.0%
Average adequacy scores (1-A)	68.24%	64.37%	68.13	66.67	66.15	60.95	70.11	65.28
Inadequacy adequacy scores (A)								
Disempowerment Index (M0 =HxA)								
5DE Index (1-M0)	0.8679	0.817	0.884	0.974	0.808	0.7516	0.875	0.792
No. of observations used	161	64						
Total observations								
% of women without gender parity (H _{GPI})	48.8%		94.9		80.2		74.1	
% of women with gender parity (1- H _{GPI})	51.2%		5.6		19.8		25.9	
Average Empowerment Gap (I _{GPI})	10.33%		10.56		15.74		4.67	
FGPI	0.949		0.899		0.874		0.966	
No. of observations used								
mWEAI (0.9x 5DE +0.1xGPI)	0.86		0.886		0.815		0.884	

it would have been assumed that belonging to a group would lead to empowerment. It is possible that while it improved access to government agents and input support, belonging to the irrigation scheme may have limited the decisions farmers could make about land, water and other resources they accessed through the group. This could have been the case in instances where their plans went against the groups' rules and regulations. However, the differences in empowerment score were not significant. There was no link between education and empowerment in this study, which seems to support the premise that empowerment is about achievement, not education alone.

5.4.3 The contribution of the 10 indicators to women's empowerment

Over 90% of the women in this study were empowered in the income, autonomy, asset ownership, purchase, sale or transfer of assets and group participation indicators. Women were considered empowered in the income indicator if they participated in making decisions regarding income generated from food and cash crops, livestock and other household income. Their ability to make individual decisions regarding major household expenditure was also considered. Table 5.4 shows that all the women in this study were empowered in income indicator. This is significant for women's agency and decision-making in the household and community as Jeckoniah et al. (2012) and Mahmud and Tasneem (2014) show that women with access to income are more empowered. They add that these women can challenge oppressive social norms due to increased agency (Mahmud and Tasneem, 2014, Jeckoniah et al., 2012).

These high levels of adequacy for the income indicator differ significantly with the other WEAI findings, which found that the income indicator largely contributed to women's disempowerment (Malapit et al., 2014). In the South African context, adequacy for this indicator can be explained by the effects of historical male migration, which resulted in de facto female household heads gaining increasing responsibility over financial administration at household level (Oberhauser and Pratt, 2004) Many women participate in financial decision-making in the household partly due to receiving the government child and pension grants for children under 18 years which is usually allocated to their primary caregiver and women over the age of 60 years respectively (Neves and du Toit, 2013). In the present study, 87.7% of the female respondents belonged to a household which received a grant, which made them responsible for administering this money.

Table 5.4: Indicators in The Five Domains of Empowerment (5DE) index

Indicators	Mafefe Adequacy (%)	Steelpoort Adequacy (%)	Rambuda Adequacy (%)	Total Adequacy (%)
Production				
Input in productive decisions	70.5	47.8	52.8	56.2
Autonomy in production	100	100	100	100
Resources				
Ownership of assets	95.5	89.1	94.4	93.2
Purchase, sale and transfer of assets	95.5	91.3	100	96.3
Access to and decisions on credit	22.7	8.7	19.4	17.3
Income				
Income	100	100	100	100
Leadership				
Group participation	97.7	100	98.6	98.8
Public speaking	77.3	65.2	80.6	75.3
Time use				
Workload	70.5	67.4	81.9	74.7
Leisure	34.1	39.1	41.7	38.9

Finally, since the majority of female farmers sold their produce, it is likely they controlled how this money was used. These three factors contributed to women's empowerment in this indicator.

All the women in this study were adequately empowered regarding the Autonomy in Production Indicator as they felt that they were not coerced into taking part in agricultural production for fear of physical harm or the need to please an external individual. This is interesting, given that only 56.2% of the women were adequately empowered in the input in productive decisions domain. This could be because the women felt that carrying out production fell under their duties as wives and mothers to provide food for their households (Kabeer, 1999). Some respondents in an earlier study cited production as the only means to ensure food availability, considering the high unemployment levels and prevailing income poverty in the communities (Murugani et al., 2014). Agriculture for them was a way of life and a means of survival, so it was essential that they take part in agriculture for the benefit of their households. Without engaging in agriculture, most households would rely on meagre child and old-age social grants for survival. Finally, it could be attributed to women implementing the decisions agreed on by the household head and this would support what Ambunda and de Klerk (2008) and Kabeer (1999) show. Since sole and joint decision-making are weighted equally in this study, it could mask the true level of women's empowerment. The male household head could decide on the crops to be planted, but could delegate the procurement, planting, field selection and day-to-day activities to the woman. This could reflect the social norms and different roles allocated to men and women regarding crop production. This is what Kabeer (1999) terms control vs. management decisions.

Group participation was a significant contributor to women empowerment in the study. Adequacy in this indicator shows that most of the women were members of at least one group in their community. Women mostly belonged to burial societies (93.2%), religious organisations (87%) and the irrigation scheme, suggesting that women had strong social networks which they could use to access important information and other resources for the enhancement of their agency. This confirms the findings of other WEAI reports for sub-Saharan African countries (Malapit et al., 2014) and other South African studies (Mudimeli, 2011, Thabethe and Mathe, 2010, Oberhauser and Pratt, 2004). Attending group meetings possibly gave the women an opportunity to join together, share information and deal with their social problems (Tripathi et al., 2012). Women's groups are an important source of social capital and allow woman to

interact with other women who may have important information about health practices, child-care and other beneficial issues (The World Bank, 2012). It was also an opportunity for them to participate in public life and acquire some decision-making skills, since some of them had leadership positions in the irrigation scheme and other organisations (FAO, 2015). Only 14.2% of the female farmers interviewed in this study had a leadership position in a local community group. This is significant for the development of a social network and leadership skills for the leader. It also made other women realise that women could lead. Yet it also leads one to question the opportunities available for capable women to lead organisations in rural communities. For instance, some churches in the communities were African indigenous churches, which had a strong patriarchal doctrine, amplified by a patriarchal community. Women had little opportunity to lead, except in women's meetings. These findings are echoed by Mudimeli (2011) who says, *"It was evident that in this particular church, women could only be leaders of other women and could only become members of the church board ... If a man decided to join the church, then the woman who was in a certain position because there had not been enough men, would be requested to stand aside to give the man his rightful position."* Although women constituted the majority of members in some organisations, such as the church, most positions of authority were held by men (Mudimeli, 2011). This could be based on prevailing patriarchal attitudes, which may limit the women's access to positions of power. Without giving women the opportunity to lead, women may never believe they are capable of leading (The World Bank, 2012).

For the asset ownership indicator, most women were adequately empowered, as they either solely or jointly owned a major asset e.g. land, a house, agricultural equipment or means of transportation (Table 5.4). Asset ownership increases the agency of a respondent. This was largely similar to the WEAI reports in other studies (Malapit et al., 2014). The literature showed that women or communities with assets are more likely to be empowered (Trommlerová et al., 2015). This has been attributed to asset ownership strengthening a woman's bargaining power in the household and it opens different empowerment opportunities (World Bank Institute, 2007). In addition, women who own assets often use them to further their own ambitions and household goals (FAO 2015). The importance of assets to women is shown in that when women earn income, they invest it in assets which they can use for other income-generating activities to cushion their households in times of shock and to leave a bad marriage (FAO 2015; World Bank 2012).

Speaking in public contributed to the empowerment of 75.3% of the women in the sample (Table 5.4). These seem to suggest that women are comfortable speaking about different issues relating to community development. This high percentage of women who speak for themselves denotes high confidence and, possibly, agency in the respondents. This is in contrast to what Walker (2003) and Ambunda and de Klerk (2008) had observed, where women would generally not speak in the presence of their male counterparts. Such behaviour was attributed to women's upbringing in patriarchal communities which suppress women from speaking out. This change could be due to a possible shift in how society in Limpopo Province expects women to conduct themselves. This would improve the interaction of the farmers with their extension officers and possibly marketing agents.

Finally, the women in this study were adequately empowered in terms of their workload, as the majority of them had worked for 8.6 hours in a day, which is less than the 10.5 hours a day threshold. Their days started at dawn and they were mostly involved in labour intensive work on the farm and in the household. Achieving this adequacy was, in part, attributed to the use of field labourers, particularly in the Rambuda community.

