

**EMPOWERMENT OF WOMEN IN RURAL AREAS THROUGH  
WATER USE SECURITY AND AGRICULTURAL SKILLS TRAINING  
FOR GENDER EQUITY AND POVERTY REDUCTION IN  
KWAZULU-NATAL AND NORTH WEST PROVINCE**

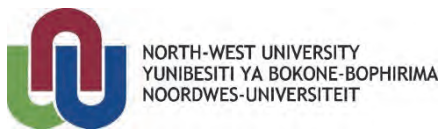
Report to the  
**WATER RESEARCH COMMISSION**

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## **Short executive summary**

This compilation is a WRC report on the project entitled, ‘Empowerment of women in rural areas through water use security and agricultural skills training for gender equity and poverty reduction in KwaZulu-Natal and North West Provinces’. Firstly, the study sites are described, followed by an analysis of the socioeconomic aspects of the women who were selected for the study (i.e. with respect to their political, social, institutional, and cultural environment). It also reports on the specific agricultural needs that are critical to the empowerment of women in the study areas. The report also identifies the skills training crucial for empowering women in the study areas and enabling them to achieve their desired livelihood outcomes (i.e. food security, poverty reduction, self-reliance, etc.). Lastly, the report puts forward several recommendations on the adjustments needed in order to empower women in the study areas for them to achieve their livelihood outcomes.

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## **Executive summary**

The rural landscape of South Africa is typified by high levels of poverty, with approximately 70% of the country's poor residing in rural areas. This is despite the fact that many of those residing in rural areas have some access to land and water resources for productive use. There is an untested hypothesis of the relationship between rural poverty and under-utilization of natural resources, such that a contradiction is often presented. The aim of the project was to investigate the constraints, opportunities and challenges to achieve empowerment of women to improve gender equity and livelihoods through increased water productivity with crop cultivation and animal husbandry, in selected traditional rural areas in North West and KwaZulu-Natal provinces of South Africa.

The specific objectives of the project were to:

- Review existing reports and literature on gender equity in agriculture and synthesise findings.
- Identify and describe the women who should be targeted in the selected study sites with reference to others: demographics of women at the selected study sites; age and gender, composition of households, aspirations of women currently residing in these areas; livelihood strategies followed by these women; existing and expressed constraints and needs of women to change practices; mechanisms for attracting women into agriculture and broadening the current demographic profile.
- Describe and explain the political, economic, social, institutional and cultural environment in which women operate, with reference to: land and water allocation reform; role of traditional authorities; available infrastructure and access to markets; family relationships and social networks; land tenure and water use security; and the status of women within local traditional culture. Given the above factors, to make recommendations regarding locally preferred adjustments and adaptations which are suitable to create a favourable environment for women to realise their aspirations with specific reference to constitutional prescriptions compared with cultural realities.
- Specify appropriate agricultural (farming and non-farming skills) based on a needs assessment of women in rural areas, with reference to: existing skills among women in the selected study sites; relevant skills that will make a difference to the lives of women in the current reality; linking the skills identified with SAQA requirements for future mainstreaming of training; identifying suitable facilitating and training organisations which are capable of meeting the requirements for skills training; starting a facilitation process of skills training in cases where available training material and trainers are able to make a contribution at the selected study sites.
- Make recommendations for development of training material for the identified skills which are required in agriculture (farming and non-farming activities).

This project was conducted in North West and KwaZulu-Natal Provinces. It proceeded from the identification of research sites that could allow data collection to answer the objectives. A mixed method approach was used, where both formal and informal data collection procedures

were used. Students were co-opted to conduct the research. The site selection in North West Province was based on the following criteria: project location, social profile and cultural context, agriculture infrastructure and resources and opportunities and risks. These are Rethuseng, Bosele, Ipeleng, Tshidiso from Taung; Nchapeo, Mabobo Dinku, Khanya, Molatedi, Nyetse, Dinokana and Mayiyeyene/Disaneng.

In KwaZulu-Natal, site selection was based on availability of an irrigation scheme with neighbouring rain-fed areas, level of government interventions/subsidies, level of agricultural production and logistical constraints. Tugela Ferry, Mooi River irrigation schemes and Machunwini area were covered.

In North West Province, a probability sampling method involving simple random sampling techniques was used to select the respondents. A sample of 84 farmers was randomly selected to obtain a representative sample from the participating farmers on the schemes. Some farmers on irrigation schemes have access to land in the old scheme design, even though the decision and management of their plots rests solely on them. In KwaZulu-Natal, households in the three study sites were stratified into three main groups, namely gravity-fed irrigators, pump-fed irrigators and dry-land farmers. The gravity-fed and pump-fed irrigators/farmers were obtained from Tugela and Mooi River Irrigation Schemes. The dry-land farmers were sampled from the Machunwini area.

In North West, data were collected with a structured questionnaire developed on the basis of the study objectives and review of the literature. Open- and close-ended questions were used for collecting demographic information. The second section of the questionnaire dealt with livelihood strategies, which include four capital assets, namely natural, physical, human and financial capital employed as a measure of the livelihood strategies used by the farmers on the schemes. The financial capital was measured on a three-point scale indicating availability, adequacy and non-adequacy. Physical capital investigated infrastructure, human capital (knowledge and skills) and natural capital (natural resources, mainly land and water). The third section concerned socio-economic status, considering access to credit and farm incomes. The last section was on food availability and accessibility. The questionnaire was designed to avoid ambiguity, sensitivity and provocation of respondents.

In KwaZulu-Natal, the study employed a mixed method approach. Formal and informal data collection methods were used. Informal methods were in the form of focus group discussions. Five such sessions were conducted. In addition, key informant interviews were conducted. People considered to be familiar with the general aspects of political, economic, social, institutional and cultural environment, especially with respect to women, were identified and interviewed. In the case of the key informant interviews and the focus group discussions, interview guides were prepared first and then used in the sessions. The formal survey was designed to collect information from a representative set of households. A structured questionnaire, pre-tested before use, was administered by trained isiZulu-speaking enumerators.

In this study, Stata (version 11) and the Statistical Package for Social Sciences (SPSS version 21) were used to analyse the data collected from farmers. Data presentation tools in the form of tables, bar graphs and pie charts were used. Descriptive analysis for all the variables was carried for data analysis. This involved looking at means, frequencies and standard deviations of the variables. The t-test was used to make comparisons between irrigators and non-irrigators, with respect to relevant continuous variables, and the  $\chi^2$ -test was used to test the degree of association between the irrigation access variable and other relevant categorical variables. A one-way ANOVA was employed to determine whether agricultural skills and knowledge had a significant effect on agricultural productivity.

Data was subjected to various econometric models to get a better understanding of the patterns in different aspects among the farmers. The models included a simple linear regression model for estimating land access determinants, binary logit model for estimating the determinants of land security and the ordered logit regression model for assessing the determinants of household food security. Econometric models used was the Principal Component Analysis (PCA).

Based on the results obtained, women in the study areas are operating in environments characterized by high levels of poverty and lack of economic opportunities. They have low education levels and lack employment opportunities. Apart from agriculture, households rely on government grants as a source of income. There are also few opportunities to diversify household incomes away from agriculture due to the low level of economic activity in the area. Although agriculture could be the way out of poverty, women face a number of institutional constraints, ranging from lack of support services, poor management, especially in irrigation schemes, and socio-cultural constraints.

Women in the study areas work in an environment with poor institutional settings. In the irrigation schemes, although analysis of the conveyance efficiency of the canal shows that the system delivers enough water to irrigate the whole scheme, lack of institutional framework hinders water distribution within and among the blocks. Although rules were put in place initially, they had become obsolete over the years. The irrigation schemes have no management committees or water users' associations to take responsibility for managing them. The management of the irrigation schemes is dysfunctional, because the different sections of the irrigation schemes were being managed separately, with no overall co-ordination of the management committees. Extension is generally poorly equipped in terms of staff skills and financial resources for identifying and communicating technology needs and for managing local level interventions.

The political environment due to differences in political affiliations affects people's trust, communication and co-operation, which are all needed for collective management of the irrigation schemes. The cultural environment in which women in the study areas operate appears to be the area presenting most challenges to their livelihoods and survival, because customary norms, including the customary marriage systems and the practice of primogeniture, prohibits women from being the legal holders of the most important resources,

including land, livestock and machinery. Although women have access to these resources, they have little control over their purchase and transfer.

Rural women generally have low levels of off-farm skills. Their enterprise/business management skills are poor, because they have poor numeracy and literacy levels, operations management skills, financial knowledge and marketing skills. Because of the lack of economic opportunities in the rural areas, most women with vocational skills out-migrate to find opportunities elsewhere.

Training evaluations showed that the training that was rendered to the women in the study areas met their expectations and could contribute to improvement of their livelihood needs, since the majority of them indicated that they were impressed by the training. It was realised that, since women in rural areas pursue diversified livelihoods, efforts should be made to provide them with farm and off-farm skills.

It was found that rural women pursue multiple livelihood activities and have different levels of the different livelihood skills. In general, most women in the study areas had high levels of agricultural skills, but generally low levels of off-farm skills. In agriculture, the sampled women farmers were competent in determining seed depth, appropriate planting method, plant spacing, water conservation methods and fertility management methods, but were incompetent in weed & pest control techniques. The sampled women farmers were also incompetent in animal husbandry skills. They have poor knowledge of animal health, animal nutrition, animal welfare requirements and meat processing skills. The sampled women were very incompetent in farm management skills. They had little knowledge of farm record keeping, farm financial management skills, post-harvest procedures, marketing contracts, knowledge of product markets and poor price determination skills. Mushroom production was identified as a relevant skill that could make a difference to the lives of women in the current situations.

The specifics of the preferred adjustments include credit provision to be improved and adequate, through banks and government subsidies, human capital development in skills acquisition and improved competence on water management, record-keeping and marketing-related activities and linkage to markets with fair prices is the main preference with respect to physical livelihoods, such that farmers have established relationships with markets for their produce and sustain their positions in the value chain for their different agricultural enterprises.

The majority of the women expressed preference for political institutions that would assist them to have good access to land and to local, cultural and traditional authorities that would help to improve their access to water and to change.

Most farmers indicated they neither had water security nor did they benefit from water reforms. The level of empowerment among women in irrigation farming shows disempowered in the control of the use of income; access to productive resources, credit, leadership roles and decision-making for the majority. This report recommends that:



- The composition of the groups to receive skills training workshop among rural people should consider their levels of education, literacy and numeracy, rather than their training needs alone.
- Practical demonstrations, rather than theoretical sessions, are valuable to the rural women with low levels of education.
- Government and non-governmental organisations should continue to fund programmes aimed at training rural women in the skills to successfully pursue their livelihood strategies.
- Rural women are offered opportunities to improve their numeracy and literacy levels since their low levels of education is a major hindrance to the acquisition of new skills.
- Further training sessions are to be conducted as the sessions that were conducted generated demand for training by other female farmers.
- There is a need for specific women's programmes that will emphasize women's issues in the policy and spell out concessions for women through policy and reforms. This will define the specific interventions targeting women, as well as specify the monitoring and implementation of interventions targeting women.
- The main recommendation from the study areas is that government authority needs to be increased, since it is losing money through the revitalising and maintenance of irrigation schemes.
- There is need for the government to lay down rules and guidelines that have to be followed, especially in irrigation schemes.
- The Department of Agriculture should resuscitate, monitor and mentor management committees within the blocks to monitor the water distribution.
- It is recommended that seasonal infrastructure inspection be carried out and damaged components repaired.
- Replacement of the distributary canal with pipes may assist in improving delivery performance and monitoring water use.

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## List of Abbreviations

CASP	Comprehensive Agricultural Support Programme
DAFF	Department of Agriculture, Forestry and Fisheries
DFID	Department for International Development
DOA	Department of Agriculture (South Africa)
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
ECA	Economic Commission for Africa
FANRPAN	Food Agriculture and Natural Resource Policy Analysis Network
FAO	Food and Agricultural Organisation
FGT	Forster Greer Thorbecke
GDP	Gross Domestic Product
GHS	General Household Survey
GPI	Gender Parity Index
HSRC	Human Sciences Research Council
KZN	KwaZulu-Natal
ICID	International Commission on Irrigation and Drainage
ICT	Information Communication Technology
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IFSS	Integrated Food Security Strategy
IMAWESA	Improved Management of Agricultural Water in Eastern and Southern Africa
LA	Livelihood Approach
LARP	Land Affairs and the Land and Agrarian Reform Project
LRAD	Land Redistribution for Agricultural Development
MDG	Millennium Development Goals
MRIS	Mooi River Irrigation Scheme
NWU	North-West University
PCA	Principal Component Analysis
PSM	Propensity Score Matching
SAQA	South African Qualifications Authority
SPSS	Statistical Package for Social Sciences
STATSSA	Statistics South Africa
TFP	Total Food Production
TFIS	Tugela Ferry Irrigation Scheme
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
USA	United States of America
USDA	United States Department of Agriculture
WFS	World Food Summit
WRC	Water Research Commission

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# **CHAPTER ONE: INTRODUCTION**

**Oladele, O. I. and Mudhara, M.**

## **1.1 Background**

The rural landscape of South Africa is typified by high levels of poverty, with approximately 70% of the country's poor residing in rural areas. This is in spite of the fact that many of those residing in rural areas have some access to land and water resources for productive use. This contradiction between rural poverty and under-utilization of natural resources was highlighted by the Minister of Agriculture and Land Affairs at the end of a Ministerial Lekgotla held on 2-4 November 2006 in Benoni, when she stated that, "If you go to some of the poorest areas of our country, people have land, but poverty and food insecurity are still high". The Accelerated and Shared Growth Initiative for South Africa (ASGISA) has termed this situation a dead asset in the hands of the poor. The Departments of Agriculture and Land Affairs and the Land and Agrarian Reform Project (LARP) jointly proposed, among other things, the prioritization of the revival of agricultural production by 10 to 15% in former homelands, where valuable fertile land lies fallow. This plan is complemented by the objectives of the Department of Agriculture, Forestry and Fisheries (DAFF) which seeks to ensure reliable and equitable supply of water for sustainable economic and social development including the eradication of poverty.

In rural areas have high unemployment rates yet land is relatively readily availability. Unemployment generally ranges from 30% to 40%, suggesting the availability of labour to practise agriculture. Most policy analysts and decision-makers interpret these contradictions as being the result of lack of capital, in particular financial and physical capital. Whilst financial and infrastructure (physical) support for resource-poor farmers in rainfed and irrigated agriculture is clearly required, investment in social and human capital, i.e. trust among people, clear property rights, the rule of law, education and skills development, are equally important. Secure water use entitlements and land tenure are essential to provide incentives for enabling the poor to use and increase productivity of their natural resources. Yet attempts to improve security of tenure in rural areas have made little progress over the years. These issues were highlighted in a document that seeks to guide policy in Eastern and Southern Africa, compiled by a number of international organizations. The report published by Improved Management of Agricultural Water in Eastern and Southern Africa (IMAWESA) recognized that meeting the agricultural water management challenge requires five key actions. Among these are providing secure rights to land and water and developing human capacity (Backeberg, 2015).

A key feature for sustainable rural productivity will clearly be to develop the capacity of the principal users of the land, who are women. It has been reported that women constitute 70%

of the agricultural labour force and are the main food producers for rural households in South Africa (Gladwin et al., 2001; Bob, 2002; Ashby et al, 2011). However, there is sufficient evidence to suggest that poor rural women are considerably more disadvantaged than poor rural men because of an explicit gender bias in land allocation, access to credit, access to rural organisations, marketing channels and agricultural services in general (Ashby et al, 2011). Women living in traditional rural areas form part of the most economically and socially disempowered groups in South Africa (Sharaunga et al., 2015). This project focuses on the skills and training needed by rural women in order to sufficiently equip them to address the challenges of food insecurity and poverty. Although reports on agricultural training and skills development are widely available and have been well documented, very few, if any, are specifically tailored to meet the skills and training requirements of women in rural areas within cultural and traditional realities.

Unlike in the developed world, the bulk of the people in rural areas of most developing countries depend on agriculture for their livelihood and food. In many developing countries women are the principal agricultural producers of both cash and subsistence crops (IFAD, 2011). The majority of women in rural areas of most developing countries are immersed in multiple agricultural activities, including land preparation, planting, weeding, harvesting and caring for animals. Women are generally responsible for maintaining food gardens and looking after small animals such as poultry, goats and pigs (Bob, 2002). Male out-migration for wage labour increases the work load for, and the responsibilities of, women (Bryson, 1981; Cloud, 1988).

Despite women's labour being critical to rural agricultural production systems in rural societies, their contributions are often overlooked (Ogunlela & Mukhtar, 2009; Bob, 2002). Programmes that aim to improve livelihoods and food security often fail to recognise the contributions and needs of rural women (Jacobs and Hart, 2012; Bob, 2002). It is argued that equitable access to water and the improved management of water are imperative to sustainable development, improving household food security, poverty alleviation and biodiversity preservation (Sharaunga & Mudhara, 2016; Bhawana, 2003).

## **1.2 Project objectives**

The aim of the project was to investigate the constraints, opportunities and challenges to achieve empowerment of women and improve gender equity and livelihoods through increased water productivity in crop cultivation and animal husbandry, in selected traditional rural areas in North West and KwaZulu-Natal provinces of South Africa.

The project addressed the following specific objectives:

- To review existing reports and literature on gender equity in agriculture and synthesise findings.



- To identify and describe the women who should be targeted in the selected study sites, with reference to amongst others: their demographics age and gender; composition of households; aspirations of women currently residing in these areas; the livelihood strategies followed by these women; existing and expressed constraints and needs of women to change practices; mechanisms for attracting women into agriculture; and broadening the current demographic profile.
- To describe and explain the political, economic, social, institutional and cultural environment in which women operate; with reference to: land and water allocation reform; the role of traditional authorities; available infrastructure and access to markets; family relationships and social networks; land tenure and water use security; and the status of women within local traditional culture. Given the above factors, to make recommendations regarding locally preferred adjustments and adaptations which are suitable to create a favourable environment for women to realise their aspirations, with specific reference to constitutional prescriptions compared with cultural realities.
- To specify appropriate agricultural farming and non-farming skills based on a needs assessment of women in rural areas, with reference to: existing skills amongst women in the selected study sites; relevant skills that will make a difference to the lives of women in the current reality; link the skills identified with South African Qualifications Authority (SAQA) requirements for future mainstreaming of training; identify suitable facilitating and training organisations which are capable of meeting the requirements for skills training; and begin a facilitation process of skills training in cases where available training material and trainers are able to make a contribution at the selected study sites.
- To make recommendations for the development of training material for the identified skills which are required in agriculture (farming and non-farming activities).

## **CHAPTER TWO: LITERATURE REVIEW OF GENDER, AGRICULTURE AND LIVELIHOODS**

**Oladele, O. I., Mudhara, M., Shraunga, S. and Tekana S.S.**

### **2.1 Gender, agriculture and economic development**

Agriculture is a vital sector of the economy of many developing countries, as it significantly contributes to domestic production and employment (FAO, 2006). Agriculture is crucial because of its significance contribution to ensuring food security, which remains a major challenge in many developing countries. The World Bank (2007) noted that agricultural production is important for food security as it is a source of food for the majority of the rural poor, especially due to the variable nature of domestic production, which includes the limited tradability of food staples and foreign exchange constraints in terms of the ability to purchase imports. Agriculture is the main source of livelihood for 86% of rural households; 75% of the poor people still live in rural areas and derive the major part of their income from the agricultural sector and related activities (Dethier & Effenberger, 2012).

Women play a pivotal role in agriculture. The FAO (2011) describes women in agricultural production in developing countries and pursue multiple livelihood strategies, in addition to their immense workload in managing households. Women can be farmers on their own farms and as unpaid workers on family plots. Women produce food (staples) and cash crops and manage mixed agricultural operations involving crops, livestock and fish farming (FAO, 2011). However, in most rural areas of South Africa, where subsistence agriculture is important, women's contribution to agricultural production is affected because unlike men, women face a number of constraints and obstacles to enhance their productivity (Madzwamuse, 2015; IFAD, 2010).

Agricultural productivity is low in many developing countries for a myriad of reasons. Among these is the fact that women lack resources and opportunities to make the most productive use of their time. Quisumbig (1996) points out that women's ascribed lower levels of human and physical capital result in lower agricultural productivity. In poor areas, where men have been forced to migrate in search of work, women often have the sole responsibility of farming and raising children (IFAD, 2011). Women as smallholder farmers are *marginalized* and face significant challenges to engaging productively in agricultural activities. Rural women are vulnerable to both economic and social shocks and stresses, such as indebtedness due to economic, food insecurity, health problems, lack of access to inputs and gender discrimination in the ownership of productive assets (Holmes & Jones, 2009). Nkala et al. (2011) add that women experience problems of inadequate farming knowledge and skills.

Close to half of South Africa's population (45%) resides in rural areas. In KwaZulu-Natal, 56.7% of the total population and 54% of women reside in rural areas. In South Africa, an

estimated four million people engage in smallholder agriculture and the majority of these people are in rural areas (Baiphethi & Jacobs, 2009). The most common reason given for engaging in agriculture is to procure “an extra source of food”. More than half of the rural households in South Africa are headed by women and are among the poorest of the poor (Thabethe & Mathe, 2010). Women make up a substantial majority of the agricultural workforce and produce most of the food that is consumed locally (World Bank, 2008). The large proportion of agricultural production that is attributable to woman makes them the principal agents of food security and household welfare in rural areas. However, lack of skills, especially agricultural, among rural women results in poor performance and negatively affects their livelihoods and that of their households (Machethe, 1990 cited in Chibanda et al., 2009).

The New Growth Path for South Africa opined that employment creation is possible, both within economic sectors, as conventionally defined, and in cross-cutting activities and analyzed the policies and institutional developments required to take advantage of these opportunities. The agricultural value chains were identified as a job driver through the restructuring of land reform to support smallholder schemes with comprehensive support concerning infrastructure, marketing, extension; to upgrade employment in commercial agriculture, especially through improved worker voice; to measure and support growth in commercial farming, while addressing price fluctuations in maize and wheat. This will target 300 000 households in smallholder schemes by 2020; agro-processing anticipates the creation of 145 000 jobs by 2020; and to upgrade employment on commercial farms (currently total of around 660 000). It is expected that these projections will adequately cover women farmers since they form the bulk of the smallholder farmers.

## **2.2 The gender gap in agriculture**

Women comprise 43% of the agricultural labour force in developing countries. Agriculture is underperforming in many developing countries for a number of reasons. Among these is the fact that women lack the resources and opportunities they need to be productive (Ashby et al, 2011). Women are farmers, workers and entrepreneurs, but almost everywhere they face more severe constraints than men in accessing productive resources, markets and services. This “gender gap” hinders their productivity and reduces their contribution to the agriculture sector and to the achievement of broader economic and social development goals. Closing the gender gap in agriculture would produce significant gains for society, by increasing agricultural productivity, reducing poverty and hunger and promoting economic growth. Governments, donors and development practitioners now recognize that agriculture is central to economic growth and food security – particularly in countries where a significant share of the population depends on the sector – but their commitment to gender equality in agriculture is less robust.

Gender issues are now mentioned in most national and regional agricultural and food-security policy plans, but they are usually relegated to separate chapters on women, rather than treated as an integral part of policy and programming. Many agricultural policy and project

documents still fail to consider basic questions about the differences in the resources available to men and women, their roles and the constraints they face – and how these differences might be relevant to the proposed intervention. As a result, it is often assumed that interventions in areas such as technology, infrastructure and market access have the same impacts on men and women, when in fact they may not.

The agricultural sector is becoming more technologically sophisticated, commercially oriented and globally integrated. At the same time, migration patterns and climate variability are changing the rural landscape across the developing world. These forces pose challenges and present opportunities for all agricultural producers, but women face additional legal and social barriers that limit their ability to adapt to and benefit from, change. Governments and donors have made major commitments aimed at revitalizing agriculture in developing regions, but their efforts in agriculture will yield better results more quickly if they maximize the productive potential of women by promoting gender equality. Women, like men, can be considered “productive resources”, but they are also citizens who have an equal claim with men on the protections, opportunities and services provided by their governments and the international community.

Gender equality is a Sustainable Development Goal (SDG) in its own right. It is directly related to the achievement of the SDG targets on reducing extreme poverty and hunger. Clear synergies exist between the gender-equality and hunger-reduction goals. Agricultural policy-makers and development practitioners have an obligation to ensure that women are able to participate fully in, and benefit from, the process of agricultural development. At the same time, promoting gender equality in agriculture can help reduce extreme poverty and hunger. Equality for women would be good for agricultural development and agricultural development should also be good for women.

The roles and status of women in agriculture and rural areas vary widely by region, age, ethnicity and social class and are changing rapidly in some parts of the world. Policy-makers, donors and development practitioners need information and analysis that reflect the diversity of the contributions women make and the specific challenges they are confronted with in order to make gender-aware decisions about the sector. Despite the diversity in the roles and status of women in agriculture, the evidence and analysis presented in this report confirm that women face a surprisingly consistent gender gap in access to productive assets, inputs and services. A large body of empirical evidence from many different countries shows that female farmers are just as efficient as their male counterparts, but they have less land and use fewer inputs, so they produce less. The potential gains that could be achieved by closing the gender gap in input use are estimated in this report in terms of agricultural yields, agricultural production, food security and broader aspects of economic and social welfare. Because many of the constraints faced by women are socially determined, they can change. What is more, external pressures often serve as a catalyst for women to take on new roles and responsibilities that can improve their productivity and raise their status within households and communities. For example, the growth of modern supply chains for high-value agricultural products is creating significant opportunities – and challenges – for women in on-

farm and off-farm employment. Other forces for social and economic change can also translate into opportunities for women. Gender-aware policy support and well-designed development projects can help close the gender gap. Given existing inequities, it is not enough that policies be gender-neutral; overcoming the constraints faced by women requires much more. Reforms aimed at eliminating discrimination and promoting equal access to productive resources can help ensure that women – and men – are equally prepared to cope with the challenges and to take advantage of the opportunities arising from the changes (IFPRI, 2012)

Women make crucial contributions in agriculture and rural enterprises in many developing countries, as farmers, workers and entrepreneurs. Their roles vary across regions but everywhere women face gender-specific constraints that reduce their productivity and limit their contributions to agricultural production, economic growth and the well-being of their families, communities and countries (FAO, 2010). Women face a serious gender gap in access to productive resources. Women control less land and have insecure tenure than men, and the land they control is often of poorer quality. Women own fewer of the working animals needed in farming. They also frequently do not control the income from the typically small animals they manage. Women farmers are less likely than men to use modern inputs such as improved seeds, fertilizers, pest control measures and mechanical tools. They also use less credit and often do not control the credit they obtain. Finally, women have less education and less access to extension services, which make it more difficult to gain access to, and use, some of the other resources, such as land, credit and fertilizer. These factors also prevent women from adopting new technologies as readily as men do. The constraints women face are often interrelated and need to be addressed holistically.

### **2.3 Women in agriculture**

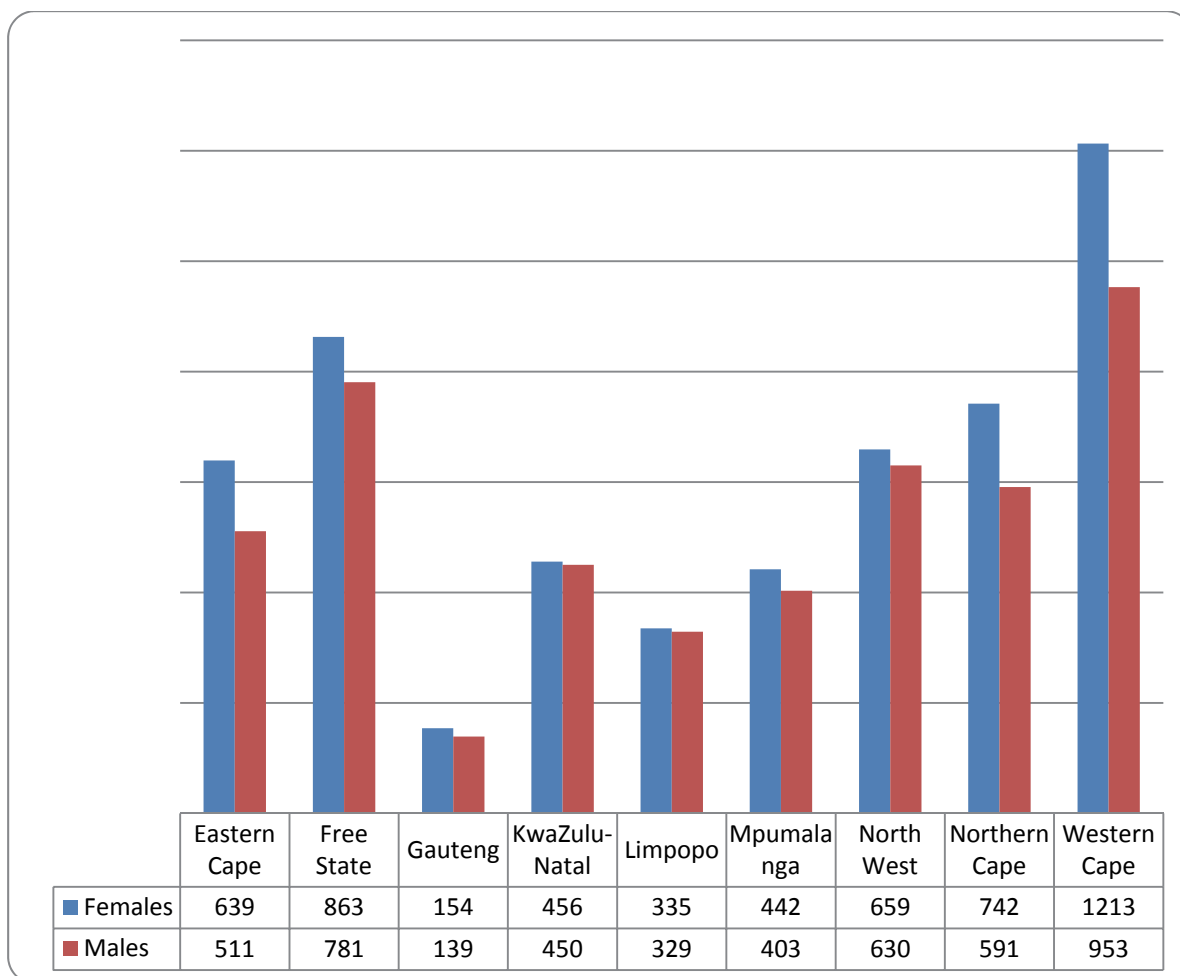
Women work in agriculture as farmers on their own account, as unpaid workers on family farms and as paid or unpaid labourers on other farms and agricultural enterprises. They are involved in both crop and livestock production at subsistence and commercial levels. They produce food and cash crops and manage mixed agricultural operation, often involving crops, livestock and fish farming. All of these women are considered part of the agricultural labour force. Based on the latest internationally comparable data, women comprise an average of 43% of the agricultural labour force of developing countries. Women in sub-Saharan Africa have relatively high overall labour-force participation rates and the highest average agricultural labour-force participation rates in the world. Cultural norms have encouraged women to be economically self-reliant and traditionally give women substantial responsibility for agricultural production.

### 2.3.1 Women's access to productive resources

Access to productive resources such as land, modern inputs, technology, education and financial services is a critical determinant of agricultural productivity. Agriculture is important to women, but female farmers have less access to the productive resources and services required by agricultural producers. In some cases, women do not even control the use of their own time. While the size of the gender gap differs by resource and location, the underlying causes for the gender asset gap are repeated across regions: social norms systematically limit the options available to women. Regardless of cause or magnitude, however, the gender asset gap reduces the agricultural productivity of women and thus involves broader economic and social costs (FAO, 2010). Women become farmers for various reasons. Some become farmers because they inherited land from their parent(s) who have either passed away or are old and cannot carry out farm practices. Others assume the role after their partners either pass away, migrated or they have separated. Women also become farmers because of their personal interest in it. Women are gradually assuming a major role in the farming sector, even though in some places it might be taboo for a woman to be a farmer (FAO, 2010).

Women face more challenges in agriculture than men as they do not have access to resources and opportunities for production like men do (FAO, 2011). This gap hinders their optimum productivity and overall contribution to the sector (FAO, 2011). If this gap was closed, more would be supplied to the market and the livelihoods of female farmers would be secured. Yields would increase by 20-30%, reducing the numbers of the hungry in developing countries by 12-17% (FAO, 2011). Government can bridge this gap through gender sensitive policies that address women's needs and enhance their production potential.

Figure 2.1 shows the number of South African farmers who are engaged in farming. These are farmers “*who farm for themselves and unpaid family members involved in farming activities*” (STATSSA, 2011). According to this figure, there are more women in all nine provinces who are involved in farming than men. Gauteng has the least number of farmers, while the Western Cape has the highest number of farmers.



**Figure 2.1:** Family members involved in farming, South Africa

Source: StatsSA (2011)

More men than women in all the nine provinces of South Africa are farm managers, with Western Cape having the highest number of male and female farm managers. This might be due to the fact that women are not educated as men are to assume farmer manager's roles. The view and norms of place may also make it difficult for women to be managers. If women are given this opportunity, placing women as farm managers would bridge the gender gap and ensure that women are empowered (STAT SAA, 2011).

### 2.3.1.1 Land

According to Allendorf (2007), land is the most important household asset for households that depend on agriculture for their livelihood. Access to land is a basic requirement for farming and control over land is synonymous with wealth, status and power, in many areas. Strengthening women's access to, and control over, land is an important means of raising their status and influence within households and communities. Land is a key resource for agricultural production. Owners of land are perceived as wealthy and powerful. Improving women's access to land and security of tenure positively impacts farm productivity and can also have far-reaching implications for improving household welfare (Ajadi et al., 2015).

Women do not only need access to land, but they also requires entitlement to control what the land is used for. Strengthening land ownership by women in Nepal, for example, is linked with better health outcomes for children. Gender gap can be bridged by ensuring that women have access to land. According to the FAO (2011), women in developing countries have a small likelihood of owning or operating land, or accessing rental land. Land that they are able to access is of poor quality and of smaller sizes. FAO (2011) defines an agricultural holder as:

*“the person or group of persons who exercise management control over an agricultural holding. The holding may be owned, rented or allocated from common property resources and may be operated on sharecropped basis.”*

In South Africa, there are more females than male farmers. Although women have access to land in South Africa, they tend to have only user rights over the land and cannot transfer through selling or loaning it.

### **2.3.1.2 Farm labourer**

Female-headed households face more severe labour constraints than male-headed households, because they typically have fewer members but more dependants. In some areas, male out-migration adds to the constraints already imposed by gender specific farming tasks (Cousins, 2012). Female-headed households may receive help from male relatives, but only after the men have taken care of their own plots. The fact that female-headed households typically farm smaller plots may not compensate for the lower availability of family labour. For example, among small-scale maize farmers in Malawi, females own less land but still use about 10 % less total labour per hectare than their male counterparts and much of that labour is supplied by children, who must work to make up the shortfall caused by their mothers' other duties (Takane, 2008). Household and community responsibilities and gender-specific labour requirements mean that women farmers cannot farm as productively as men and make it more difficult for them to respond when crop prices rise. Depending on cultural norms, some farming activities, such as ploughing and spraying, rely on access to male labour without which women farmers face delays that may lead to losses in output. For example, women maize farmers in Malawi require male labour for ploughing, but female-headed households often lack male family members who can do the work and they may not have the cash needed to hire male labour. As a result, women cultivate smaller plots and achieve lower yields (Gilbert et al., 2002).

### **2.3.1.3 Education**

Human capital is a major factor in determining the opportunities available to individuals in society and is closely linked to the productive capacity of households and their economic and social well-being. The level of human capital available in a household is strongly correlated with measures such as agricultural productivity, household income and nutritional outcomes – all of which ultimately affect household welfare and economic growth at the national level (World Bank, 2007). In most developing countries, female household heads in



rural areas have lower levels of human capital development. Human capital establishes opportunities available to individuals (FAO, 2011). According to FAO (2011), female farmers are disadvantaged when it comes to education levels. Education is very important in that it plays a role in the level of income earned and type of work one gets to do. Men are more educated in most developing countries. In Southern Asia and sub-Saharan Africa the education gap is wide (FAO, 2011).

STATSSA (2011) stated that in terms of number of paid workers in agriculture, more women are unskilled, compared to men in the whole country. The gap between skilled male and female farmers is disturbing. The figure also shows that there is a high level of female farmers/workers who are hired on a casual and seasonal basis. According to Kehler (2001), women are mostly employed on a seasonal or temporary basis, receiving low remuneration compared to men, and receiving no additional assistance like medical, maternity or pension benefits, even bonuses. Women need education to ensure that they generate income from a stable source.

#### ***2.3.1.4 Financial services***

Financial services, such as savings, credit and insurance, provide opportunities for improving agricultural output, food security and economic vitality at the household, community and national levels. Producers who are unable to cover their short-term expenses, or who want to purchase productive but more expensive technologies, must rely on either credit markets or other credit sources. Without access to credit, producers may be unable to bear the risks and up-front costs associated with the innovations and investments necessary to enhance their productivity, income and well-being. Evidence shows that credit markets are not gender-neutral. Legal barriers and cultural norms sometimes bar women from holding bank accounts or entering into financial contracts in their own right. Women generally have less control over the types of fixed assets that are usually necessary as collateral for loans. Institutional discrimination by private and public lending institutions often either ration women out of the market or grant women loans that are smaller than those granted to men for similar activities (Fletschner, 2009; World Bank, FAO and IFAD, 2009).

In Uganda, nearly all female-headed households reported a desire to expand agricultural activities, but lacked the money to purchase land and inputs such as seeds, fertilizers and pesticides and/or to hire-in labour. They cited the lack of access to credit as one of the most prominent barriers to livelihood diversification (Ellis, Manuel and Blackden, 2006). White (1991) found that about 50% of loans taken out by women were used for men's productive activities; Goetz and Gupta (1996) reported that, on average, women retained full or significant control over loan use in only 37 % of all cases; while Chowdhury (2009) reported that credit to women from the Grameen Bank was positively and significantly correlated with the performance of male-managed micro-enterprises, but not those managed by females. An FAO/UNDP (2002) study carried out in Vietnam, indicates that female-headed households borrow less, have less access to formal credit and pay higher interest on loans than dual-

headed household. For a farmer to achieve set goals, money is needed. In a case where a farmer does not have cash to meet farming obligations an external source of funds can assist. These are either formal or informal financial markets. However, for female farmers it is a challenge accessing these services due to legal barriers. Institutions require collateral as a form of security and most female farmers do not have ownership of land rights. There are also cultural norms that bar women from opening a bank account and/or entering into financial contracts in their own right (FAO, 2011). Formal financial markets have tedious procedures to be followed, such as filling in forms and some farmers are illiterate. Other procedures require that women should visit financial institutions several times before their request is approved and they have other on-and-off farm responsibilities to take care of.

### ***2.3.1.5 Extension services and technology***

Extension services provide advice and training to enable farmers to use new inputs and methods for more productive farming. Technological developments and the impacts of climate change are making extension services ever more important. Women farmers already have too many demands on their time such that they have little time for extension services and training. Many women farm in remote rural areas where extension services are limited. As smallholder farmers, women are not regarded as “economically active” farmers so they are excluded from membership of farmer groups and cooperatives. This makes it very difficult for them to access or demand public extension services. Extension services are mostly designed for commercial farmers who grow cash crops yet most women farmers are smallholders who grow subsistence food crops. Most extension workers are male and few have been trained to provide the services and information to female smallholder farmers. Extension service providers usually expect women to go to where they are, but there may be social, cultural or religious taboos against doing so (ActionAid International, 2011).

Despite women’s prominent role in agriculture, they do not get an proportionate share of agricultural extension advice. Worldwide, women farmers still receive only five percent of all agricultural extension services (FAO, 2011). In Africa, since women farm separate plots and given that males do not necessarily share extension information with their female counterparts, women’s direct access to extension services is important (Quisumbing et al., 1995). Quisumbing et al. (1995) identified four primary constraints limiting women’s access to extension services. First, in many places, cultural restrictions prevent male extension officers from meeting with women farmers. Second, domestic responsibilities sometimes limit women’s mobility, making it harder for them to attend meetings and courses away from home. Third, women are less likely than men to speak the national language and extension services are often not offered in the local language. Fourth, there are not enough female agents.

### **2.3.1.6 Women's work**

Agriculture is a source of employment for many women but this differs across regions (FAO, 2011). Other industries, however, like exports and agro-processing, afford women better opportunities. According to FAO (2011), contract farming and high-value products offer more opportunities to women than men, but the level of income is unknown. Women have many roles to play. They engage in family activities that do not generate income, such as taking care of children and other domestic chores. In agriculture they are preoccupied with agricultural crop production, tending livestock, managing the farms and selling their produce to the market.

## **2.4 Sustainable Livelihoods Framework**

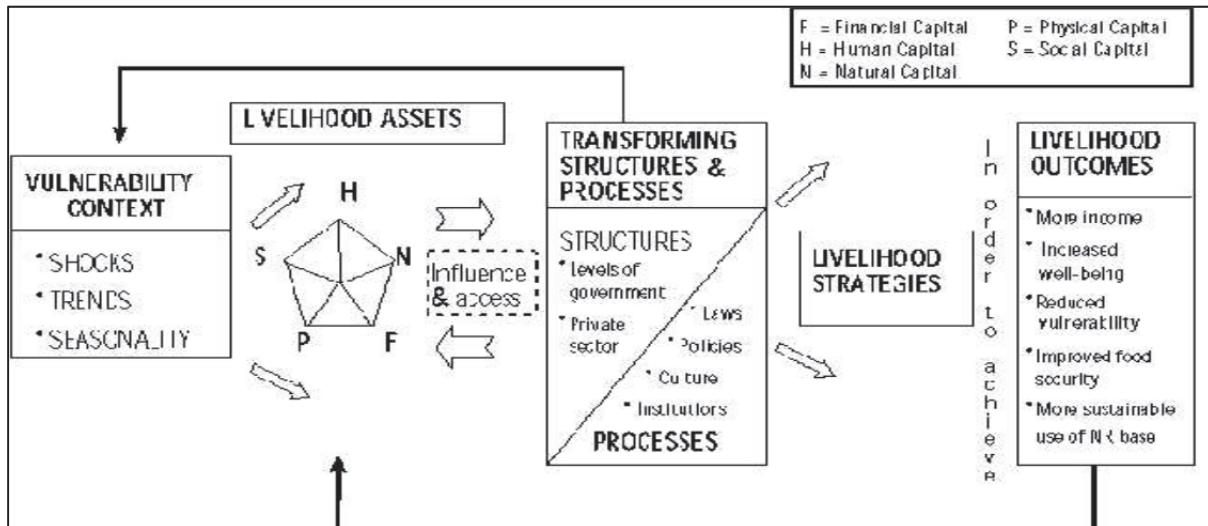
Amatya Sen is generally credited with shifting the food security debate away from an exclusive focus on the availability of food towards a focus on the ability of households to access food (Maxwell & Slater, 2003). He highlighted the effect of personal entitlements (resources used for production) in ensuring household food security. Adato & Meinzen-Dick (2002) reasoned that the concept of "livelihoods" has become increasingly popular in development, thinking as a method of conceptualizing the economic activities poor people undertake in pursuing their livelihoods.

The Sustainable Livelihood Approach (SLA) (Figure 2.4) allows the analysis of the relationship between people's access to resources, their diverse livelihoods activities and factors at micro, intermediate and macro levels. It is also a framework for assessing and prioritizing interventions (Adato & Meinzen-Dick, 2002). The SLA draws attention to the activities that take place within the broader policy and institutional context at different times and how they support or undermine livelihood strategies (DFID, 2000 cited in Hart 2009).

Households and communities must have access to and exploit livelihood assets in order to be food secure. The SLA recognizes that households require assets to enhance their livelihood strategies. The assets are categorized into human, natural, physical, financial and social capital. Households adjust to their social, physical, economic and political environments by using their assets for livelihood strategies designed to strengthen their wellbeing (Timmer, 2003 and Bryceson, 2005, cited in Matshe, 2009). Households are viewed as sustainable if they can adjust to threats without compromising their future ability to survive shocks to their livelihoods. This approach suggests that adequate ownership of livelihood assets is essential for pursuing a range of livelihood opportunities and is a key determinant of livelihood performance and the ability to accumulate assets for optimal production and for consumption smoothing in the face of seasonal climatic and market risks (Matshe, 2009).

Increasing the asset base of the poor is key to enhancing food security and livelihoods for poor and vulnerable rural agricultural households. Transforming structures and processes, such as government and private sector players, laws, policies, culture and institutions, play a role in shaping the livelihood strategies that can be pursued to attain higher livelihood outcomes (Dorward & Kydd, 2004). The SLA is ideal for this study, because the predicament

of rural people is largely determined by the erosion of their livelihood assets, in one form or another. The framework is holistic, as it interrogates the notion of empowerment for rural people and acts as a tool for understanding the implications of access to assets for rural people. Human capital, which encompasses education and agricultural skills within this context, influences the effective use of other livelihood assets and hence agricultural productivity and household welfare.



**Figure 2.2:** The Sustainable Livelihood Framework

**Source:** Farrington et al. (1999)

Expanding on the Sustainable Livelihood Framework, de Stage et al. (2002), using case studies, drawn from Lesotho, Mozambique, South Africa, Zambia and Zimbabwe, show the impacts of retrenchment, flood risk, recurrent drought, HIV/AIDS, violence and political instability on individual households and their communities and the pressure facing people living in precarious circumstances across southern Africa. The case studies examined the following issues:

- Gender and power relations within and between households;
- Communities and localities and explored how these relations are influenced by age and ethnicity;
- How households use their capabilities to draw on assets and resource entitlements and engage in diverse livelihood activities that contribute to household livelihood security;
- The factors and trends in the local and wider environment which contribute to the relative vulnerability and livelihood security of different households; and
- Local livelihood strategies and the different ways that people cope with vulnerability in a broader context of policies and institutions.

## **2.5 Women empowerment in agriculture**

Women play a critical and potentially transformative role in agricultural growth in developing countries, but they face persistent obstacles and economic constraints, limiting their further inclusion in agriculture. The Women's Empowerment in Agriculture Index (WEAI) tool measures the empowerment, agency and inclusion of women in the agriculture sector in an effort to identify ways to overcome those obstacles and constraints. According to IFPRI (2012, 2), "the Index is a significant innovation in its field and aims to increase understanding of the connections between women's empowerment, food security, and agricultural growth. It measures the roles and extent of women's engagement in the agriculture sector in five domains: (1) decisions about agricultural production, (2) access to, and decision-making power over, productive resources, (3) control over use of income, (4) leadership in the community and (5) time use". It also measures women's empowerment, relative to men within their households. According to IFPRI (2012), the WEAI is a composite measurement tool that indicates women's control over critical parts of their lives in the household, community and economy. It helps in identifying women who are disempowered and understand how to increase autonomy and decision-making in key domains (Table 2.1). The WEAI is also a useful tool for tracking progress toward gender equality and a tool to monitor progress in the South Africa's National Development Plan. The WEAI is composed of two sub-indexes. The first one measures the five domains of empowerment for women while the second measures gender parity in empowerment within the household. IFPRI (2012) argues that the WEAI is an aggregate index, that is based on individual-level data on men and women within the same household.

### **2.5.1 Five domains of empowerment (5DE)**

This sub-index assesses whether or not women are empowered across the five domains examined in the WEAI. For women who are disempowered, it also shows the percentage of domains in which they meet the required threshold and thus experience "sufficiency". The 5DE sub-index captures women's empowerment within their households and communities.

### **2.5.2 Gender Parity Index (GPI)**

This sub-index reflects the percentage of women who are as empowered as the men in their households. For those households that have not achieved gender parity, the GPI sub-index shows the gap that needs to be closed for women to reach the same level of empowerment as men. Based on both sub-indexes, the WEAI is an aggregate index that shows the degree to which women are empowered in their households and communities and the degree of inequality between women and men within the household. Therefore, progress toward empowering women in agriculture will be achieved by empowering them in the five domains and achieving gender parity within the household.

**Table 2. 1:** The five domains of empowerment in the WEAI

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

Sources: IFPRI (2012).

### 2.5.3 Five Domains of Empowerment

The five domains are agricultural production, resources, income, leadership and time. They comprise ten indicators. Each domain is weighted equally, as are each of the indicators within a domain. The 5DE sub-index is constructed using a multidimensional methodology called the Alkire Foster Method. It is a measure of empowerment, rather than disempowerment, which shows how many domains women are empowered in. The 5DE sub-index contributes 90% of the weight to the WEAI (IFPRI 2012).

The domain indicators are built on the following definitions:

- **Production:** Sole or joint decision-making over food and cash-crop farming, livestock and fisheries, as well as autonomy in agricultural production.
- **Resources:** Ownership, access to, and decision-making power over productive resources such as land, livestock, agricultural equipment, consumer durables and credit.
- **Income:** Sole or joint control over income and expenditure.
- **Leadership:** Membership in economic or social groups and comfort in speaking in public.
- **Time:** Allocation of time to productive and domestic tasks and satisfaction with the available time for leisure activities.

A woman is defined as empowered in 5DE if she has adequate achievements in four of the five domains, or is empowered in some combination of the weighted indicators that reflect

80% total adequacy. The main advantage of the Index it shows the number of domains in which women are empowered and, at the same time, reveal the connections among areas of disempowerment (Torell et al., 2016, 18). This enables decision-makers to focus on improving the situation of the most disempowered women. In addition to tracking the nature of empowerment in five domains, the WEAI measures how empowered women are relative to men in the same household, which is critical to understanding the gender empowerment, gap (IFPRI 2012).

## **2.6 Food security**

South Africa faces a wide spectrum of food security problems, conceptually ranging from national level to household issues. At the national level, challenges undermining South Africa's ability to achieve food security are complex (De Cock et al 2013). These obstacles have implications for vulnerable households, in addition to a range of other household level problems. In the 1996 Rome Declaration on World Food Security, food security is defined as "Food that is available at all times, to which all persons have means of access, that is nutritionally adequate in terms of quantity, quality and variety and is acceptable within the given culture." In South Africa, according to the StatsSA (2013), about 13.6 million individuals (26.1%) of the population had inadequate or severely inadequate access to food. Households continue to face a wide spectrum of developmental issues such as poverty, increasing food prices, unemployment, inadequate safety nets, unstable food production and these increase their vulnerability to food insecurity (StatsSA, 2013).

### **2.6.1 Food security pillars**

Food availability: 'An effective or continuous supply of food at both national and household level. This is affected by input and output market conditions, as well as the production capabilities of the agricultural sector' (Abu, 2012, 32).

Food access or effective demand: 'The ability of the nation and its households to acquire sufficient food on a sustainable basis. This addresses issues of purchasing power and consumption behaviour' (Abu, 2012, 32).

Reliability: Utilisation and consumption of safe and nutritious food (Abu, 2012, 32).

Food distribution: Equitable provision of food to points of demand at the right time and place. This spatial/time aspect of food security relates to the fact that a country might be food-secure at the national level, but still have regional pockets of food insecurity at various points of the agricultural cycle. Food security is noted when all members of a household can be supplied with sufficient and adequate food, whether through their own production which is farming livestock or crop production, or supplied by purchasing food (Abu, 2012, 32).

Food insecurity and malnutrition are highest in provinces with large rural populations, such as KwaZulu-Natal, Limpopo, Eastern Cape and the Free State (Department of Agriculture, 2007). The demand for male labour in urban areas have resulted in the erosion of the agriculture-based livelihoods among black Africans but has increased reliance on non-farm

and non-rural incomes. It has also resulted in greater reliance on purchased food, as opposed to own-produced food, which exposes vulnerable households to the adverse effects of price fluctuations (De Cock et al 2013). For example, the 17% inflation on food prices between 2001 and 2002 had a disproportionate and devastating impact on the living standards of the predominantly rural ultra-poor, which spent more than 50% of their income on food (Stats SA, 2004). Food availability in any household had a pattern within a timeframe which was either increased, decreased or was at a constant level (Obadire et al., 2010). Food insecurity and poverty are locked into the same destructive cycle. Poverty is the leading cause of food insecurity and food insecurity is a major contributor to the continuation of poverty. Several studies have been carried out to assess household food insecurity in the semi-arid areas of southern Africa.

Mfekaye (2015) found that poverty and food insecurity in KwaMthethwa area of South Africa was the result of several centuries' worth of colonial and apartheid policies, that created unfavourable conditions to the well-being of black people, especially in the former homelands. Thus it is crucial to better understand these historical processes in order to design effective policy interventions to redress the injustices of the past (Mfekaye, 2015). Contemporary South Africa evolved at the turn of the 20th century from an agrarian setting through, the rapid growth of commodity markets that sprung up around major industrial mining, urban populations and commercial agriculture centres. Initially, African farmers and entrepreneurs had successfully participated in the growing commodity markets under conditions of relative land abundance, low population size, low production, processing and distribution technologies, weak government interventions and relatively undistorted markets. Food insecurity and poverty among the majority African population, which at the time was largely made up of independent producers and entrepreneurs, was almost non-existent. With political and economic forces that led blacks to become the expected providers of wage labour to mining, industry and large-scale agriculture, this situation of relative food security in South Africa among the majority population was to change. Impelled by its social and economic imperatives, successive white governments throughout the greater part of the 20th century transformed agrarian 19th century society through a two-pronged strategy that set in motion a process that would simultaneously cripple and debar African farming and entrepreneur development.

### **2.6.2 Household and intra-household food insecurity**

With respect to food security, although South Africa presently boasts of national food sufficiency through a combination of its own production and food imports, secure access to food for all is still not guaranteed. Household food security is threatened by climate change and poor storage and distribution of food (StatsSA, 2013). The distribution of poverty in the country is uneven in its spread and intensity. Gauteng and the Western Cape are wealthier provinces, with the least number of poor households, at less than 12% each. The Free State, Eastern Cape and Northern provinces have the worst of poverty in South Africa. In the middle group are Mpumalanga, KwaZulu-Natal, and Northern Cape and North West provinces. According to the General Household Survey (GHS) (2013), about 13.6 million



individuals (26.1%) of the population had inadequate or severely inadequate access to food. The incidence of poverty and food insecurity is higher in rural areas than urban areas (StatsSA, 2013).

According to StatsSA (2011), nearly one-third of all South African households are female-headed, which are considerably poorer than male-headed households (Sharaunga et al., 2016; Bob, 2002). Almost 40% of children under the age of seven years live only with their mother, while many live with their grandmothers (Sharaunga et al., 2016; SAHO, 2012). Thus, the productivity and economic empowerment of women is, therefore, a logical priority of agriculture programs and policies that seek to promote rural development. The priority is warranted both in terms of the importance of women's agricultural production as a source of economic growth, and as a source of rural livelihoods and poverty reduction (Ashby et al., 2011).

**Inadequate safety nets:** Poor households are typically characterized by few income-earners and many dependants. They are also often primarily dependent on migrant remittances and social security grants, making them vulnerable to food insecurity. Rural households are particularly vulnerable because of their reliance on the remittances from urban areas. In South Africa, they are also frequently constrained by a lack of economic activities in close proximity to their communities and inappropriate farmer support services. They face constraints to gaining access to employment elsewhere, such as a lack of information and transport. At the national level, the challenge is to create the economic conditions that favour poor, food-insecure households. This means instituting changes that actively foster the participation of all in the mainstream economy, thereby minimizing poor households' dependency on government assistance. In other words, social safety nets should be viewed as a policy of 'last resort', helping those food insecure households that have not benefited from the enabling, pro-poor economic environment that government has supported.

**Weak support networks and disaster management systems:** In order to develop new policies and implement food security programmes, policy-makers at all levels of government require considerable information on the conditions of food supply and demand in different parts of the country. This information can be used to identify risky and vulnerable areas, with respect to food access and use. Food security information is multi-sourced and, when using existing data collection systems through established agencies, co-operation and co-ordination is key to establishing efficient and cost-effective systems. One such example of weak institutional support networks relates to disaster management systems. South Africa does not yet have a structured system of dealing with food security disasters, such as droughts or floods. These disasters, which occur at regular intervals, can substantially threaten the food security position of agriculture-based households. With fewer reserves to draw on, these households are hit hard by crop failure and asset loss.

**Inadequate and unstable household food production:** According to Meals on Wheels (2016), hunger and malnutrition in South Africa arise from insufficient, unstable food supplies, at the household or intra-household level. The majority of households in the former homelands are unable to feed their families from own-produced food. Such households are deficit producers

and thus net consumers of purchased food. Thus, they rely on non-farm income to meet most of their household needs. Non-catastrophic events such as seasonal, climatic variation can even make them vulnerable to food insecurity (DAFF (2002). Government assistance is often a major source of income for many of these households, given the high level of rural unemployment and dwindling migrant income transfers. As a result, many rural areas experience periodic bouts of hunger (Meals on Wheels, 2016; Abu, 2012).

**Lack of purchasing power:** The majority of households in South Africa lack cash to purchase food. Underlying the lack of purchasing power is the limited scope of income opportunities, especially in the rural areas. Unemployment rates have remained high at 38%, despite other decent economic indicators (Statistics SA, 1998). Black households have the lowest standards of living and are much more vulnerable to poverty and food insecurity. Although food insecurity is highest among Africans, it also affects a significant number of Coloured and Indian households. There are also some pockets of food insecurity among urban whites. The HIV/AIDS epidemic and other communicable diseases have further undermined food-insecure households.

According to the Lund Report on Child and Family Support (1999), one child in four under the age of six years (which translates to approximately 1.5 million children) is stunted, due to chronic malnutrition. These figures dramatically highlight the vulnerability of children in South Africa. Food insecurity and malnutrition are highest in provinces with large rural populations such as KwaZulu-Natal, Northern Province, Eastern Cape and the Free State.

### **2.6.3 Food security context in South Africa**

South Africa is unlikely to feature at the top of the agenda at any international dialogue on food security. The country is a net exporter of agricultural commodities and has a high *per capita* income, even for an emerging economy. There are no tight foreign-exchange constraints and the country is not landlocked. The innovative Constitution entrenches the right to adequate nutrition and this is the basis of the national Integrated Food Security Strategy (IFSS) (NDA, 2002). Taking all these features into account, one could easily conclude that food ought to be available and accessible in South Africa at all times. But is this conclusion correct? The confusing reality is that, despite all the favourable indicators and South Africa's national food secure status, about 14% of the population is estimated to be vulnerable to food insecurity and 25% of children under the age of six years are reckoned to have had their development stunted by malnutrition (HSRC, 2004).

South Africa's inability to meet basic needs has a variety of causes but, in contrast to most other countries, poverty and hunger are particularly shaped by the legacy of apartheid. One aspect of that system was the deliberate dispossession of assets, such as land and livestock, from members of the black majority, while denying them opportunities to develop, access to markets, infrastructure and human capital. In addition, until 1985, agricultural policies pursued self-sufficiency, thus protecting domestic commercial farm production, often at the cost of consumers, resulting in a total welfare loss for the country as a whole agriculture

policy unit 1997). Post-apartheid policies, including the IFSS, all aimed to address the adverse impact of apartheid and move the country forward as a unity.

As a consequence of the policy debates on agriculture and food security, the IFSS turned out to be a multidimensional strategy, structured mainly around household food security in rural areas. The arrangements proposed in the strategy appear to be an innovative blend of mechanisms with clear programmes, co-ordinating units and multi-sectoral fora to stimulate and support programmes that would engage creatively with food insecurity.

Section 27(1) of the South African Constitution states clearly that ‘Everyone has the right to have access to sufficient food and water...The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights (IFSS, 2002).

The vision of the IFSS is to attain universal physical, social and economic access to sufficient, safe and nutritious food by all South Africans, at all times, to meet their dietary and food preferences for an active and healthy life. This vision is closely aligned with the definition of food security provided by the United Nations Food and Agriculture Organisation (FAO).

In sub-Saharan Africa, two thirds of the working population still make their living from agriculture, especially commercial agriculture (ILO, 2007). Approximately 70% of the population live in rural areas, where crop and animal production, fisheries and forestry activities are direct sources of food and provide income with which to buy food. Increased and diversified food production for family consumption, or as a source of income, is a basic prerequisite for improved household food security (FAO, 1997). Even though total food supply may be secure in a country or a region, households or individuals may not have access to adequate food. It is thus important for policy-makers to distinguish food security at the national, regional and household levels (FAO, 1997).

Achieving household food security requires broad policy instruments such as strategies for increased production, supply and price stabilisation, employment, land distribution, macroeconomic growth and income stabilization. With respect to agriculture, more support will be necessary for extension work, credit availability, irrigation and encouragement of the greater use of inputs such as fertilizer and improved seeds. Because of agriculture’s central role in generating employment and income in rural areas, policies aimed at increasing agricultural production and productivity are essential for improved household food security and nutrition in sub-Saharan Africa. However this does not mean that focus must be only on food production for domestic consumption. Research by the international food policy research institute (IFPRI) in The Gambia, Kenya and Rwanda showed that cash crop production can result in significant increases in household income and improved household food security (Kennedy & Haddad, 1992). In this context, it is important to emphasize not only the absolute level of income, but also the control of income and the source, as these can significantly influence household food security (FAO, 1997).

Food enters a household in a variety of ways. A household may produce food when it has the human and material resources to do so and such households are said to have direct access to food. The ability of farmers to produce in adequate amounts and sufficient variety depends, to a large extent, on their access to resources. Food is also purchased. Most households purchase a portion of their dietary requirements depending on need and affordability. This type of food acquisition represents economic access. Rural farming households regularly purchase a proportion of food commodities which they do not produce themselves. Given the ways food is accessed, diversity of food income sources is considered to be one of the main practices against risk in agrarian communities (FAO, 1997).

There are many areas where smallholder's food security comes under risk, such as, failure or loss of crop production due to pests and drought, agricultural trade due to disruption of exports and imports, large sudden food price rises and loss or lack of employment.

Households which are most at risk are smallholders who have little income diversification and limited access to improved technology such as seeds, fertilizer, irrigation and pest control (FAO 1992).

## **2.7 Reforms and policies on land in South Africa**

Since 1994, South Africa has developed and implemented a wide range of land reform policies and programmes. From the beginning, the ANC-led government viewed land reform as key to rural development. Building on the sentiments expressed in the Reconstruction and Development Programme (RDP), the White Paper on Land regarded the land reform as a cornerstone for reconstruction and development, arguing that a land policy for the country needs to deal effectively with the injustices of the racially based land dispossession of the past, the need for a more equitable distribution of land ownership and the need for land reform to reduce poverty and contribute to economic growth (Fabbriani, 2007). Land reform in South Africa has been implemented through three principal programmes, namely land redistribution, land restitution and land tenure reform (Woodhouse, 2012).

### **2.7.1 The land redistribution programme**

The purpose of the land redistribution programme is to provide the poor with access to land for residential and productive uses, as a way of improving their income and quality of life. The programme aims to assist the poor, labour tenants, farm workers, women and emergent farmers. Redistributive land reform is largely based on "willing buyer, willing seller" arrangements (Commission for Gender Equality, 2009). The Settlement and Land Acquisition Grant (SLAG), initiated in the 1990s, explicitly targeted poorer people who generally had to pool their grants in order to purchase a (large-scale) commercial farm, which they subsequently subdivided or attempted to run collectively (Woodhouse, 2012).

In 2001, the SLAG was replaced by the Land Reform for Agricultural Development (LRAD) scheme, which provided larger grants and hence enabled existing commercial farms to be acquired by individuals. The LRAD aimed to contribute to the transfer of 30% of the nation's medium and high-quality agricultural land (i.e. 24.66 million hectares) to blacks over the

following 15 years. The strategic objectives of the sub-programme include improving nutrition and incomes of the rural poor, who want to farm on any scale, de-congesting of overcrowded former homeland areas and expanding opportunities for women and young people who stay in the rural areas (South Africa, Ministry of Land and Agriculture, 2000). Following the Land Summit in 2005, the Proactive Land Acquisition Strategy (PLAS) allowed government to purchase land as it came up for sale, for later redistribution to black farmers (Woodhouse, 2012).

Land redistribution was expected to supply the greater part of the government's 30 per cent land transfer target. However, by 2009, it had transferred just 3.04 million ha to black owners, equivalent to about 12 per cent of the target area. The redistribution programme has been the subject of criticism since its inception, both for its slow pace and for its lack of impact, attributed to failure of government to provide financial and technical support to the black owners of transferred land (Woodhouse, 2012).

### ***2.7.1.1 Impact of the land redistribution on women farmers***

With respect to gender, LRAD aims to expand opportunities for women and youth in rural areas as well as to overcome the legacy of past racial and gender discrimination in land tenure. The programme hopes to achieve this by encouraging women-only projects and by ensuring that at least one-third of transferred land resources accrue to women (Rakolojane, 2013; Commission for Gender Equality, 2009). As far as gender issues are concerned, the South African government views the LRAD as an initiative that provides a vehicle for redressing gender imbalances in land access and land ownership, and thus in improving the status of rural women (Moeng, 2011). Adult individuals, including women can apply for grants in their own right, rather than as members of households under the programme (Rakolojane, 2013; Ministry of Land and Agriculture, 2000).

In terms of policy and legislation, there is no doubt that the South African government is committed to gender equity. The ANC's 1992 Land Policy Document called for special procedures to ensure that women gain equal access to land and participate effectively in policy formulation and decision-making. The Reconstruction and Development Programme recognised women's land rights (Weideman, 2003). The RDP also stated that the national Land reform programme should address gender inequities and that support services and government assistance for agricultural production should especially benefit women (Weideman, 2003). The 1996 Green Paper on South African Land Reform expressed a clear commitment to end discrimination and ensure gender equity in land ownership (Weideman, 2003). The 1997 White Paper on South African Land Policy places considerable emphasis on gender equity in land access and effective participation of women in decision-making procedures (Weideman, 2003).

Despite the government's stated commitment to gender equity (e.g. the Department of Land Affairs in 1997 gave priority to women applicants), poor rural women appear to have gained fewer benefits as a result of the Redistribution Programme. In September 1999, the National

Land Committee (NLC) estimated that only 7 331 of the 50 152 beneficiary households that participated in the Land Redistribution Programme were female-headed households. In 2000, the NLC estimated that female-headed households represented only 14% of the households to whom land had been transferred under the Redistribution Programme (Weideman, 2003). A review of statistics by the Commission for Gender Equality (2009) indicated that a total of 18 284 women benefited from the redistribution and tenure reform during the period 2005 to 2009, indicating that women constituted about 36% of the total beneficiaries of land reform during that review period.

The National Land Committee and gender activists stated that poor rural women face more constraints in accessing land than their male counterparts. The most frequently cited factor that prevented women from accessing land under the 1994 to 1999 Redistribution Programme is the fact that the Settlement/Land Acquisition Grant was paid to household-heads. Policies and redistribution project business plans were often constructed without a clear definition of what constitutes a household and without acknowledging that family power relations are generally skewed in favour of men. The allocation of grants to household-heads (usually men) has meant that other household members' access (usually women) to land continues to be mediated by, and dependent on, a spouse, partner or family member (Weideman, 2003).

Women's isolated and inferior status in South African society contributed to their difficulties in accessing the Redistribution Programme and information pertaining to it. Very few women, for example, were aware of the fact that women in polygamous marriages who maintained households separate from their husbands/partners could apply independently for the Settlement/Land Acquisition Grant (DLA, 2001). Similarly, women were often unable to effectively articulate their demands and needs for land, which left them vulnerable to exploitation by male members of their communities (Weideman, 2003). Furthermore, in those cases where communities/beneficiaries had to move considerable distances to redistributed land, poorer female-headed households' participation in the Redistribution Programme was likely to be inhibited, since they lacked the money and inclination (including risk-taking ability) to move (Zimmerman, 2000).

Weideman (2003) believes that the South African Land Reform Programme had done little to improve women's access to land, wealth and authority. According to Weideman (2003), the Land Reform Programme had failed women because policies and procedures did not take account of the fact that women's position in society is fundamentally different (inferior). Women's particular position is influenced by the unequal division of labour, institutionalised violence, lack of legal protection, social services, education and training, patriarchal patterns of land allocation and inheritance, traditional authorities and culture, restrictions on their movement and the omission of women's voices from the processes of policy formulation and implementation (Weideman, 2003).

Gender inequities in land access and ownership in South Africa are exacerbated by the fact that women face the additional burden of domestic violence (Commission for Gender Equality, 2009). Social isolation and the lack of places of safety for abused women in rural

areas, combined with the fact that many women retain access to land, housing and employment only through male relatives, leave rural women with little option other than to stay in abusive relationships. In a study conducted by Artz (1999), 100% of respondents said that they feared losing everything, including farming land, if they brought a charge against their abusive partners. In general, the national Land Reform Programme (and its sub-programmes) is based on genderless categories such as households, families and communities. As a consequence of the current power relations in (rural) society and current traditional/patriarchal practices regulating land access and ownership, the benefits of land reform tend to accrue to men (Weideman, 2003). Moreover, the LRAD that set (commendable) quotas for female participation, but required a minimum own contribution, only benefited those women who already had access to relatively significant resources (Weideman, 2003).

### **2.7.2 Land restitution**

Land restitution, as mandated by the Constitution, seeks to restore land to those who were forcefully removed from it, provided the dispossession can be proved to have occurred no earlier than 19 June 1913 (Department of Land Affairs, 1997). Restitution is an integral part of the broader land reform programme and is closely linked to the need for the redistribution of land and tenure reform. The Restitution of Land Rights Act 22 of 1994 and the Constitution provide a legal framework for the resolution of land claims against the State, where possible through negotiated settlements. The restitution process is driven by the just demands of claimants who have been dispossessed (Department of Land Affairs, 1997).

Restitution can take the following forms: restoration of the land from which claimants were dispossessed; provision of alternative land; payment of compensation; alternative relief, including a package containing a combination of the above; sharing of the land; special budgetary assistance, such as services and infrastructure development where claimants presently live; or priority access to state resources in the allocation and the development of housing and land in the appropriate development programme. The principle is that preference is given to the restoration of land. Any compensation that was received at the time of removal, and any improvements to the property since dispossession, is taken into account when structuring the package for restoration (Commission for Gender Equality, 2009).

Land restitution was originally due to be completed by the end of 2007. About 70 per cent of claims had been settled by late 2005 and the great majority of claims to land that now lies within urban areas had been resolved (usually by payment of cash compensation) by 2008 (Lahiff, 2008). In rural areas, land claims more often involved transfer of ownership of land, with existing (white) landowners being compensated by government at an agreed valuation of the land. The most delayed of restitution cases involved large areas of highly productive commercial farmland, among which land claims in Mpumalanga Province featured prominently (Woodhouse, 2012).

Nationally, it has been estimated that, by 2009, the settlement of 75 787 restitution claims had resulted in the transfer of 2.62 million ha of land to black owners (Greenberg, 2010). Set against a total of 79 696 claims registered (Lahiff, 2008), this suggests that less than 5 per cent (3 909) of restitution claims remained unresolved by 2009. However, about a third of the remaining unresolved claims are ‘complex’ (i.e. often subject to contestation by the existing owners, or by competing restitution claims to the same land, boundary disputes between customary authorities, or insufficient evidence of eviction) and require lengthy hearings in the Land Claims Court (Lahiff, 2008). Progress is consequently slow, but also costly. In 2011, the Department of Rural Development and Land Reform was spending R2.5bn on restitution claims, but with the target to resolve only 60 claims in a year (Woodhouse, 2012).

### *2.7.2.1 Impact of the land restitution reform on women farmers*

Claims for restitution are lodged with the Commission for the Restitution of Land Rights, which, according to the 1997 White Paper on Land Reform, is responsible for publicising the process and providing information, investigating and mediating claims, settling claims through negotiations and assisting communities and individuals to lodge claims (Commission for Gender Equality, 2009). Claimants, as conceived in this policy, are viewed as largely “un-gendered”, despite the fact that the denial of land rights to black women was only a part of a broad legacy of centuries of land dispossession through racially discriminatory laws. The programme has thus failed to acknowledge the specific gender-based experiences that underpinned much of colonial apartheid land dispossession experiences (Hall, 2007). In addition, the policy has not developed any specific procedures that are targeting women as a category worth acknowledging, given their historical experiences (Commission for Gender Equality, 2009). This is despite the fact that women have faced a double process of dispossession, as black South Africans and as women, due to discriminatory cultural and social practices and traditions relating to land ownership and access (Hall, 2007).