5.4.4 5DE Indicators contributing the least to women's empowerment

Access to credit and leisure had the least number of adequately empowered respondents (Table 5.4). This contributed least to women's empowerment. Only 17.3% of the women in the study were empowered with regards to making decisions about credit in their households. This mirrors the results of the WEAI comparison across FTF projects (Malapit et al., 2014). Access to credit made the smallest contribution to empowerment. The largely qualitative data which was collected in August 2013 in this study shows that the respondents reported having little access to formal institutions offering credit at suitable rates and terms. This was compounded by very few respondents having bank accounts, as they did not have regular income. There seemed to be a unanimous agreement among the farmers that they were ineligible for formal credit services and they questioned their ability to repay the loan in a timely manner. Informal money-lenders gave loans in these communities when friends and family could not assist. The farmers said they preferred not to borrow from money-lenders because of their very high interest rates. This poor access to credit disempowers farmers, as it restricts investment in improved inputs and

equipment, the payment of labourers, postharvest processing and market access (Poulton et al., 2010).

Finally, the leisure time indicator also made a small contribution to women's empowerment. This can be related to their working consistently throughout the year. Since most women worked for 8.6 hours on a typical day, it left them with little time to devote to group activities outside the church or other essential activities. This confirms what is shown in the World Development Report. Other literature shows that women will only engage in activities and assignments that can accommodate their time constraints (Tripathi et al., 2012, The World Bank, 2012, Duflo, 2011). Working on an irrigation scheme meant that most women were involved in consistent production all year round and this did not leave them with opportunities to pursue other lucrative off-farm opportunities. Furthermore, younger women and some older women had other household and caregiving work to attend to before going to the field and after coming back home. Limiting women's ability to work, negatively affects their ability to earn autonomous income thus reducing empowerment (Duflo, 2011).

5.4.5 Empowerment indicators and market access

Table 5.5 shows that the following indicators, input in productive decisions and speaking in public, and have a significant relationship with female farmers whose households have market access at $p < 0.05$ and 0.01 respectively. Women who were adequately empowered in the 'input in productive decisions' indicator were more likely to sell their produce ($\beta=5.674$, $p=0.017$). This could be because they had some influence in how the produce was disposed of. Similar observations were made among female onion farmers in Simanjiro, Tanzania (Jeckoniah et al., 2012). Increased female decision-making in productive decisions could benefit female farmers if they could also control income. Women who were adequately empowered in the 'speaking in public' indicator were more likely to sell their produce ($\beta=9.390$, $p=0.002$). This is expected because speaking in public is a reflection of confidence in the female respondent.

Table 5.5 Correlation of households which sell and empowerment variables

Empowerment Indicator	Chi-square	p-value
Input in productive decisions	5.674***	0.017
Autonomy in production	2.875***	0.090
Ownership of assets	0.669	0.413
Purchase, sale and transfer of assets	2.181	0.140
Access to, and decisions, on credit	2.388	0.122
Group participation	0.611	0.434
Public Speaking	9.390**	0.002
Workload	0.067	0.795
Leisure	0.060	0.806

Notes***=p<0.05, **p<0.01

Autonomy in production was also significantly associated with market access ($\beta=20.875$, $p=0.090$). This could be a result of the female farmers being motivated to produce enough to feed their families and to earn extra income. This can be attributed to women being motivated to produce crops that they knew they would be able to control and possibly also control the income generated from these. This is consistent with literature (Manfre et al., 2013, Quisumbing and Pandolfelli, 2010). Generally the money was little and was earned from small daily sales of farm produce, as shown in Chapter 4. This money which trickles in daily is controlled by women and, while it is not recorded, is used for small daily purchases. Increasing the money that women handle from their own sales could raise the number of women with adequacy in this domain. It would also reflect true empowerment, as this seems to be a traditionally male domain in the developing world. Many studies have shown that when women earn their own income and can decide how to use it, they are better empowered and gain self-esteem in the household and in the community (Mahmud and Tasneem, 2014, The World Bank, 2012). In some instances this has resulted in women being able to challenge the social norms which they find restrictive (Mahmud and Tasneem, 2014, Jeckoniah et al., 2012).

These indicators could be correlated to market access because they are associated with increased decision-making capacity in the respondent, both at community and household level. These levels of responsibility can increase agency and self-esteem in the farmer, which is essential for marketing. This supports Vorley et al (2012) who found that increased confidence resulted in increased expression of agency. Leadership also allows the women to network with local and external individuals and groups, thus increasing their access to information, resources and

opportunities. While it may have been expected that women with adequacy in the group participation and time indicators would have a correlation with market access, it was not established in the present study.

5.5. Conclusions And Recommendations

Empowering women in agriculture can contribute to rural development. It is known that women as smallholder farmers have less opportunities to access productive resources than male farmers due to patriarchal institutions and social norms. The markets have the potential to increase income in smallholder agricultural households but these are normally reserved for male crops. This study contends that agricultural development the current institutional environment could deepen women's disempowerment. Transformed institutions are required which view women as farmers. Although women's disempowerment is acknowledged, it has traditionally been difficult to measure. This study used the recently developed WEAI to determine empowerment in three smallholder irrigation scheme communities in Limpopo Province. The study had two objectives, first to measure empowerment using the 5DE, FGPI and mWEAI. Second, to establish if there is an association between women empowerment indicators and market access.

The study showed that 56.5% of the women in this study were empowered in at least 4 domains or had scored at least 80% in the 5DE. The study also shows that women who were not empowered were empowered in at least three domains. Fifty one point two per cent (51.2%) of the farmers had achieved gender parity with the average male farmer in their community. The overall mWEAI for the sample was 0.86 which can be considered as high.

Women in this study were adequately empowered in the income and autonomy in production domains which are normally disempowering to women. Seemingly money that enters the household through agricultural sales and government grants is controlled by women and this can increase their agency at the household and farm levels. Government interventions which increase women's access to markets could result in higher agency among women. Women were empowered in autonomy in production although less than 60% of them were empowered in the productive decisions indicator. This possibly reflects the importance of agriculture as a food source and deeply entrenched gender roles in determining livelihood activities. However, the need to feed the household may limit women to viewing agriculture as a source of food alone, when it can offer more livelihood opportunities.

Leisure and credit access contributed significantly to women's disempowerment in this sample. The low levels of leisure satisfaction in this study show that women bear the brunt of agricultural work alone with little input from their male relatives. This possibly takes away the time for them to imagine, reflect on and attempt any new income generating projects which they could engage in. There is need to bring in the youth and men resident in the communities who are absent from agricultural production. This could make production more profitable as they may have different ideas for market access fuelled by their market oriented gender roles. However, this must be done in ways which do not disempower women.

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CHAPTER SIX
WOMEN EMPOWERMENT IN AGRICULTURE AND HOUSEHOLD FOOD
SECURITY IN RURAL LIMPOPO PROVINCE

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Abstract

The link between women empowerment and food security has been proven in many studies when women empowerment was associated with education and health indicators. Empowered women are thought to have healthier children, with increased access to education opportunities. This study sought to investigate the link between women empowerment in agriculture and food security in the study area. In addition, the relationship between empowerment and food security was investigated. Data was collected using a modified WEAI questionnaire. The data was analysed to determine the empowerment levels and further analysed to establish the relationship between empowerment and food security. The results show that the communities were largely food secure, with an overwhelming majority reporting low incidence of hunger and achieving a high dietary diversity score. Furthermore, leadership, input into agricultural input decisions and some demographic qualities had a relationship with food security.

Key words: women, empowerment, food security

6.1. Introduction

It is acknowledged that a significant proportion of smallholder farmers worldwide are female farmers who may not own the productive resources needed for their work (Alkire et al., 2012, FAO, 2011). They produce most of the world's food, but remain food insecure. This, in part, has been attributed to them working on small farms, with poor adoption of improved technologies due to income poverty, weak institutions and their reliance on rain for agriculture (Koocheki, 2004, FAO, 2011). Even where smallholder farmers have access to irrigation water and production increases, food security is not guaranteed in the household (Sraboni et al., 2014, Domènech, 2015). Cash crops, which are normally controlled by male farmers, may benefit from irrigation at the expense of food crops, which are usually regarded as women's crops (Domènech, 2015). Women's secondary access to resources (inputs, irrigation water and labour) and reduced control is disempowering and may reduce female productivity and household food security.