The Restitution Programme is essentially rights-based and thus restores land rights to those who formerly held them (Weideman, 2003). Under apartheid, the patriarchal system in which land rights were denied to African women was perpetuated. The effect is that the Restitution Programme is restoring land rights to men. Power relations in society further curtail women’s ability to benefit from the Restitution Programme. Women are less likely to be represented on community-based organisations, representing claimant groups and male claimants tend to outnumber female claimants (Govender and Van Wyk, 1999). In addition, hostility to women within communities and the lack of commitment among some officials in the DLA also undermine the Commission and the Court’s powers (Weideman, 2003).

There are no accurate figures available, but the socio-economic position of women in land reform projects does not appear to have improved significantly from the Restitution Programme (Commission for Gender Equality, 2009). According to Weideman (2004), there are four basic reasons for this.

- The Restitution Programme is failing to take account of women’s particular experience of dispossession,



- The Restitution Programme is rights based,
- Appropriate methodologies and procedures are absent yet power relations in societies in question are skewed in favour of men and;
- Restitution Programme was not developed with sufficient emphasis on, or understanding of, gender (Weideman, 2004).

According to Hall (2007), gender is mentioned in the 1997 White Paper in relation to redistribution and tenure reform, but not in relation to restitution. In essence, women did not benefit significantly from the Restitution Programme because of the failure of policy developers and implementers to take socio-economic differences (in this case gender) sufficiently into account (Hall, 2007).

Weideman (2004) argues that women continue to have less access to land, have weaker land tenure, have less influence in making decisions within the community and tend to lose access to land due to inheritance systems based on male succession, even if land rights have been restored to communities. In cases where chiefs are claiming or holding land on behalf of communities, the restitution process has resuscitated the chieftancy (Cross, 1999). The re-emergence of the chieftancy has undermined the government's political and constitutional commitment to restructuring gender relations (Weideman, 2003).

Unlike in the developed world, the bulk of people in rural areas of most developing countries depend on agriculture for their livelihoods and food. In most developing countries, women are the principal producers of food. Women are important agricultural producers of both cash and subsistence crops (IFAD, 2011). The majority of women in rural areas of most developing countries are immersed in multiple agricultural activities, including land preparation, planting, weeding, harvesting and caring for animals. Women are generally responsible for maintaining food gardens and looking after small animals such as poultry and pigs (Bob, 2002). Male out-migration for wage labour increases the workload for, and the responsibilities of, women (Bryson, 1981; Cloud, 1988).

Despite women's labour being critical to rural agricultural production systems in societies (Davison, 1988), their contributions are often overlooked (Bob, 2002). Programmes that aim to improve livelihoods and food security often fail to recognise the contributions and needs of rural women (Bob, 2002). Moreover, poor rural women are considerably more disadvantaged than their male counterparts, because of an explicit gender bias in land allocation, access to credit, access to rural organisations, marketing channels and agricultural services in general. Women living in traditional rural areas form part of the most economically and socially disempowered groups in South Africa.

Since the late 1990s, strategies for tackling global poverty have begun to emphasize the importance of empowering marginalized people to advocate for their own change. According to Pandya (2008), empowerment has become the key strategy for addressing many social problems as it initiates the process of obtaining the basic opportunities for marginalized people. Although the process of empowerment is applicable to both sexes, it is more relevant

to women, since women's disempowerment is more pervasive as it cuts across class and other social distinctions and is made more complicated by the fact that household and intra-familial relationships are a major source of women's powerlessness (Malhotra & Schuler, 2005). Understanding the social, economic, political, institutional and cultural environment in which women operate is crucial to the establishment of effective ways to empower them.

A productivity revolution in smallholder farming and mass poverty reduction through the proliferation of rural livelihoods will not be possible without women. Reaching rural women with resources and services is therefore a cardinal priority for agricultural and rural development.

Kameri-Mbote (2013) reported that land ownership indicates a person's identity, social standing and citizenship, such that the negation of women's rights to land has implications at the national, family and household level. Social standing is also influenced by gender, age and marital status, raising the need for holistic policy responses to transform the position of women in Africa. The issue of land rights in African countries is complex, because of the multiplicity of claims to land and land-based resources. Land policies and laws in Africa have to deal with a number of key issues, which include state sovereignty over land, unequal distribution of land resources, the plurality of property systems, land tenure security, sustainable management of the environment and natural resources, protecting the commons, competition between different land uses and users, gender and generational biases in land relations, HIV/AIDS, which has affected a sizeable part of the labour force in many African countries, land management in conflict situations, the place of the rights of women and youth within community and customary claims, structuring land administration systems and institutions and designing land policy implementation processes and programmes.

The past decades have seen a range of governance reforms that can help improve agricultural and rural service provision (Birner 2007). Democratization is one of the most promising of these reforms. The number of countries that have become democracies increased rapidly in recent decades. Although many of them are not yet fully institutionalized democracies, democratization provides more voice to the rural poor and rural women, because their votes count. Another important governance reform is decentralization, which entails a far-reaching change in the structure of the state. Eighty percent of all developing countries have engaged in some form of decentralization during the past several decades (Work 2002). Although local empowerment is not always the explicit or implicit goal of this reform, decentralization brings government closer to the people, thereby improving people's ability to make their demands heard and to hold public sector agencies accountable. According to Weideman (2004), community-driven development and group-based approaches, which have gained increasing relevance in recent years, pursue similar goals. He asserts that other types of reform approaches have also targeted the providers of agricultural and rural services. Important examples include the introduction of new management approaches, civil service reforms, the contracting out of service provision, public-private partnerships and the involvement of NGOs in service provision (Weideman, 2004). These governance reform approaches have been linked with various efforts to improve gender sensitivity in service

provision. They include gender budgeting, the establishment of quotas for women in political leadership positions, the reservation of seats for women in national parliaments and local councils and the formation of self-help groups and quorums for women in community meetings (The World Bank, 2010).

### **2.7.3 Land tenure programme**

Land tenure is defined as the terms and conditions on which land is held, used and transacted or transmitted (Makopi, 1999). A fundamental goal of tenure reform is to enhance people's land rights and thus provide tenure security. This may be necessary in order to avoid the suffering and social instability caused by arbitrary or unfair evictions, landlessness and the breakdown of local arrangements for managing common property resources (Adams et al., 1999). Tenure reform may be essential if rights holders are to manage their land resources, invest in the land and use it sustainably (Commission for Gender Equality, 2009).

South African tenure reform can be divided into reform in the former 'homelands' and reform on farms (Weideman, 2004). Although the tenure reform programme has been the slowest and most difficult aspect of the South African land and agrarian reform programme, to date, there are a number of laws that have been promulgated since 1994 to address the tenure insecurity of persons or communities or groups of persons in the former homelands and former South African Development Trust (SADT) areas, the former Coloured areas and the white commercial farming areas, as well as the peri-urban areas, where farm-workers and farm-occupiers are mainly found (Ministry for Agriculture and Land Affairs, 2005). The Draft Land Rights Bill was developed in 1999. This was followed by the Communal Land Rights Bill, which has been criticized for arguably increasing the power of traditional authorities over land administration in the Bantustans. The two mechanisms for tenure reform on farms are the Land Reform Labour Tenants Act (LTA) and the Extension of Tenure Security Act (ESTA) (Weideman, 2004). The ESTA addresses the relationship between occupiers and owners, as well as the circumstances under which evictions can take place and the procedures to be followed. The Act is underpinned by the following principles: The law should prevent arbitrary and unfair evictions, existing rights of ownership should be recognised and protected, and people who live on land belonging to other people should be guaranteed basic human rights. In essence, this law promotes long-term security on the land where people are living at the moment (Hornby, 2000).

The second piece of legislation dealing with tenure reform in the established freehold farming areas is the Land Reform Act (Labour Tenants Act No. 3 of 1996). This Act differs from ESTA in that it not only places restrictions on the eviction of labour tenants from farms, but also gives tenants the right to claim stronger rights, including ownership of the land they use. For instance, it allows labour tenants to obtain long-term secure independent tenure rights through the purchase of the land they currently use, or alternative land. Like the ESTA, the LTA is concerned with evictions, but there is a stronger imperative to give labour tenants the right to assert stronger claims to the land on which they reside and work, including ownership rights (Hornby, 2000). With the LTA, there is a focus on giving labour tenants the opportunity to acquire long-term, secure and independent tenure rights through the assisted

purchase of the land they currently use, or alternative land (Commission for Gender Equality, 2009).

### ***2.7.3.1 Tenure reform in the former homelands***

South Africa's former homelands, which constitute 13% of the country, require far-reaching reforms that ensure gender interests in land access, ownership and use. Unfortunately, in the years 1994-2009, the legislation and implementation of these key reforms in South Africa's former homelands have proven a daunting task (Commission for Gender Equality, 2009). Though rights that people hold in communal areas seem secure, in reality they are often weak in terms of their jurisprudential validity. Since land is owned by the State, the people who hold these rights hold derivative or secondary rights. These forms of rights are not acquired on the basis of membership, but rather on that of occupation and use over a period of time and, most of the time, these rights tend to be nested (i.e. operate at different levels of social organization that cut across the community, tribe and family) (Commission for Gender Equality, 2009). Rights held by women in this regard are even weaker than that held by males due to the customary practice that marginalises females as property-holders. The prevalence of male-dominated traditional authorities thus restricts the gender-fair treatment of land tenure (Adams et al., 2000). In addition, local government plans and service delivery interventions are thwarted or delayed by chiefs refusing to "release" land for development projects (Adams et al., 2000). As a result of these sets of problems, the Communal Land Rights Act, 2004 (CLRA) was legislated with the sole aim of according statutory recognition to tenure rights in the former homelands (Department of Land Affairs, 2004).

The core of the CLRA is to provide for legally secure tenure in communal areas and accord comparable redress, where necessary. Its overall aim is to enable the registration and transfer of communal land to communities to occur and be recognised under statutory law. This process will be preceded by a process of land rights enquiries to establish the extent/location of land to be transferred to a person or community. These processes will be facilitated through the establishment of a Land Rights Board and a Land Administration Committee/Traditional Council, as stipulated under the bill. The main objective of CLRA is to transfer communal land currently held by the State to communities and individuals who reside on and have rights to that land. Central to the Communal Land Rights Programme is a Rights Enquiry, through which the people and communities that have rights to the communal land are identified (Department of Land Affairs, 2004).

One of the key reservations concerning the Communal Land Rights Act, 2004 (CLRA) is that it tends to undermine the attainment of gender equality, one of the constitutional rights enshrined in the Bill of Rights. Women face serious problems under communal tenure. Under customary law, only men are allocated land. In many instances women can access the rights to use land, provided they are in a relationship with a man. The unequal and discriminatory nature of women's access to land under customary law has been reinforced by formal law. For example, the most common record of land rights in communal areas is through Permission to Occupy (PTO). Yet PTO regulations provide that they are issued only to men.

PTOs are an example of an old order right to land tenure. However, old order rights were highly gendered in the allocation of land rights in communal areas (Commission for Gender Equality, 2009).

### ***2.7.3.2 Impact of the land tenure reform on women farmers***

In communal land tenure systems, women generally access land through their relationships with male relatives (Weideman, 2004). Women's lack of authority in society limits their control over the land resources that they are able to access. Communal tenure systems, for example, generally discourage or prohibit land sales and therefore land transactions take place privately. In cases where disputes arise, they cannot be addressed in a public forum. This insecurity of land transfer is serious for men, but reaches prohibitive levels for women (Cross, 1999). The point is that, although women are particularly vulnerable under traditional and communal land tenure systems, they are not guaranteed land rights under any system of tenure if societal values remain fundamentally patriarchal. Cross and Friedman (1997) explain that tenure is best understood, not as a system of laws, but rather as a social and political process. By implication, they argue that it is very difficult for any government to change tenure systems and women's positions therein by means of formal legislation (Weideman, 2004).

The report by the Commission for Gender Equality (2009) noted that just over three-quarters of those evicted from farms are women and children and they are more likely to be evicted than men. This is because the judicial interpretation of ESTA and the attitude of many land owners has, in practice, defined women's and children's tenure rights as secondary, being acquired indirectly through their relations with employed men. The main reason for farm dwellers being evicted relates to farm workers losing their jobs and, as a direct result, the family having to leave the farm. This is at least in part due to the connection between employment and land tenure rights. Generally, the provision of farm dweller legal support has not been very successful with regard to securing tenure security for the elderly, women and children. Their long-term occupier status is rarely acknowledged by farm owners. Women in these circumstances are even more vulnerable, as their tenure is often primarily via their relationship with a male head of household's tenure status. Loss of his income, job or historical agreement puts added pressure on women, as they are seldom employed for hard labour activities on farms and, when employed, are paid lower wages. The study by the Commission for Gender Equality (2009) also indicated that, despite the introduction of new legislation protecting the rights of farm workers, there has been an increase in evictions. The core cause of their vulnerability is the lack of security of tenure they experience. The systemic violation of their rights is exacerbated by the lack of access to legal resources, an awareness of their rights as tenants and the unequal power relations that pervade rural South Africa (Commission for Gender Equality, 2009).

#### **2.7.4 Land Reform Proposal by the National Planning Commission**

The NPC (2011) included land reform in its analysis and recommendations of policies that would be required for South Africa to realise its vision for 2030. Land reform is necessary to unlock the potential for a dynamic, growing and employment-creating agricultural sector. With respect to women, the manners in which land reform is conducted is intrinsically intertwined with the manners in which that are able to use water or irrigation to improve their livelihoods. The commission proposed land reform based on the following principles:

- Enable a more rapid transfer of agricultural land to black beneficiaries, without distorting land markets or business confidence in the agribusiness sector.
- Ensure sustainable production on transferred land, by making sure that human capabilities precede land transfer through incubators, learnerships, apprenticeships, mentoring and accelerated training in agricultural sciences.
- Establish institutional arrangements to monitor land markets and limit opportunism, corruption and speculation.
- Bring land transfer targets in line with fiscal and economic realities, to ensure that land is successfully transferred.
- Offer white commercial farmers and organised industry bodies the opportunity to significantly contribute to the success of black farmers, through mentorships, chain integration, preferential procurement and meaningful skills transfer.

NPC (2011) proposed a model that each district municipality with commercial farming land in South Africa should convene at the district lands committee with all agricultural landowners in the district, including key stakeholders such as the private sector and government and its agencies.

- This committee would identify 20 % of the commercial agricultural land in the district, which can be transferred to blacks. In doing this, only land already available on the market land from farmers under severe financial pressure; land held by absentee landlords who would like to exit and land in a deceased estate.
- Land could be obtained through the state at 50 % of market value. It is hoped that other commercial farmers who volunteer will further compensate the sellers.
- In exchange, commercial farmers would be protected from losing their land in future, by gaining black economic empowerment status, This should remove the uncertainty and mistrust that surrounds land reform and the related loss of investor confidence. This model still has to be put to the test.

#### **2.8 Irrigation – household welfare linkage**

Literature that examines the impact of irrigation on agricultural performance, household income and poverty is mixed. While few studies have found no linkage between irrigation and household welfare, many others have found irrigation to be of great significance for household welfare. Most studies have used poverty as an indicator of household welfare. Jen et al. (2002) also did not find a link between irrigation and the total factor productivity growth of any major grain crop in China between 1981 and 1995. In Tigray region, Ethiopia,

Berhanu and Pender (2002) showed that the impacts of irrigation development on input use and the productivity of farming practices controlling all other factors were insignificant. In line with irrigation and poverty linkage, there are a number of studies in different countries which show that irrigation has served as the key driver behind growth in agricultural productivity, in increasing household income and alleviating rural poverty. Lipton et al. (2004) state that irrigation can reduce poverty, through increasing production and income and reduction of food prices. This helps very poor households meet the basic needs associated with improvements in household overall economic welfare, protection against risks of crop loss due to erratic, unreliable or insufficient rainwater supplies, promotion of greater use of yield-enhancing farm inputs and creation of additional employment, which together enable people to move out of the poverty cycle.

In India, Narayanamoorthy (2001) points out that, besides increasing cropping intensity and productivity of crops, the intensive cultivation of crops due to timely access to irrigation increases the demand for agricultural labourers and hence wage rates for those who lived below the poverty line. He concluded that improvement in access to irrigation and investment in human capital development are the two most important factors for agricultural growth and rural poverty reduction in India. A study carried out by Fan et al. (1999), examining the linkages between government spending, growth and poverty in rural India, using state level data from 1970 to 1993, showed that government spending on productivity-enhancing investments, such as irrigation, research and development in agriculture, rural infrastructure (including roads, electricity and education), which target the rural poor, have all contributed directly to the reduction of rural poverty. They found that irrigation development, in addition to raising agricultural productivity, encourages private investment in these regions.

Empirical evidence from Australia shows that a dollar's worth of output generated in irrigated agriculture generates more than five dollars' worth of value to the regional economy, which suggested irrigation development has a strong multiplier effect on other sectors of the economy (Ali and Pernia 2003). In India, Shah and Singh (2004) found that more irrigation means fewer people below the poverty line. Fan et al. (2000), in their study on the role of public investment on growth and poverty, noted that government expenditure on productivity-enhancing investment which includes investment, in irrigation, has played a significant role in poverty reduction and enhancing productivity in rural China.

Bhandari and Pandey (2006: 15-20), using farm-level data collected from 324 households in Nepal, indicated that shallow tube well irrigation has generated a significant positive effect in increasing rice yields and the overall incomes of farmers. An average yield of shallow tube well irrigation owners was increased by 86% when compared to that of rainfed farmers. The net income of shallow tube well irrigation owners exceeds that of the rainfed farmers by US\$69 per hectare, which has an obvious effect on the ability of the farmers to reduce poverty and sustain their livelihood strategies. Hussain and Hanjra (2004), found that the productivity of irrigated lands were twice that of non-irrigated reference areas. The net productivity benefits, defined as the difference in net output values between irrigated and non-irrigated lands, varied widely across settings from US\$23 to US\$600 per hectare.

Lire (2005), in eight public-managed micro dams and 29 surrounding villages in Tigray, Ethiopia, showed that agricultural yield and farm profit have significantly increased in villages with closer proximity to the dams than in those farther away from the dam water resource. According to the study, the overall evidence suggests that carefully designed irrigation dams could significantly improve agricultural production and overall food security. Empirical results on the determinants of poverty in Tigray, reported by Hagos and Holden (2003), indicated that physical asset endowment, in terms of access to irrigation, farm size and livestock holding, were reported to have a positively significant effect in improving household welfare and food security status. Irrigation not only contributes to increased crop production, but may also reduce variability in production through improved control of the crop environment. In this respect, an empirical study carried out in Nigeria showed that the proportions of population of irrigation beneficiaries that experienced crop failure and poor harvest dramatically declined in comparison to the pre-irrigation status (Babatunde, 2006).

A study conducted by Madhusuda et al. (2002) in India, indicated that availability and access to irrigation infrastructure, coupled with the availability and access to new technologies, high yielding varieties and fertilizers, were major underlying factors for the success of the green revolution in India. They noted that better access to irrigation facilitated intensification of cropping practices and inputs used and contributed to the “modernisation” of the agricultural sector.

By creating more secure and stable rural communities, access to irrigation water can help stop migration to already overcrowded cities and slums (Van Hofwegen and Svendsen, 2000, Chambers, 1988). This is supported by Hussein et al. (2002) who found that labour employment per hectare and wage rate were found to be significantly higher in irrigated settings than in non-irrigated settings in Sri Lanka and Pakistan. A study conducted by Hussein and Hanjra (2003) in South and South-east Asia, found that higher labour employment and wage rates were reported in irrigated than in rain-fed areas. They concluded that this change in wage was a direct result of irrigation development. These researchers provided evidence of the significant contribution of irrigation to employment generation in agriculture. They noted that the annual labour work per hectare in the Ganges-Kobadak irrigation system of Bangladesh was around 100 days more than that in nearby non-irrigated areas. This additional labour demand creates better full-time employment opportunities for farm family members and also creates employment opportunities for hired labour. They indicated that hired labour used in irrigated settings was double, compared to that of nearby non-irrigated areas and the wage rate was 15% higher in the former than in the latter areas.

Qiuqiong et al. (2005) argue that the green revolution in Asia would not have happened without massive irrigation development. Without continuous irrigation, many countries would have been unable to achieve the agricultural and economic growth rates required to achieve food security and reduce poverty. They state that irrigation has been tremendously effective in generating a variety of benefits, such as improvements in productivity, employment, wages, incomes and consumption expenditures, which has a direct effect on reducing poverty within the irrigated perimeter. Van Koppen (1998) states that small-scale irrigation schemes, given their dispersed nature and relatively small size, suitability for



households under resource-poor conditions, small-scale water harvesting, are not likely to attract significant external support, although small-scale irrigation schemes do offer considerable potential for poverty eradication and equitable resource access.

### **2.8.1 Water use security**

Water security is an emerging concept and there is no universal definition. Instead, there are multiple definitions, which are often competing (Grey and Sadoff, 2007; Schultz and Uhlenbrook, 2007; Norman et al., 2010). The GWP (2000), for instance, defined water security as meaning that “every person has access to enough safe water at affordable cost to lead a clean, healthy and productive life, while ensuring that the natural environment is protected and enhanced.” Although this definition brings out some components of water use security such as water availability, affordability and the environment element, its limitation is that it focuses on water availability and affordability for mainly household use. Schultz and Uhlenbrook (2007) defined water use security more broadly, emphasizing that it involves “sustainable use and protection of water systems, protection against water-related hazards (floods and droughts), the sustainable development of water resources and the safeguarding of (access to) water functions and services for humans and the environment.

Grey and Sadoff (2007) defined water security in a more comprehensive manner, highlighting the importance of ensuring water access for livelihoods and productive uses, not just consumptive use. According to Grey and Sadoff (2007), water security is “the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies. In simple terms, water security involves harnessing the productivity of water while limiting the negative impact of its use (Grey and Sadoff, 2007). Although informative, this definition applies at the national level and fails to address the requirements at local or household level for achieving water security for irrigating households (Muller et al., 2009). Muller et al. (2009) stressed that, as it is widely recognized that food security needs to be considered at both household and national level, water security should be considered in a similar way, particularly in the rural context.

The common feature of the different definitions of water security is that they relate mainly to the macro level. The emphasis is on the availability of water in a country and the investments to ensure water reaches the population in appropriate quantities and qualities, while minimizing water-related hazards. At irrigation scheme level, water security is achieved when the social and productive potential of water has been harnessed adequately, to the benefit of all the irrigators, and its destructive potential is sufficiently contained (Muller et al., 2009). The above definitions of water security can be adapted so that they become applicable to the level of an irrigating household. In order to operationalize the definitions, some elements can be added. Firstly, there is need for water availability and reliability. All the definitions emphasize water supply and its reliability and thus this aspect is maintained. Secondly, the ability of the household to access the water is critical. Access here implies the household’s ability to pay for the water and also the rights or entitlement to the water. Lack of entitlement to water leads to water use insecurity. Water use security of different farmers

may be influenced by their location in the irrigation scheme, gender and other socio-economic factors.

Water security can thus be defined at the irrigating household level, as access by the irrigating household to sufficient and reliable water to meet agricultural use needs and the ability to assert the water rights against other parties. Water insecurity, on the other hand, refers to the difficulty people face in securing adequate and reliable access to water for food production (Rijsberman, 2006; Komnencic et al., 2009). These difficulties could be physical, economic or institutional. DWA (2012) acknowledged that the reliable supply of water in sufficient quantities and required quality is a crucial input to economic growth and job creation. South Africa cannot yet be considered to be water secure (Muller et al., 2009). Pursuing water security is thus one of the core water strategies in South Africa (DWA, 2012), where farmers have no ownership rights to water but use rights (DWAF, 1998). Water security that can be attained by an individual farmer is this basically water use security. 'Water security' and 'water use security' essentially mean the same thing in the South African context and are used interchangeably here.

### **2.8.2 Main aspects of water use security**

The key aspects of water use security are access to reliable and adequate supply of water with acceptable quality, the ability of the household to pay for the water and their right or entitlement to the water which they are able to assert against other parties. Water supply is a function of bio-physical and engineering aspects (physical, hydrological and water resources aspects of water security); while rights and entitlements are a function of water governance, institutions and capacity building (Muller et al., 2009).

Water insecurity is not primarily the result of not having enough water (Muller et al., 2009). Muller et al. (2009) explained that water insecurity is mainly due to limited financial resources and institutional capabilities, rather than to physical limitations of the resource. According to Muller et al. (2009), what matters is not how much water a country has, but how it is used and by whom, and how well the resource is managed. These points go beyond infrastructural investments, to also investing in institutions and human capital.

Bruns et al. (2005) warned against focusing only on the physical aspects of water scarcity, emphasizing that the water issue is not only about physical availability, but involves social, political and distributional issues. Bruns (2007) pointed out that countries need to develop good governance in the water sector, looking not just at technical issues, but establishing an institutional framework within which people have rights, participation and means to protect their rights. Emphasis on the 'hardware' (physical aspect) of irrigation, while neglecting the 'software' (institutions), results in failure of irrigation schemes (Inocencio et al., 2007). While too much attention has been placed on the physical aspect of irrigation at the scheme level, the social and distributive issues have largely been ignored in South Africa (Fanadzo, 2012). The findings by Fanadzo (2010) point to the need for balancing soft (institutional, organizational and technical) and hard (infrastructure) components of the irrigation system in order to attain sustainability in smallholder irrigation.

The neglect of the distributive issues has led many farmers in irrigation schemes to be water use insecure. As Zeiton (2011) noted, water scarcity is primarily social, with water use security of some individuals being associated with insecurity of others. Water use insecurity stems from a combination of the built infrastructure, biophysical environment and institutions or human governance (Norman et al., 2010; Zeiton, 2011). Zeiton (2011) stated that efforts to achieve water security have failed in many countries because the prevailing water policies have narrowly focused on biophysical processes. The narrow and deterministic approach blames water insecurity chiefly on physical phenomena and reacts through infrastructure (Zeiton, 2011). Instead, the development of water infrastructure and institutions should go hand-in-hand to achieve water use security (Grey and Soddoff, 2007; Zeiton, 2011).

### **2.8.3 Water rights and smallholder irrigation**

Water rights are property rights to water. Property rights are the social institutions that define or delineate a range of privileges of specific resources, such as water or land, to individuals (Kima and Mahoney, 2005). Property rights are not a relationship between a person and a thing but are social relationships between people with relation to some object (the property) (Meinzen-Dick and Nkonya, 2007). The crucial point here is that property rights are effective (legitimized) only if there is an institution to back them up. Institutions are defined as sets of formal and informal rules, including their enforcement arrangements, which shape human interactions (Perret, 2002). These institutions can be the state, or traditional or religious institutions. Water rights are wider than legal rights and include social norms (force of etiquette, social custom and acceptance, voluntary ostracism and code of conduct) (Bruns and Meinzen-Dick, 2000). Property rights to water, therefore, are institutions that regulate behaviour and social interactions with respect to water (Perret, 2002). According to Bruns and Meinzen-Dick (2000), water rights are simply socially accepted and enforceable claims to water. For water rights to exist, there is a need for a person's claim to water to be accepted by other people and that person with the right should be able to seek protective action against offenders.

Due to the fluidity of water, water rights are generally defined in terms of use rather than ownership (Hodgson, 2006). Meinzen-Dick and Nkonya (2007) explained that water rights are usually not homologous to ownership rights, where the holder can do whatever they please with the water resource, but are a bundle of rights that may be held by different parties. These bundles may be grouped into three broad categories: (i) use rights of access and withdrawal; (ii) decision-making rights to regulate and control water uses and users, including the rights to exclude others, manage the resource or alienate it by transferring it to others; and (iii) usufruct rights, which are the rights to earn income from a resource (Meinzen-Dick and Nkonya, 2007). Most state, customary and religious laws do not grant alienation rights (to sell, give away or otherwise transfer one's rights to someone else) (Meinzen-Dick and Nkonya, 2007).

Water rights can be formal or informal. Hodgson (2006) presented a concept of formal water rights, defining it as a 'legal right to abstract and use a quantity of water from a natural source such as a river, stream or aquifer'. Hodgson (2006) emphasized that water rights are legal

rights, created pursuant to a country's formal legal system and they thus have legal consequences. This definition seems inadequate in developing countries, as it assumes that the state is the only source of rights to water. Property rights to resources in many developing countries, particularly in Africa, are governed by statutory and customary law, depending on whether one is in the rural or urban areas (Boelens et al., 2007). Statutory law confers the legal or formal rights, as defined by Hodgson (2006), while rights conferred by customary law are not as legalistic, but are based on local traditions, beliefs and values. These two law regimes are based on different precepts and confer different bundles of rights to an individual (Joireman, 2008).

Formal rights usually describe the volume of water that applies to the right, the duration of the right, the conditions attached to the right and the mechanism that guarantees the right (Hodgson, 2006). The key objective of formal water rights is to promote certainty and security on behalf of the holder of the rights. Statutory formal rights are generally superior to customary rights, while their acceptability is not as clear-cut. Roy and Tisdell (2002) explain that, even if a person has formal property rights to a resource, they may not be able to exercise those rights in the absence of customary rights. Customary rights impart social recognition of legal rights and therefore legal rights without customary rights may not be that useful, especially in rural areas (Roy and Tisdall, 2002). According to Roy and Tisdall (2002), customary rights are more important than the formal statutory rights. This highlights the importance of conferring customary rights for women, not just legal rights, to ensure gender equity in resource access, something that has been lacking in most modern water reforms.

There has been an increasing attention to property rights in recent years. Meinzen-Dick and Nkonya (2007) presented five reasons why attention to property rights is critical. The reasons are based on efficiency, the environment, equity, empowerment and conflict reduction. In terms of efficiency, Meinzen-Dick and Nkonya (2007) stressed that secure property rights are needed to provide incentives to invest in a resource. For water, this often means developing and maintaining the infrastructure, such as a well or an irrigation canal. Property rights also provide an incentive to protect the resource and, without property rights that are enforced, resources often become degraded. Equity can be accomplished if the water rights are distributed, based on either equality of access or in proportion to the investments that people make, or some combination thereof (Meinzen-Dick and Nkonya, 2007). Holding property rights is empowering to individuals or groups, particularly control rights that recognize authority over how the resource is managed. This highlights the importance of how the property rights are defined and distributed, which determines the inclusion or exclusion of people in the control of a vital resource (Meinzen-Dick and Nkonya, 2007). Clearly defined rights are also thought to reduce conflicts over resources during scarcity. However, as explained above, defining water rights is complex. Due to its fluidity and re-usability, water rights cannot be easily defined in the same manner as property rights to land and other resources (Hodgson, 2004; 2006; Meinzen-Dick and Nkonya, 2007). Consequently, conflicts over water may be inevitable if there is no clarity in the definition of its rights.

Water rights can be divided into public, common, private and open access, according to who holds the rights and, particularly, the decision-making rights of allocation (Bruns and Meinzen-Dick, 2000; 2005; Meinzen-Dick and Nkonya, 2007). Public water rights are rights held by the state, where the government allocates rights to users. Under this system, people can get water rights by acquiring water permits, which give them legal licence to use, but not own, water. This is the system under which water is managed in South Africa (DWAF, 1998). Common water rights refer to communal water rights where water can be used by people in ways that are specified by some community. In most African customary water laws, water from natural resources is considered as a community property and private ownership of such water is not recognized (Meinzen-Dick and Nkonya, 2007).

Private property rights are rights held by an individual or legal individuals such as corporations (Bruns and Meinzen-Dick, 2005). With regard to water, it is generally only use rights that are recognized for individuals, particularly permits or licences that give an individual a right to use water in certain ways (Hodgson, 2006). Lastly, there is open access, which if there are no rules or restrictions in access, will result in the overuse and degradation of the resource, a phenomenon commonly referred to as the ‘tragedy of the commons’ (Bruns and Meinzen-Dick, 2005). However, it is important to note that the different types of water rights overlap in practice. Water rights have been historically linked with land rights, treated as more of a subsidiary component of land rights (Meinzen-Dick and Nkonya, 2007). Although there is movement from riparianism, land rights are still crucial in obtaining water, especially in irrigation schemes. Riparianism has been abolished in South Africa, although it was the water rights system that governed the water sector before democracy in 1994 (DWAF, 1998).

The rights of the individual farmers and their ability to exercise those rights are pivotal in ensuring their water security. According to Cremers et al. (2005), security of access to water refers to the possibility of materializing water-use rights now and in the future, and to avoiding, or controlling the risks of, unsustainable water management. To secure these rights, it is important to consider the bundle of rights, as explained above (water access and withdrawal rights, operational rights and decision-making rights) (Cremers et al., 2005). It is also important to understand that farmers may try to materialize their claims by addressing rules, rights and regulations which originate from different (and sometimes divergent) rights systems and which best represent their interests, a common strategy known as ‘forum shopping’ (Cremers et al., 2005; Bruns, 2007). One way to increase the security of local water rights is to assign water rights to collectives within irrigation systems, instead of assigning water rights to individuals (Cremers et al., 2005). The National Water Act (NWA) recommends the same approach when dealing with smallholder irrigators (DWAF, 1998). The question, however, is whether or not particular farmers in an irrigation scheme are able to seek recourse if they do not receive water they are entitled to.

Hodgson (2006) stated that the single greatest problem in water resource management in the developing world is that property rights to water are very insecure and ineffective. Moreover, the central role of women has remained largely unrecognized as far as water rights regimes are concerned (Hodgson, 2006). The need for institutional frameworks that structure socially

accepted access and entitlements to water has received increased attention from researchers as well as policy-makers (Bruns, 2007; Bruns et al., 2005; Molle, 2004; Bruns and Meinzen-Dick, 2000).

#### **2.8.4 Linkages between water security, smallholder irrigation and household welfare**

Many studies have hypothesised that ensuring smallholder farmers' access to irrigation is critical for addressing the many dimensions of agricultural production, poverty and food security in developing countries (Molden, 2007; Gebregziabher et al., 2009; Bacha et al., 2011). However, participation in an irrigation scheme, although a necessary condition, is not sufficient to ensure improved household welfare. Investments to achieve water security, not just irrigation participation, remain at the heart of the struggle for economic growth and poverty reduction (Grey and Sadoff, 2007). Hope et al. (2008) indicated that participating in smallholder irrigation results in the expected income and food benefits only to those farmers with secure access to irrigation. Therefore it is important that individual farmers have secure access to adequate and reliable water.

Reliable access to water under irrigation allows farmers to invest in higher-yielding crop varieties, or new high-value crops (Tyler, 2007). This, in turn, leads to increased productivity, overall higher production and greater returns from farming (Hussain and Hanjra, 2004; Tyler, 2007; Fanadzo, 2012). In contrast, uncertainties regarding how much water would be available to a particular farmer results in low incentives to invest in improved inputs and technologies (Faurès and Santini, 2008). Faurès and Santini (2008) pointed out that uncertainty regarding access to a reliable irrigation water supply causes farmers to apply less seed and fertilizer than would otherwise be the case. A household's access to irrigation, coupled with physical, socio-economic and institutional factors, leads to household water use security. Namara et al. (2010) however, added that the prevalence of poverty and the availability of water are not necessarily linked, noting that some of the poorest areas in the world are well endowed with water resources. What, then, is critical is the equity in access to the water resources. The incidence and severity of poverty depend on the level of control over water resources, rather than on the overall endowment (Namara et al., 2010). Inequity in access to land and water resources results in low productivity, particularly in downstream areas.

Heterogeneity within the scheme in terms of gender, plot sizes, income sources and social capital variables influences households' capacity to participate in the WUA, management of the organization, making and enforcement of resource-use rules and regulations and the resolution of emerging conflicts (Kamara et al., 2002). These factors result in water use security for an individual irrigating household. Water use security gives the household the incentives to invest in inputs such as high yielding seed varieties and in fertilizers, leading to increased crop production and household incomes.