Food security is said to exist “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2003).” As the definition of food security has evolved, it has become apparent that availability, access, utilisation and stability of access are key components (Jones et al., 2013, FAO, 2003). Agricultural production and food imports account for the food available in a country, but availability does not guarantee access (Jones et al., 2013, FAO, 2003). Instead, a household's entitlements, production, selling or bartering, working or receiving gifts, determine how it accesses food (FAO, 2003). In his seminal work on famine, Sen showed that famine can exist even when food is available in local markets, when the poor lack entitlements (FAO, 2003). Where it is not possible to produce food for a household, the markets and income are critical, but poor households may not have the opportunities to earn sufficient income (FAO, 2003). Significant work has been done on smallholder farmers, access to irrigation and food security, but to our knowledge, not much has been done to investigate the linkages between women empowerment in agriculture. This paper seeks to contribute to the generation of knowledge in this area.

6.2. Literature Review

6.2.1. Women empowerment and food security

Most smallholder farmers are women, yet their access to productive resources and opportunities is often limited by patriarchal institutions and prevailing social norms (Alkire et al., 2012, The World Bank, 2012, FAO, 2011). The potential gains of empowering women as smallholder farmers include increased production, income and money spent on household and child welfare (Malapit and Quisumbing, 2014, Sraboni et al., 2014, Duflo, 2011). These differences are attributed to the gendered division of responsibilities which have made the household and its maintenance a female domain (Midgley, 2006, Gartaula et al., 2010, Niehof, 2004). In most cultures, women are responsible for care-giving and household food preparation and when they have access to more assets and income, the proportion they spend on household food and children's education and health increases (Bhagowalia et al., 2015, Sraboni et al., 2014). For female smallholder farmers, when they control production they also control the produce and its disposal. More often than not some of this produce is consumed in the household (Domènech, 2015). When women are better educated, household food security and child nutrition improve. This is partly due to improved nutrition knowledge and the potential to earn more income (Duflo, 2011).

However, not all the outcomes of empowerment have a positive effect on household outcomes, including food security. For instance, when women empowerment results in women earning income, it may upset the gender dynamic in the household and lead to gender-based violence (Bolis and Hughes, 2016). Women who experience gender-based violence may not be adequately empowered to influence expenditure on their own or child welfare (Bhagowalia et al., 2015). Other examples include a reduction in the amount of money contributed to food consumption by the male household head, in response to an increase in the woman's earnings (Jeckoniah et al., 2012).

6.2.2. Women empowerment and food security in South Africa

Although South Africa is food secure, many rural and urban households suffer from chronic food insecurity (Baiphethi and Jacobs, 2009, Aliber and Hart, 2009a), which is caused by structural

poverty and low incomes (FAO, 2003). Limpopo, KwaZulu-Natal and Eastern Cape provinces are the poorest and most rural provinces in South Africa and experience more hunger and food security than other provinces (Kepe and Tessaro, 2014). Although smallholder agriculture is an important livelihood activity for farmers in these communities, production is marginal and accounts for a small percentage of food consumed in the household, as this is mostly additional food (Baiphethi and Jacobs, 2009, Aliber and Hart, 2009a).

The poorest and most food insecure South African households are predominantly found in rural areas and are mostly female-headed households. Research has revealed that female-headed rural households generally score less on food security measures than male-headed households (Tibesigwa and Visser, 2015, De Cock et al., 2013). Women own fewer assets and have access to fewer opportunities to earn money, as their work is mostly reproductive (Oberhauser and Pratt, 2004). This is a significant disadvantage, for them given the importance of markets in food access. As Baiphethi and Jacobs (2009) show, even when smallholder farmers have access to irrigation, more than 70% of their food comes from markets.

Although agriculture has been identified as a potential means of developing and empowering rural communities (Kepe and Tessaro, 2014), women's lower social status and weaker voices may limit their full participation. Women in agriculture generally have a low status, which is reinforced by their secondary status in patriarchal communities (Thabethe and Mathe, 2010). Token membership without real responsibility and the transformation of gender roles in agriculture will have limited empowerment effect for women in agriculture (Thabethe and Mathe, 2010). For instance, a community in KwaZulu-Natal was involved in an agricultural project, but most of the workers were women and most of the management was male (Thabethe and Mathe, 2010). Although the women performed most of the work, social institutions and norms which kept women in a secondary position were used to disempower the women (Thabethe and Mathe, 2010).

6.3. Methodology

6.3.1. Site selection

The study was conducted in Limpopo Province which borders Zimbabwe, Mozambique and Botswana. There are five districts in Limpopo Province and its total area accounts for about 10% of the area of South Africa (Statistics South Africa, 2012a). The 2011 Census estimates the provincial population at 5.4 million the majority being black Africans from the Sepedi, Tsonga and Tshivenda groups (Statistics South Africa, 2012a). There is a history of *de facto* female-headed households in the province, mainly due to the prevalent male migration (Statistics South Africa, 2012a). The majority of the province is rural and peri-urban, and Census 2011 showed that 16% of the household are engaged in agricultural production.

The study was conducted in three purposively selected irrigation schemes in Limpopo Province, each in a different district. The female farmers were purposively selected from farming households in the irrigation scheme and dry-land farming areas. Links between empowerment in agriculture and food security were investigated.

The data was collected from 162 women, using an adapted WEAI questionnaire. The data was collected from women, since they were more likely to be knowledgeable about food consumed in the household (Alkire et al., 2013a). The first parts of the questionnaire focused on demographic data, agency and decision-making in the household and agricultural activities and the last module focused on ‘consumption and consumption habits.’ This was in keeping with recommendations from the Food and Nutrition Technical Assistance (FANTA) manual, because of the sensitive nature of the questions (Ballard et al., 2011). A Household Hunger Scale questionnaire, with a 30-day recall period and seven-day recall food frequency questionnaire, with a source of food were used.

6.3.2. Measuring Empowerment

The Women Empowerment in Agriculture Index (WEAI) is the sum of two weighted sub-indexes; the Five Domains of Empowerment (5DE) and the Gender Parity Index (GPI) (Alkire et al., 2013a). The five domains of empowerment are production, resources, income, leadership and time. All domains have equal weight (Koocheki, 2004, Alkire et al., 2013a). The five domains have 10 indicators which feed into them, as shown in Table 5.1, and the detailed methodology is given in Chapter 5 (section 5.3.2).

Data from the WEAI questionnaire was first analysed to determine the Five Domains of Empowerment (5DE), the Farmer Gender Parity Index and the modified WEAI. This is shown in Table 5.3.

Table 5.3 shows that 56.5% of the women in the sample were empowered. A woman was considered empowered if she had an empowerment score of 0.8 and above.

6.3.3. Measuring Food Security

Many tools have been designed to measure food security. Due to its complexity, most tools only measure one of the four pillars of food security (production, access, utilization and stability of access) (Headey and Ecker, 2013). Several tools exist to measure food access and this study adopts the Household Hunger Scale (HHS) and a measure of household dietary diversity (Food Consumption Score).

The HHS is a tool that was developed and validated for cross-cultural use by FANTA. It is a shorter version of the Household Food Insecurity Access Scale (HFIAS), which proved difficult to use in different cultural contexts (Ballard et al., 2011). The HHS measures hunger in the 30 days prior to the survey because hunger is often conflated with food insecurity, (Jones et al., 2013, Ballard et al., 2011). It focuses on the food quantity dimension of food access. It should therefore complement other food security measures such as the household dietary diversity or anthropometric measures (Ballard et al., 2011). Ideally, it should be administered during or after the lean season, when food insecurity would be widespread (Ballard et al., 2011). The data was collected in December which coincides with times when hunger was experienced in the communities (De Cock et al., 2013).

The second part of the ‘consumption and consumption habits’ section in the WEAI questionnaire focused on the food that was eaten in a household during the previous seven days and the sources of the food. The table had a list of 17 food items, the number of days the food item was eaten and the main source of the food item. This data was used to construct the Food Consumption Score (FCS), which is a measure of dietary diversity in the household (WFP, 2008). The World Food Programme (WFP) has developed the tool because dietary diversity and food frequency are strong proxies for food security and food intake (WFP, 2008). The tool was developed in Southern Africa and has the following advantages: it is standardized, replicable data analysis in a

data set and it is also comparable between data sets (WFP, 2008). Its disadvantages are that it is assumed that it is applicable in different contexts and that the weights for different food groups and food consumption group threshold values, while standardized, are subjective choices (WFP, 2008).

6.3.4. Data analysis

To calculate the Household Hunger Score (HHS), the responses from the three frequency questions was recoded, so that the responses ‘rarely’ and ‘sometimes’ took the value 1 and ‘often’ took the new value 2. A new value, ‘0’, was added for those households which had responded ‘no’ to any one of the frequency questions. The responses for the three frequency questions were then added to create the HHS, variable whose scores ranged from 0-6. These variables were categorized as shown in Table 6.1.

Table 6.1: HHS Categories

HHS	Categories
0-1	Little to no hunger
2-3	Moderate hunger
4-6	Severe hunger

The seven day food frequency data was then used to compute the Food consumption score (FCS) using the prescribed WFP methodology as follows. First the food items were grouped into the follow food groups: main staples (2), pulses (3), vegetables (1), fruits (1), meat and fish (4), milk (4), sugar (0.5), oil (0.5) and condiments (0); the weights are given in parenthesis (WFP, 2008). Second the consumption frequencies of all foods in each group added together. If the frequency exceeded 7, the score was recoded to 7 (WFP, 2008). Third the frequency was multiplied by the weight for the group to create a weighted group score (WFP, 2008). The weighted group scores are added together to create a FCS variable. The scores were then recoded into the three profiles, using the threshold values shown in Table 6.2 The food frequency data was further analysed to show the frequency of consuming a given food.

Table 6.2: Food Consumption Profiles

FCS Score	Profiles
0-21	poor
21.5-35	borderline
>35	acceptable

In this study the food consumption profiles (poor, borderline and acceptable) were adopted as a proxy for food security. To investigate the relationship between food security and empowerment variables, Ordinal Logistic Regression was used, since the food security data was ordinal. Ordinal logistic regression is preferred when the dependent variable has more than two outcomes (Harrell, 2015). The empowerment variables used were generated from literature and are agricultural asset decisions, access to credit, production decisions, daily hours worked and leadership role (Alkire et al., 2012). In addition to the empowerment indicators, the following independent variables were used to predict the probability of a respondent falling in one of the three profiles: community, education level, age, marital status, irrigation membership, plot size, household size, sex of the household head, HHS profiles and monthly grant income; these were also sourced from the literature (Malapit et al., 2014, Sraboni et al., 2014).

6.4. RESULTS AND DISCUSSION

This study was conducted to investigate the linkages between women empowerment in agriculture and food security in irrigation scheme communities. The objectives of this paper were: 1) to determine the food security status of the households of female respondents in the study; and 2) to establish if there is a link between empowerment and its alternative measures and food security in the sample.

6.4.1. Demographic Data

Table 5.2 shows that most of the respondents in this study were irrigation scheme members. Women over the age of 45 years accounted for more than three-quarters of the sample. An overwhelming majority of the female respondents received a government grant in their household. From this sample, 70% of the respondents came from a female-headed household. There was almost an even split between households, with at most five members and households with more members. The higher household sizes may indicate an extended family arrangement. Fewer than half of the respondents had a working household member in their household,

demonstrating the dearth of employment opportunities in the former homelands. Agriculture may therefore contribute significantly to household food security.

6.4.2. Household Food security in Limpopo Province

Table 6.3: Household Hunger Survey Score Classifications

HHS Classification	Mafefe (%)	Steelpoort (%)	Rambuda (%)	Total (%)
Little to no hunger	79.5	84.8	84.7	83.3
Moderate Hunger	15.9	15.2	9.7	13.0
Severe hunger	4.5	0	5.6	3.7

Table 6.3 shows that the incidence of severe hunger due to the inability to access food was very low in the community and that most households experienced little to no hunger. This finding contradicts some authors, who have spoken about the prevalence of household food insecurity in the former homelands (Kepe and Tessaro, 2014, Baiphethi and Jacobs, 2009, Walsh and van Rooyen, 2015). However, it is important to acknowledge that their studies may have been measuring different components of food security, as was found in De Cock et al. (2013). This could be explained by the prevalence of government grant recipients as has been proposed by Statistics South Africa (2012). According to this survey, most respondent households received an average of R1200 in grant money every month. It is also possible that the year-round agriculture practised in the communities led to an increase in food which was locally available. This has been found to be the case in other studies. The benefits of having irrigation facilities in communities spilled over to those households which had no access to irrigation facilities, as fruit and vegetables were widely available in such communities (Domènech, 2015, Namara et al., 2010).

Table 6.4: Dietary Diversity (Food Consumption Score)

Dietary Diversity	Mafefe (%)	Steelpoort (%)	Rambuda (%)	Total (%)
Poor	0	4.3	1.4	1.9
Borderline	15.9	4.3	5.6	8
Acceptable	84.1	91.3	93.1	90.1

Table 6.4 shows that the households in this study mostly had an acceptable dietary diversity score. This means that their diets were micronutrient rich and supplied most of the nutrients that a person may require to lead a healthy lifestyle (Jones et al., 2013, Headey and Ecker, 2013). It also seems to contradict the assumption that diets in rural communities are of a low quality and monotonous (Maxwell et al., 2013, Arimond and Ruel, 2004). Table 6.5 shows the average consumption of foods in the different food groups and shows that the main staples, which are mainly carbohydrates from maize, rice and wheat, were the most frequently consumed items in the study. It can be assumed they formed the main component of most meals. This would be consistent with the findings of De Cock et al. (2013) and those of other researchers in Southern Africa. Meat (beef, fish and poultry) was consumed frequently in the three communities, showing that households in this study had ready access to protein, which is considered an important source of amino acids and micronutrients (Faber and Wenhold, 2007). This frequent consumption of meat contradicts the literature which shows that most diets are based on carbohydrates and vegetables (Arimond and Ruel, 2004). The benefits of eating proteins for the general population, and young children and women of child-bearing age, in particular, are well documented (Faber et al, 2007). Vegetables and fruit were also consumed fairly often, as were pulses and milk. Although Tables 6.4 and 6.5 show the quality of the food consumed by households in an average week, they do not give details of how the food was allocated in the household. This would have enabled a more detailed analysis of gendered allocation of food in the study area.

Table 6.5: Food groups and average weekly consumption

	Mafefe	Steelpoort	Rambuda	Total
Main staples	6.97(0.15)	6.78 (0.86)	6.98 (0.11)	6.92 (0.48)
Pulses	1.95 (2.62)	6.78 (2.32)	2.01 (2.11)	2.24 (2.34)
Vegetables	3.5 (2.29)	4.13 (2.29)	3.7 (2.05)	3.78 (2.19)
Fruits	1.54 (2.24)	2.41 (1.78)	4.34 (2.71)	3.03 (2.63)
Meat	5.25 (2.50)	6.08(1.97)	5.27(2.17)	5.5 (2.23)
Milk	1.40 (2.03)	2.28 (2.22)	1.91 (2.33)	1.88 (2.23)
Sugar	6.29 (1.78)	4.95 (2.54)	5.18 (2.4)	5.4 (2.3)
Oil	3.25 (2.74)	2.06 (2.48)	4.8 (2.5)	3.6 (2.8)

Mean (standard deviation)

Interesting community differences are, first, the almost daily consumption of pulses in Steelpoort, possibly because these were grown on the scheme. Pulses are protein rich and a

source of many micronutrients, which are beneficial to the body (Asif et al., 2013). Second, households in Rambuda consumed fruits almost twice as often as the households in Steelpoort and Mafefe. This can be attributed to the prevalence of fruit trees in the Rambuda area and that they were ripening at the time of the study. Some fruit and vegetables are a good source of Vitamins A and C, which are essential for the maintenance of good health (Aliber and Hart, 2009a).

6.4.3. Investigating the relationship between empowerment and food security

Table 6.6 shows the results of food security (FCS profiles). According to the results, six variables influence food security at the varying levels of significance. In a nutshell the results revealed the following: household hunger score profiles at $p < 0.01$; education level at $p < 0.05$; and number of agricultural decisions, community, household members who work and leadership position at $p < 0.1$. First, the marginal effects for the household hunger show that a unit increase in HHS increased the probability that the household had either a poor or an acceptable FCS by 0.083% and 1.24%, respectively; while the probability of having an acceptable FCS decreased by 1.32%. This means that as food access decreases, dietary diversity would also fall. This is consistent with the literature (Jones et al., 2013, Headey and Ecker, 2013, De Cock et al., 2013). When production is limited and the household does not have the financial resources to provide sufficient food, households tend to purchase more starchy foods and less proteins and vegetables.