The inter-linkages between the physical aspect of irrigation (ensuring reliable water supply), the socio-economic circumstances of the farmer (ensuring ability to pay for the water and water-related services) and the institutional and organizational structure ensures water rights

are respected and that conflicts are resolved (Sinyolo et al., 2014; Norman et al., 2010; Zeiton, 2011). It is these different aspects which lead to household water use security. Household water use security encourages investment in improved water management and agricultural technologies such as fertilizer and high yielding varieties (Kumar, 2003). This leads to improved crop output and household welfare. Improved household welfare has a positive feedback to crop production and household water use security, as improved incomes enhance the ability of a household to invest in improved technologies, pay for water and enhance water use security.

Downstream farmers are usually economically worse off than farmers upstream, because of heightened uncertainties regarding water availability downstream compared to upstream (Mbatha and Antrobus, 2008). According to Mbatha and Antrobus (2008), downstream farmers are usually water use insecure and uncertainties confound their production decisions resulting in economic inefficiencies. The economic disadvantage translates to political disadvantage, which has the effect of further worsening water use insecurity. Efforts in irrigation schemes should be to improve household level access to reliable and sufficient water, to enable farmers to improve productivity within current cropping patterns and for diversifying their cropping options (Faurès and Santini, 2008). Water use security has substantial influence on the motivation, ability and success of smallholders in maximizing production and the value of investments in the water sector (Faurès and Santini, 2008).

Equitable access to, and control over, irrigation water is required for irrigation schemes to operate successfully and contribute to household food security (Kumar, 2003; Van Averbek, 2008). Water use insecurity increases the vulnerability of the politically and economically weaker poor water users (Bruns et al., 2005). As farmers at the front-end of the canal have first access to the water in the canal, the tail-end farmers get less water if the front-end farmers take more than their share (Van Averbek, 2008). This has adverse consequences for the performance of tail-ender plots and is one of the common causes of conflict among farmers on irrigation schemes (Hope et al., 2008; Van Averbek, 2008). Water use insecurity results in poor production performance, resulting in lower contribution to household incomes. Kumar (2003) highlighted three concerns that need to be addressed to ensure irrigation impacts on food security. These are the adequate supply of irrigation water at national (or scheme) level, water use security for the farmers at household level and adequate economic incentives for farmers to maximize their production from the available land and water with least environmental consequences.

Mnkeni et al. (2010) reported that water distribution inequities were one of the major problems in the Tugela Ferry smallholder irrigation scheme. The scheme has been plagued with technical, financial, institutional, economic and political problems, leading to reduced water use security of some of the individual irrigators (Mnkeni et al., 2010). The key question here is whether or not the inequities in water distribution and access have significant impacts on household welfare in smallholder irrigation schemes.

There are several definitions of water security, which are often competing. The common feature of most of the different definitions is that they relate closely to water security as it

applies mainly at national level. In this paper, these definitions have been operationalized to apply at the household level. Water security at household level is defined as access by the irrigating household to sufficient and reliable water to meet their agricultural use needs and their ability to assert the water rights against other parties. The main components of the different water security definitions are access to reliable and adequate water supply of acceptable quality, the ability of the household to pay for the water and their right or entitlement to the water which they are able to assert against other parties. Clearly defined water rights are critical in ensuring water use security, efficiency, equity, empowerment and conflict reduction. Although the South African Water Act has been lauded as having the most promising legal framework in the world, its setback has been its slow implementation. Participation in an irrigation scheme, although necessary, is not sufficient to stimulate agricultural productivity and improve household welfare. It is important that the individual farmers have secure access to adequate and reliable water, in other words, water security.

### **2.8.5 Water policies**

South Africa suffered a long history of colonization, racial domination and land dispossession, which resulted in the bulk of agricultural land being owned by a white minority (Rugege, 2004). During the same period, water for production purposes was largely allocated unequally, for the benefit of the minority, without consideration for equity, efficiency and sustainability. In order to promote the beneficial use of land and water in the interest of all South Africans, the government adopted several reforms to address rural poverty and inequalities inherited from the previous apartheid regime (Perret, 2000).

There has been an on-going strong focus on land reform since the first decade of democracy, to address legacy of the inequitable land distribution in South Africa. The land reform policy aims to deal effectively with the various injustices of racially-based land dispossession, thereby achieving a more equitable distribution of land ownership that leads to security of tenure for all and a system of land management that would support sustainable land-use patterns and land availability for development (Fabbriciani, 2007).

Amongst other programmes, the South African government has adopted a new water legislation that promotes equity, sustainability, representativity and efficiency, through decentralization of water management, new local and regional institutions, water users' registration and licencing, and the emergence of water rights' markets (Perret, 2000). Since the enactment of the legislation, the South African Department of Water Affairs and Forestry has engaged in a complex implementation programme (Anderson et al., 2008).

Considerable progress has been made in terms of putting legislation, policy, systems and procedures in place for land and water reform (Lahiff, 2008). However, in many instances there is a disconnection in the outcomes of these reforms with respect to gender interests and the stated vision and targets provided for in the policy and legislative framework. The present paper reviews reforms and policies on water and land in relation to women farmers in South Africa.



### 2.8.6 Reforms and policies on water

Since 1994, the South African government has undertaken massive reforms aimed at addressing rural poverty and inequalities inherited from the past regime (Perret and Geysler, 2007). The White paper on Water Policy (DWAF, 1997), the National Water Act (NWA) of 1998 (DWAF, 1998) the National Water Resource Strategy-1 (NWRS-1) (DWAF, 2004) and the National Water Resource Strategy-2 (NWRS-2) (DWA, 2012) are the important policy documents that shape the current water policies in South Africa. These policy documents have put South Africa among the leaders in water reform. The National Water Act (NWA) of 1998 has been lauded by many researchers as a progressive policy with the most promising legal framework to address the country's challenges in the water sector (Perret, 2002; Hodgson, 2006; Tlou et al., 2006; Movik, 2009; Speelman, 2009). The NWA initiated several changes in the management and use of water in South Africa.

While water was allocated on a riparian system during apartheid, the new water law abolished riparianism and water access was separated from land ownership. Water is now understood as a common resource which cannot be privately owned by individuals, but is owned by the public, with the State acting as its custodian, in the public interest (DWAF, 1998). The government allocates water use rights to individuals who are supposed to apply and be registered. The allocation between uses and users is based on the need to 'achieve optimum, long-term, environmentally sustainable social and economic benefit for society from their use' (DWAF, 1998). Water rights allocations are time limited to allow for re-allocation flexibility. Licences are granted on a five-year cycle, with a maximum length of 40 years (DWAF, 1998). Hodgson (2006) warned that time limited licenses are a source of insecurity if, for instance, license renewals are not certain. Secure water rights help to expand opportunities for farmers by reducing the risks associated with appropriation by external agents and lengthening farmers' planning and investment horizons (Tyler, 2007).

Water access was characterized by racial and gender inequity during the apartheid era (Movik, 2009). Therefore the NWA sought to ensure that water is 'shared on an equitable basis, so that the needs of those without water for productive and consumptive activities are met' (DWAF, 1998). The NWA emphasized the need for efficiency, equity and sustainability in the use of water resources. The NWA represents a unique approach, as it has sought to incorporate issues of racial and gender equity in water reform, something that has not been done by many countries (Faysse and Gumbo, 2004; Hodgson, 2006). Many modern water policies allocate water resources to those activities with the highest productivity per cubic metre, as a result benefitting predominantly the economically and politically well-to-do (Boelens et al., 2007). However, researchers have reported that the reallocation of water resources to promote equitable distribution in South Africa has progressed slowly (Anderson et al., 2008; Movik, 2009; Muller et al., 2009; Van Koppen et al., 2009).

Movik (2009) recorded that water redistribution has been hampered by the emergence of narratives that frame the continuation of the *status quo* as being pivotal for economic stability and sustainability. Water redistribution to historically disadvantaged individuals (HDIs) has been perceived as being associated with low production and/or productivity, posing a high

degree of risk of destabilizing the economy (Movik, 2009). Achieving gender equity in water access has also been hampered by culture, especially in the rural areas (Kemerink et al., 2011). Therefore, although the equity vision established by the South African Water Act is clear, actually achieving that vision on the ground has been elusive (MacKay et al., 2003).

Whereas irrigating farmers were organized into irrigation boards (IBs) before, the NWA calls for the transformation of all the Irrigation Boards (IBs) into Water User Associations (WUAs) (DWAF, 1998). These WUAs are expected to incorporate all users in the defined area of jurisdiction, whether they have a formal water entitlement or not (Faysse, 2004). It is through these WUAs that water user groups such as smallholder farmers secure water rights. It was also envisaged that the transformation from IBs to WUAs would enable better participation of historically disadvantaged individuals (HDIs) in the management of water resources (Faysse, 2004). Although incorporating smallholder irrigators into WUAs holds promise, there has been little progress with the establishment of WUAs, thus far (Perret, 2002; Tlou et al., 2006; Speelman, 2009). The government was working on the transformation of all irrigation boards into WUAs by 2014 and the required transformation plan is in place (DWA, 2012). It remains to be seen if this will happen as envisaged, and whether these new WUAs will successfully work as vehicles for building the capacity of smallholder farmers.

One important aspect of the WUAs is their role in irrigation schemes. Each irrigation scheme is to be managed by a WUA, which will take charge of water management and cost recovery for water services (Perret and Geyser, 2007). The WUA is expected to achieve financial sustainability by selling water and water services to farmers who, it is assumed, are willing and/or able to pay (Perret, 2002; Backeberg, 2006). The NWA pointed to the need to introduce water pricing and full cost recovery. Although introducing water pricing and full cost recovery would be viable in the long run, the NWA acknowledged the need to waive these water charges for a determined time, so that disadvantaged groups could also access water for productive purposes such as agriculture (RSA, 1998). Speelman (2009) reported that there was yet to be water charges in many smallholder irrigation schemes. Speelman (2009) and Yokwe (2009) cautioned that introducing water charges would lead many of the small-scale farmers to bankruptcy, as they were currently not making enough money to cover other costs, in spite of not paying for water. According to Perret and Geyser (2007), achieving full cost recovery is unrealistic in developing countries like South Africa, because of the subsistence-oriented nature of smallholder irrigation schemes.

The NWA sought to ensure widespread stakeholder participation of those in the water sector, which includes the poor, women and those in rural areas (DWAF, 1998). However, this stakeholder participation, envisaged in the NWA, has not been accomplished (Kemerink et al., 2011). Although there has been establishment of water management structures meant to promote stakeholder participatory governance, this has not materialized in rural areas (Malzbender, 2005). The participation of the poor, the majority being women, has often been limited in rural areas because of language and illiteracy (Marlzeberg et al., 2005; Kemerink et al., 2011).

Generally, despite its noble intentions, the setback of the NWA has been in the implementation of its provisions. Many of the obstacles faced by the water sector, according to DWA (2012), are related to poor implementation of good policies and strategies. Tlou et al. (2006) agreed, adding that the NWA remains unclear about the implementation of key issues such as water rights, local institutions and water markets. Tlou et al. (2006) noted that the NWA has been difficult and slow to implement, especially in smallholder irrigating farming. However, the fact that the law recognises the need for such reforms to take place offers hope that, ultimately, smallholder farmers and the poor will play a meaningful role in the South African water sector.

The water policy acknowledged the importance of farming in rural areas, stressing that water should not be transferred from agriculture to other sectors based on water productivity, as this would destroy the backbone of rural economies (DWA, 1998). This is why the introduction of water markets needs to be regulated. Farolfi and Perret (2002, 6) pointed out “that there is evidence that, if allowed to trade water rights, small-scale farmers would easily transfer all their rights to the mining sector because of the high water productivity of mining compared to agriculture”.

According to Backeberg (2005) since 1994 South Africa adopted water institutional reforms. The reforms included changes in the policy, legal and organizational dimensions of water allocation and management. They impacted all water sub-sectors, including environmental allocations and also resulted in a new national water policy, a National Water Act and a national water resources strategy. Major organisational changes have also occurred, including the adoption of a decentralisation management approach, user participation and licence-based allocation of water (Backeberg, 2005).

The post-apartheid reforms in South Africa, which put into place the existing water framework, were intended to redress the disparities inherited from the apartheid era racially segregated policies, which had resulted in stark inequalities between black and white communities in access to water (Francis, 2005). The natural scarcity of national fresh-water resources has contributed to diminishing availability of water and increasing competition between the various users. Consequently, water reform policy and water justice were a central aspect of the new government’s policy of reconstruction and development; it has remained a topical issue a decade later. South Africa has adopted a progressive law and policy framework for water which is based upon the constitutional recognition of the right of access to water (Gowlland-Gualtieri, 2007).

### **2.8.7 Constitutional protection of the right to water**

South Africa formally recognises the right of access to water at the Constitutional level, where it underpins the whole law and policy water framework (Gowlland-Gualtieri, 2007). The Constitution adopted on 8 May 1996 represented the cornerstone of the water policy reform adopted. The right to water defined in the Constitution has been concretised through a number of legislative and policy documents adopted as part of the restructuring of the water

framework. The two main acts are the 1997 Water Services Act (WSA) and the 1998 National Water Act (NWA) (South Africa Department of Water Affairs and Forestry (DWAF), 2008). The Constitution allocates the management of water resources to the national government, while local governments (municipalities) are responsible for the management of water and sanitation services (Gowlland-Gualtieri, 2007).

### **2.8.8 Water institutional reforms in South Africa**

Water, like all other resources in South Africa, is historically allocated unequally, largely on racial grounds. Thus the NWA No. 38 of 1998 and subsequently the National Water Resources Strategy (NWRS), in line with the Constitutional imperative provides for the correction of past imbalances. The provisions of Chapter 9 of the Constitution provide the mandate for government to take measures to address previous inequalities (DWAF, 2008). In the years between 1994 and 1997, wide-ranging consultation took place with stakeholders, through provincial and national workshops, symposia and public hearings. Key documents, such as the Water Law Principles and the Resource Pricing Policy for South Africa, were published. Many professionals contributed to the policy process with verbal or written submissions and analysis of draft proposals (Backeberg, 1996). The process culminated in the declaration of the Water Supply and Sanitation Policy and the enactment of the Water Services Act. These were quickly followed by the White Paper on a National Water Policy and the National Water Act, as well as the Pricing Strategy for Raw Water Use Charges (South Africa Department of Water Affairs and Forestry, 2008).

The NWA stipulates that equity, sustainability and efficiency are the guiding principles of water resources management in South Africa. However, since the promulgation and implementation of the NWA, one principle that has not received the desired attention is equity, which the Water Allocation Reform (WAR) aimed to change. This Water Allocation Reform Strategy (WARS) serves as the strategic link between policy intent and the practical implementation of the provisions of the NWA providing the implementation targets towards the realization of the NWA (DWAF, 2008).

Preceding the development of WARS, the DWAF prepared a draft position paper on WAR in South Africa. Subsequently, the position paper, the Broad-Based Black Empowerment (BBBEE) guidelines for water use and the WARS, were workshopped intensively with internal and external stakeholders to ensure their commitment and buy-in (DWAF, 2008). The strategic objective for WARS is to redress past imbalances in the allocation of water. The WARS stipulates national targets, which are inclusive of black women and are to be progressively achieved by the year 2024. In terms of these targets, 60% of allocable water should be in the hands of black people, of which half should be in black women's hands. The targets are to ensure that resources are channelled or focused to meet the objectives of the WAR programme (DWAF, 2008).

### **2.8.9 Linkages between water and agricultural policy**

Parallel to the process of water policy reform, agricultural policy reform was undertaken, with particular attention to irrigation policy. Between 1996 and 1997, provincial and national consultation workshops were organized and efforts were made to involve representatives of black subsistence farmers and white commercial farmers. A discussion document on Agricultural Policy in South Africa was then published, which contains a section on irrigation policy (NDA, 1998). An important overall objective of agricultural policy reform is to create opportunities for smallholders and resource-poor farmers. It is explicitly stated that irrigation policy is intrinsically linked to water policy and that provisions of the NWA have implications for the development of irrigation works and the application of water in agricultural production. The four principal challenges for irrigation policy are, therefore, rehabilitation of existing irrigation schemes, determination of the development capacity of new irrigation, establishment of effective organizations to implement policy and increased efficiency of water use. The focus is on subsistence farmers, so as to address the inequities resulting from past policies (Backeberg, 2005), but this has a number of important dimensions, which will be explored further.

### **2.8.10 Water rights and pricing**

The reforms in the water sector resulted in the abolishment of the system of water rights based on riparian ownership of surface water and private ownership of groundwater. These property rights were already diminished by the 1956 Water Act, but they consisted only of use rights in government controlled areas (Backeberg, 2005). The NWA has provisions for lawful use of riparian water rights, water quotas or pumping permits held by all farmers to continue under the same conditions, until such time as it is formally licenced. This process of authorizing water use in terms of the NWA begun with registration of all water users and was then followed by compulsory licensing. According to this Act, a water use licence is explicit to a particular user. Property and use is reviewed every five years and is valid for a specific time period not exceeding 40 years (Backeberg, 2005).

In the NWRS it is specifically stated that in calling for licence applications, the responsible authority must identify users, especially from marginalized or disadvantaged groups, to ensure that available water is allocated fairly (DWAF, 2002). This should accommodate all subsistence farmers, including resource-poor farmers, as well as emergent farmers who either had no access or no lawfully recognized access to water resources. If the due process is followed, it meets the requirement of obtaining general acceptance of the initial apportionment of water use rights or water licences. Many issues are still to be clarified, especially the expropriation or deprivation of existing lawfully exercised water use rights (Backeberg, 1997).

A directly related concern is that of the pricing of water use rights. According to the National Water Policy, a legal framework for allocation must be set up to achieve the best possible use of water. This concept involves more than productive use of water, since it explicitly provides

for weighing up of social, economic and environmental objectives by government authorities to achieve equity, efficiency and sustainability (DWAF, 1997). Accordingly, Section 25 in the NWA provides for temporary and permanent transfer of water use authorizations. The NWRS stipulates that trade in water licences may be used to achieve equity of access to water, or to increase efficiency of water use, by moving water use from lower-value to higher-value uses. Regulations will be introduced, specifying the conditions under which trade will be permitted (DWAF, 2002). It must be accepted that these regulation will prevent, for instance, the subsistence farmers from selling their water use rights for short-term gain. Equally important is the promotion of the opportunity to raise, for instance, cash for the development of subsistence farming by leasing water use rights (Backeberg, 2005).

### **2.8.11 Formation of user associations and cost recovery**

One of the important objectives of the National Water Policy is progressively to decentralize water management responsibilities (DWAF, 2002). Similarly, the intention of agricultural policy is to move towards farmer-operated irrigation schemes, by transferring operation and management to users (NDA, 1998). To realize these goals, water user associations (WUAs) were created under the provisions of the NWA. WUAs are co-operative associations of individual water users who undertake water-related activities at a local level for their mutual benefit. Besides the transformation of 300 existing organizations of commercial farmers, such as the irrigation boards, many new WUAs were created for subsistence farmers (DWAF, 2002). With the target of full cost recovery, water charges were also to be progressively raised over time. On government water schemes, charges will include depreciation, as well as operation and maintenance (DWAF, 2002). However, the policies on management transfer and cost recovery are not free of problems as there are still unresolved issues and larger economic ramifications (Backeberg, 2005).

### **2.8.12 Effects of water reforms and policies on women farmers**

According Gowlland-Gualtieri (2007), although the implementation of the right to water has resulted in the development of a policy of free entitlement to productive and domestic water, huge disparities in access to basic water services remain. They attribute these disparities partly to the application of an economic approach to water policy. Indeed, the integration of such concepts as cost recovery and privatisation in water policy have contributed to maintaining the poorest segments of the population, mainly women and children, with little or no access to water for household needs and sanitation, and limited water infrastructure (Gowlland-Gualtieri, 2007).

Current water use patterns in South Africa show not only a racial bias but also a gender bias. Even though, in many rural households, women are the primary decision-makers and have the responsibility for raising crops to feed the family, land ownership is often in the hands of the male members of the household. Gender inequality may therefore be further entrenched by linking water use to property rights over land. The water reform process must recognize and correct these gender inequities in water use (Bruns et al., 2005).

Irrigation management transfer and similar decentralization schemes have had some unintended negative consequences, for example, by strengthening local strongmen or giving men unequal power over women (Gelles, 1998). The distribution and adjustment of water uses and rights are processes entailing harsh confrontations among individual users and among collective sectors, which are not based on harmonious, consensual negotiation. The less powerful groups, especially women, although also facing internal conflicts among themselves, have almost always suffered the consequences of reorganization of rights and uses by other, stronger players. Many studies in South Africa have shown how certain interest groups, such as women, and poor users are denied access to decision-making positions and negotiation platforms (Moreyra, 2001; Boelens & Hoogendam, 2002).

One difficulty with regards to water rights in communal areas of South Africa is that different people, groups, or agencies may hold different and overlapping bundles of rights over the same water source. For example, all women of the community may have rights to draw water from a stream for cooking and washing purposes. Animal owners may have the right to water their herds or flocks at certain places. Farmers who invested in building an irrigation system may have rights to divert water for their crops (all of which are use rights). At the same time, the village community, irrigators' association, or the state may claim rights to decide on the timing of water use, changes to the river and granting of permission to new users (management or control rights). These overlapping uses and users of water complicate analyses and mean that simplistic models of water rights derived from pure state or private land ownership are unlikely to be appropriate (Bruns et al., 2005).

Given South Africa's legacy of racial and gender discrimination, equity is a strong driver of policy on natural resources (DWAF, 1998). In the NWRS, it is specifically stated that in calling for water licence applications, the responsible authority must identify users, especially from marginalized or disadvantaged groups, including women, to ensure that available water is allocated fairly (DWAF, 2002). However, culture and customs in communities functioning under traditional authority may prevent licences being apportioned to individuals, in particular women, who are actually cultivating the land and using water (Backeberg, 1997).

## **2.9 National Development Plan 2030**

The National Development Plan (NPC 2011) is the most recent long-term development plan adopted by the government. It encompasses many sectors, including agriculture. The plan sets out strategic direction of the various sectors until 2030. The policy points to the need to develop an integrated and including rural economy. The plan notes that "Since 1994, the main challenge for rural development has been the need to combat the marginalisation of the poor" (NPC, 2011: 196). The reduction in rural poverty achieved between 1993 and 2008 has been attributed to the government's social grants programmes. Nevertheless, rural areas remain in greater poverty and inequality when compared with urban areas.

In defining a path to achieving the vision for 2030, where rural communities have greater opportunities to participate fully in the economic, social and political sectors of the economy,

the report proposed that rural people have access to high-quality basic services that allow them to be well nourished, healthy and increasingly skilled. The report places agriculture at the centre of its strategy to uplift rural economies.

The report recognises the need for an integrated approach to development. To achieve better integration of the country's rural areas, the commission proposes the expansion of irrigated agriculture, supplemented by dry-land production. The proposed development strategy advocates a focus on smallholder farmers.

The report observes that agriculture has the potential to create one million jobs between 2012 and 2030. To achieve this target, it proposes the expansion of irrigated agriculture. An increase of irrigated land by 500 000 hectares, from the current 1.5 million hectares, could be achieved through better use of existing water resources and developing new schemes and converting some under-used land in communal areas and land reform projects into commercial production. The report proposes to enhance job creation through linking the agricultural sector to upstream and downstream industries. An approach that looks at bundles of components is proposed, where irrigation infrastructure is developed in combination with relevant support industries and other areas that result in job creation. A value-chain approach is recognised as being critical. Labour intensive production, which is based on irrigation investments to smallholder farmers, is projected to create 300 000 jobs. Other employment in the smallholder sector is expected to increase through a variety of ways, such as improved livelihoods for subsistence farmers and small-scale farmers with fewer than five hectares. The report postulates that, with the right support, better land use in communal areas has the potential to improve the livelihoods of some 370 000 people. Farmers with more than five hectares are expected to employ workers on their farms.

The report is realistic in noting that job creation can be achieved when other aspects are in place. These include credible programmes, sound implementation, significant resources and stronger institutions. In particular, provision of extension services is noted as an area that needs attention. It is noted that farmers require the right signals, such as infrastructure and functioning market institutions for them to invest. In addition, to expand agriculture and create an additional million jobs in the sector, the commission makes the following recommendations:

- To substantially increase investment in water resource and irrigation infrastructure and improve the efficiency of existing irrigation to make more water available. However, the report is silent on the gender composition of the anticipated beneficiaries.
- To improve market linkages (domestically and externally) for small-scale farmers in the communal and land reform areas. Improved market access requires infrastructure to improve the time and place utility of farm products through road, rail and communications infrastructure that gets the products from the farm through the different stages of the value chain. Market information should be provided to farmers, traders and other players along the value chain concerning buying and selling prices, and supply and demand trends. The commission proposes that co-operatives be



employed to achieve economies of scale when the smallholder farmers produce is to be processed. Various types of infrastructure would be required to allow the smallholder farmers to be serviced during processing, and all forms of value addition to raw commodities, cold chains.

- To identify the security of tenure for communal farmers and to give them the positive signal to invest their resources in production. The commission recommends the investigation of alternative tenure arrangements for communal areas.
- To investigate different forms of financing and vesting of private property rights to land reform beneficiaries that does not burden them with high debts.
- To increase the role played by the private sector in creating new job opportunities. The commission recognises the role that the private sector can play through public-private partnerships. South Africa's commercial farming sector has examples of major investments that have resulted in new growth and new job opportunities, e.g. in the table grape industry, sugar and the wine industry. These have led to increased employment through exports. The role of agriculture in the green economy and conservation efforts in general can potentially create new employment opportunities.
- To increase research and development in the agricultural sector to spur growth. Indeed, growth in agricultural production in South Africa has been fuelled by technology and the returns on investment in agricultural research and development have always been high, especially due to spill-over effects. Agricultural research should address all scales of farming. Ecologically, greater attention should be paid to alternative energy, soil quality, minimum tillage and other forms of conservation farming.
- To expand skills development and training in the agricultural sector, including entrepreneurship training, is another area for strategic intervention. A new cadre of extension officers should be trained to create effective responses to the needs of smallholder farmers and successfully integrate them into the food value chain. The value of farmer-to-farmer skills transfer and transfers from commercial farmers must be encouraged, to develop a new generation of farmers.
- To improve access to agricultural extension. Innovative means of providing agricultural extension services and training by the state, in partnership with private sector, are required.

Despite South African women's contributions to ensuring food security in rural areas, they are considerably more disadvantaged because of an explicit gender bias in land allocation, water use security and agricultural services in general. Discriminatory cultural and social practices and traditions relating to land ownership and access to water further prohibit their participation in agriculture. As a result, reforms and policies on land and water in South Africa have, to a greater extent, included specific procedures that are targeting women as a category worth acknowledging, given their historical experiences. Despite such efforts, women continue to be disadvantaged in terms of access to land and water due to social practices and traditions relating to land ownership and access to water.

Although the South African government has developed and implemented a wide range of land reform policies and programmes, as far as women are concerned the programme of land reform has not effectively reached its targets of multiple objectives of historical redress, redistribution of wealth, equitable outcomes and economic growth. This is because the programme has done little to transform social relations at the micro-level. This impedes the ability of females to independently access, use and own land. The majority of the country's landless population are poor rural women, so an effective land reform programme has to address social practices and traditions relating to land ownership. In the former homelands, which have predominantly female-headed households, women bear the additional burden of domestic and reproductive responsibilities. As a result, achievement of both national and household level objectives of land reform depends on the improvement of female access to, and control over, resources, including land.

Considerable progress has been made in terms of putting legislation, policy, systems and procedures in place for water reforms. However, in many instances, there is a disconnection in the outcomes of these reforms with respect to gender interests and the stated vision and targets provided for in the policy and legislative framework. It is worth noting that many of the barriers to gender equity in land and water access in South Africa lie in the context of a society in which power relations are skewed in favour of men. These rules and practices undermine the State's pursuit of gender equity in land and water reform projects and processes.

## **2.10 Agricultural skills, training needs among women farmers and gaps**

Close to half of South Africa's population (45%) resides in rural areas (Statistics SA, 2009). In KwaZulu-Natal, 56.7% of the total population and 54% of women reside in rural areas (National Land Committee, 2000). In South Africa, an estimated four million people engage in smallholder agriculture and the majority of these people are in rural areas (Baiphethi and Jacobs, 2009). The most common reason given for engaging in agriculture is procuring "an extra source of food". It is also widely accepted that more than half of the rural households in South Africa are headed by women who, together with children, make up the poorest of the poor (Thabethe and Mathe, 2010).

The segregation and discrimination policies of the apartheid system left a legacy of inequality and poverty among rural communities in South Africa (Woolard, 2002, cited in Shisanya & Hendriks, 2011). Kirsten and Moldenhauer (2006) report that low agricultural productivity in rural areas is a major cause of household food insecurity in South Africa. The National Department of Agriculture has reported that limited agricultural production in the former homelands means that households are often not able to feed themselves (NDA, 2002). Machete (2004) observes that agriculture could be the most effective way to reducing rural poverty and food insecurity.

Low farm income of smallholder farmers in South Africa is a major concern for the agricultural industry. Several factors hinder smallholder farmers from reaching their full potential. The South African government has, in recent years, spent significant amounts of

the budget on supporting the development of smallholder farmers (Moloi, 2008). However, constraints still remain. These constraints (e.g. lack of agricultural skills and limited access to output markets) make it difficult, if not impossible, for smallholder farmers to successfully participate in the agricultural sector, despite having access to land (DBSA, 2005).

### **2.10.1 Women's role in agriculture**

In sub-Saharan Africa, agriculture is becoming a predominantly female dominated sector as a consequence of faster male migration to urban areas in search of work (FAO, 2002). Women constitute the majority of smallholder farmers, providing most of the farm labour. They manage large parts of the farming activities. Women contribute 60 to 80% of the food produced in most developing countries. In sub-Saharan Africa, women produce up to 80% of the staple crops (Yekinni, 2010; FAO, 2011). Rural women are exclusively responsible for storage, handling, marketing and processing of agricultural produce in developing countries. Traditionally, the roles of men and women in farming differ in Africa. Men clear the land and women undertake most of the remaining farming activities, particularly planting, weeding and processing (FAO, 2011).

### **2.10.2 Women's agricultural skills**

From a livelihoods framework, human capacity is key to achieving a viable livelihood. Human assets encompass the physical being of the people and the knowledge and skills which allow them to manipulate and make use of the other assets at their disposal. The low level of education among smallholder farmers, especially women who form the bulk of the agricultural labour force, has remained a major constraint to the adoption of modern farming techniques and the ability to access other inputs necessary for increased productivity in the agricultural sector. The importance of capacity building or investing in education was underscored by Mwaniki (2005) and von Braun et al. (2003). They recommend that Africa should focus on education, research and development, access to capital, in addition to infrastructure development. Education would enable the acquisition of new information and positively facilitate adoption of new technologies. In Malawi, educational investments helped smallholders enter into tobacco production (Machingura, 2007). Better access to information, together with improved ability to use it, may be especially valuable in improving productivity. With sound educational background farmers are better equipped to improve managerial ability as well as to acquire better information to improve marketing ability (Machingura, 2007).

According to Wye (2003), relevant agricultural training, socio-economic conditions and extension services are a determinant of smallholder farmers' market access. In most instances, these factors have a direct positive or negative impact on the level of farm income. Low levels of education and lack of farmer support have a negative impact on the emerging farmers in this dispensation of the free market system. Education plays a key role in the agricultural industry where competition between the previously disadvantaged and previously advantaged farmers is high. A high level of education among rural farmers may assist them to understand and interpret market information better. Education can also assist them to have

better farm management principles and marketing skills and to develop financial intelligence. Several studies have found a direct relationship between the level of education and successful performance in farming (Montshwe et al., 2005, cited in Moloji, 2008; Bizimana et al., 2004; and Mohammed & Ortmann, 2005). According to Montshwe et al. (2005) cited in Moloji (2008), the marketing training received by small-scale farmers was found to have improved the possibility of the farmers to sell livestock. This, in turn, created income for them.

### **2.10.3 Importance of skills training on livelihood outcomes**

Providing training in vocational skills plays an important role in equipping vulnerable groups, especially women, with the skills required for work and social integration (IIEP, 2006). Education, skills development and technical training are central to agricultural and rural employment. They prepare the vulnerable people for work in the formal and informal sectors in rural areas and play important roles in poverty reduction. The better the training and the more refined the skills, in terms of human capital, the higher the income and returns and the better the rural livelihoods achieved (Hartl, 2009).

In many developing nations, agriculture still holds the key to reducing poverty and increasing the security of livelihoods. In attempting to deal with these issues, the importance of training in agricultural skills cannot be underestimated. The skills to improve productivity, increase adaptability to deal with change and crisis, and facilitate the diversification of livelihoods to manage risks, are needed in rural areas. In many cases, these skills are an issue of survival. Over half of the world's agricultural producers are women, yet men still tend to receive more and better training and women's training is often inappropriate (Collett & Gale, 2009).

Integrating agricultural training with enterprise training can help women smallholder farmers to manage farm production and market their produce more effectively, while taking advantage of new agricultural opportunities. Enterprise training can help farmers take and manage the risks associated with introducing new, improved production technologies. It can also help women diversify their productive activities by branching out into non-farm enterprises, an important mechanism in reducing susceptibility to crisis and developing a more stable year-round income. Successfully integrating enterprise development into the women's lives involves an array of integrated approaches (Collett & Gale, 2009). The present paper identifies the appropriate farming and non-farming skills identified through a needs assessment among primary female head-of-households in Msinga rural areas and Taung in KwaZulu-Natal and North West Provinces, respectively.

In rural areas, where most of the world's hungry people live, women produce most of the locally consumed food. Despite their prominent role in agriculture and rural food security, women do not get an appropriate share of skills training commensurate with their role (FAO, 2011). The contribution of women to agriculture could be much greater if they had equal access to training, in addition to essential resources and services, such as land and credit (Ahmed et al., 2012). In South Africa, statistics show that almost half (47%) of its women live in rural areas, characterised by lack of socio-economic development and infrastructure

and lack of opportunities for employment and income generation. In addition, rural women are faced with limited access to education and skills training, which further contributes to them living below the poverty line (Perret, 2002). Improving rural women's farm and off-farm skills could be critical to achieving household welfare, particularly food and nutritional security. The range of skills needed by rural women to meet livelihoods is constantly changing and are difficult to predict, due to a wide range of factors that change the economic circumstances, over time. In these circumstances sound research findings are vital to efficiently resource new skills training, as well as continuous upgrading of skills for existing workers (NSW DET, 2007). This research brings together knowledge on training needs of rural women to provide the learning, training or skills development requirements among irrigating and dryland communities.

Formal and non-formal education is essential for improving food security and rural development, thus reducing poverty. Improvement of a country's human resource capacity for enhanced productivity is a prerequisite to overcome the challenges of poor agricultural production and food insecurity facing African countries. In agriculture, numerous studies have shown that farmer training has a significant effect on agricultural production. FAO, (1999) reported that investment in farmers' education or a policy of educating farmers can accelerate agricultural production. Smallholder farmers need training in agricultural best-practices, to increase their productivity in a sustainable way, which raises their own living standards and produces surpluses. Agricultural education and skills increase the ability to innovate and adopt new technologies in agriculture and enhance farmers' performance (Lindley et al., 1996).

In South African rural areas, households access food from three main sources, namely markets, subsistence production and transfers from public programmes or other households (Du Toit et al., 2011). While farming remains important for most South African rural households, people are looking for diverse opportunities to increase and stabilise their income (Baiphethi and Jacobs, 2009). Off-farm skills are central to improving employability and livelihood opportunities, reducing poverty and enhancing productivity in non-agricultural activities (Collett and Gale, 2009). Integrating agricultural training with enterprise training can thus help women smallholders to manage and market their farm production more effectively, by taking advantage of new opportunities in agriculture. Enterprise training also helps women diversify their productive activities by venturing into non-farm enterprises, an important mechanism for reducing susceptibility to crises and developing a more stable year-round income. The right kind of training is important for supporting women to adopt forward-looking, responsive attitudes and actions. For women, training in enterprise skills is particularly valuable, as it allows them to expand into new business areas. Stevenson and St-Onge (2005) found that entrepreneurship training allowed producers in growth industries (including agriculture) to access more of the value chain associated with their products. In small-scale enterprise training projects delivered to women, they found that training was associated with a number of improvements in existing business practices. Kantor (2001) reviewed good practices in entrepreneurship projects and found that providing business skills to the rural poor allows them to improve the quality of their goods and gain higher prices in

the market. Leach et al. (2000) followed women who undertook enterprise training in India, Ethiopia, Peru and Sudan. They found that the primary benefits for the women's enterprise training were self-esteem, confidence and reduced susceptibility to crisis. They also found that group training offered women the chance to reflect on and re-evaluate their productive activities, encouraging them to think entrepreneurially. Women in Development (2003) noted that farmers with poor marketing skills had to sell to traders at very low prices, or to sell in nearby markets with limited demand. Training is also beneficial in instilling an 'entrepreneurial' mind-set, which is a precondition for the successful take-up of new enterprises (Collett and Gale, 2009).