Second, a unit increase in education level resulted in the probability of a household being in the poor and borderline FCS categories falling by 0.18% and 2.81%, respectively, while the probability of falling in the acceptable category rose by 3%. This shows that farmers who are more educated are more likely to consume a diverse diet at home. This is consistent with the literature (Malapit and Quisumbing, 2014, Sraboni et al., 2014, Duflo, 2011). More educated mothers are expected to have improved knowledge about the importance of a balanced diet, or have the probability of earning more income. Since the majority of these women were farmers responsible for food crop production, it is likely they selected crops for production based on what would be consumed in their households.

Table 6.6: Food Security (FCS profiles) and Empowerment and demographic variables

	Coefficient	S.E	P>Z	Marginal Effects		
				Poor	Borderline	Acceptable
Household Hunger Scale	-0.61087**	0.21826	0.005	0.00083	0.01240	-0.01323
Agricultural equipment decisions	-1.5193*	0.84309	0.072	0.00207	0.0308	-0.0329
Community	0.7325*	0.4253	0.085	-0.0010	-0.0148	0.01587
Sex of Household head	1.1409	1.0249	0.266	-0.0015	-0.0231	0.0247
Marital Status	0.70957	0.5876	0.227	-0.00096	-0.0144	0.0153
Education level	1.3878**	0.7034	0.049	-0.00189	-0.0281	0.0300
Est. grant money received	0.00048	0.00047	0.308	-6.63e-07	-9.85e-06	0.000010
Age	0.038005	0.0402	0.344	-0.000052	-0.000772	0.0008245
Household size	0.1649	0.1764	0.350	-0.0002252	-0.003348	0.00357
Household members at work	1.1639*	0.6586	0.077	-0.00158	-0.02363	0.02522
Irrigation scheme membership	0.73323	0.8096	0.365	-0.00123	-0.01815	0.0193
Hours worked	0.1977	0.1534	0.198	-0.0002701	-0.00401	0.0042
Credit access decisions	-0.4089	1.0423	0.695	0.0006432	0.00949	-0.0101
Leadership position	-1.7650*	0.9370	0.060	0.005123	0.07098	-0.0761
Production decisions made	0.0107	0.9234	0.991	-0.0000146	-0.000021	0.0002322
Plot size (ha)	0.0070	0.4706	0.988	-9.65e-06	-0.00001435	0.0001532
Number of obs =141						
LR chi(16)=37.21						
Prob>chi2= 0.0020						
Pseudo R2 =0.3466						

Notes: *** = p<0.01, **=p<0.05, *=p<0.1

Third, having a leadership positions had a significant influence on food security. A unit increase in leadership position (i.e. the female farmers had a leadership position) increased the probability of the household having a poor or borderline FCS by 0.51% and 7.098%, respectively, and decreased the probability of having an acceptable FCS by 7.61%. Female farmers with leadership positions were likely to have reduced FCS. This contradicts many findings on women empowerment, which usually associate empowerment with increased agency and the possibility of accessing more resources and social networks (Malapit et al., 2014, Alkire et al., 2012, Bhagowalia et al., 2015), but supports those findings which do not always find linkages between empowerment and food security outcomes (Cunningham et al., 2015, Sraboni et al., 2014). These results suggest that leadership may help a woman achieve these positives, but these are not enough to ensure food security. Possible reasons could be that the time spent performing these additional duties could negatively affect food security. This has found to be the case in instances where mothers found employment which led to an increase in income, but also reduced the amount of time the women were at home (Duflo, 2011).

The agricultural equipment decisions a farmer made increased the probability of the farmers' household having a poor and borderline score by 0.207% and 3.08%, respectively. Conversely, the probability of having an acceptable FCS decreased by 3.2%. This means that female farmers who are empowered to decide on the purchasing of agricultural equipment and inputs have food insecure households. This seems to contradict the literature which usually associates women empowerment with food security (Meinzen-Dick et al., 2014, Scanlan, 2004). A possible reason could be the prevalence of female-headed households in this sample. This could be attributed to the generally low access to resources and assets (Quisumbing et al., 2014). However, this evidence is inconclusive and further research is needed to establish the causes of this occurrence.

The number of household members who worked also influenced the household FCS. A unit increase in the number of household members who worked resulted in a decrease in the probability of the household having a poor or borderline FCS score by 0.158% and 2.36%, respectively. The probability for having an acceptable FCS rose by 2.52%. This shows that having a working household member improved food security. This agrees with the literature (Bonnal et al., 2015, Floro and Swain, 2013). This is most likely due to the increased money which is available in the household. Some studies have shown that when the disposable income

available in the household increases (The World Bank, 2012), women may have more input and the money is less contested. This would then enable the woman to allocate a larger share of the household budget to preferred food groups such as meat, milk, fruit and vegetables, which are all rich in micronutrients.

Finally, a unit increase in the community led to a decrease in the probability that a household would fall in the poor and acceptable groups by 0.1% and 1.48%, respectively, while the probability of scoring an acceptable FCS increased by 1.58%. This implies that the community of residence affected the FCS of the respondents. Due to their location and resources, different communities may have differing access to preferred foods. For instance, in a study of nutrition in South Africa, it was found that some households did not consume certain fruit and vegetables because they were not readily available in the communities. No one grew them and shops did not stock them (Faber and Wenhold, 2007). Table 6.8 shows these different community-specific food access characteristics. For instance, households in Mafefe consumed fruit, milk and pulses less than twice a week- a factor attributed to their distance from major towns (physical access) and income poverty. In contrast, Rambuda households consumed fruit at least four days in a week because the area produced many types fruits.

Due to the prominence given in the literature to the sex of the household head, access to credit, hours at work and receiving social protection, it was expected that these would significantly influence a household's FCS, but this was not supported in this study. This points to the complexity of food security and empowerment issues and the possibly correlations that exist between many of the variables in question.

6.5. Conclusions and Recommendations

The relationship between food security and women empowerment is often presented alongside supporting evidence in the literature. Although the relationship is complex, it is often argued that women who own and control resources, earn and control their own income and can use their time efficiently are likely to have food secure households. This study sought to investigate: 1) the food security status of households of female farmer households in Limpopo Province; and 2) if empowerment and its alternative measures were linked to food security.

It emerged that the majority of the households in the study had not experienced hunger in the 30 days before the survey. This implies that the households had access to adequate food, through

production and markets. The majority of the respondents' households' consumed food which had acceptable dietary diversity, signifying that these household members consumed a balanced diet and had access to macronutrients and micronutrients.

It was established that agricultural equipment decisions, leadership, household hunger score, education level, the number of household members who work and community were associated with food security. These results show that when women make agricultural decisions or have a leadership role in the community, the probability of their households falling in the poor or borderline food categories increased and their probability of being in the acceptable category decreased. This calls for further research to establish what could cause these unexpected trend as literature has shown that when women are empowered their households are likely to be food secure.

The HHS, having a working member and the education level of the respondent all had an expected relationship with food security in the study. Interventions which improve the education level of the mother are likely to result increased food security which is reinforced by their nutritional knowledge. It is recommended that further research be conducted with anthropometric measures to identify the effects of women empowerment and women and children's health outcomes.

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CHAPTER SEVEN

CONCLUSIONS AND RECOMMENDATIONS

7.1. Introduction

Agricultural development will have to focus on gender if it is also to act as a vehicle for women empowerment. Previously development initiatives have focused on the development of tangible assets at the expense of intangible assets. Women are generally less empowered than male farmers. This is evident in the pattern of resource ownership, access to opportunities and even the opportunities to exercise agency. These inequalities have been attributed to institutions and social norms in patriarchal rural areas and smallholder agriculture, which accord women as individuals and farmers secondary status. In spite of these challenges and limitations, rural women remain engaged in agriculture and aspire to access formal and better paying markets. It will take the transformation of agricultural, social and market institutions to achieve women empowerment objectives through agriculture.

This thesis was guided by the question “Can existing institutions empower smallholder farmers, particularly female farmers, on smallholder irrigation schemes in Limpopo Province to a level where they can access produce markets and improve food security?” The question was further broken down into three sub-problems:

- 1) What is the role of institutions for agency enhancement in the study areas?
- 2) What is the level of empowerment of the female farmers in the study areas using the Women Empowerment in Agriculture Index (WEAI)?
- 3) What is the relationship between WEAI indicators and food security in the study?

The study was guided by the Sustainable Livelihood Framework which states that individuals and households have five livelihood assets. The five assets; physical, natural, financial, human and social, can be divided into two groups assets and capabilities. It was argued that while building the asset base of smallholder farmers is important, empowerment can only be achieved through building human and social capital, and allowing agency to be exercised. This would contribute to development of smallholder farmer skills, lead to rural development and an increase in off-farm empowerment opportunities.

A mixed methods approach was used. Data was collected twice using a questionnaire with open-ended and closed questions (Appendix A) and an adapted WEAI survey tool (Appendix B). Data was collected with the aid of trained translators from purposively selected respondents from three irrigation scheme communities from Sekhukhune, Capricorn and Vembe districts of Limpopo Province. The questionnaire data was analysed using descriptive statistics in SPSS and content analysis for qualitative data. The survey data was analysed using SPSS guided by the WEAI manual to construct a modified WEAI score. The data was further analysed by running an Ordinal Regression to investigate the relationship between empowerment indicators and food security.

7.2. Conclusions

7.2.1. Sub-problem1: What is the role of institutions for agency enhancement in the study areas?

The objectives under investigation in Sub-problem 1 were to, first, identify key production, market and institutional challenges that smallholder farmers are faced with in making linkages to formal markets. Second, the study seeks to determine if local institutions and organisations available empower smallholders to improve market access. It was found that market access is a significant challenge for all three irrigation scheme communities in this study with only a small percentage of farmers who were predominantly male with access to markets outside their communities. The smallholder farmers' challenges largely emanated from their low human capital. Most of the farmers were largely over 50 years of age and had received little education. Women's secondary access to resources in patriarchal institutions and their less preferred status during apartheid, resulted in them receiving little formal education, and this may act as a barrier to smallholder productivity and market access. The presence of extension staff in all three communities is acknowledged, however, this has done little to facilitate the transformation of smallholder farmers from being from a largely subsistence orientated to being commercially oriented. This may imply a weakness in the capacity building approach used by the extension agents.

Agricultural production in the communities was limited due to sub-divided plots in the irrigation schemes, coupled with lack of market-linked agricultural production. In the three study sites, irrigation scheme land had been exhausted and there were currently no new irrigation schemes under development. The importance of the irrigation schemes as base for subsistence food

production for the household, remained the focus of production, despite expressed commercial aspirations. Prevailing inheritance practices which are rooted in social institutions that determine norms, codes and practices of access to land and productive resources most likely led to the reduction in plot size. For these farmers, sustainable market access may only be achieved through collective action and there may be a need to invest in strategies which build collective agency and strengthen existing organisational structures such as the irrigation scheme. Institutions that can support the building of robust and farmer-led marketing institutions is important.

The farmers' subsistence orientation was largely influenced by the nature of the development of the schemes which were established largely to meet household food production. This is demonstrated by crop choices and the farmers' need to secure household consumption above everything. If smallholder farmers aspire to increase their activity in formal markets, it may be necessary to intentionally reorient the farmers' activities towards niche commercial production to overcome scale challenges.

The farmers in the three communities had insufficient knowledge on markets and their functions, as most had experienced formal markets as buyers only. This was confounded by the existence of few local institutions which had engaged the farmers to enhance their capacity to access formal markets. It is possible that most institutions in the communities had not developed these services because they largely perceived smallholder farmers as subsistence farmers with no commercial potential.

7.2.2. Subproblem 2: What is the level of empowerment of the female farmers in the study areas using the Women Empowerment in Agriculture Index (WEAI)

The objectives of this sub-problem were to determine the level of empowerment among female farmers in Limpopo smallholder irrigation schemes using a modified Women Empowerment in Agriculture index and its two sub-indexes (Five Domains of Empowerment (5DE) index and the farmer Gender Parity Index (GPI); 2) and to establish the empowerment indicators which contributed to female farmer market access.

It was established that just over half of the farmers in this study were empowered using the five domains of empowerment (5DE). Most indicators in the 5DE contributed to empowerment in varying degrees, although access to credit and leisure were the only two domains where less than

25% of the women were empowered. Although the farmer gender parity index was high, just over half of the farmers had parity with the average male farmer in their community.

This study showed that empowerment was not related to demographic characteristics but rather adequacy in the production, leadership, assets, income and time use domains. Most indicators in this study largely contributed to women empowerment, except the leisure and access to and control of credit indicators.

The majority of women in the study were empowered that may have been accessed as a result of marriage. This has negative implications for single or divorced women who need to pursue agriculture and other land-based livelihood activities. These indicators include autonomy in production, access to and ownership of assets and group membership. Adequacy in these would increase women's agency to pursue livelihood activities and lead an active life. Their capacity to empower sustainably, however, may be reduced by the institutions and social norms surrounding them which may constrain women's exercise of agency as they may reinforce women's subordinate position. There were certain policies and local practices in the communities which may be related to the empowerment of women in indicators such as income and speaking in public which would have been expected to be ascribed to men. Empowerment in such domains has the capacity to transform power relations in the communities. How then can institutions that govern social norms encourage adequacy in accessing markets and sustainably empower women in agriculture?

Leisure satisfaction and credit access in the study areas were sources of low empowerment adequacy. Leisure satisfaction shows that, female farmers in this study were largely overwhelmed by production activities. Given the labour intensive nature of smallholder agricultural production, this would leave the smallholder farmer with little time to imagine and implement more profitable livelihood activities. This situation was prevalent in all three communities and may be indicative of the status quo in rural Limpopo Province and other parts of rural South Africa. It may be important for government through its different agencies and other stakeholders to find ways of including men in agriculture without disempowering women. Increased market access would make agriculture more attractive to men whose gender roles are more market oriented and providing for the household.

Female farmers with market access are more likely to have the following characteristics: speaking in public, input into productive decisions and autonomy in production. The government and other stakeholders need to invest in the development of markets which sell ‘women’s crops’. Intervening in this way may increase the control women have on production and the proceeds of the sales.

Finally, the measurement of empowerment using WEAI further underscores that empowerment is a process and not an event. This may have implications on how farmer empowerment is conceptualised by government extent agents. Farmer training initiatives which focus on short programmes without a long-term strategy to build agency and capacity in the smallholder farmers may not achieve their desired results.

7.2.3. Sub-problem 3: What is the relationship between WEAI indicators and food security in the study?

The objectives of this sub-problem were to first, determine the food security status of the households in the study area by 1) establishing the incidence of hunger in the communities using the HHs and determining dietary diversity using the Food Consumption Score. Second, to establish if there was a relationship between empowerment indicators and food security in the households of the female farmers in the study.

The analysis showed that almost all the households in the three communities were food secure. In addition, they consumed a diverse diet as shown by the frequency with which they consumed meat, vegetables, milk and pulses. There were also community specific differences of the food most frequently consumed because of the increased availability of certain foods. This shows the importance of leveraging locally available foods for improved nutrition. The results show that playing a role in agricultural equipment decisions and having a leadership position were associated with an increase in the likelihood of the household falling in the poor or borderline food security groups. This was unexpected given the assumption that empowerment increases food security and shows that empowerment in some decisions may lead to negative household welfare outcomes. A further look at the institutions and social norms in place may shed more light on empowerment and food security. Other results show that the HHS, the education level of the farmers, having a household member who worked and the community of residence were also significantly associated with food security.

7.3. Policy Recommendations

This study has confirmed that the face of smallholder agriculture in South Africa is female, yet they have largely secondary rights to productive resources. Policies and strategies which do not take into account women's secondary access to tangible and intangible resources, risk failure if they do not engage with this issue. Recognising the rights of women as farmers with the capacity to grow the smallholder agricultural sector may contribute significantly to rural development. The Ministry of Co-operative Governance and Traditional Affairs and the Department of Rural Development and Land Reform have the mandate to begin the transformation of land rights in South Africa by engaging with traditional leaders and land administration structures in rural South Africa.