#### **2.10.4 Rural women and agricultural skills training**

Women make up the majority of the agricultural sector in South Africa, but recent evidence suggests that their productivity is constrained by a lack of appropriate skills training, among other factors (Danida, 2004). Over half of the world's agricultural producers are women, yet, men still tend to receive more and better training and women's training is often inappropriate. Moreover, agricultural education and training in sub-Saharan Africa has continually failed to deliver to the needs of farmers because the range of skills needed by part-time farmers, subsistence producers and, above all, by rural women are often ignored or are poorly addressed (Collett and Gale, 2009). Only training which accurately addresses the needs of women smallholders, which takes into account both their productive processes and their needs in terms of accessing and applying training, offers serious prospects of raising women's productivity and improving their livelihoods. While this is uncontested theoretically, the issue of agricultural extension for women nevertheless highlights one of the fundamental challenges that development currently faces. Specifically, there has been a strong recognition of the need to draw on the knowledge of local communities to deliver effective development programmes during the past decade (Mansuri & Rao, 2003).

Drawing on the insights of the capability approach (Sen, 1981), there is increased recognition of the value of freedom for communities to shape development programmes to ensure that training reflects their values and priorities (Alkire, 2005). While it is valuable for training to contain input and direction from outside the community, at the same time it is important to draw on community capacity to orientate training to local needs (Collett & Gale, 2009). Ensuring that women, who typically do a substantial proportion of the work in smallholder agricultural production and food security in South Africa, receive technical training can be key to improving agricultural productivity. However, recent studies of agricultural education and training in sub-Saharan Africa suggest that many agricultural education curricula have shortcomings, as they are unresponsive to socio-economic, technological, physical and environmental changes in the rural sector and are inappropriate for the local context. Agricultural extension services lack the numbers of personnel to reach the large numbers of black farmers in South Africa (DOA, 2008; Düvel 2003). More importantly, they lack the skills to support the diverse types of black farmers (large-scale commercial, small-scale commercial and small-scale subsistence) that currently exist (DOA, 2008). The majority of these farmers are women, producing crops for household consumption on small plots. It is

odd that, while 73% of all extension officers are men, the majority of the farmers are female. Gender ratios and skills of extension officials need to be commensurate with the farmers they serve (Hart & Aliber, 2012). Incidentally, in six out of nine provinces, female extension officials possess higher qualifications than their male counterparts (DOA, 2008), but the proportion of female extension officers needs to be increased.

### **2.10.5 Women and non-agricultural skills training**

In South Africa, the majority of individuals who describe themselves as smallholder farmers do not, in fact, rely exclusively on farming (Baiphethi & Jacobs, 2009). Second, wage employment in agriculture is highly seasonal, so that the poor value non-farm sources as supplementary employment. Rural non-farm activities are especially suitable for poor households, because they require little capital and generate more employment per unit of capital than do farm activities (IFAD, 2005).

In the absence of a significant market for agricultural wage labour as influenced by the level of skills acquired, the main source of alternative incomes is in the *rural non-farm economy* which comprises a very wide range of extremely varied activities defined only in terms of not being agricultural such as agroprocessing, manufacturing, mining, commerce, transportation, utilities, tourism and a wide range of other services (Wiggins, 2014). The involvement in non-farm activities can offer a pathway out of poverty only if there are sufficiently productive and remunerative opportunities (UNCTAD, 2015). For most households, non-farm economic activities provide a significant source of supplementary income, often from multiple sources: Household income diversification is the norm (UNCTAD, 2015).

Although it is acknowledged that women are the backbone of the rural non-farm economy in South Africa, they face limited access to education and skills, which further contributes to their living below the poverty line (Perret, 2002). Despite the significant progress in providing universal education that South Africa has made, the vast majority of adult women living in poor remote rural areas cannot read or write. Illiteracy has a profound socio-economic impact on rural families, perpetuating cycles of poverty (due to limited productive capacity, a lack of the skills needed to gain formal employment, an inability to educate children, insufficient access to basic social services and a high prevalence of HIV/AIDS) (UNESCO, 2014). In South Africa, women are less likely than men to receive formal schooling, but more likely to support dependants. Low levels of education and training deny many women access to decent employment opportunities. The low wages that they consequently receive means that, as breadwinners, they cannot meet their families' needs. As a result, many women and their dependants remain trapped in poverty (SASIX, 2014). While available research suggests that major strides have been made in closing the gap between men and women, in terms of accessing education and the labour market, gender continues to play a significant role in women's lives in general, and in their academic and workplace success specifically, and consequently in the quality of the lives they lead (SASIX, 2014).

According to Mtshali (2000), rural women's training in South Africa tends to pursue the Western, middle-class approach 'of a woman's place being in the private or domestic sphere

of the home'. Almost all extension services thus have a home economics feature, which advocates the teaching of Western-type domestic skills such as sewing, crocheting, knitting, cookery and child care. Such home economics training offered to rural women is inappropriate and ineffective for women's reproductive, economic and community management. Furthermore, most of the training services are irrelevant to deal with the level of poverty prevailing in rural areas. Much of the planning of training is based on the needs of rural communities, as decided by policy planners. Even where participatory approaches to identify training needs have been adopted, the monitoring and evaluation of progress made in achieving the objectives are often neglected (Mtshali, 2000).

### **2.10.6 Skills in agricultural production**

According to Crosby et al. (2000), low yields realized by on smallholder irrigated fields in South Africa have been concrete evidence of poor farmer performance of such farmers. Machete et al. (2004) linked low crop yields to limited knowledge and lack of skills in crop production among farmers. Machete et al. (2004) and Mnkeni et al. (2010) identified basic management practices, such as weed, water, fertilizer and plant population management, late planting and choice of cultivars, all of which are within the farmers' abilities to control, as the main agronomic factors limiting productivity among rural farmers.

At Zanyokwe in the Eastern Cape, yield gap analysis of grain maize and butternut indicated that large gaps existed between yields achieved by farmers and those achieved with good management in researcher-managed, on-farm trials (Fanadzo et al., 2010, cited in Van Averbeké et al., 2011). The average maize grain yield of 2.4 t·ha<sup>-1</sup> and 6 t ha<sup>-1</sup> for butternut was less than 25% of the maximum economic yield achieved at Zanyokwe in on-farm experiments managed by researchers (Fanadzo et al., 2010, cited in Van Averbeké et al., 2011). Even though experimental plots are easier to manage than field-scale plantings, these findings suggested that inadequate farm management, rather than infrastructural constraints, was the principal factor that limited crop productivity at Zanyokwe. As a result of these findings, Mnkeni et al. (2010) concluded that investment in capacity building and competence among farmers could improve the performance of the scheme.

Mnkeni et al. (2010) conducted a study at Tugela Ferry irrigation scheme to assess infield water management by farmers. Results showed that water was applied inefficiently to crops, particularly with regard to distribution uniformity. This could affect crop yields, as crops may, in some cases, be over-irrigated and in some cases under-irrigated. Water allocation among farmers was found to be a problem, as some farmers used larger volumes compared to others, making the water less available to others.

### **2.10.7 Access to markets and skills**

Access to output markets, ranging from small, village-level markets to sophisticated export processors, is the key for small farmers to earn more from the sale of their produce (Senyolo et al., 2009). With very few options for employment in rural areas, as farmers in the second economy, rural women seek to expand production and sell their produce for income (Garcia, 2006, cited in Thamaga-Chitja, 2012). Poor farmers in remote areas appear to have limited



access to markets. According to the FAO (2011), rural people in Africa, especially the poor, often say that one reason they cannot improve their lives is because of poor access to markets where they can obtain agricultural inputs and sell their produce. Even those who produce surplus cite inaccessibility to markets as a major constraint. A study conducted by Mathye et al. (2000) cited in Senyolo et al. (2009), among banana and mango farmers in the Limpopo province of South Africa, indicated that knowledge about markets is a contributing factor in the choice of marketing channels among smallholder farmers. Improving market access for the disadvantaged involves not only the provision of physical infrastructure, it requires a range of interventions by the State. Such interventions include capacitating farmers with product grading skills and improving their market knowledge through extension.

## **2.11 Summary and conclusion**

The literature review established that agricultural productivity is low in many developing countries for a myriad of reasons. Among these is the fact that women lack resources and opportunities to make the most productive use of their time. It was stated that woman's lower levels of human and physical capital result in lower agricultural productivity. In poor areas, where men have been forced to migrate in search of work, women often have the responsibility for farming and raising children. Women as smallholder farmers are marginalized and face significant challenges to engaging productively in agricultural activities. Rural women are vulnerable to both economic and social shocks and stresses such as indebtedness due to economic, food insecurity, health problems, lack of access to inputs, gender discrimination in the ownership of productive assets and that women experience problems of inadequate farming knowledge and skills.

In some countries, gender issues are now mentioned in most national and regional agricultural and food-security policy plans, but they are usually relegated to separate chapters on women, rather than treated as an integral part of policy and programming (FAO 2011). Many agricultural policy and project documents still fail to consider basic questions about the differences in the resources available to men and women, their roles and the constraints they face – and how these differences might be relevant to proposed interventions. As a result, it is often assumed that interventions in areas such as technology, infrastructure and market access have the same impacts on men and women, when in fact they may not (FAO 2011). However, In South Africa efforts have been made since 1994 to empower women through various ways.

Women's access to productive resources such as land, modern inputs, technology, education and financial services is a critical determinant of agricultural productivity. Agriculture is important to women, but female farmers have less access to the productive resources and services required for agricultural production. Women are less likely than men to own land or livestock, adopt new technologies, use credit or other financial services, or receive education or agricultural extension advice. In some cases, women do not even control the use of their own time. While the size of the gender gap differs by resource and location, the underlying causes for the gender asset gap are repeated across regions. Social norms systematically limit

the options available to women. Regardless of cause or magnitude, however, the gender asset gap reduces the agricultural productivity of women and involves broader economic and social costs (FAO, 2010).

Women become farmers for various reasons (FAO 2011). Some become farmers because they inherited land from their parent(s), who have either passed away or are old and cannot carry out farm practices. Others assume the role because their partners either passed away, migrated or they have separated. Women are also farmers because some have genuine interest in the field. They are gradually assuming their role in the farming sector. In some countries it might be taboo for women to be farmers (FAO 2011). Nevertheless, this has never been reported in South Africa.

The Sustainable Livelihood Approach (SLA) allows the analysis of the relationship between people's access to resources, their diverse livelihoods activities and factors at micro, intermediate and macro levels. It is also a framework for assessing and prioritizing interventions (Adato & Meinzen-Dick, 2002). The SLA draws attention to the activities that take place within the broader policy and institutional context at different times and how they support or undermine livelihood strategies (DFID, 2000, cited in Hart, 2009). Households and communities must have access to and exploit livelihood assets in order to be food secure. The SLA recognizes that households require assets to enhance their livelihood strategies. The assets are categorized into human, natural, physical, financial and social capital. Households adjust to their social, physical, economic and political environments by using their assets for livelihood strategies designed to strengthen their wellbeing (Timmer, 2003 and Bryceson, 2005, cited in Matshe, 2009). Households are viewed as sustainable if they can adjust to threats without compromising their future ability to survive shocks to their livelihoods. This approach suggests that adequate ownership of livelihood assets is essential for pursuing a range of livelihood opportunities and is a key determinant of livelihood performance and the ability to accumulate assets for optimal production and for consumption smoothing in the face of seasonal climatic and market risks (Matshe, 2009).

Luthans et al. (2004) noted that with the rising recognition of human resources as a factor for competitive advantage in today's global economy, human capital and, more recently, social capital are being touted in both theory, research and practice. To date, however, positive psychological capital has been virtually ignored by academics and practitioners. "Who I am" is every bit as important as "what I know" and "who I know." By avoiding a preoccupation with personal shortcomings and dysfunctions, and focusing instead on personal strengths and good qualities, individuals can develop confidence, hope, optimism, and resilience, thereby improving both individual and organizational performance. Like human capital, the recognition of, and investment in, social capital seems vital to the success and competitive advantage of organizations, both today and tomorrow. However, the present study goes beyond both these types of assets and embraces what can be termed "positive psychological capital."

Women play a critical and potentially transformative role in agricultural growth in developing countries, but they face persistent obstacles and economic constraints limiting further inclusion in agriculture. The Women's Empowerment in Agriculture Index (WEAI) tool measures the empowerment, agency and inclusion of women in the agriculture sector in an effort to identify ways to overcome these obstacles and constraints. The Index aims to increase understanding of the connections between women's empowerment, food security and agricultural growth. It measures the roles and extent of women's engagement in the agriculture sector in five domains: (1) decisions about agricultural production, (2) access to, and decision-making power over, productive resources, (3) control over use of income, (4) leadership in the community, and (5) time use. It also measures women's empowerment relative to men within their households. According to IFPRI (2012), the WEAI is a composite measurement tool that indicates women's control over critical parts of their lives in the household, community and economy. It helps in identifying women who are disempowered and understand how to increase autonomy and decision-making in key domains. The WEAI is also a useful tool for tracking progress toward gender equality, which is one of the Millennium Development Goals. The WEAI is composed of two sub-indexes: one measures the five domains of empowerment for women and the other measures gender parity in empowerment within the household. It is an aggregate index reported at the country or regional level that is based on individual-level data on men and women within the same households.

In terms of household and intra-household food insecurity, according to Statistics South Africa (Stats SA), currently about 35% of the total population, or 14.3 million South Africans, are vulnerable to food insecurity. Among these, women, children and the elderly are particularly vulnerable (Stats SA, 2000). In 1996, nearly a third, or 2.8 million of households, spent less than R1 000 per month, while only 18%, or 1.63 million households, spent more than R3 500 per month. These figures disguise the bi-polar mode of income distribution that characterizes South Africa, which has many poor, food-insecure people and a few wealthy ones. The distribution of poverty in the country is uneven in its spread and intensity. Gauteng and the Western Cape are wealthier provinces, with the least number of poor households, at less than 12% each. The Free State, Eastern Cape and Limpopo provinces have the worst poverty in South Africa. In the middle group are Mpumalanga, KwaZulu-Natal, Northern Cape and North West Provinces. The average household in Gauteng spends about R7 742 per month, compared to R2 665 in the Eastern Cape. Within the provinces there is an also unequal level of poverty, according to urban and rural location, race and gender.

With reference to land reforms and policies in South Africa, reforms covered in the review include the land redistribution programme, the land restitution programme, the land reform proposal by the National Planning Commission, reforms and policies on water, constitutional protection of the right to water, water institutional reforms in South Africa and the linkages between water and agricultural policy and the impact of such policies on gender. Literature that examines the impact of irrigation on agricultural performance, household income and poverty, has mixed opinions. While few studies have found no linkage between irrigation and household welfare, many others have found irrigation to be of great significance for

household welfare. Poverty is often used as an indicator of household welfare. Linkages between irrigation, total productivity, input use, the productivity of farming practices, agricultural productivity, household income and alleviating rural poverty and the reduction of food prices were explored. This helps very poor households meet the basic needs associated with improvements in household overall economic welfare, protection against risks of crop loss due to erratic, unreliable or insufficient rainwater supplies, promotion of greater use of yield-enhancing farm inputs and creation of additional employment, which, together, enable people to move out of the poverty cycle.

A study by Grey and Sadoff (2007) defined water security comprehensively, highlighting the importance of ensuring water access for livelihoods and productive uses, not just consumptive use. Water security was conceptualised as “the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies.” In simple terms, water security involves harnessing the productivity of water, while limiting the negative impact of its use. Although informative, this definition applies at the national level and fails to address the requirements at local or household level for achieving water security for irrigating households. It could be argued that it was widely recognized that food security should be considered at both household and national level. Water security should also be considered in a similar way, particularly in the rural context. The key aspects of water-use security are access to reliable and adequate supply of water with acceptable quality, the ability of the household to pay for the water and their right or entitlement to the water which they are able to assert against other parties. Water supply is a function of bio-physical and engineering aspects (physical, hydrological and water resources aspects of water security), while rights and entitlements are a function of water governance, institutions and capacity-building. It can be reasoned that ensuring smallholder farmers’ access to irrigation is critical for addressing the many dimensions of agricultural production, poverty and food security in developing countries. However, participation in an irrigation scheme, although a necessary condition, is not sufficient to ensure improved household welfare. Investments to achieve water security, not just irrigation participation, remain at the heart of the struggle for economic growth and poverty reduction. Participation in smallholder irrigation results in income and food benefits only to those farmers with secure access to irrigation. Therefore it is important that individual farmers have secure access to adequate and reliable water.

The review of the literature looked at agricultural skills and training needs among women farmers. Relevant agricultural training, socioeconomic conditions and extension services were identified as determinants of smallholder farmer’s market access. In most instances, these factors have a direct positive or negative impact on the level of farm income. Low levels of education and lack of farmer support have a negative impact on the emerging farmers’ access to markets. Education plays a key role in the agricultural industry, where competition in the market between the previously disadvantaged smallholder farmers and previously advantaged large-scale commercial farmers is high. A higher level of education amongst rural farmers may assist them to understand and interpret market information better. Education can also assist them to have better farm management principles and marketing

skills and develop financial intelligence. A direct relationship between the level of education and successful performance in farming can be inferred. The training received by small-scale farmers was found to have improved the possibility of the farmers to sell livestock which, in turn, created income for them.

Based on the attendance of the skills training programs, it was concluded that women in rural areas appreciate the importance of skills training in improving their livelihood opportunities. Moreover, in general, younger women who are looking for opportunities are more willing to attend such trainings. However, from the trainers' point of view, it was noted that the biggest challenge is that most of the skills training workshops comprise people with different levels of education, literacy and numeracy. This creates the need to have different training materials for people in the same class.

Based on training evaluations, it was concluded that the training that was rendered to the women in Msinga met their expectation and could be suitable for improving their livelihood needs since the majority of them indicated that they were impressed by the training. It was also realised that since women in rural areas pursue diversified livelihoods, efforts should be made to provide them with both farm and off-farm skills.

## **CHAPTER THREE: STUDY METHODOLOGY**

**Mudhara, M. and Oladele, O. I.**

### **3.1 Introduction**

This project was conducted in North West and KwaZulu-Natal. It proceeded from identification of research sites that could allow data collection to answer the objectives. A mixed method approach was used, where both formal and informal data collection procedures were used. Students were co-opted to conduct the research. This chapter presents a detailed account of the methodology followed in the study.

### **3.2 Criteria for choice of study sites in North West Province**

The site selection in North West province was based on the following criteria:

- Project location
- Social profile and cultural context
- Agriculture infrastructure and resources
- Opportunities and risks.

Table 3.1 and Figure 3.1 show the research sites in North West Province. The selected sites are described below.

#### **3.2.1 Rethuseng and Bosele Ipelegeng Projects in Taung**

The Rethuseng, Bosele and Ipelegeng projects are located in the western part of the North West Province, in the Dr Ruth Mompati District Municipality. There is predominantly good access during all seasons, because the gravel road to the farm is well maintained. GPS coordinates: 27° 34` south and 24° 44` east. The dominant people in the area are the Tswana, who are characterized by rural poverty. The farm is operated by 15 female farmers. Household food plots play an important part in their livelihoods. The area has uniform terrain that consists of slightly irregular plains and pans, hills and escarpments. It lies between an altitude of 1 100 m and 1 300 m above sea level and has a slope factor of between flat and 9%. The area is generally dry, with an average annual rainfall of 318 mm. The area experiences high temperatures ranging from 18.7°C to 32.5°C. Securing crop production from rainfed agriculture is impossible. The project thus extracts water from the Vaal dam which is located about 50 km from the irrigation farm. The irrigation system is a centre pivot. Individuals within the farm have expressed interest in household food production, as well as income generation from the produce. Water security could prove to be a challenge to sustain small-scale farming, due to large-scale irrigation farming, as well as other water demand activities in the area, such as mining. Farmers have to pay a water fee of R600/annum, which sometimes is difficult.

### **3.2.2 Tshidiso Project – Taung**

The Tshidiso project is located in the western part of the North West Province, in the Dr Ruth Mompati District Municipality. There is predominantly good access during all seasons, because the gravel road to the farm is well maintained. GPS co-ordinates: 27° 32` south and 24° 45` east. The dominant people in the area are the Tswana. The majority (53%) of households are headed by men and women are the head of the household in 40%. The farm is an initiative of two women farmers, who were inspired by an award from “Family farmers”. Household food plots play an important part in their livelihoods. The area has uniform terrain that consists of slightly irregular plains and pans, hills and escarpments. It lies between 1 100 m and 1 300 m above sea level and has a slope factor of between flat and 9%. The area is generally dry, with average annual rainfall of 318 mm. The area experiences high temperatures, ranging from 18.7°C to 32.5°C. Securing crop production from rainfed agriculture is impossible and the project extracts water from the Spitskop dam, which is located about 50 km from the irrigation farm. The women within the farm have expressed interest in household food production, as well as income generation from the produce. There is interest in empowering other women as soon as the project is established. Water security could prove to be a challenge to sustain small-scale farming, due to large-scale irrigation farming, as well as other water demand activities in the area, such as mining. An innovative floppy irrigation system is used to reduce water wastage and maintain moisture, considering that the area is very humid.

### **3.2.3 Molatedi – Rustenburg**

The Molatedi project is located in the western part of the North West Province, in the Bojanala District Municipality. It is 250 km by road from Rustenburg. There is predominantly good access during all seasons, because the gravel road to the farm is well maintained. GPS co-ordinates: 24° 51` south and 26° 27` east. The dominant people in the area are Tswana. Access to the farm is difficult as it is 250 km from Rustenburg town, with rugged terrain and impassable roads, especially during the rainy season. Only one family is actively involved with farming on only 2ha of the 24ha of land. Household food plots play an important part in livelihoods. The area has uniform terrain that consists of slightly irregular plains and pans, hills and escarpments. It lies between 1 100 m and 1 300 m above sea level. The area is generally dry, with average annual rainfall of 450 mm. The area experiences high temperatures, ranging from 21°C to 32°C. Securing crop production from rainfed agriculture is impossible and the project extracts water from the Madikwe River which feeds the Molatedi dam, which is located about 2 km from the irrigation farm. Because of a high rate of theft, the farmer has moved from vegetable farming to tobacco production. Water security could be a concern, because many activities use water from the same source – domestic for the households in Madikwe town and Gaborone, irrigation schemes and the mining sector in Rustenburg. Marketing of produce is difficult because the farm is remotely located in the bush of the Madikwe veld.

### **3.2.4 Nyetse – Zeerust**

The Nyetse project is located in the western part of the North West Province, in the Ngaka Modiri Molema Municipality. It is 30.8 km and 98.4 km by road from Zeerust and Mahikeng, respectively. There is predominantly good access during all seasons, because the gravel road to the farm is well maintained. GPS co-ordinates: 25° 17` south and 26° 02` east. The dominant people in the area are Tswana, but they are characterized by rural poverty. However, a farmer owns the farm and employs 39 workers, out of whom 56% are women. The entire farm is 80ha, with active farming operating on 25ha, with possible expansion to the entire farm area, as soon as the water tank under construction is finalized. Active farming started in 2007. The farm is surrounded by hills and natural vegetation that acts as wind breaks during the months of July and August. The area is generally dry with average annual rainfall of 439 mm. It experiences high temperatures ranging from 19.4°C to 30.8°C. Securing crop production from rainfed agriculture is impossible and the project uses ground water, with boreholes drilled 110 m deep where the water feeds into tanks located on the farm. Individuals on the farm have expressed interest in household food production, as well as income generation from the produce. Water security is not of great concern, since ground water reserves are plentiful in the area and the hills around the farm augment precipitation. Another dam (of about two million cubic litres) is under construction to alleviate water shortages. Women farmers present a large percentage of the producers on the scheme and the farm owner is transferring farming and marketing skills to the locals.

### **3.2.5 Nchapeo – Brits**

The Nchapeo project is located in the eastern part of the North West Province (Brits) in the Bojanala District Municipality. There is predominantly good access during all seasons, because the gravel road to the farm is well maintained. GPS co-ordinates: 25° 33` south and 27° 46` east. The dominant people in the area are Tswana. A woman farmer using sprinkler irrigation system owns the farm, which is 138 ha. Labour is sourced from the community around the farm. The area is generally, dry with an average annual rainfall of 600 mm. The area experiences high temperatures, ranging from 19.8°C to 29.3°C. There is mixed farming, consisting of a vegetable garden, a piggery and poultry. Securing crop production is sustained with irrigation water from the Hartbeespoort dam, which is located about 50 km from the irrigation farm. The farm mainly serves the surrounding community, with no known external markets for the produce.

### **3.2.6 Zeerust – Dinokana**

The Dinokana project is located in the eastern part of the North West Province, in the Ngaka Modiri Molema District Municipality (Lehurutshe). There is predominantly good access during all seasons, because the gravel road to the farm is well maintained. GPS co-ordinates: 25° 26` south and 25° 51` east. The dominant people in the area are Tswana. Most of the active farmers are women. Household food plots play an important part in their livelihoods. The area has uniform terrain that consists of hills undergoing massive deforestation. The



irrigation farm (85ha) encompasses a former rice scheme, which has now been converted to vegetable plots, distributed to 35 members of the co-operative. Each plot of 2.5 ha, or in some cases 5 ha, is allocated to an individual, either a female or a male farmer. Not all plots are cultivated. The area is generally dry, with an average annual rainfall of 439 mm. It experiences high temperatures, ranging from 19° C to 30°C. Since reliance on rain for crop production definitely results in crop failure, the project abstracts groundwater which feeds into furrows for distribution within the farming area.

Individuals on the farm have expressed interest in household food production, as well as income generation from the produce. Water security could prove to be a problem to sustain small-scale farming, due to the current system of irrigation – furrow where plots are serviced using a cyclic rotation. When the system of irrigation is revised, the farm has the potential to provide and improve the livelihoods of the community.

### **3.2.7 Khanya –Brits**

The Khanya project is located in the central part of the North West Province, in the Ngaka Modiri Molema District Municipality. It is 170 km by road from Brits. There is predominantly good access during all seasons, because the farm is located next to a tarmac road. GPS co-ordinates: 25° 38` south and 27° 41` east. The dominant people in the area are the Tswana. In this group farming scenario, three male and four female farmers own the farm, which covers 5 ha. Distribution of labour is based on a cultural setup, where gender defines activities, i.e. the male farmers engage in ploughing, while the female farmers do most of the weeding and harvesting. A furrow system is the main form of irrigation. The area is generally dry, with an average annual rainfall of 600 mm that falls between November and April. The area experiences high temperatures, ranging from 19.8°C to 29.3°C. Due to the unreliability of rainfall in the area, the project abstracts water from a dam located about 50 km from the irrigation farm. Ground water is used to supplement irrigation water. Individuals on the farm are very active and the 5 ha is fully utilised, with a variety of vegetables grown. There is a secure market for their produce in Rustenburg. Indian shops in Brits and Rustenburg buy the spices which are produced on the farm.

### **3.2.8 Mabobo Dinku – Brits – Lethlabile**

Mabobo Dinku project is located in the eastern part of the North West Province, in the Bojanala Municipality. It is less than 50 km by road from Brits. There is predominantly good access during all seasons, because the gravel road to the farm is well maintained. GPS co-ordinates: 25° 29` south and 27° 49` east. The dominant people in the area are Tswana. The co-operative has six members: three males and three females, located within a residential area. The farm mainly serves the surrounding community, with no known external markets for the produce. The area is generally dry, with an average annual rainfall of 600 mm and experiences high temperatures, ranging from 19.8°C to 29.3°C. The farm uses water from the municipality municipal water at no costs, but the issue of a consistent water supply hinders vegetable production. Individuals on the farm have expressed interest in household food production, as well as income generation from the produce. Water security could prove to be

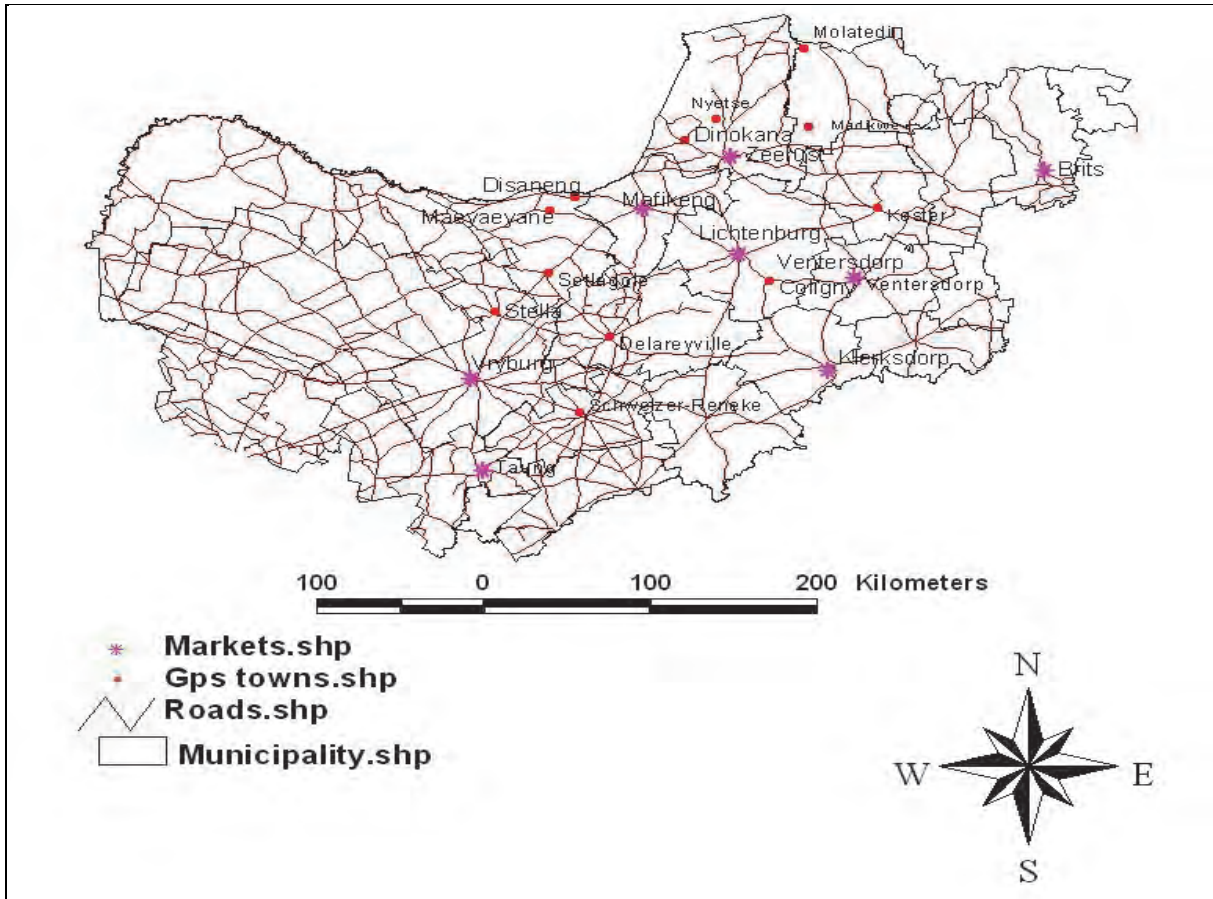
a problem for small-scale farming, due to large-scale irrigation farming, as well as other water demand activities in the area, such as mining. When water supply is disrupted, so too are farming activities. There is, however, potential, since the farmers have shown interest in vegetable production if they have a consistent water supply. Ground water utilisation and an extension service could improve production.

### **3.2.9 Mayiyeyene – Mafikeng**

Mayiyeyene project is located in the western part of the North West Province, in the Ngaka Modiri Molema District Municipality. It is about 50 km by road from Mafikeng. There is predominantly good access during all seasons, because the gravel road to the farm is well maintained. GPS co-ordinates: 25° 53` south and 25° 08` east. The dominant people in the area are the Tswana. Most of the active farmers are women. The farm is situated within the arid tropical savannah climate, with a mean annual summer rainfall of 571 mm. The rainfall is unreliable and is highly variable. The mean monthly minimum and maximum temperature, vary from 4.0°C in July to 17.1°C in January and 20.4°C in July to 29.7°C in February respectively. Due to the unreliability of rainfall in the area, rainfed agriculture is difficult. Individuals on the farm have expressed interest in household food production, as well as income generation from the produce. Water security could prove to be an obstacle to small-scale farming, due to the granite rock which is a hard, igneous rock that is impermeable. It produces a landscape of high ground, with wet and water-logged areas, especially during the rainy season.

### **3.2.10 Disaneng – Mafikeng**

Disaneng project is located in the western part of the North West Province, in the Ngaka Modiri Molema District Municipality. It is about 40 km from Brits. There is predominantly good access during all seasons, because the gravel road to the farm is well maintained. GPS co-ordinates: 25° 48` south and 25° 17` east. The dominant people in the area are Tswana. The farm is owned by a group of women farmers, who have sourced a contract with Fruit and Veg City in Mafikeng. Household food plots play an important part in their livelihoods. The area has uniform terrain that consist of slightly irregular plains and pans, hills and escarpments. The farm is surrounded by a built-up area and short bushveld vegetation. The area is generally dry, with an average annual rainfall of 550 mm. It experiences high temperatures, ranging from 18.7°C to 32.5°C. Very little is known about the irrigation system and market potential. Individuals on the farm have expressed interest in household food production, as well as income generation from the produce. Water security could prove to be an obstacle to small-scale farming due to the impermeable parent rock material. It produces a landscape of high ground with wet and water-logged areas, especially during the rainy season.