The Department of Agriculture, Forestry and Fisheries is already active in rural Limpopo communities and through its extension personnel, is involved in smallholder capacity building and support. In spite of the work they do, there has been little transformation of smallholder farmers from being largely subsistence oriented to being semi-commercial and commercially oriented. This calls for the re-examining of approaches to agricultural development versus desired outcomes and the determining of the best approach to reorient smallholder farmer production in rural South Africa. Further, a partnership between the Department of Agriculture, Forestry and Fisheries, academic institutions responsible for training and other stakeholders to investigate the effectiveness and appropriateness of the current extension approach to building capacity and agricultural agency is urgent. In addition, they could also investigate which institutions are best positioned to build smallholder farmer knowledge and partner with them to access formal markets are required. They may include non-traditional partnerships and acquiring of social development personnel to work with extension personnel. Smallholder farmers' needs are evolving as they pursue markets which can increase the income they earn through agriculture. Government departments, private companies, academic institutions and NGOs which work with smallholder farmers should also transform their approach and diversify the services they offer to meet the farmers' needs. This has the potential to drive the capacity building of extension officers and farmers to build agency and the development of appropriate services.

There is also a need to further interrogate the understanding of the empowerment process and how it comes about by Government departments, private companies, academic institutions and NGOs. Our findings have shown that most interventions which were thought to bring about

empowerment were implemented as one-day or one-week courses without any long-term interventions planned. Currently many interventions are in place and these may need to be brought to together so that they may be implemented systematically by the different service providers but in partnership towards one articulated goal.

Finally, there were some success stories in the three communities that we visited. Interventions into the communities should first investigate what works among those successful so that best practices can be scaled up and improved with training and other resources needed.

7.4. Recommendations for further study

Further research can be conducted on how to engage with social institutions which may impede the successful implementation of smallholder farmer market development programmes. Other research could also determine how the WEAI tool can be tailored to the South African context and also look into creating an upward trajectory in the empowerment continuum. This could lead to better targeting in empowerment in agriculture interventions that particularly benefit rural women.

APPENDICES:

APPENDIX A

RURAL INSTITUTIONS FOR SMALL-SCALE FARMERS

DEMOGRAPHIC DATA

1. Community name
 - A. Mafefe
 - B. Rambuda
 - C. Steelpoort
2. Sex of Respondent M/ F
3. Sex of household head M/F
4. Age
 - A. Below 25
 - B. 25 -30
 - C. 31-40
 - D. 41-50
 - E. Over 50
5. Highest level of education
 - A. No education
 - B. Primary
 - C. Secondary
 - D. Tertiary
6. Irrigation scheme membership Yes / no

FARMING

7. What do you need to improve the way you farm?

Needs	Please tick (you can tick more than one)
Production training	
Fertiliser application training	
Improved access to seeds and fertilisers	
More irrigation water	
Access to more land	
Other _____	

8. What are your farming goals? (You can tick more than one)
- A. Increased crop output
 - B. Better quality produce
 - C. Other _____
 - D. Other _____

9. What are your aspirations?

10. How did you get the land you use for farming?

- A. Inheritance
- B. Given by chief
- C. Borrowed

11. Do you have a PTO? Yes / no

12. Water Access

- A. Where do you get the water you use?
- B. Canal
- C. River
- D. Other source _____

13. Do you pay for water? Yes/ no

14. Does paying for water stop you from using enough for your production?

15. How often do you consult your extension officer? _____

16. What information do you normally ask for from them?

- A. Farming procedure
- B. Suitable crops
- C. Where to sell
- D. How to sell in new markets

17. Do you find them knowledgeable?

18. Have you ever received training from

- A. Tompi Seleka agriculture training college?
- B. Madzivhandila agriculture training college?
- C. Department of Agriculture?
- D. Other _____

If yes what courses did you take and for how long

Course	Time taken

16. Did you pay to attend the training? Yes/ no

If yes how much? _____

17. How do you access the following inputs?

	Certified seed	Fertiliser	Chemicals (pesticide spray)
A. Buy			
B. Given by government			
C. Given by NGO			
D. Other			

18. If given any inputs, please identify the organisation

19. What do they expect from you in return?

20. Who controls farming activities in your household?

A. The farmer

B. The household head

C. Both

D. Other _____

21. Do you sit down as a scheme to discuss what to grow together? Yes/ no

Explain _____

22. Which is better; farming as a scheme or alone?

23. What determines your crop planting choices?

A. The customers tell me

B. I grow what I can eat with my family

C. It is what grows here

D. Other _____

24. If many maize/spinach/ carrot varieties can grow in your area, how do you choose which one to grow?
- A. the one with a short growing time
 - B. the one I know how to grow
 - C. the one I was told to grow
 - D. Other _____

INCOME FOR FARMING

25. Where does the money you use for farming come from?
- A. Grant
 - B. Salary
 - C. Other _____
26. Are you/ a member household part of a stokvel? yes/no
If yes do you use the money for farming or other livelihood activities? Yes/ No
27. If you are not a member of a stokvel, can you borrow money from them? Yes/ no
If yes, explain terms _____
28. Can you borrow from a bank? Yes/ no
If yes, explain terms _____
29. How would having enough money to farm change the way you farm?

30. Who does the farm work in your household? (please tick all relevant)
- A. The farmer
 - B. Household members
 - C. I hire labourers (how much per day) _____

MARKETING

31. Do you sell? Yes/ no
32. Who is your biggest customer?
- A. Neighbours
 - B. Informal traders
 - C. Local schools
 - D. Small shops
 - E. Big supermarkets
 - F. Other _____
33. Where are they?
- A. Local
 - B. In town
 - C. Other _____

34. How much do they buy?

35. Do you have contracts with your buyers? Yes/no

If yes, explain terms

36. What happens when you do not deliver to your buyers?

37. What happens when your buyers delay or do not pay? Who helps you?

PRODUCE QUALITY ATTRIBUTES

38. What physical characteristics are desirable in the crops you grow at harvest?

Crops	Desirable physical characteristics at harvest

39. How do you know these are the desired physical characteristics?

- A. The local customers tell me what they want
- B. The people from town who come to buy tell us what people want
- C. This is how I like them to be
- D. The extension officer told me
- E. Other

40. Have you received training on the grades and standards to use when selling your produce?

Yes/ no

41. If yes, explain terms _____

If no, how do you think this training would improve the quality of your produce?

42. Have you received training in how to produce crops whose quality could be bought by the supermarkets? Yes/no

43. If yes who?

44. How do you know how much to grow?

PRICES

45. How do you decide on the price for your produce?

46. Do you have a way of knowing if you have sold your produce for a fair price?

A. Radio programme if yes which programme

B. TV programme if yes which programme

C. Call a friend

D. Go to market in town and see

E. Rely on the buyer

47. What could be done to improve the way you find out about prices?

48. Where is the nearest market? _____

49. How do you get your produce to the market?

A. Hire a car

B. Use a bus / taxi

C. Buyers come

D. Other

50. How much does it cost to take your produce to the market?

51. Is the transport reliable? Yes/ no

Explain

52. When the buyer comes to your field, does this lower your price compared to if you sold for yourself?

53. Would you consider selling your produce under a co-operative run by the scheme? yes/no
Please explain

54. Who decides how the money from selling produce will be used?

55. If you could sell more, would you grow more produce? Yes/no

56. Are you good at selling in your scheme? Yes/no

57. What do you do?

58. Who is very good at selling their produce in your scheme? _____

59. What do they do differently?

INFRASTRUCTURE

60. In your opinion is your road system good for marketing yes/ no

61. Are there any local businesses/ industries in your area which you can work with? Yes/no
If yes mention examples

62. How do you harvest your produce?

A. Using a tractor

B. I do it myself

C. Other _____

63. Where do you store your produce after harvest, before selling it?

64. Do you go to church? Yes/ no

65. What roles are acceptable for men and women in the home at your church?

KEY INFORMANT

DEMOGRAPHIC DATA

1. Community name
 - A. Mafefe
 - B. Rambuda
 - C. Steelpoort
2. Sex of Respondent M/ F
3. Age
 - A. Below 25
 - B. 25 -30
 - C. 31-40
 - D. 41-50
 - E. Over 50
4. Highest level of education
 - A. No education
 - B. Primary
 - C. Secondary
 - D. Tertiary
5. What is your position in the community?

- _____
6. How does the scheme work?