**Figure 3.1:** Location of research sites in North West Province

**Table 3.1:** Report on the criteria and process of identification, motivation, selection and final choice of study sites\*

Irrigation scheme	Total area (ha)	No. of beneficiaries by gender		Availability of water	Irrigation method	Climate			Market	
		M	F			Temp °C (Jan - Min)	Temp °C (Jan - Max)	Rainfall (mm/a)		
										Temp °C (Jan - Min)
Selected Sites										
Taung: Rethuseng	1054	114	22	Receives water from Vaal Dam channelled by pipes	Sprinkler	18.7	32.5	318	Klerksdorp, Mafikeng, Jhb	
Taung: Bosele	940	85	9	Receives water from the Vaal Dam, channelled by pipes	Pivot	18.7	32.5	318	Klerksdorp, Mafikeng, Jhb	
Taung: Ipeleng	1000	78	20	Receives water from the Vaal Dam, channelled by pipes	Sprinkler	18.7	32.5	318	Info not available	
Taung: Tshidiso	560	39	27	Receives water from the Vaal Dam channelled by pipes	Floppy	18.7	32.5	318	Klerksdorp	
Brits 1: Nchapeo	10+	5	6	Scheme uses of municipal water	Sprinkler	19.8	29.3	600	Local community	
Brits 2: Mabobo Dinku	10+	3	3	Scheme use municipal water	Furrow	19.8	29.3	600	Local community	
Brits 3: Khanya	10+	3	4	Schemes uses of municipal water	Furrow	19.8	29.3	600	Brits, Rustenburg	
Sites not selected										
Madikwe: Molatedi	36	1	2	Water is supplied from Molatedi dam	Sprinkler	21	32	450	Cash crop - Rustenburg	
Lehurutshe: Nyetse	500	10	5	Water is drilled from bore hole	Drip, Sprinkler, Pivot	19.4	30.8	439	Klerksdorp, Zeerust, Mafikeng, Local community	
Zeerust: Dinokana	10+	5	5	Water is supplied from river	Furrow	19.4	30.8	439	Local community - most plots inactive	
Mayiyeyene: Disaneng	498	5	20		Drip			500	Mafikeng	

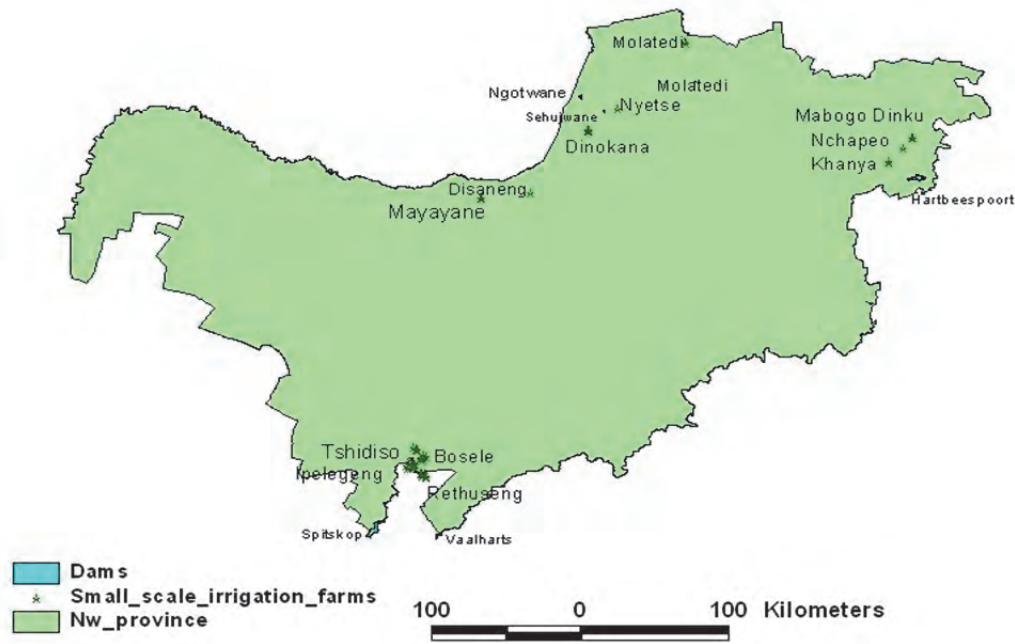


Plate 1: Small scale farms and proximity to sources of water for irrigation

It was revealed in the study that irrigation systems' implemented includes sprinkler and/or drip irrigation, furrow and pivot. But in cases where water sources are far from the farm like the Tshidiso-Taung irrigation which is about 80 km away from Spitskop dam, floppy irrigation system was used as a means of maintaining moisture and reducing water wastage.



Plate 2: Small scale farms and irrigation type

The bulk of produce was generally consumed within the major towns of the province and some in Johannesburg. Marketing of produce takes different forms ranging from direct selling to consumers surrounding the farms (in form of loose stock), itinerant dealers, pre-

harvest contractors and wholesale markets such as Spar, Fruit and Veg City, Choppies and Shoprite in the major towns. Marketing pattern, therefore, varies considerably from farmers to farmers depending upon the nature of the vegetables and capacity of the farmers. The study revealed that the marketing cost was high because of the higher transportation cost due to poor infrastructure facilities like absence of all-weather roads connecting the farm clusters with markets, lack of cold transport and storage, and lack of an independent vehicle for transport of produce from field to market.

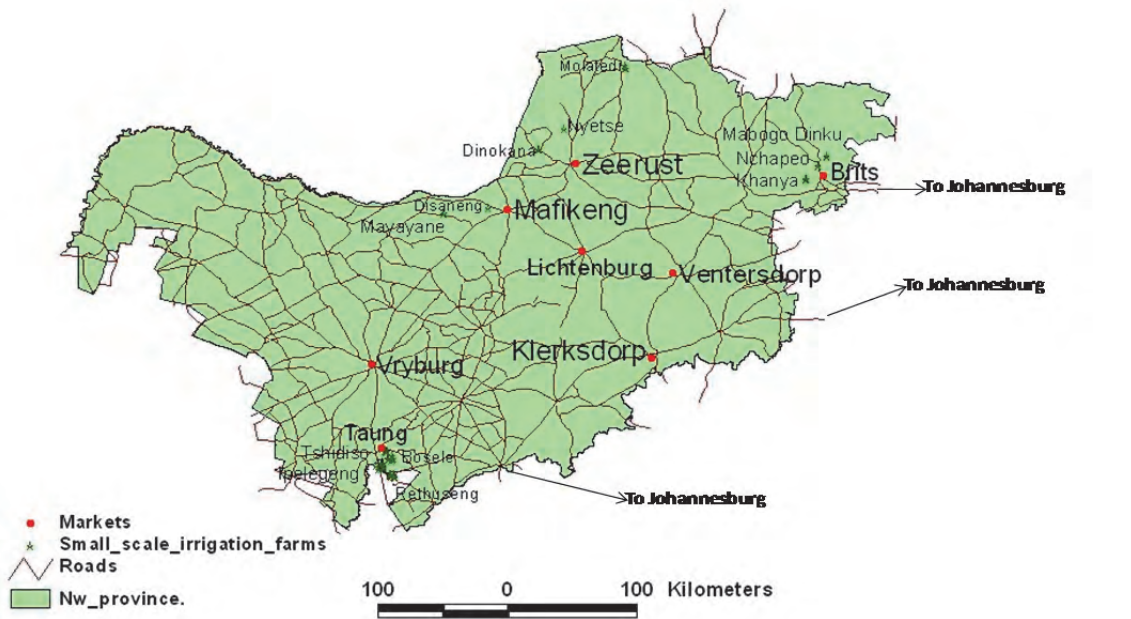


Plate 3: Proximity of small scale irrigation farms to road network and market

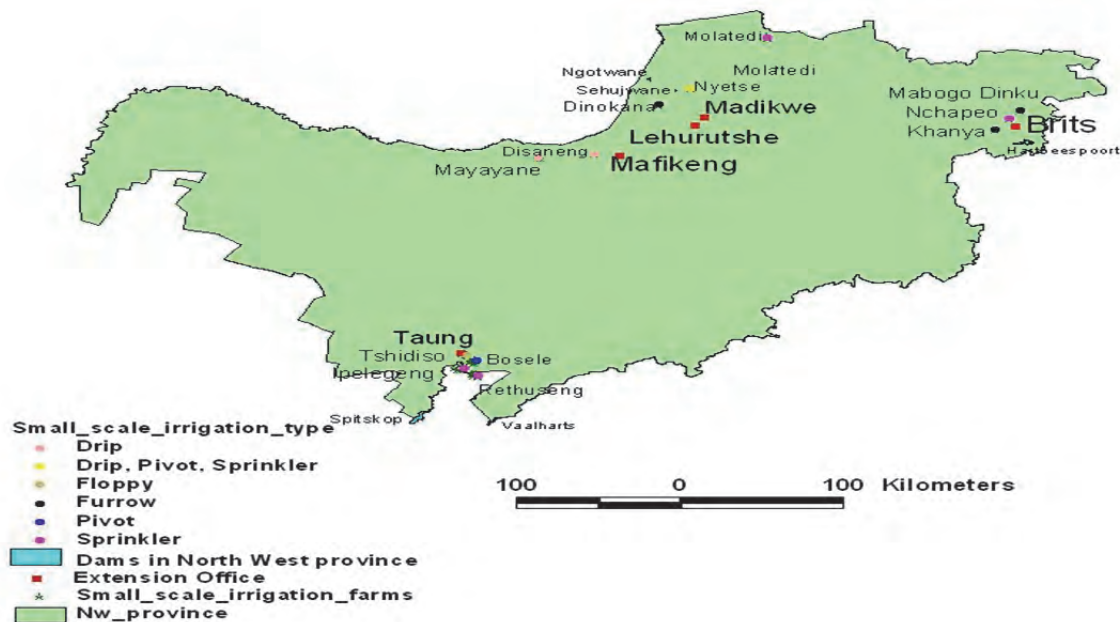


Plate 4: Small scale farms: type of irrigation, proximity to extension service and water

### **3.3 Criteria for choice of study sites in KZN**

In KwaZulu-Natal, site selection was based on the availability of an irrigation scheme with neighbouring rain-fed areas, level of government interventions/subsidies, level of agricultural production and logistical constraints.

#### **3.3.1 Availability of an irrigation scheme with a neighbouring rain-fed areas**

Irrigation schemes were considered as indispensable in allowing the study, as it was crucial to make comparisons between households farming under rain-fed conditions and those using irrigation, with regards to agricultural productivity, household food security and poverty. Therefore the availability of rain-fed areas in the vicinity of the irrigation scheme was one criterion for selecting research sites.

#### **3.3.2 Level of government interventions/subsidies**

The level of evidence of farmers' decision-making was critical in deciding whether or not to include a site. The presence of excessive government subsidies blurs the decisions that farmers make and the outcomes of the decisions. Schemes relied heavily on government subsidies. This made it difficult to understand the real challenges that farmers (especially women farmers) would encounter if the funding was reduced or removed. Therefore, irrigation schemes that were heavily subsidised by the government were disqualified as potential study sites.

#### **3.3.3 Current level of agricultural production**

For a site to be selected, it was required that there is an on-going and relatively high level of agricultural production on it and in the neighbouring rain-fed areas. The irrigation scheme had to be functional and contributing to household incomes and food security.

#### **3.3.4 Logistical constraints**

The study sites were selected based on location and accessibility, with reference to the University of KwaZulu-Natal, Pietermaritzburg campus. A list of all the irrigation schemes in KwaZulu-Natal was compiled from the literature and consultations with government extension officers (Table 3.1). This was followed by a review of the literature on the history and the current levels of production at each irrigation scheme. After consideration of the project objectives and field logistical implications, and defined in the selection criterion, the selected irrigation schemes were reduced to four (Table 3.2).

**Table 3. 2:** Summary details of irrigation schemes in KwaZulu-Natal

Scheme	Area irrigated (hectares)	Participants			Irrigation method	Major crop	Support agency
		CF	FPH	Total			
Bululwane	350		430	430	Flood	Vegetables, Maize	KDA
Mzondeni	167	43		43	Sprinkler	Maize, Wheat, Cotton, Vegetables	Illovo Sugar
Ndumu B	150	11		11	Sprinkler	Sugarcane	KDA
KwaDlama	167	43		43	Sprinkler	Sugarcane	Tongaat/Hulett Sugar
Biyela	501	277		277	Sprinkler		Tongaat/Hulett Sugar
Ngwelezana	16		105	105		Vegetables, Maize	KDA
Nzimele	338	125		125	Sprinkler	Sugarcane	Tongaat/Hulett Sugar
Mkuphula	20		244	244	flood	Vegetables, Maize	KDA
Mooi River	340		824	824	Flood	Vegetables, Maize	KDA
Tugela Ferry	540		1832	1832	Flood	Vegetables, Maize	Illovo
Mansomeni	186	63		63	Sprinkler	Vegetables, Maize, Sugarcane	Illovo
Sinamfini	272		176	176	Sprinkler	Vegetables, Maize, Sugarcane	Illovo
Shinga	20	20		20	Sprinkler	Vegetables, Maize	Illovo
Daka Daka	234	160		160	Sprinkler	Sugarcane	Illovo
Mtondeni	93	33		33	Flood	Sugarcane	KDA
Tukhela estates	374		1275	1275	Sprinkler/ Flood	Maize, Wheat, Vegetables	KDA
Makhathini	2620	259		259	Sprinkler	Sugarcane, Cotton, Maize, Vegetables, Wheat	Vunesa cotton
Impala	535	47		47	Sprinkler/ semi-dragline	Sugarcane	KDA/SASRI

KDA = KwaZulu-Natal Department of Agriculture

CF = Commercial farmer

FPH = Food plot household

SASRI = South African Sugar Research Institute



To justify the study selection sites, a reconnaissance survey was conducted in KwaZulu-Natal province, to identify and collect information for objectively selecting the study sites. The four sites were visited and assessed by the research team, which also held consultations with stakeholders relevant for each scheme, including representative groupings/members of the communities. The stakeholders included government extension officers, non-governmental organisations (NGOs) and academic networks involved in agricultural and rural development within the study sites, to establish a clear understanding of the areas. Reports and information on the irrigation schemes were reviewed. Site-level reports were compiled after every field visit. After the reconnaissance survey, and discussions among the stakeholders involved in reviewing the sites, the two irrigation schemes were finally selected in KwaZulu-Natal. These were Tugela Ferry and Mooi River Irrigation Schemes. The communities neighbouring the irrigation schemes were then taken as the dryland sites.

### 3.4 Description of the selected sites

A summary description of the four short-listed sites with regards to selection criterion is presented in Table 3.3.

**Table 3.3:** Summary details of the selected sites of interests in the terms of the selection criteria

<b>Scheme</b>	<b>Availability of an irrigation scheme with neighbouring rain-fed areas</b>	<b>Level of government interventions/ input subsidies</b>	<b>Current level of agricultural production</b>	<b>Distance from UKZN (km)</b>	<b>Decision</b>
Tugela Ferry	Present	Limited	High	124	Select
Mooi River	Present	Limited	Moderate	143	Select
Tukhela Estates	None	None	None	152	Disqualify
Makhathini	Present	Very high	Very high	408	Disqualify

#### 3.4.1 Makhathini Irrigation Scheme

Makhathini is an area of about 13 000 hectares, spread over the low-lying areas east of the southern Lebombo mountain range, in northern KwaZulu-Natal. In this area lies the Makhathini Irrigation Scheme, occupying an area of 3 864 hectares, most of which is divided into ten-hectare plots, rented and managed by 314 individual farmers. The Makhathini Irrigation Scheme was established for small-scale and emerging farmers, on the floodplains of the Pongola River. Many of these engage in small-scale commercial farming (Lankford et al., 2011). The remaining land within the scheme is divided into 243 smaller gardens of 0.02 hectares each. Beyond the scheme live ‘dry-land farmers’ and other residents, who rely on limited and intermittent rainfall and various other sources of income. Mixed cropping is the norm, with maize, sugarcane, beans and a variety of vegetables grown widely. Following the

closure of the local cotton ginnery in 2008, cotton is barely grown in the area, despite having been the main cash crop for years (Hull, 2012). Despite the visual landscape, which suggests a local economy driven by agriculture, subsistence for the majority of its residence rests predominantly upon the receipt of government grants, including pensions, child grants and disability grants. Petty trade and various piece-meal jobs, and remittances from family members working in the city, all contribute to incomes. Despite the government's efforts, particularly via the irrigation scheme, to create a cadre of middle-class farming entrepreneurs, farmers in the study areas have developed a dependency syndrome and are persistently relying on annual government subsidies to finance their operations (Hull, 2012).

### **3.4.2 Tugela Ferry Irrigation Scheme**

The Tugela Ferry Irrigation Scheme is located in the Msinga District in KwaZulu-Natal Province, on both banks of the Tugela River. The scheme was originally planned by the then Department of Bantu Administration and Development and was operational before 1932. The scheme consists of seven blocks of irrigable land, covering 840 ha, of which approximately 540 ha are flood-irrigated (Mnkeni et al., 2010). Tugela Ferry Irrigation Scheme is close to the small town of Tugela Ferry, and is among the largest irrigation schemes in the province, i.e. one of the only four that are greater than 500 ha in size. Out of the 840 hectares of the land with high potential soils available for irrigation, around 540 hectares are currently under cultivation by between 800 and 1000 producers, who probably comprise 15 per cent of all smallholder irrigation farmers in the province (Cousins, 2012). All major revitalisation are the responsibility of the government. The irrigation water is mainly gravity fed, but the main canal is old and leaking badly. Water is drawn from a diversion weir across the Tugela River and distributed via a main canal 31 kilometres in length, holding dams and smaller distribution canals. Within the beds, crops are irrigated using the short-furrow system. Siltation, cracks, leaks and dysfunctional holding dams, the result of inadequate maintenance and repair work since the 1960s, are major problems during the time when most surveys were done. In 2012, a R20 million government funded repair programme was implemented, under the auspices of the Comprehensive Rural Development Programme (Cousins, 2012). The revitalisation project was finalised in 2015 and most of the canal problems were solved. Two blocks, i.e. blocks 4 and 7, use pumps to extract water from the river, as they cannot rely on the water supply from the canal. The mean 'bed' size is about 0.1ha, while the mean number of beds per producer is about 3.37 (0.4 ha) (Cousins, 2012)

As far as livelihood sources are concerned, the Msinga municipality comprises densely settled communal areas with a long history of out-migration in search of waged employment. As elsewhere in rural South Africa, livelihood sources include cropping and livestock production, wage labour on large-scale commercial farms, migrant labour in cities, such as Johannesburg and Durban, and remittances (Cousins, 2012). A few households operate small-scale local enterprises, such as spaza shops or local taxi services. Child support grants and old age pensions are an important source of income for many (Fanadzo, 2012).

The Tugela Ferry Irrigation Scheme has some distinctive features. The great majority of plot holders are women, rather than men; the production of food crops for home consumption is limited and the bulk of production is for sale; almost all crops use costly fertilizers and crop protection chemicals; use of hired labour is common; individual plots (or 'beds') are much smaller than on other schemes; an active, informal plot rental market makes it possible for many farmers to gain access to additional plots; and the land rental market means that most plots remain in cultivation in most years. Cropping here can be described as highly commoditized, in relation to both inputs (including labour) and outputs, with land only partially commoditized (in that plots cannot be sold) but nevertheless subject to a great many informal transactions between owners and others who gain 'temporary' usage rights (Cousins, 2012).

### **3.4.3 Thukela Irrigation Scheme**

The 813 hectare Thukela Estates Irrigation Scheme has a long history, going back to 1912. In 1985 the responsibility for the scheme reverted to the KwaZulu Department of Agriculture. A number of attempts have been made in the past to revitalise and rehabilitate the scheme. Apparently, institutional problems relating to land allocation, inappropriate management, lack of participation and local conflicts have led to failure. Virtually all of the 1275 households living near the scheme have been allocated small plots of varying sizes. All major revitalisation are the responsibility of the government. Because of lack of maintenance and deterioration, the original canal is no longer functional and less than 30% of the productive area is being utilised by pumping from the Tugela River. Many potential participants are unable to irrigate due to the collapse of the main supply canal and ancillary works. The pressurised system is in a poor state of repair and dysfunctional. More recently, lack of unity and stability within the community, due to factional conflicts, have hindered rehabilitation of the scheme (WRC, 2006). Agricultural production was virtually non-existent at the time of the reconnaissance survey in 2012.

### **3.4.4 Mooi River Irrigation Scheme**

The Mooi River Irrigation Scheme (MRIS) is located in the Msinga District in the Midlands region of KwaZulu-Natal province in South Africa. Water is diverted from a weir constructed across the Mooi River into a parabolic canal, which runs for 20.8 km from the diversion point to the end of the scheme (DAEA, 2001). The concrete-lined canal, with a top width of 2.0 m, and a depth of a metre, is designed to convey approximately 0.36 m<sup>3</sup> per second (DAEA, 2001). The scheme is divided into 15 blocks of different sizes for management and ease of water distribution. At the time of the reconnaissance survey in 2012, the level of production was moderate. Siltation, cracks, leaks and dysfunctional holding dams, the result of inadequate maintenance and repair work, are major problems preventing greater utilisation of the irrigation scheme.

The actual year the scheme was established is not clear but farmers remembered that the scheme started in the early 20th century, with earthen canals and concrete-lined in 1973. The scheme was intended to provide food and jobs to the local people. It covers 600 hectares and

consists of distinctly demarcated plots, approximately 0.1 ha each in size. However, some farmers own or use more than one plot, with most of them using about 0.5ha, on average. There are 824 farmers in the scheme. The scheme is managed through block committees which are responsible for water distribution within each specific block, among other responsibilities. The overall scheme is managed by an irrigation management committee (IMR), which is made up of the chairpersons and secretaries of all blocks. The irrigation management committee ensures equitable water distribution among the blocks, inspection of irrigation infrastructure and sourcing funds for repairs and conflict resolution (Gomo, 2012).

Water is distributed into the various plots through parabolic distributary canals of varying size, depending on the area to be irrigated in the block. The scheme has 15 blocks of varying sizes, averaging 40 hectares. Plots are 0.1 hectares each distributed across 824 plot holders.



**Figure 3.2** A view of Tugela Ferry Irrigation Scheme (2012)

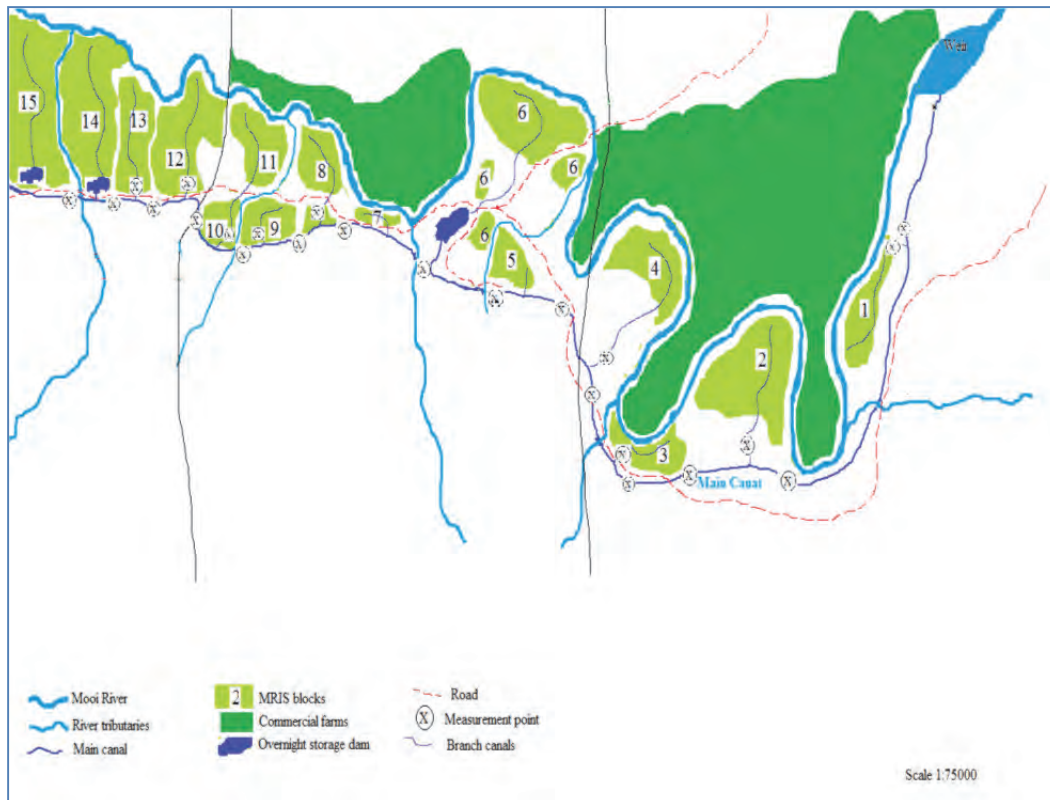


Plate 5: The scheme layout showing blocks and main canal  
 Source: Adapted from Gomo (2012).

### 3.5 Selection and choice of the women included in the study

In North West Province, a probability sampling method involving simple random sampling techniques was used to select the respondents based on initial cluster sampling with random sampling per location. A sample of 84 farmers was randomly (with replacement) selected to obtain a representative sample from the participating farmers on the schemes. Some farmers on irrigation schemes have access to land in the old scheme design, even though the decision and management of their plots rests solely on them.

Households in the three study sites were stratified into three main groups, namely gravity-fed irrigators, pump-fed irrigators and dry-land farmers. The gravity-fed and pump-fed irrigators/farmers were obtained from Tugela and Mooi River Irrigation Schemes. However, gravity-fed irrigators/farmers in Tugela Ferry were not included in this part of the study, because their section of the irrigation scheme was undergoing a major revitalisation at the time of the survey. Moreover, the farmers had not been producing food for almost a year, which made it difficult to assess the impact of the irrigation scheme to households' livelihood outcomes. The dry-land farmers were sampled from the Machunwini area. A proportional random sampling method was used to select the women used for the study to equally represent the three categories by which farmers had access to water for agricultural purposes (i.e. gravity-fed, pump-fed and dry-land farmers). Table 3.4 shows the distribution of sampled women farmers in each study area.

**Table 3.4:** Distribution of sampled women farmers in each study area

Irrigation method	Total number of households			Number of respondents sampled			Total
	Tugela Ferry	Mooi river	Machunwini	Tugela Ferry	Mooi river	Machunwini	
Gravity-fed	0	473	0	0	100	0	100
Pump-fed	270	403	0	40	60	0	100
Dryland	0	0	1 234	0	0	100	100
<b>Total</b>							<b>300</b>

**Source:** Survey data (2013)

### 3.6 Survey data collection procedures

In North West, data were collected with a structured questionnaire, developed on the basis of the study objectives and review of the literature. Open and close-ended questions were used for collecting demographic information. The second section of the questionnaire dealt with livelihood strategies, which include four capital assets, such as like natural, physical, human, financial capitals, employed as a measure of the livelihood strategies used by the farmers on the schemes. The financial capital was measured on a three scale, indicating availability, adequacy and non-adequacy. Physical capital looked at infrastructure. Human capital is about knowledge and skills and natural capital about natural resources, mainly land and water. The third section was on socio-economic status, considering access to credit and farm incomes. The last section was on food availability and accessibility. The questionnaire was designed to avoid ambiguity, sensitivity and provocativeness.

In KwaZulu-Natal, the study employed a mixed method approach. Formal and informal data collection methods were used. Informal methods were gathered through media analysis, rumours, etc. Five such sessions were conducted. In addition, key informant interviews were conducted. People considered to be familiar with the general aspects of the political, economic, social, institutional and cultural environment, especially with respect to women, were identified and interviewed. In the case of both the key informant interviews and the focus group discussions, interview guides were prepared first and then used in the sessions. The formal survey was designed to collect information from a representative set of households. A structured questionnaire, pre-tested before use, was administered by trained isiZulu-speaking enumerators.

### **3.7 Data analysis methods**

This section discusses how the data obtained from the sampled households was analyzed. In this study, Stata (version 11) and the Statistical Package for Social Sciences (SPSS version 21) were used to analyse the data collected from farmers. Data presentation tools, in the form of tables, bar graphs and pie charts, were used. Descriptive analysis for all the variables was carried for data analysis. This involved looking at means, frequencies and standard deviations of the variables. The t-test was used to make comparisons between irrigators and non-irrigators, with respect to relevant continuous variables, and the  $\chi^2$ -test was used to test the degree of association between the irrigation access variable and other relevant categorical variables. A one-way ANOVA was employed to determine whether or not agricultural skills and knowledge had a significant effect on agricultural productivity.

Data was subjected to various econometric models, to get a better understanding of the patterns in different aspects among the farmers. The models included a simple linear regression model for estimating land access determinants, a binary logit model for estimating the determinants of land security, an ordered logit regression model for assessing the determinants of household food security. Econometric model used was the principal component analysis (PCA).

#### **3.7.1 Measurement of women's empowerment**

In KwaZulu-Natal, the approach used in this study firstly identified all indicators of women's capabilities (i.e. resources and agency), under each dimension of empowerment, in the context of South African rural areas. The indicators that capture women's access and control of resources and their agency at each dimension of empowerment were compiled. With the help of an enumerator, each woman respondent rated her levels of capabilities (i.e. resources and agency) on a five-point Likert scale. PCA was applied on the levels/scores of resources and agency at each of the four dimensions of empowerment (namely, economic, social, agricultural and civic) to generate indices representing the different sub-dimensions, namely, financial capital, human capital, physical capital, economic agency and social capital. The dominant PCs (i.e. with Eigen values greater than one, using the Kaiser criterion) were retained in each dimension. Absolute PC loadings greater than 0.50 were considered dominating and indicated a strong association among the resources used to generate that particular PC. PCA was chosen over other variable reduction techniques (e.g. cluster analysis and factor analysis), because most of the indicators of empowerment capabilities are correlated and can be grouped by PCA into a few principal components (i.e. dimensions of empowerment), which account for most of the variance of the indicators.

The above mentioned approach was employed because based on the review of the literature, it was concluded that women empowerment is a multidimensional process occurring at four main dimensions (i.e. economic, social, civic and agricultural) in which other sub-dimensions (e.g. physical, informational and moral, etc.) are fitted. It was also concluded from literature that resources are undoubtedly the most important aspect of women's empowerment.

However, it was also noted that resources on their own are not adequate for allowing individuals to achieve desired livelihood outcomes. Women also need a sense of agency to be able to independently utilise resources and achieve their desired livelihood outcomes. As a result, it was concluded that women's capabilities (i.e. resources and agency combined) are the most suitable indicators of women empowerment. However, with regards to women, the household institutional settings (emanating from their socio-cultural norms and values) are the major source of their powerlessness. Hence, women's resources should be measured as their level of access and control of each household resource. Since women empowerment is multidimensional, this study, therefore, proposed the application of PCA on women's level of agency and resources to quantitatively generate factor scores (i.e. indicators of each woman's level of empowerment) at each dimension of empowerment (i.e. indicated by each PC). The indicators that capture women's access and control of resources and their agency at each dimension of empowerment were compiled following Uphoff (2003), Kabeer (1999; 2001; 2005), Alsop and Heinson (2005) and Alsop et al. (2006).

In North West, a modified Women Empowerment in Agriculture Index (WEAI) was used because the questionnaire did not cover time budgeting. The empowerment indices covered in this study include the use of income, access to productive capital, access to credit, leadership roles and decision-making. From the scoring of the empowerment indices the mean was calculated for each of the indices and used as the cut-off point. Women with scores below the mean depict disempowerment, while those above the mean indicate empowerment.

### **3.7.2 Measurement of household food security status**

Food security is a multidimensional concept and measuring it has been an on-going challenge for researchers and practitioners (Coates et al., 2007). In response to the need to improve the tools and frameworks for targeting food security interventions (especially for the vulnerable segments of a population) to achieve optimum resource allocation, the Food and Nutrition Technical Assistance (FANTA) project of the US Agency for International Development developed the Household Food Insecurity Access Scale (HFIAS), which is an adaptation of the 18-item Household Food Security Survey Module (HFSSM) used by the US Department of Agriculture (USDA) and other US agencies to measure the access component of food insecurity in the USA (Coates et al., 2007).

One limitation of the US HFSSM is that it was not universal across different cultural and social contexts. There are other studies where the US HFSSM questions have been translated, with some adaptation, to developing country settings and found to be correlated with poverty and food consumption indicators (Coates et al., 2007; Perez-Escamilla et al., 2004). However, the HFIAS was developed on the notion that households across different cultural or social contexts respond to food insecurity in universal ways (Coates et al., 2007). The method is based on the idea that the experience of food insecurity (i.e. poor household food access) causes predictable reactions and responses that can be captured and quantified through a survey and summarized in a scale. According to Deitchler et al. (2011), the HFIAS reflects



the three universal domains of the experience of inadequate household-level food access, which are anxiety about household food supply, insufficient quality, which includes variety and preferences, and, lastly, insufficient quantity of food supply, the amount consumed and the physical consequences of insufficiency. Thus, in HFIAS, respondents are asked directly whether or not the household has experienced conditions typical of a food-insecure household during a specified recall period. The three domains in HFIAS are anxiety about quality and quantity of household food supply, insufficient quality, which includes food variety and preferences, and insufficient food quantity, which includes food supply and intake and physical consequences.

The HFIAS, therefore, serves as a universally appropriate tool for assessing the access component of household food insecurity in different cultural settings across countries (Deitchler et al., 2011). The HFIAS has the advantage that it tends to be cost-effective, unlike most other household-level measures of food access, such as income and caloric adequacy that are technically difficult, data-intensive and costly to collect. The HFIAS is also more sensitive to changes in household food insecurity and is also user friendly (Kirkland et al., 2011). This study adopts the HFIAS to categorise households in the Msinga Local Municipality, according to their household food insecurity status. Based on the three domains of food insecurity determined through the HFIAS, four categories of household food insecurity status can be established. The four categories are severely food insecure, moderately food insecure, mildly food insecure and food secure. A brief explanation of these categories is given below:

- Food secure: These households do not express anxiety about quality and quantity of household food supply because they have access, at all times, to enough food for an active, healthy life for all household members.
- Mildly food insecure: Such household express anxiety about quality and quantity of household food supply over the recall period, although they have adequate quantities of food.
- Moderately food insecure: Such households experience insufficient quality, which includes limited food variety and preferences.
- Severely food insecure: Such households experience insufficient food quantities, which include food supply and intake, and the accompanying physical consequences.

### **3.7.3 Forster Greer Thorbecke (FGT) analysis**

Forster Greer Thorbecke (FGT) analysis was used to measure the poverty status of women farmers in the study areas. In this study household income was used as the welfare measure. The poverty line was set at one USD (about R15 in March 2016) as a level of daily income corresponding to some minimum acceptable standard of living in South Africa. The poverty line acts as a threshold, with households falling below the poverty line considered poor and those above the poverty line being considered non-poor. At  $\alpha = 0$ , this indicated the poverty incidence/poverty headcount ratio. This was the share of the population whose income was below the poverty line.

### 3.7.4 Skills development process in KZN

Two groups of women attended the skill training courses in KwaZulu-Natal in the year 2015, which was facilitated by the University of KwaZulu-Natal project team as part of the WRC project. The two skills training workshops were conducted at Sampofu Primary School in Msinga, which lies in the Umzinyathi District. The first group attended training on ‘co-operative management’ and the second group attended on ‘vegetable production’. These two skills training sessions were conducted by Wanyuka consultants, who are well experienced in training.

The training to give to the women was based on the preliminary assessment of skills training needs in the study areas, Table 3.4 shows the most important areas in which women in the study communities require training. These were identified through focus group discussion and key informant interviews and were ranked from the most important to the least important according to each area.

**Table 3.4:** Critical areas in which women in the study communities required training

<b>Mooi River upper blocks</b>	<b>Mooi River upper blocks</b>	<b>Tugela Ferry</b>
1 Determining nutrient deficiency <i>(Training by extension officers)</i>	1. Determining seed depth <i>(Training by extension officers)</i>	1) Cooking/ processing <i>(Training by Siyazisiza Trust’s)</i>
2 Chicken/poultry production <i>(Training by LIMA)</i>	2. Poultry production <i>(Training by LIMA)</i>	2) Crop protections (pests and diseases) <i>(Training by extension officers)</i>
3) Crop protections (pests and diseases) <i>(Training by extension officers)</i>	3. Sewing <i>(Training by Siyazisiza Trust’s)</i>	3. Produce packaging; Post harvesting techniques; <i>(Training by LIMA)</i>
	4. Cooking <i>(Training by Siyazisiza Trust’s)</i>	4. Financial management <i>(Training by FSG)</i>
		5. Pricing; finding markets and negotiating skills <i>(Training by FSG)</i>

Women who attended the training were drawn from the three study areas that had been identified following the criterion which was in the contractual requirements of the WRC project that have been explained in section 1.2. Extension officers from all the wards in the three areas were requested to submit names of five women farmers to attend training. The

inclusion/exclusion criterion was simply on a first-come first-served basis. However, there were also a considerable number of women farmers who 'gate-crushed' the training, while others withdrew.

Table 3.6 shows the distribution of women trained according to each area. A total of 13 women were trained from the two irrigation schemes while a total of 21 women were trained from the dry-land areas. Table 3.6 summarises descriptive statistics of the socio-economic characteristics of the women who attended the training. In general, younger women attended the training than older ones. The average age of the women who attended the training was 32.5 years and the average ages of women who attended the training from both the irrigation and dry-land areas were almost similar. The average household size for women who attended the training is 8.1. However, the average household size for women from Machunwini was much lower than that from Tugela Ferry Irrigation Scheme. The women sampled from Machunwini and the surrounding dry-land areas had smaller households. The households of women from the dryland area had a higher dependency ratio of about 1.9, compared to 0.8 for those from the irrigation scheme.

The majority (68.2%) of women in the study communities were not married (i.e. either single, widowed or divorced/separated). Most of the women (81.8%) were unemployed and the percentage of unemployed women was highest in Tugela Ferry (Table 3.6). In this study, farming was not regarded as a form of employment. The majority of the women (81.86%) had no formal education and none of them had reached tertiary education. Likewise, the majority of the sampled women's husbands had no formal education. As a result, most of the women's husbands, just like their spouses, were not formally employed.