Objectives	
Aspirations	
Gender roles	
Labour	
Decision making (poverty, age, gender)	
Access to machinery	
Access to inputs (government/ buy)	
Water scheduling	
Water regulation (allocation and measurement)	
Training opportunities	

Madzivhandila/ Tompi Seleka/DoA? Frequency? Criteria	
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7. Please describe the farmers

Age	
Gender	
Production capacity	
Willingness to learn	
Market readiness	

66. Where do people in the scheme sell their produce?

- A. Neighbours
- B. Informal traders
- C. Local schools
- D. Small shops
- E. Big supermarkets
- F. Other _____

8. What are small-scale farmer challenges and opportunities in market access in your area?

9. How can the gap between farmers and the market be bridged?

10. Where can small-scale farmers get money for inputs? How?

- A. Stokvel
- B. Banks _____
- C. Other _____

11. How do farmers get access to market information? Is it accurate?

12. How do they transport produce to market?

13. Are there any NGOs or companies that could work with the farmers to provide market access?

14. Would the following work in this scheme?

Growing as a cooperative?	
Selling to:	
Local schools?	
Mines / local companies?	
As a co-operative?	

15. How is the quality of their produce now?

16. What kind of training do they need to improve produce quality?

17. Do you think a household's religion determines the work one can or cannot do with regards to farming and marketing?

18. Do you think local leadership can help improve farming and marketing? How

APPENDIX B

Women's Empowerment in Agriculture Index - Dec 2013

A. Mafefe	B. Steelpoort	C. Rambuda
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1. Irrigation Scheme member YES/NO
2. Sex of Respondent M/F 2b) Sex of Household head M/F
3. Marital Status
 A Single
 B Married
 C Widowed
 D divorced
4. Age or year of birth _____
5. Highest education grade _____
6. What languages do you speak? _____
7. Can you read and write YES/NO

Module B

8. How many people live with you? _____
9. How many get the :
 - i. child grant _____
 - ii. Pension grant _____
 - iii. Other grant _____
10. How many are at:
 - i. school? _____
 - ii. Work? _____
 - iii. Work in the scheme? _____
 - iv. Unemployed? _____
11. Can they read and write? _____

Module C

12. Do you have agricultural land at the:
 - i. scheme? _____ plots
 - ii. at your house? _____ size
 - iii. other place in the village? _____ size

13. Who owns the land? _____

14. Is their name on the title _____

15. How did you use the land this year (January to December):

- i. scheme? _____
- ii. at your house? _____
- iii. other place in the village? _____

16. What crops did you grow?

- i. At the Scheme? 1. _____ 2. _____ 3. _____
- ii. at your house? 1. _____ 2. _____ 3. _____
- iii. Other place in the village? 1. _____ 2. _____ 3. _____

17. Who made the decision to grow these crops?

(A. Farmer B. father C. family D. scheme members)

- i. At the Scheme? _____
- ii. at your house? _____
- iii. Other place in the village? _____

18. Who worked on the land?

(A. Farmer B. family C. workers)

- i. At the Scheme? _____
- ii. at your house? _____
- iii. Other place in the village? _____

19. If you sold any crops who took them to the market and decided on the price? _____

20. Who decided how the money was used?

(A. Farmer B. father C. mother and father D. family)

- i. At the Scheme? _____
- ii. at your house? _____
- iii. Other place in the village? _____

21. If you put a fence/ grow trees/ dig a well on your land; who decided that you should?

22. Module F

	How many do you have?	Who owns them?
Cattle		
Donkeys		
Goats, sheep, pigs		
Chicken		
Ducks, turkeys		
Other.....		

23. Who takes care of them?

(A. Farmer B. family boys C. family girls D. workers)

24. Who decides to buy or sell livestock?

(A. Farmer B. father C. family)

25. Did you buy any animals this year (Jan-Dec):

What? _____ How much? _____

Number? _____

26. Did you sell animals this year (Jan-Dec)

What? _____ How much? _____

Number? _____

Module G Business =(spaza/ brickmaking/ ice cream/ grinding mill)

27. Has anyone in your house started a business? YES/ NO

28. What type of business is it? _____

29. Who decided to start this business? _____

30. Is it still working? _____

31. How much money do you get a week? _____

32. Who works there? _____

33. Who manages it? _____

34. Who controls the money? _____

Module B (individual)

	Do you have at your house? tick	Who owns?	Who decides to buy or sell?
i. Hoes, sprays,			
ii. Tractors			
iii. Other business equipment			
iv. House			
v. Fridge/tv/sofas			
vi. Radio/ stove			
vii. cellphone			

35. Has anyone at your house taken a loan, borrowed money or food from:

	Yes/ No	Who borrowed	Who decided how money was used
i. Non-governmental organization (NGO)			
i. Mashonisa			
i. Banks			
v. Friends or family			
v. Stokvel			

36. Have you ever seen an extension officer this year? _____

37. How many times? _____

38. Was it a man or woman? _____

Module E

39. What leadership position do you have in the scheme or community?

40. Do you like to speak at meetings to build roads or maintain the scheme?

41. Do you say something about the money you get for working on the road if it is late?

42. When people complain about leaders in meetings do you also talk?

43. Group membership

Scheme	Are you a member? Yes / no	Do you help make decisions A. no B. Sometimes C. Always
i. Water users association		
ii. Stokvel		
iii. Burial society		
iv. Business association		
v. Civic		
vi. Local Council		
vii. Church		
viii. other		

44. If you are not a member of a group say why you did not join?

Module G

45. At your house who decides to do these things:

	Who decides at your house?	Is it ok for you to decide alone? Yes / No
i. Agricultural		

	production		
ii.	Seeds and fertilizer to buy		
iii.	What crops to grow		
iv.	When to take the crops to the market and who		
v.	Livestock raising		
vi.	Business		
vii.	Buying Daily food		

46. Choose why you do the following from: (Tick correct answer)

	A. I should do it	B. I am forced to	C. Everyone does it	D. It is right
i. Agricultural production				
ii. Getting seeds and fertilizer				
iii. What to grow				
iv. Selling or not				
v. Business				
vi. My money				
vii. Buying furniture				
viii. Buying daily food				
ix. The work I do				

47. Please tell me the work you did yesterday from when you woke up

Time	Activity

MODULE H: CONSUMPTION AND CONSUMPTION HABITS Enumerator: Ask this section to the female head/spouse or member who has the most knowledge on food preparation. Respondent ID:

Question	Code	Response	Item	Food frequency: READ: Now I would like to ask you about foods that the members of your household consumed at home. Could you please tell me how many days in the past week your household has eaten the following food items, prepared and/or consumed at home and what the source of the food was?	H07. Number of days eaten in previous 7 days: If 0 >> Next item CODE 1	H08. What was the main source of this food in the last 7 days? CODE 2
H01	In the past 4 weeks was there ever no food to eat of any kind in your house because of lack of resources to get food? 1 = Yes 2 = No (if No >>H03)			Food Item		
H02	How often did this happen in the past 4 weeks? 1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (> 10 times)		1	Wheat flour (bread, noodles)		
			2	Rice		
			3	Potatoes, cassava, <u>matooke</u> and other roots/tubers		
H03	In the past 4 weeks did you or any household member go to sleep at night hungry because there was not enough food? 1 = Yes 2 = No (if No >>H05)		4	Cereals (maize, sorghum, millet, barley)		
			5	Vegetables		
			6	Fruits/fruit juices (fresh and dry)		
H04	How often did this happen in the past 4 weeks? 1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (> 10 times)		7	Beans, lentils, peas, nuts		
			8	Eggs		
			9	Dairy products (milk, cheese, yoghurt)		
H05	In the past 4 weeks did you or any household member go a whole day and night without eating anything at all because there was not enough food? 1 = Yes 2 = No (if No >>H07)		10	Meat (goat, beef, lamb, pork)		
			11	Poultry (chicken, duck, <u>pidgeon</u>)		
			12	Fish (fresh and dry)		
			13	Oil/fats (ghee, butter, veg oil)		
H06	How often did this happen in the past 4 weeks? 1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (> 10 times)		14	Sugar, Honey		
			15	Condiments (spices, ketchup)		
			16	Nuts and seeds (ground nut, <u>simsim</u> , sunflower)		
			17	Alcohol and tobacco		

CODE 1: (H07) Food Frequency	Code 2: (H08) Source of Food
Not eaten 0	Own production 1
1 day 1	Hunting/gathering/fishing 2
2 days 2	Bought using cash 3
3 days 3	Borrowed on credit 4
4 days 4	Borrowed (friends/relatives) 5
5 days 5	Gifts (friends/relatives) 6
6 days 6	Begging 7
7 days 7	Received as payment 8
	Food assistance 9