**Table 3.6:** Socio-economic characteristics of women who received training

Characteristic	Tugela Ferry Irrigation	Machunwini Dryland areas	Overall
	(n = 13)	(n = 21)	(n = 34)
Average age of women(Years)	32.6	32.4	32.5
Household size	8.4	6.80	8.1
Mean dependency ratio	0.8	1.9	1.0
<b>Marital status (%)</b>			
Married (%)	35.3	20.0	31.8
Single (%)	11.8	20.0	13.6
Widowed (%)	5.9	40.0	13.6
Separated/Divorced (%)	47.1	20.0	40.9
<b>Employment status (%)r</b>			
Unemployed (%)	88.2	80.0	86.4
Informal / non-permanent employment (%)	11.8	20.0	13.6
<b>Women's level of education (%)</b>			
No formal education (%)	88.2	60.0	81.8
Primary education (%)	5.9	20.0	9.1
Secondary education (%)	5.9	20.0	9.1

Table 3.7 shows the distribution of trained women according to their main occupation and farming systems they are involved in. The majority of the women (63.6%) were full-time farmers. A moderate percentage of women were employed in seasonal or temporary jobs. As far as agricultural systems are concerned, the majority of women (77.3%) were involved in vegetable production. Since the majority of trained women were from the dry-land areas, the largest proportions were involved in community gardens. More women from the dry-land areas (70.6%) than the irrigation schemes were involved in field crop production. In general, the majority of women were keeping or owning some livestock (cattle, sheep, goats, pigs or chicken).

Table 3.8 shows that the women had previously attended only three types of training. The majority of women (50.0%) had previously attended training in crop production. This is followed by business management skills, which had previously been attended by 40.9% of the women. The lowest percentage of women had attended training in animal production. A relatively large number of women in the study area had received formalised training through various NGOs working in the area over the years.

**Table 3.7:** Distribution of trained women according to their involvement in agricultural activities

Characteristic	Tugela Ferry	Machunwini	Overall
<b>Main occupation (%)</b>			
Full-time farmer	64.7	60.0	63.6
Seasonal/temporary job	17.6	20.0	18.2
Unemployed	11.8	20.0	13.6
<b>Farming systems (%)</b>			
Field crop production (%)	40.0	70.6	63.6
Vegetable production (%)	76.5	80.0	77.3
Community gardens (%)	60.0	82.4	77.3
Livestock production (%)	88.2	80.0	86.4

**Table 3.8:** Percentage distribution of women according previous training attended

Training previously attended	Tugela Ferry	Machunwini	Overall
Crop production skills	47.1	60.0	50.0
Animal production skills	11.8	0	9.1
Business management skills	41.2	40.0	40.9

### 3.7.5 Facilitation process in North West province

In North West province a focus group discussion was organised with men and women on irrigation farming separately around Taung at a central location. The results (Table 5.2) of the competence on the skills of activities identified among women on various agricultural enterprises were presented and the areas of low competence were consequently listed as those requiring training. The list of skills was sieved, with the level of competence indicated by the majority of the women.

From the identified list of skills requiring training, women were asked to rank them in order of priority for the training to take place. It is important to know that irrigation Water scheduling was reintroduced as an area requiring training. The trend of the ranking was also unanimous for men and women, though in separate meetings.

## **CHAPTER FOUR: SOCIO-ECONOMIC, POLITICAL, INSTUTIONAL & CULTURAL ENVIRONMENT WOMEN OPERATE**

**Mudhara, M., Oladele, O. I., Tekana, S.S., Shraunga, S. and Balarane, A.**

### **4.1 Introduction**

This chapter discusses the findings on political, economic, social, institutional and cultural environment in which women selected for the WRC survey operate. As a specific objective in the study, this section, it discusses the land and water policies in South Africa, as well as the water and food security status of women. Lastly, the section provides an overview of the state of women's empowerment in South Africa.

### **4.2 Political environment**

#### **4.2.1 Political environment in studied areas of KwaZulu-Natal**

Msinga is a local (Category B) municipality established in December 2000, as one of the four local municipalities constituting the uMzinyathi District Municipality. Msinga is composed of six Traditional Authority areas, namely Qamu, Mchunu, Bomvu, Ngome, Mabaso and Mthembu, comprising an area of 2500 km<sup>2</sup>. The area is divided into 17 political wards, with 33 Councillors (Msinga Municipality, 2009). Msinga municipal area had a chequered past. It was once a battlefield for political parties that waged war against party supporters. Gun battles were fought in the 1980s and many lives were lost as the Inkatha Freedom Party (IFP) and the African National Council (ANC) challenged each other for supremacy. Groups aligned to different parties raided each other's homesteads at night. The area was a bloody battlefield until an uneasy truce settled over it in the early nineties.

Currently, politicians are trying to rectify the historical imbalance by sending economic reinforcements into this area. Political tensions continue to play out due to the mismatch in the power of political parties at different levels of government, i.e. national and local levels. The national government is under the ANC while the district and local government levels are under the IFP. Therefore, often the national government programmes and those of the local government are not synchronised. Such a scenario stifles development. Indeed, Msinga was recently voted the worst municipality in the country, in terms of development. The government's effort to bring infrastructure to the area is a challenging task.

The Umzinyathi District Municipality (i.e. in which the Msinga Local Municipality lies) is one of the 17 municipalities in KwaZulu-Natal affected by political instability. The Provincial Report by the Co-operative Government & Traditional Affairs (2012) lists a number of causes of political instability, including: the lack of understanding and adherence to the roles and responsibilities of political office-bearers; interference in council matters from the regional and provincial political structures; a lack of deliberations on matters in

council; domination of some councils by politically powerful administrations; power struggles between political office-bearers from the same parties and a lack of communication and public participation frameworks which creates an environment for un-coordinated interaction with the community. As of the 2009 election results, the ANC is the leading party in terms of proportional DC40 Seats in Umzinyathi, with 11 seats of 25 seats (Co-operative Government & Traditional Affairs, 2012).

**Table 4. 1:** 2006 Local Government Election results and seat allocations

Party	Local Government Election		National Elections 2009
	Percentage of Party Votes	Percentage of Ward Votes	
IFP	55.57	56.02	4.55
ANC	32.83	31.68	65.90
DA	0.96	1.42	16.66
COPE	0.44	0.83	7.42

According to the provincial report by the Department of Co-operative Government and Traditional Affairs (2012), the Umzinyathi District Municipality is one of eight municipalities in KwaZulu-Natal facing serious challenges, politically. According to the Provincial Report, the most recorded complaint by stakeholders is the tendency to appoint politically aligned Municipal Managers. Some of the other reasons for a poor relationship between the political issues which were negatively affecting service delivery arise from councillors getting over-ruled by officials, political office-bearers interfering in administrative functions, lack of strategic direction on service delivery by council, due to poor leadership and focus on political rule in council and staff forced to show political alliance to ensure job security (Co-operative Government & Traditional Affairs, 2012).

According to the same report by the Co-operative Government & Traditional Affairs (2012), Umzinyathi District Municipality is one of the 24 councils that do not seem to perform any oversight function. The Provincial Report states that the lack of councillor oversight has emerged as the single factor contributing most to poor governance and service delivery. A large number of councillors appeared not to appreciate the nature and importance of their oversight role and the administration seemed to ignore the need for oversight due to the administrative and accountability implications it will have for them (Co-operative Government & Traditional Affairs, 2012). Although focus group discussions indicated that there was no more politically motivated violence in the study areas, the Mooi River and Tugela irrigation schemes are facing major infrastructural and institutional problems, along with local political power games that characterise those schemes. This hinders effective problem solving.

## **4.2.2 Political environment in studied areas in North West Province**

### ***4.2.2.1 Political history***

North West was created after the end of Apartheid in 1994. It includes parts of the former Transvaal Province and Cape Province, as well as most of the former Bantustan of Bophuthatswana. It was the scene of political violence in Khutsong, Merafong City Local Municipality, in 2006 and 2007, after cross-province municipalities were abolished and Merafong Municipality was transferred entirely to North West. Merafong has since been transferred to Gauteng province, in 2009.

### ***4.2.2.2 Law and government***

The provincial government consists of a premier, an executive council of 10 ministers, and a legislature. The provincial assembly and premier are elected for five-year terms, or until the next national election. Political parties are awarded assembly seats based on the percentage of votes each party receives in the province during the national elections. The assembly elects a premier, who then appoints the members of the executive council. The premier of North West Province, as of 21 May 2014, is Supra Mahumapelo, of the African National Congress. He replaced Thandi Modise as premier after the 2014 general election.

## **4.3 Socio-economic environment**

### **4.3.1 Socio-economic environment in KwaZulu-Natal**

Msinga Local Municipality (location of the three study sites) is a grossly underdeveloped area with poor infrastructure (most severely felt in the community's difficulty to access water), high unemployment and low levels of economic activity and education (Coan, 2009). The economic activity within Msinga is adversely affected by economic pull factors external to the municipality. These factors are predominantly towards Greytown, Dundee and, to some extent, Ladysmith. Social services and private households generate 29% of the income for the area. This indicates a heavy reliance on government grants to provide the balance of the income for the area (Dearlove, 2007).

Trade and commerce, mainly in Pomeroy, Tugela Ferry and Keates Drift, account for 11% of economic activity and appears to be relatively stable. The informal trade in its various forms, e.g. tuck shops, butcheries and street vending, provide essential services to isolated settlements. Women play a major role in these activities, especially street vending of fruit and vegetables. The male-dominated sectors of manufacturing and construction account for 10% of the economic activity (Dearlove, 2007).



#### ***4.3.1.1 Livelihood strategies***

Households in the study communities in Msinga generally have multiple sources of income, comprising a mix of small-scale production of crops and livestock for consumption and sale, wage labour on large-scale commercial farms and forestry plantations, migrant labour in cities such as Johannesburg and Durban and some small-scale local enterprises, such as spaza shops or taxi services (Fanadzo, 2012). However, there tends to be some differences in livelihood diversification strategies between men and women, and between households in irrigation and those in dry-land farming. Table 4.2 shows the average annual incomes and the percentage contribution of the various livelihood activities that women in the study areas engage in.

#### ***4.3.1.2 Contribution of crop production to livelihoods***

The most important agricultural activity in the study areas is crop production, which is important both as the main source of food and as a main source of income. The crop production system in Msinga is largely divided into two, dry-land and irrigated farming systems.

Dry-land farming occurs in most of the communal lands where there is no irrigation. As expected, because of the harsh climatic conditions of the area, the contribution of crop production to household food or income among dry-land farmers is small. Crop production is considered as a supplementary activity and is not central to the livelihoods of farmers in dry-land areas. The inherently poor agricultural potential emanates from the low rainfall, coupled with the hot temperatures and poor soils found in the Msinga area of Machunwini.

**Table 4.2:** Percentage contribution of livelihood activities to annual income among the sampled women's households

Income sources	Mooi river		Tugela Ferry		Machunwini	
	Mean ann. Inc.	% contr.	Mean ann. Inc.	% contr.	Mean ann. Inc.	% contr.
<b>Agricultural activities</b>						
Crop production	15260.0	29.6	15856.7	35.6	245.0	0.6
Livestock production	5794.1	11.2	1365.0	3.1	2083.0	5.0
Agricultural wage labour	120.1	0.2	240.0	0.5	2312.5	5.5
Vending of agricultural products	856.1	1.7	1103.4	2.5	0	0
<b>Non-agricultural activities</b>						
Formal employment	3811.8	7.4	2000.0	4.5	5094.1	12.2
Wage/temporary employment	612.2	1.2	200.0	0.4	2354.7	5.6
Dress-making	0	0	153.6	0.3	0	0.0
Own business	0	0	872.6	2.0	240.4	0.6
Petty trade/hawking	864.3	1.7	430.6	1.0	0	0.0
Vending/marketing	25.3	0			0	0.0
Craft-work/arts	176.3	0.3	0	0	262.6	0.6
<b>Donations</b>						
Government grants & pensions	21812.3	42.3	21600.0	48.5	25381.1	60.7
Remittances	2214.0	4.3	738.1	1.7	3814.7	9.1

The main crops grown under dry-land farming in the Machunwini area are sorghum (grown for beer) and maize (grown for green mealies, beer, feed for chickens and stover for cattle in winter is a residual benefit). Sometimes the maize is milled for maize meal, which is the local staple diet. Usually maize is intercropped with cowpeas, beans, different types of melons and sweet sorghum. There is very low income from the dry-land cropping system, with a mean percentage contribution to household income of 0.6% (Table 4.2). This indicates that availability to a reliable and sufficient source of water for agricultural/crop production is a critical step towards empowerment of women through agricultural crop production. As a result of the poor rainfall and lack of access to irrigation, land among dry-land farmers in Machunwini is used predominantly for grazing purposes, and only to a lesser extent for producing dry-land crops. Small garden plots, which can be watered, are attached to many homesteads and are used to produce vegetables and maize for home consumption.

Irrigated farming in Msinga is more central to livelihoods, both as a source of income and food (Table 4.2). Irrigated cropping is primarily done in the Mooi River and Tugela Ferry Irrigation Schemes. In both irrigation schemes, crop production is the second most important

contributor of incomes for female-headed households, after government grants (child and disability grants and pensions) (Table 4.2). Comparatively, the contribution of crop production is even higher (35.6%) in Tugela Ferry than in Mooi River (29.6%). The farmer fares better because of a ready market for agricultural produce in the small town of Tugela Ferry. Under irrigated cultivation in Msinga, farmers are able to produce two crops in the two production cycles. The first cycle runs between January and June and the second one is from July to December. Vegetable crops grown during winter and summer are tomatoes, butternuts, spinach, sweet potatoes, potatoes and onion, in their order of importance. The main crop during summer is maize (Mkhabela, 2005).

The pursuit of any livelihood activity depends on the resource endowment of a household or individual (Ellis, 1998). According to Table 4.3, women in the irrigation schemes have relatively less land for agricultural purposes than women in dry-land farming. The land under dry-land farming in the Machunwini area ranges between 0.01 and 1.2 hectares, with an average of 0.4 ha being used for agricultural purposes. Irrigated crop production in the selected irrigation schemes is based on plots size of 0.1 hectares, commonly known as ‘beds’ in local parlance. Women in the irrigation schemes were using an average of 2.5 ‘beds’ (0.25 hectares) for agricultural production. Some farmers have only one plot/‘bed’, while others have more plots acquired through varying forms of lease agreements with owners. The possession of plots of land depends on historical allocation to families, which is then passed from one generation to another through inheritance. Women in the study areas owned relatively less agricultural equipment (Table 4.3).

**Table 4.3:** Household ownership of agricultural resources for the sampled women’s households

<b>Characteristic</b>	<b>Mooi River (n = 85)</b>	<b>Tugela Ferry (n = 21)</b>	<b>Machunwini (n = 53)</b>
Mean size of land being used for farming (ha)	0.25	0.25	0.4
<b>Ownership of agricultural machinery</b>	<b>Percentages of households</b>		
Trucks	3.5	28.5	9.4
Tractors	3.5	4.7	1.9
Tractor-drawn plough	3.5	4.7	1.9
Animal-drawn ploughs	8.2	9.5	38.1
Hoes	98.8	100	92.5
Wheelbarrow	24.7	61.9	22.6
Garden fork	60.0	85.7	20.7
Knapsack sprayer	49.4	71.4	0
Spades	65.8	80.9	39.6
Animal drawn cart	1.1	0	5.6
Rake	68.2	85.7	7.5

### 4.3.1.3 Contribution of livestock production to livelihoods

Common species of livestock in Msinga are cattle, goats, chickens and dogs, with sheep, pigs, donkeys, geese and turkeys held by very few households. A study conducted by Bayer et al. (2003) shows that livestock in Msinga have multiple functions. Most people regard cattle as the most important livestock species, although not all people own them. Cattle are used for meat, draught, *lobola* (bride price), for cultural ceremonies and occasional sales. Their hides are used to make traditional attire of various forms (Cousins et al., 2011). However, in this study, the contribution of livestock production to incomes of female-headed households is very low (Table 4.2). This is attributed to the fact that livestock, especially cattle, are a symbol of wealth and are rarely sold or are only slaughtered at very important functions, such as weddings and funerals. A discussion with some farmers who owned cattle suggested that there is a minimum threshold number of cattle which defines a respectable herd. Therefore, in most cases, cattle owners make an effort to build their herds to this minimum threshold. Consequently, farmers would start selling their cattle only after they have exceeded the threshold of 20 cattle. Few of the farmers interviewed relied exclusively on their cattle as a source of income. However, the contribution of small ruminants, especially goat production, to women's incomes is slightly higher in the Machunwini area (rain-fed) than the two irrigating areas. This could be attributed to the availability of vast grazing land, since crop production in the dry-land areas is limited. In this study, it was noted that households owned more chicken and goats and relatively fewer of all the other animal species (Table 4.4).

**Table 4.4:** Ownership of livestock among the sampled women's households

Animal species	Mooi River	Tugela Ferry	Machunwini
	Mean no. owned per household	Mean no. owned per household	Mean no. owned per household
Cattle	5.3	3.9	5.9
Goats	6.9	10.9	13.0
Sheep	0.02	0.2	0.1
Pigs	0.12	0	0.1
Chickens	10.4	15.5	13.8
Donkeys	0.2	0.01	0.8

### 4.3.1.4 Other agricultural related livelihood activities

The contribution of agricultural wage labour is very low across the three study areas, even though the contribution is higher among the irrigation schemes than in the dry-land areas (Table 4.2). Wage labour in the irrigation schemes contributes very little to women's income because most farmers have very small plots (of about 0.4 ha each), requiring less labour. Vending of agricultural produce is another livelihood activity practised more by women in irrigation schemes than by those in the dry-land farms. However, the contribution of vending of agricultural produce was higher in Tugela Ferry than in Mooi River, due to the availability

of a ready market for agricultural produce in Tugela Ferry. Since there was very little crop production among dry-land women farmers, vending of agricultural produce was not practised as a livelihood strategy.

#### ***4.3.1.5 Non-agricultural livelihood activities***

As shown in Table 4.2, the contribution of formal employment in all three communities is minimal. This is because among the women sampled in this study over 90% were unemployed. As a result, many women are involved in informal and subsistence activities. According to Dearlove (2007), nearly 70% of the population in Msinga is illiterate. The majority of these are women and girls who had received no education or schooling beyond elementary level (Dearlove, 2007). It is a common expectation that girls should get married and look to their husband for support. In addition, the Msinga Municipal area has very few job opportunities compared to other municipalities in South Africa. Although wage employment in road construction, forestry and NGOs is common in the study areas, it is very uncommon for women with irrigation plots to engage in such activities possibly because the opportunity cost of engaging in such activities is high and they could get more income from crop production. Culturally, women are expected to remain at home to take care of children, while their spouses go to urban areas in search of formal employment. All these factors mean that women derive little income from employment.

Craftwork is another non-agricultural livelihood activity many women in the study area practise (making clay pots, mats and brooms). However, the activity has minimal contribution to women's incomes (Table 4.2). No women in the study area engaged in construction-related activities, even though road construction is common wage employment in Msinga. Very few women indicated that they had their own businesses. Since farmers, only, were included in the study, it is possible that those with businesses could not engage in agriculture, probably because they have assessed their options and determined that the opportunity cost of engaging in agriculture is very high.

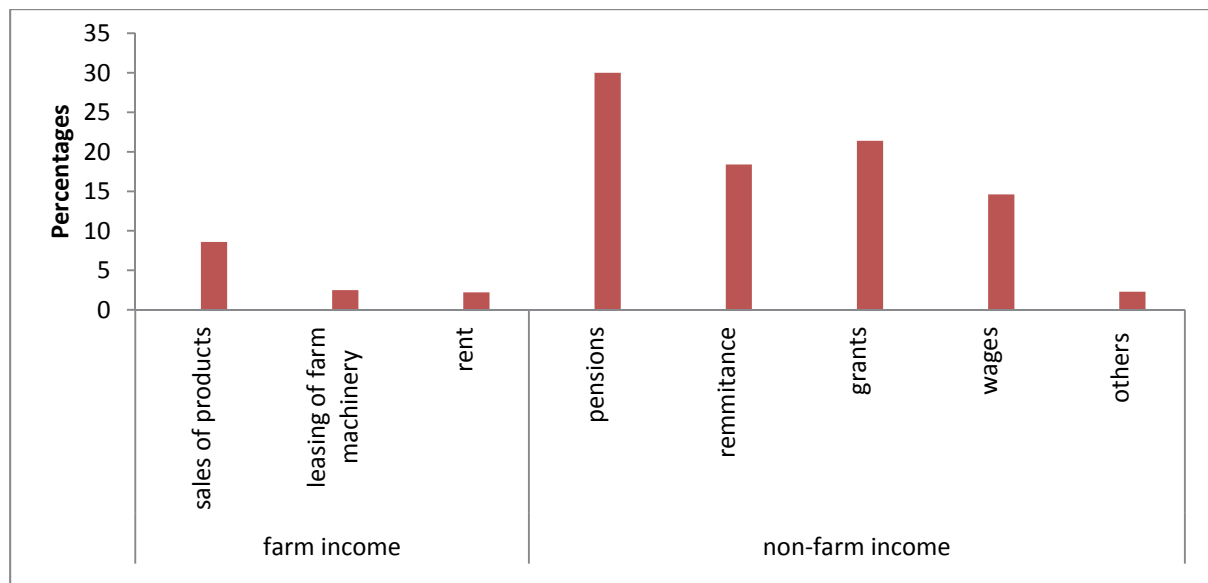
The Machunwini dryland area had the highest percentage contribution of government grants and pensions to household incomes in comparison to the other two sites (Table 4.2). Welfare grants from government, such as the child support grant and the old age pension, are sources of income for rural households in Msinga. Although other studies have indicated the importance of remittances to household incomes, their contribution among selected women-headed households in Msinga was minimal. This is also despite the long history of out-migration by men in this area. During focus group discussions, women indicated that it was common practice for men to migrate to, and work in urban areas. Nevertheless, they also indicated that remittances were not sent reliably and they had to resort to irrigation farming so that they could at least meet the immediate food and financial needs of their households. This can be attributed to the fact that the majority of people in Msinga are less educated and cannot find good employment opportunities in the big cities. Their chances of being capable of contributing financially through remittances are thus low (Fanadzo, 2012; Cousins et al., 2011). There is also much illegal activity, including car hijacking and gun-running, which are

made possible by the relative inaccessibility of the district and by ineffective policing. The most common illegal source of income is the growing and selling of marijuana (*Cannabis sativa indica*) (Cousins et al., 2011). Natural resources on the common lands (thatching grass, timber, fuel wood, brushwood for fencing, medicinal plants and wild fruit) make small but significant contributions to people’s livelihoods, but not directly to women’s incomes (Cousins et al., 2011).

### 4.3.2 Socio-economic environment in North West Province

#### 4.3.2.1 Sources of household income

The sources of household income among the studied women in North West Province can be divided into two broad categories, namely farm and non-farm activities. Farm incomes include sales from farm produce, leasing of equipment and rent from land, while non-farm activities include pensions remittance, wages, grants and other sources. Figure 4.1 indicates that pensions are the greatest non-farm income contributor (30%). This is followed by grants (21.4%), remittance (18.4%), wages (14.2%) and others (2.3%). In farming activities the highest contributor is sales from farm produce (8.6%), followed by leasing of farm machinery (2.2%) and rent (2.2 %). According to Babatunde and Qiam (2010), farming as a primary source of income has failed to guarantee sufficient livelihood for most farming households in developing countries.



**Figure 4.1:** Sources of income among studied households in North West Province

De Janvry and Sadoulet (2001) emphasised that off-farm income has been widely documented as an important strategy for overcoming credit constraints faced by rural households in developing countries. Studies in Uganda have linked off-farm income to poverty reduction (Ellis and Bahiigwa, 2003). McNally (2001) and Goodman and Mishra (2002) pointed out that the pursuit of off-farm income by farmers may undermine their adoption of modern technology, by reducing the amount of household labour allocated for

farming enterprises. In summary, off-farm income is expected to provide farmers with liquid capital for purchasing production inputs such as improved seeds and fertilizers.

#### 4.3.2.2 Types of household livelihood strategies among irrigation farmers

Table 4.5 shows the livelihood strategies of households. About 42.3% of respondents depend solely on agriculture (irrigation farming and a little livestock holding) for their livelihood strategy. About 36.9% rely on non-farm activities such as sewing, transportation of school children and traditional healing.

Non-farm activities assist farmers in terms of filling income and food gaps that agriculture is unable to do. The remaining 20.8% of respondents derived their livelihood strategies from agriculture and non-farm activities. These results are supported by Gecho et al. (2014), who found that the majority of households in Ethiopia sustained their livelihood strategies by combining agriculture with non-farm activities. However, some of the households carried out non-farm activities as the primary livelihood strategy, rather than agriculture. It is essential to encourage rural people to choose alternative livelihood strategies by promoting what they are currently depending on. If irrigation farmers rely on crop farming as their livelihood, they need to be encouraged to combine crop farming with livestock and not necessarily increase their land to meet household food security (Twomlow & Bruneau, 2000).

**Table 4.5:** Distribution of respondents based on household livelihood strategies

Livelihood strategy	Frequency	Percentage
Agriculture alone	63	42.3
Non-farm	55	36.9
Agriculture and non-farm	31	20.8
Total	149	100.0

#### 4.3.2.3 Poverty among the studied women in North West Province

Table 4.6 shows the results of FGT, which indicated that about 15% of the respondents were living below the threshold of R15 per person per day. This implies that the majority of farmers in irrigation farming were better off according to the set poverty line. This could be because of the support, such as tractors, seeds and market information, which farmers were receiving from the government. The gross income was used in this calculation because of limitations in recall of records by the respondents.

At  $\alpha = 1$ , the FGT index measures show the depth of poverty among studied women's households. This provided information regarding how far off respondents are from the poverty line. The results indicated 0.005 as depth of poverty among studied women's households. This implies that the *per capita* income of farmers who were below the poverty line needed to be increased by 0.5% to reach the level of the poverty line. At  $\alpha = 2$ , the FGT index shows the severity of the distance of the farmers from the poverty line. The results

showed a severity of 0.1%, implying that the gap of respondents from the poverty line is very small. Respondents who are poor are not much further from the poverty minimum threshold that was set at R15. Namara et al. (2011) found that incidence, depth and severity of poverty are lower for farmers that have access to irrigation.

**Table 4.6:** Forster Greer Thorbecke Analysis

Index	Estimated value	Estimated value	Estimate value
FGT	0.3353	0.17	0.11781
Poverty line	9.2	9.2	9.2
EDGE	0	1.6058	3.15

#### 4.3.2.4 Women's access to productive assets in North West Province

Table 4.7 shows the socio-economic status of the studied women farmers. It shows the average household assets among women farmers in smallholder irrigation farming. The table indicates that 82.8% of the women owned houses, while 78% of those houses were brick/cement. This indicates these farmers were better off. In terms of position in society, 75.6% indicated that they do not play much role in society. The majority of the respondents had household appliances like fridges (88%), electric irons (84.3%), and television sets (91.6%), electric stoves (84.2%) and radios (73.5%). The respondents (97.5%) have cell phones as a means of communication, which will also help them get information on time.

**Table 4.7:** Women's ownership of household appliances

Household appliances	Yes	No
Ownership of a house	69 (82.8)	14 (16.8)
- Cement type	65 (78.0)	17 (20.4)
- Mud type	7 (8.4)	73 (87.6)
- Shack type	4 (4.8)	76 (91.2)
- Other	8 (9.6)	72 (86.4)
Electric stove	71 (84.2)	12 (14.4)
Good type mattress	59 (71.1)	24 (28.9)
Television set	76 (91.6)	7 (8.4)
Radio	61 (73.5)	22 (26.4)
Vehicle	26 (31.3)	57 (86.7)
Wheelbarrow	62 (74.7)	21 (25.3)
Electric iron	70 (84.3)	13 (15.7)
Metal spoon	83 (100)	0 (0)
Coal iron	22 (26.5)	61 (73.5)
Bicycle	17 (20.4)	66 (79.5)
Fridge	73 (88.0)	10 (12.0)

(Percentages in brackets)



Table 4.8 shows women's access to different forms of productive assets. Koopman (1983) states that in patrilineal societies, women can only access land through male relatives. This access is withdrawn after the death of their husband, or after divorce. From Table 4.8, about 85.7% of the women owned houses, 89.3% had powers to decide how to use or dispose of their houses. Some 82.1% of women owned large, non-movable assets and 91.7% of them could make decisions to use or dispose of them. However, only 7.1 % of the women owned mechanised farm equipment, while 41.3 % had non-mechanised farm equipment.

**Table 4.8:** Women's access to productive assets in North West Province

Productive capital	Ownership		Quantity		Owner of most assets			
	Yes	No	Less than 10	Above 10	Wife	Husband	Both	Group
Agricultural land	61 (72.6)	23 (27.4)	31 (40.6)	50 (59.5)	54 (64.3)	9 (10.7)	21 (25.0)	7 (8.3)
Large livestock (cattle)	15 (17.9)	69 (82.1)	81(95.3)	3(3.6)	77(91.6)	2(2.4)	5 (6.0)	3 (3.6)
Small livestock (goats, sheep)	20 (23.8)	64 (76.2)	79 (94.1)	5 (6.0)	77 (91.6)		7 (8.3)	
Poultry	20 (23.8)	64 (75.2)	78 (92.8)	6 (7.2)	82 (97.6)		2 (2.4)	
Farm equipment (non-mechanized)	12 (14.3)	72 (85.7)	84 (100)		78 (92.8)		3 (3.6)	3 (3.6)
Farm equipment (mechanized)	6 (7.1)	78 (92.8)	84 (100)		84 (100)			
Nonfarm business equipment	13 (15.5)	71 (84.5)	84 (100)		81 (96.4)		3 (3.6)	
House (and other structures)	72 (85.7)	12 (14.3)	84 (1000)		61 (72.6)	2 (2.4)	21 (25.0)	
Other land not used for agricultural purposes (Residential or commercial land)	11 (13.1)	73 (86.9)	84 (100)		82 (97.7)		2 (2.4)	
Means of transportation (bicycle, motorcycle, car)	40 (47.6)	44 (52.4)	84 (100)		82 (97.7)		2 (2.4)	

(percentages in brackets)

With regard to access to physical capital, Table 4.9 indicates that 67.5% of the women indicated that there is availability of water canals. Fifty-nine percent reported the availability of road access, electricity (72.3%), access to markets (44.6%), storage facilities (62.7%) and 39.8% of them have transport facilities to take their produce to the market.

Table 4.9 shows that 84.3% of the farmers obtain their credit from their relatives, although the majority (62.75%) of them indicated that it is not adequate. Seventy-nine percent of the farmers indicated that banks were the other source of credit, while only 6% of the farmers

indicated that credit from the banks was adequate. Credit is important for farmers, because it helps them to secure fertilizers, improved varieties of seed and other technologies on the farm. Inadequate finance can prevent farmers from investing in new methods of crop production and irrigation (FAO, 2008). Lack of access to credit is one factor that reduces women's efficiency and productivity. Machete et al. (2004) stressed that one of the most critical problems threatening the viability of smallholder irrigation is the absence of credit. Access to credit needs collateral, mostly in the form of land rights which some farmers, particularly women, do not possess.

**Table 4.9:** Access to forms of capital necessary for agricultural production

Financial capital	Availability		Adequate	Not adequate
	Yes	No		
Access to Credit from:				
Banks	66 (79.5)	17 (20.5)	5 (6.0)	63 (75.9)
Cooperatives	68 (81.9)	15 (18.1)	2 (2.4)	67 (80.7)
Money lenders	67 (80.7)	16 (19.3)	4 (4.8)	63 (75.9)
Relatives	70 (84.3)	12 (14.5)	18 (21.7)	52 (62.7)
Personal savings	65 (78.3)	18 (21.7)	17 (20.5)	49 (59.0)
Contractors	52 (62.7)	31 (37.2)	10 (12.0)	43 (51.8)
Government subsidies	51 (61.4)	32 (38.5)	9 (10.8)	45 (54.2)
Human capital	Availability		Adequate	Not adequate
	Yes	No		
Training	57 (68.7)	26 (31.3)	35 (42.2)	23 (27.7)
Vocational training	20 (24.1)	63 (75.9)	16 (19.3)	5 (6.0)
Extension service	52 (62.7)	31 (37.3)	40 (48.2)	13 (15.7)
Skills training	Availability		Adequate	Not adequate
	Yes	No		
Record keeping	44 (53.0)	39 (47.0)	38 (45.8)	6 (7.2)
Water management	47 (56.6)	36 (43.4)	37 (44.6)	8 (9.6)
Equipment handling	53 (63.9)	30 (36.1)	40 (48.2)	11 (13.3)
Financial management	32 (38.6)	51 (61.4)	21 (25.3)	12 (14.5)
Soil management	52 (62.7)	31 (37.3)	39 (47.0)	13 (15.7)
Crop protection	47 (56.6)	36 (43.4)	38 (45.8)	8 (9.6)
Physical capital	Availability		adequate	Not adequate
	Yes	No		
Transport	33 (39.8)	50 (60.2)	10 (12.0)	22 (26.5)
Water supply	56 (67.5)	27 (32.5)	27 (32.5)	29 (34.9)
Markets	37 (44.6)	46 (55.4)	10 (12.0)	29 (34.9)
Road accessibility	49 (59.0)	34 (41.0)	24 (28.9)	24 (28.9)

Financial capital	Availability		Adequate	Not adequate
	Yes	No		
Electricity	60 (72.3)	23 (27.7)	49 (59.0)	12 (14.5)
Storage	52 (62.7)	31 (37.3)	27 (32.5)	24 (28.9)

Table 4.9 shows that 68.7% of the farmers indicated that they had received training, although 27.7% of them stated that the training they received was not adequate. An extension service is important in boosting agricultural productivity and 62.7% of farmers reported to have received extension services, while 15.7% indicated that it is not adequate. With regard to skills training, 63.9% of women received training in equipment handling, soil management (62.7%), water management (56.6%), crop protection (56.6%) and record-keeping (53%), while only 38.6% indicated that they were trained in financial management. Johnson and Curtis (1994) add that an understanding of financial management generates a continuous flow of irrigation schemes' profitability, liquidity and reducing risks. This provides a basis for forward planning by farmers.

#### 4.4 Institutional environment

For irrigation agriculture to be socially, economically and environmentally viable institutions must evolve and be compatible with concepts of sustainability. The findings of this study revealed that such institutions in the studied irrigation schemes were very weak and poorly monitored.

##### 4.4.1 Water-related institutional environment

Although the National Water Act (NWA) (Act 36 of 1998) stipulates the formation of WUA to ensure that people use water wisely and that they pay for it, only 16.5% of the farmers in the irrigation schemes were members of the Water Users' Association (Table 4.10). Similar to the findings of other studies (e.g. Backeberg, 2003), the impact of WUA in the studied irrigation schemes appeared to be very limited and unrecognised.

**Table 4. 10:** Distribution of women across the various institutions managing the irrigation schemes

	Mooi River (n = 85)	Tugela Ferry (n = 21)	Machunwini (n = 53)
<b>Knowledge of institutions managing the irrigation schemes</b>			
- Water users' association	2.3	0	-
- Block committee	37.6	100	-
- Co-operatives	85(85.0)	95.2	14.1
<b>Membership of institutions managing the irrigation schemes</b>			
- Water users' association	16.5	0	-
- Block committee	18.8	19.8	-
- Co-operatives	100	100	15.1

<b>Institutions that farmer wish to join</b>			
- Water users' association	5.8	9.5	-
- Block committee	3.5	9.5	-
- Co-operatives	100	9.5	0
Payment of water users' fee	37.6	100.0	-

None of the farmers in the irrigation schemes were paying any fee for accessing water and most farmers were not registered as water users. Payment for water on these irrigation schemes, which is supposed to have been linked to WUA membership, was inapplicable, because most farmers were not even aware of the existence of WUAs. Only farmers using either diesel or electric-pumps to pump water into the main canals were supposed to pay for the energy costs. Those using electricity in Tugela Ferry were expected to pay R60 per plot while those paying for diesel in Tugela Ferry were expected to pay R50 per month. In Mooi River, farmers were expected to pay R20 per month for diesel. When asked how much they would be willing to pay for improved water services, farmers indicated that they would be willing to pay service fees ranging from R30 to R200 with an average fee payment of R50. Therefore, the amounts that farmers are willing to pay are within the range that the management committees had recommended farmers to pay. However, those using pumps were facing a problem of non-payment of the monthly contribution fees. The weakness of the local institutions is revealed by the low compliance of members in making payments towards diesel and electricity. Overall, 46% of those paying for diesel indicated that they were not always able to pay the required amounts, while 51.2% of those using electric pumps sometimes failed to pay for their electricity bills. In fact, the farmers using an electric pump in Tugela Ferry owed more than a million rands to Eskom at the time of the survey. Out of the estimated 360 farmers in the co-operative who were using a diesel pump in Mooi River, approximately 200 were paying the R20. Some farmers were not consistent concerning paying the fee and the total monthly contribution had even decreased to only R900, from a high of around R2 000 when they formed a cooperative at the time the pumps were installed. The results of this study are similar to findings by several other studies (Van Averbeke et al., 1998; Speelman et al., 2008; Yokwe, 2009; Speelman et al., 2011) that have indicated that smallholders would face financial difficulties if they had to pay for water.

Due to lack of enforcement of the rules in the irrigation schemes, most of the farmers who were not paying the monthly fee for diesel or electricity continued irrigating their crops, despite the rules that prohibited them from irrigating without paying. Enforcement of rules was weak because farmers knew each other and lacked the powers and means to exclude non-paying farmers from irrigating. As a result, the money contributed towards purchasing diesel was inadequate to meet the needs of the block and farmers in blocks using pumped water were always running out of diesel to pump the water. All the women using diesel or electricity indicated that they were experiencing a shortage of water in their plots despite having the pumps with the capacity to supply adequate water.

**Table 4. 11:** Percentage of households encountering institution related water problems in the studied irrigation schemes

Problems related to institutional factors	Mooi River Scheme			Tugela Ferry	Overall (n = 106)
	Upper blocks	Middle blocks	Lower blocks	Lower blocks	
	(n = 25)	(n = 27)	(n = 33)	(n = 21)	
<b>Water shortages</b>					
- No water shortages	72.0	0	0	14.3	19.8
- Water shortages	24.0	100	100	81.0	77.4
- <i>Missing cases</i>	4.0	0	3.0	4.8	2.8
<b>Perceived main cause of water shortages</b>					
- Canal leakages	20.0	33.3	36.4	28.6	20.1
- People not sticking to their irrigation schedules	64.0	40.7	39.4	28.6	43.4
- Poor supply from the dam/weir	0	18.5	18.2	14.3	13.2
- Canal not wide enough	12.0	3.7	3.0	9.5	6.6
- <i>Missing cases</i>	4.0	3.7	3.0	19.0	6.6
<b>Action taken after water shortages</b>					
- Do nothing	12.0	70.4	81.8	81.0	41.5
- Report to irrig. committee	16.0	7.4	15.2	4.8	4.4
- Talk to upstream farmers	56.0	14.8	0	4.8	15.7
- Report to extension officers	0	3.7	0	0	0.6
- <i>Missing cases</i>	12	3.7	3.0	9.5	6.6

The irrigation water shortages in the lower blocks had been worsened by the fact that upper block farmers were no longer adhering to their irrigation schedules. In the past, the government used to employ water rangers (also known as *ipoyisa*), who used to monitor irrigation schedules, as well as other infrastructural problems in the irrigation schemes. However, with the handing over of such government programmes to local users, the irrigation scheme management has failed to replace all the water rangers that had left their posts, through retirement or for other reasons. Moreover, they have not been able to ensure continuity of the functions that the rangers used to perform. Although farmers in the upper section in the Mooi River Irrigation Scheme had water rangers, they had limited powers to deal with those who disobeyed the rules. Farmers had no incentives to adhere to the mandated irrigation schedules, as there were no penalties for those who broke the law. This situation resulted in severe water shortages for the downstream farmers.

Through focus group discussions it was established that the main reason for failure to observe the irrigation rules in the irrigation schemes is the ‘soft state’ of conditions that is prevalent in the Msinga area, where the government or the police have failed to send a strong message to the perpetrators of terror/violence who take the law into their own hands against other, law-abiding citizens. A number of people in the studied communities are feared and unquestioned for their acts of misconduct. Through focus group discussions, it was established that most

farmers fear being assassinated for provoking or taking such people to court or reporting them to the police. As a result, most of the rules governing the irrigation schemes, especially in Mooi River, have become obsolete and the formal rules have been superseded by informal norms, values and practices. After years of being practised, the informal rules have become a stable set of ‘rules’ in their own right.

The proportion of farmers experiencing a shortage of water increased as one moves from the top to the bottom of the canal in the Mooi River Irrigation Scheme (Table 4.10). However, because farmers on the lower section had installed diesel pumps to get water into the main canal, the water problems were not as severe as for the middle section farmers. The majority of middle section farmers (40.7%) indicated that they were facing water shortages, mainly because the upper section farmers were not adhering to their irrigation schedules. There were no stipulated rules and guidelines on what one should do when one failed to receive water on the stipulated day; 41.5% of the households reported that they would do nothing if they did not get water on their irrigation days.

In Mooi River, the middle section farmers who relied on the irrigation canal for conveyance of water to their plots were adversely affected by the water shortages. Access to water was very poor in these blocks, because of reliance of the canal, which was also leaking heavily and blocked in some places, resulting in less water being delivered. At the time of the survey, most plots planted to potatoes had not germinated as they had not been irrigated a month after their date of planting. In addition, farmers had delayed the planting of maize due to water shortages. Participants in the FGD indicated that they were willing to hire and pay for a water policing officer. The challenge, however, was how to organise all the scheme members to pay for such services if there was no government institution with an overall say concerning the management of the irrigation schemes.

#### **4.4.2 Institutions for maintaining and operation of irrigation infrastructure**

In Mooi River, just like in most irrigation schemes in South Africa, poor agricultural performance was associated with a range of factors, including poor maintenance of infrastructure and equipment (Bembridge, 2000; Letsoalo & Van Averbeke, 2006). Although the divergence weir delivers enough water to irrigate the whole scheme, water shortages in the Mooi River Irrigation Scheme were partly due to lack of institutions that specifically focus on infrastructure maintenance. Twenty percent of the farmers experiencing water shortages in the Mooi River Irrigation Scheme perceived that water shortages were due to canal leakages and blockages. Inadequate routine maintenance of the canal resulted in reduced water delivery and shortening the life-span of the water distribution system, posing a threat to the sustainability of irrigated farming. Shah et al. (2002) identified inadequate routine maintenance as one of the important factors that contributed to the ‘downward ratchet’ that characterised smallholder irrigation schemes in South Africa.

In the present study, it was evident that irrigation schemes are still very dependent on government, especially when it comes to repairing irrigation infrastructure. In both irrigation

schemes, the deterioration of the infrastructure has been exacerbated by the fact that all farmers were not paying any infrastructure maintenance fee. As a result of such infrastructural collapse, in 2011 (i.e. before they received pumps), all the lower-end irrigation farmers in Mooi River Irrigation Scheme had been turned into dry-land farmers and were no longer producing in winter, due to leakages from the main and subsidiary canals. Similarly, by the time of the study in Tugela Ferry the scheme was going through a major infrastructural revitalisation programme sponsored by the national government through the Comprehensive Rural Development Programme. The government was also responsible for maintenance of irrigation infrastructure, such as canals and fences, and the majority of the farmers in the two irrigation schemes (92.3%) perceived that it is the government's responsibility because of the large capital maintenance of irrigation infrastructure. The majority of the farmers believed that there are some activities, such as canal cleaning, that should be the farmers' responsibility. The majority (72.3%) of farmers were involved in canal cleaning, but the frequency of cleaning was very low.

In the study areas, the fact that farmers played a limited role in the maintenance of irrigation infrastructure could also be attributed to the fact that they had not received any training on how to do so. It was established through the focus group discussions that no workshops were held in the scheme to raise awareness and educate people on the importance of repairing irrigation infrastructure. Knowhow on how to identify suppliers and how to order spares for irrigation pumps and pipes was thus limited. In fact, farmers were ignorant of the need for servicing their pumps. Without knowhow on purchasing stocks of spares, it usually takes weeks or months before spares are ordered, let alone for them to be delivered. These delays resulted in shutdowns of the pumps, which led to water cuts in areas or sections supplied by such pumps. The farmers using diesel pumps indicated that some training on the use and repairing of the pumps could positively contribute to the availability of water within the blocks. The pumps in Mooi River had gone for more than a year without a service, as the farmers were not aware of when to service them or who they could contact to do the service. It was also evident that there was an expectation that the males were the ones responsible for looking after the pumps. The Mooi River co-operative had received a second pump from the government, but it had not been used as there were no pipes to connect it to the river.

#### **4.4.3 Institutions for managing the irrigation schemes**

The study showed that the management of the irrigation schemes, especially in the Mooi River Irrigation Scheme, was dysfunctional. There were very few farmers who were registered as water users under the WUAs (Table 4.11). Meetings of WUAs were irregular and there was little or no co-operation among the various sections of the scheme. The schemes were supposed to work as contiguous units, where the activities in one block was synchronised with those in other blocks. However, in reality each section/block handled its own affairs as it saw fit and at their own timing. There was no formal policy in place with regards to the general conduct of members of the management team. The role of government is a fascinating one. Government authority is fairly limited in the irrigation schemes, due to the decentralisation policies. Farmers generally consider that it is government responsibility

to maintain irrigation schemes, including paying for electricity bills for water pumps. Therefore, even though farmers are aware that their contributions are for paying for electricity or buying diesel to run the pumps, they frequently make an appeal for government to take its full responsibility and come to the table. Such notions are then realised when government embarks on revitalisation programmes or public works programmes. In the latter, through a third party, government pays locals to clean irrigation canals. The Department of Rural Development and Land Affairs indicated that the Mooi River would be revitalised in 2014. Through focus group discussions and surveys, it was established that only a few members of the irrigation schemes were willing to join block committees, or be in any position of authority pertaining to water management. There was a strong fear among farmers that becoming a members of the committee means that one has to take tough stances against non-compliant members. This creates enemies and could actually lead to one being murdered. Thus fear of violence and insecurity appears to be a major problem preventing the development of sustainable water management practices in the studied irrigation schemes. Because management of the scheme was dysfunctional, conflicts are commonplace, although it was indicated that farmers have to try and avoid them to avoid making enemies. Most of the conflicts are water-related. Since the rules of the irrigation schemes instructed every farmer to guard their fields from livestock, crop damage from livestock had since ceased to be a cause of conflict. There were no agriculture-linked conflicts in the dry-land area, because there were no collectively managed resources.

**Table 4.12:** Percentages of women involved in conflicts

<b>Institutional problems</b>	<b>Mooi River (n = 85)</b>	<b>Tugela Ferry (n = 21)</b>
<b>Percentage of women involved in conflicts</b>	20.0	47.6
<b>Main type of conflicts (%)</b>		
- Land-related issues	5.9	9.5
- Water-related issues	58.8	33.3
- Livestock-related conflicts	32.3	9.5

#### **4.4.4 Land related institutional settings in irrigation schemes**

Land in both the irrigation schemes had been allocated to households more than 30 years ago. In both irrigation schemes no farmer had been allocated a new piece of land in recent times. The majority women farmers were using land/plots owned by their households. Fourteen percent of the women were using rented land, 11.8% were using borrowed land and 9.4% were share-cropping (Table 4.13). As a result of the severe water shortages, especially in blocks 6 to 11 in Mooi River, demand for land had plummeted and accessing it had become relatively easy. A farmer wanting more land, could approach and ask for the identified piece of land. The farmer would pay a certain amount of money to the village head and use the land thereafter. Shortage of irrigation water was discouraging many farmers from using their plots. Some farmers were decreasing the number of plots they use in winter and then use their full



allocation in summer (rainy season). Because most of the plots were now being left idle in some blocks (especially the middle section blocks in Mooi River), it was possible in these blocks to acquire more land by speaking to an extension officer, unlike in other blocks, where the village head had to be consulted.

**Table 4.13:** Land ownership, security of ownership and transfer in the study sites

	<b>Mooi River (n = 85)</b>	<b>Tugela Ferry (n = 21)</b>	<b>Machunwini (n = 53)</b>
<b>Land ownership status (used land)</b>			
- owned	79 (92.4)	18 (85.7)	53 (100)
- rented	12 (14.1)	5 (23.8)	0 (0)
- borrowed	10 (11.8)	0 (0)	0 (0)
- sharecropped	8 (9.4)	0 (0)	0(0)
<b>Means of accessing owned land</b>			
- allocated	21 (24.7)	6 (28.6)	41 (77.4)
- bought	5 (5.8)	2 (9.5)	0 (0)
- inherited	59 (69.4)	13 (61.9)	12 (22.6)
<b>Reason for leasing out land</b>			
- Water shortages	7 (21.2)	1 (4.8)	-
- Unavailability of household labour	1 (3.0)	1 (4.8)	-
- Lack of capital	1 (3.0)	1 (4.8)	-
- Problem of crop damage by livestock	0 (0)	1 (4.8)	-
- Unprofitability of farming	3 (3.5)	2 (9.5)	-
<b>Satisfaction with present security of land</b>			
- Yes	61 (71.7)	21 (100)	53 (100)
- No	24 (28.2)	0 (0)	0 (0)
<b>Threat of eviction</b>			
- Yes	13 (15.2)	1 (4.7)	3 (5.6)
- No	72 (84.7)	20 (95.2)	50 (94.3)
<b>Legal land holder</b>			
- Women	49 (57.6)	17 (80.9)	25 (47.2)
- Men	36 (42.4)	4 (38.1)	28 (52.8)

(Percentages in brackets)

\*Because of multiple plot ownership per household, percentages do not add up to 100%

Several studies in most irrigation schemes in South Africa (e.g. Machete et al., 2004; Tlou et al., 2006) indicates that men in the studied irrigation schemes were the holders of plots, while women were doing the farming. This was not the case in the studied communities, however. The majority of the women (57.6%) indicated that they were the legal holders of the irrigation plots. All the women who were legal holders of land were not married. Women were becoming the legal holders of the irrigation plots, following the death of their husbands

(89%), or after the death of both parents, in the case of daughters. The majority of the household plots for both male and female legal land-owners had been inherited from parents. The scenario where women legally own land is a recent development, which seems to be associated with the advent of democracy and the gradual recognition of the national call to accord equal rights to males and females. The liberalisation of giving land to females does not seem to be happening beyond the household level, however. Women tend to acquire land through their households. There is no evidence that the traditional leadership has adopted the practice of allocating land directly to female heads of households.

An informal land rental market existed, especially in the Mooi River Irrigation Scheme, but to a lesser extent in the Tugela Ferry Irrigation Scheme. According to the informal rules of the Mooi River Irrigation Scheme, those owning plots or “beds”, but not willing to use them, were free to rent/lend/lease them out to farmers who were willing to use them. However, there were no formal rules or guidelines to allow some form of contractual agreements for those willing to lend, borrow or rent their land. Selling the land was prohibited, as the land was owned by the traditional authorities (Ingonyama Trust). Most farmers were reluctant to rent/lend out their idle plots, because they regarded land with a certain sentimental value and take their plots as a form of inheritance from their fore-fathers and believe that their ancestors would not tolerate them renting it out. It was found that those who were renting out land were not willing to disclose the arrangement, with the fear that such land would be taken away from their tenants. This limited the development of the full potential of a land rental market, resulting in a large number of plots being left idle, especially in the Mooi River Irrigation Scheme.

In Mooi River, the main reason for leasing out land was the prevailing water shortages that had made agricultural production very unprofitable. The rentals were thus cheaper in Mooi River than in Tugela Ferry. Very few farmers were renting out their land in Tugela Ferry. Similarly to previous studies on irrigation schemes in South Africa (e.g. Crosby et al., 2000; Machete et al., 2004; Tlou et al., 2006), the tenure system that is in the studied irrigation schemes precluded farmers from using their holding as collateral to access loans from registered financial service providers.

The area under dry-land farming in the Machunwini area, ranges between 0.01 and 0.6 hectares with some arable land being left fallow. These fields are attached to the family name and therefore belong to the family permanently. The majority of this land is owned by the households, through the male head of household. No women indicated that they were renting, sharecropping or using borrowed land in the dry-land area. There is much nostalgia attached to land ownership. A married man is expected to have some land where his household can practise agriculture. Even though agriculture is no longer viable, it is still expected that, where land is available, it would be allocated accordingly. Where a family has adequate land, it can parcel out some to family members who have come of age. Alternatively, a mature married male can approach the traditional leadership to be allocated a piece. Land is inherited along paternal lineage. Even when a male head of household dies and leaves behind a spouse, the male son is expected to inherit the land. Women alluded to

the fact that this is a practice puts them at a disadvantage. The recently proposed amendment to the Communal Land Rights Act is set to address this weakness, by legally recognising land ownership by women. The majority of the farmers (77.4%) indicated that the pieces of land had been allocated to them through traditional authorities, while fewer (22.6%) had inherited it. The majority of the women indicated that there were no threats of eviction and were very satisfied by the present security of land statuses (Table 4.13). This is in line with traditional practices, which allow women to use the land that belongs to the head of household. However, findings through focus group discussions established that women had most of the decision-making power over what to plant on the plots.

#### **4.4.5 Institutional support services in KZN**

According to Oettle et al. (1998), smallholder farmers need supportive local institutions to:

- manage resources held or used in common,
- provide a secure framework for land access and fixed investment (including security against robbery and violence),
- provide cost-effective linkages to information sources, service providers and markets,
- undertake advocacy to improve the policy environment,
- provide inter-household support (e.g. sharing of labour, implements, draught power) and learning (both informal ‘discussions over the fence’ and slightly more formal such as farmer study groups).

Institutional links between the smallholder and service providers in the study areas appeared to be very weak. This is discussed in the following sections.

##### ***4.4.5.1 Provision of extension services***

Access to extension officers is very limited and this could be adversely affecting women’s access to agricultural skills. On average, the farmer to extension officer ratio in this irrigation scheme is 438:1. The majority of farmers had no contact with the extension officer in the previous year and visits by extension officers to the area were few and far between. The extension workers are not rendering the services expected of them. The main reason for contacting the extension officers, among the few who had contact, was mainly to source tillage facilities (56%) and, secondly, to access other agricultural inputs such as seeds (37%). This is contrary to the traditional extension role of disseminating knowledge on farming. Farmer access to extension workers was even lower in dryland farming areas.

In the Mooi River Irrigation Scheme, farmers in the whole irrigation scheme had access to only two extension officers. On average, the farmer to extension officer ratio in this irrigation scheme is 438: 1. Farmers in blocks 7 to 12 were working with an extension officer. The survey established that the majority of farmers had not had contact with the extension officer in the previous year. The visits by extension officers to the area were few and irregular. The main reason for contacting the extension officers, among the few who had contact, was to source tillage facilities (56%) and to access other agricultural inputs such as seeds (37%). This is contrary to the traditional extension role of disseminating knowledge on farming. In the sampled blocks in Tugela Ferry, the farmers had access to one extension officer who was

allocated to the two blocks (blocks 6 and 7). The farmer-to-extension officer ratio was 270:1, which is much lower than in Mooi River. Consequently, frequency of contact between farmers and extension officers was much higher in Tugela Ferry than in Mooi River. This could also be due to the proximity of the extension officers to the farmers in Tugela Ferry, compared to those in Mooi River. All extension officers reside in Tugela Ferry town. The average number of times women farmers had contacted an extension officer was higher in the irrigation schemes than in the dry-land areas (Table 4.14).

**Table 4.14:** Summary of the institutional support services women in the study areas were getting

<b>Institutional support service</b>	<b>Mooi River (n = 85)</b>	<b>Tugela Ferry (n = 21)</b>	<b>Machunwini (n = 53)</b>
<b>Access to credit</b>			
- Yes	12 (14.1)	5(23.8)	10 (18.9)
<b>Source of credit</b>			
- Relative/friend	8 (15.3)	4 (14.2)	11 (20.7)
- Savings club/ <i>stokvel</i>	4 (27.1)	0 (42.9)	3 (41.5)
- Money lender	1 (0.0)	1 (0.0)	1 (0.0)
- Input supplier	1 (0.0)	1 (9.5)	0 (0.0)
- Financial institution	0 (0)	0 (0.0)	0 (0.0)
<b>Assistance in marketing related services</b>			
- Government departments	4 (19.0)	6 (28.6)	0 (0.0)
- Non-governmental organization (NGO)	18 (21.2)	2 (9.5)	0 (0.0)
- Private institutions	6 (7.1)	0 (0.0)	0 (0.0)
<b>Input support services</b>			
- Fertilizer	39 (45.9)	7 (33.3)	0 (0.0)
- Top-dressing fertilizer	39 (45.9)	2 (9.5)	0 (0.0)
- Seeds	32 (37.6)	1 (4.8)	0 (0.0)
Mean no. of contacts with extension officers	(1.9)	(2.4)	(0.3)
<b>Access to agricultural training</b>			
- Yes	24 (28.2)	5 (23.8)	0 (0.0)
<b>Provision of tillage services</b>			
- Government Department of Agriculture	48 (56.5)	13 (61.9)	17 (32.1)
- Non-governmental organization	1 (1.2)	0 (0.0)	2 (3.8)
- Municipality	10 (11.8)	2 (9.5)	0 (0.0)
- Private institutions/own household	26 (30.6)	5 (23.8)	33 (62.3)
<b>Threats of eviction</b>			
- Yes	8 (9.6)	2 (9.5)	3 (5.6)

#### ***4.4.5.2 Farmers' association/co-operatives***

In the study areas, few smallholder farmers possess the information, linkages or capacities to lobby the array of departments providing institutional support. The formation of local farmers' associations is one means by which farmers can ensure that their needs are met, or access government support. Government has made it clear that it will not provide resources to individuals, but only to registered co-operatives. Indeed, different government departments are on a mission to promote the formation of co-operatives. This incentive to form co-operatives has meant that the majority of women farmers in the study areas were part of agricultural associations or co-operatives. In the Mooi River scheme, farmers in blocks 13-15 were working as a co-operative that had been established by an extension officer in the 1990s. The same extension officer had educated the farmers about the operations and advantages of co-operatives. However, after his replacement, the activities of the co-operative diminished. The members were no longer getting the training and encouragement they required and they were no longer motivated to contribute money towards the activities of the co-operative. There were also separate co-operatives for middle and upper section farmers in the Mooi River Irrigation Scheme. However, these co-operatives were disorganised and held meetings less frequently than the co-operative in blocks 13-15. In Tugela Ferry, the majority of women were members of co-operatives. In the dry-land area, there were no co-operatives, but farmers were members of a farmers' association.

#### ***4.4.5.3 Access to credit***

There were no formal organizations in the area that provided farmers with agricultural credit. The majority of farmers indicated that they relied on informal institutions for credit. About 14.4% of the women farmers had received credit/loan facilities mainly from their family/friends/relatives in the previous 12 months. The second most important provider of credit was a savings club/*stokvel* (4.4%) and formal institutions such as input suppliers or other financial institutions were providing credit to farmers.

#### ***4.4.5.4 Access to tillage facilities***

In general, tillage services in the irrigation scheme were provided by government and the municipality. All farmers relied on government tractors, but at times supplemented this by hiring private service providers. The main complaint with regards to tillage was that it was always late and was available at the time when farmers no longer wanted it. In the study areas, government appears to be under-resourced, particularly in tillage facilities. Most farmers are disheartened by the bureaucratic processes of accessing government tillage.

#### **4.4.6 Institutional environment in North West Province**

In North west province the institutional environment were examined through a survey of how the operating institutional policy and setting had affected farmers access to livelihood assets and resources needed for their livelihood outcome. To examine the institutional environment

women in the study areas operate, with regards to land and water access, a rating scale of high, moderate and low was used. In Table 4.15, 82.1% of women farmers indicated that the institutional arrangements had assisted them to get access to land. Some 35.7% of the women farmers indicated that the productivity of their land had increased. In terms of water accessibility, 58.3% of the women indicated that the institutional settings did not assist them to have water access, because of the new water policies that have changed; 65.4% of women reported that water availability is very high, while 72.5% have indicated that the availability of water has increased land productivity.

In relation to control of land for production purposes, water sources and access to water, about 69 % of women indicated that they had secure tenure rights. These results in North West province resonate with those from Africa. According to FAO (1997), land tenure systems tend to discriminate against women. While most African states have considered agriculture as the backbone of their economies and acknowledge the significant role of women in the agricultural sector, few have paid much attention to the land tenure systems that discriminate against women. This problem is more pronounced in countries where the migrant labour system has led to an increase in female heads of household who lack power and control over the land they work (FAO, 2011; FAO, 1997).

The effects of the poor security of land tenure among women farmers is worsened by the unavailability of institutional support services (FAO, 2011). Existing rural credit policies, for example, exacerbate the existing discriminatory systems. Women agricultural producers are not benefiting from rural credit facilities and this limits their contribution to promoting sustainable development in this sector. About 69.1 % of women indicated that, because of the institutional settings, water provision in the irrigation schemes had improved. According to FAO (2011), in order to raise water productivity, it is necessary to deliver and apply water to crops more efficiently and increase crop yields per litre of water consumed. This can be done by using drip irrigation, sprinklers or other micro-irrigation systems, changing cropping patterns and growing methods to get more crops per drop of water and adopting high-yielding and early-maturing crop varieties. Women (67.9%) indicated that the local institutional setting had helped them to have access to water for irrigation.

**Table 4.15:** Significance of land- and water-related institutions on access and use among women farmers in North West (n = 84)

<b>Institutional settings</b>	<b>High</b>	<b>Moderate</b>	<b>Low</b>
<b>Land related</b>			
- Access to land	20 (23.8)	49 (58.3)	15 (17.9)
- Land availability	7 (8.3)	23 (27.4)	54 (64.3)
- Land productivity	7 (8.3)	23 (27.4)	52 (61.9)
<b>Water reform</b>			
- Access to water	9 (10.7)	26 (31.0)	49 (58.3)
- Water availability	12 (14.2)	43 (51.2)	29 (34.5)
- Water productivity	12 (14.2)	49 (58.3)	23 (27.4)

<b>Institutional settings</b>	<b>High</b>	<b>Moderate</b>	<b>Low</b>
	<b>Land related</b>		
- Local institutions influence on the control of land	18 (21.4)	40 (47.6)	26 (31.0)
- Local political institutions influence on the control of water resources	22 (26.2)	36 (42.9)	26 (31.0)
- Local political institutions influence on farmers' access to water	23 (27.4)	34 (40.5)	27 (32.1)
<b>Local , cultural and traditional authorities</b>			
- Access to land	12 (14.3)	53 (63.1)	19 (22.6)
- Land availability	15 (17.9)	44 (52.4)	25 (29.8)
- Land Productivity	18 (21.5)	45 (53.6)	21 (25.0)
- Water access	13 (15.2)	25 (29.8)	46 (54.8)
- Water productivity	2 (2.4)	28 (33.3)	54 (64.2)
- Available infrastructures	4 (4.8)	27 (32.1)	53 (63.1)
- Access to markets	17 (20.1)	14 (16.7)	53 (63.1)
- Social group membership	20 (23.8)	11 (13.1)	53 (63.1)
- Benefits of social group	17 (20.2)	25 (29.8)	42 (50.0)
- Water security	21 (25.0)	17 (20.2)	46 (54.8)
- Adjustment /changes in land reforms	17 (20.2)	29 (34.5)	38 (45.3)
- Adjustment /changes in water reforms	11 (13.1)	26 (31.0)	47 (55.9)
- Adjustment /changes in income generating activities water reforms	12 (14.3)	22 (26.2)	50 (51.5)
- Coping strategies in terms of land reforms	8 (9.5)	31(36.9)	45 (53.5)
- Coping strategies in terms of water reforms	17 (20.2)	38 (45.2)	29 (34.6)
- Coping strategies in terms of income generating activities	16 (19.0)	38 (45.2)	30 (35.7)
- Societal perceptions about your participation in farming	30 (35.7)	34 (40.5)	20 (23.8)
- Societal perceptions about your participation in your income generating activities	0	45 (53.6)	39 (46.4)

(Percentages are in brackets)

With regard to access to land, 77.4% of women farmers indicated that local and traditional authorities had assisted them to gain access to land. Overall, women's access to land in African societies is restricted, even in cases where the law protects women's rights to land. Traditional customs inhibit their access and control over land. In the studied areas, customary law protects single women and widowed women in access to land. However, there are customs that constrain women's access to land. Single women can gain access to land through their fathers, brothers or uncles. However, upon marriage their access to land is lost, as they are expected to have access to land through their husbands (Gawaya, 2008). Generally, women in the studied communities of the North Western Province tend to have smaller land holdings and less fertile plots.

According to Table 4.15, 77.4% women indicated that the local traditional authorities had assisted them to access land. In terms of access to water, 58.4 % of women indicated that the

local traditional authorities do not help them in any way with accessing water. Sokile et al. (2003) indicated that, due to the new Water Act, local traditional authorities were overlooked and now the local management have the responsibility of making sure that local people have access to water. In the studied communities in the North West Province, the local chieftain and the local councillors are not involved in the allocation of water sources. As a result, 54.8 % of farmers reported that local authorities were not assisting them in accessing water. Some 63.1 % of the farmers indicated that there a lack of infrastructure and markets are not available to sell their produce. Fifty percent do not belong to any social groups, because they believe that they are not benefiting from them. Some farmers (54.8%) indicated that they are not water secure. Their water woes were worsened by the fact that the majority of women in the study areas had not been trained on water-use management. Wahaj and Hartl (2012) stated that women's access to irrigation water, particularly in smallholder irrigation schemes, depends on the choice of technology and training. In cases in which women have not been trained in the appropriate use of the technologies introduced in irrigation systems, they have not benefited from water availability.

As many as 45.3 % of the farmers indicated that they have not benefitted from changes in land reform policies and that water reforms had affected them negatively. A considerable number (51.5%) indicated the reforms in water policies had affected their income-generating activities. About 53.5 % of women farmers stated that they do not have any coping strategies to address the problem of land reform and they feel helpless, because the government process to redistribute land is very slow and not reaching them, while 45.2 % said that they have devise some strategies to cope with water reform and income generating activities, by being involved in non-farm income generating activities. About 54% indicated that society has respect for them, as they are involved in farming.

#### **4.5 Cultural environment**

The South African Constitution, Act 108 of 1996, makes provision for people to live according to their traditions and custom provided they do not infringe on anyone else's freedoms. However, rights to land and gender equality are not always synonymous. The South African Constitution, Act 108 of 1996, protects women's rights to property and affirms that everyone has a right to equality and freedom. Despite being difficult to achieve, the Act became a cornerstone for the development and re-evaluation of laws that were previously discriminatory to any group (including women). The Recognition of Customary Marriages Act 120 of 1998 explicitly empowers women to own property, the only exception being if the married couple signs a prenuptial agreement (Curran and Bonthuys, 2004). The above sentiments for equal rights to land tenure are in Section 4(3) of the Communal Land Rights Act 11, which provides that "A woman is entitled to the same legally secure tenure, rights in or to land and benefits from land as is a man, and no law, community or other rule, practice or usage may discriminate against any person on the ground of the gender of such person." However, this Act was declared unconstitutional in 2010 on procedural grounds (Cousins, et al., 2011). Although the Recognition of Customary Marriages Act 120 of 1998 explicitly exists to protect women's property rights, Beninger and Williams (2010) and Curran and



Bonthuys (2004) point out that the major challenges towards the emancipation of women is centred on customary laws and the practice of primogeniture.

#### **4.5.1 Customary law in Msinga**

The study communities in Msinga are well known for being traditionalist and preservers of “the old Zulu ways” (Dearlove, 2007). Whilst South African law ratifies that women should be given equal access to important natural resources especially land, this is not always socially practised and may be blocked through broader social discourses, structures and processes, which still tend to be in favour of patriarchal organisation. There is a distinction between official customary law and ‘living’ customary law (Curran and Bonthuys, 2004). Official customary law refers to law carried out in courts in accordance with statutes such as the Recognition of Customary Marriages Act of 1998. A ‘living’ customary law refers to the social experiences of those living according to customary law. Curran & Bonthuys (2004) state that, while there are statutes that seek to empower women married according to customary law; ‘living’ customary law continues to oppress them. This means that official law and social practice are not always reinforcing and, in some instances, may in fact oppose one another. For example, all the married women farmers in all three study areas indicated that their husbands were the legal owners of the land and women had the right to use it and not to transfer (i.e. sell, lend or rent). Customary law treats women as minors, under the guardianship of a male figure (the woman’s father, then later the woman’s husband and even their sons), who retains control of all assets (Beninger & Williams, 2010).

Gender disparities in terms of rights constrain women’s choices in many aspects of life and limit their opportunities to participate in the economic activities of society. The patriarchal system influences socio-economic and political structures, government policies and strategies and this, in turn, impacts on accessing, managing and controlling resources. Although most women had their crops destroyed by livestock which are managed by males, they did not have the power to argue with the male owners in the event of crop damage.

The majority of women who were married (92.3%) indicated that they had no control over transfer of their household land. However, if the male heir is not yet of age, or there is no son who can inherit, then a brother-in-law (or other male relative from the husband side) takes ownership. In the case of divorce, a woman may return to her father’s homestead or be ‘abandoned’, depending on whose ‘fault’ the divorce is (although, in practice, the reasons for blaming women appear to be far more abundant than those for blaming a man). An unmarried woman can only lay claim to land if she has a son (Cousins et al., 2012). There are incremental changes to this, where some single women may lay claim to land, but, if this is granted, their land is located close to their father’s homestead, to give them the security and protection that women are deemed to need (Cousins et al., 2012). However, it will be inconceivable for a woman allocated land by her family to then sell or rent it. In other words, the woman would still have to consult her relatives regarding any decision to dispose of the land. Such findings are also similar to the studied rural communities in KwaZulu-Natal.

It is clear that women's movement and ability to secure decent provisions are largely dependent on the men in their lives (whether it be father, husband, brother-in-law, or son) and that women are far-removed from the discourse and practice of land ownership. Although traditional practices may be shifting in terms of how marriages are undertaken, this does not necessarily mean that traditional patriarchal structures are being challenged. Rather, they are dynamic and fluid, and still able to maintain control over women and their well-being through social practices ('living' customary law) which favour the rights and power of men. Consequently, women not affiliated with men (who are single or have divorced) are the most vulnerable, as they are not only limited in terms of where they can live and their access to arable land, but they may also be socially outcast. In the study communities, out of the 23 women who were single, the majority were renting land instead of owning it. Therefore creating an official law to help manage customary marriages and access to land may not bear fruit unless social gender practices are disrupted or changed.

#### **4.5.2 Culture and livestock production**

There are clear-cut gender roles with respect to livestock management responsibilities. Cattle and goats are the responsibility of men and household chickens are usually managed by women. Men may sometimes own chickens, which they may get in return for making or fixing items such as an axe-handle. Cattle are kept for prestige and status and not primarily for income, a system often referred to as the "cattle complex" or the "cattle owning cultures" of Africa. A distinction is made between indigenous chickens and so-called commercial chickens (broilers), which generally belong to men, although women may be involved in looking after them. In Msinga, a woman is not allowed to enter the cattle kraal, but older women may do so if a special status is conferred on them (Cousins et al., 2011). This practice disempowers women who might have wanted to own their own cattle. It is said that if a woman goes into a kraal, then the cow-in-milk will not produce any milk. Women indicated that the culture even makes it impossible for them to own cattle. Traditionally, when a woman gets married, one out of the eleven cows for lobola is paid to the mother-in-law. However, custom requires that the animal is slaughtered soon after it is received. This practice of paying lobola is also common in other cultures.

#### **4.6 National level legal framework governing water use in the irrigation schemes**

The dismantlement of apartheid and the adoption of a new democratic constitution in South Africa led to the adoption of a new water policy, which culminated in the new NWA (Act 36 of 1998). In the new act, water now considered a common asset. The NWA specifies that government, as the public trustee of national water resources, must act in the public interest to ensure that water is 'protected, used, developed, conceived, managed and controlled in a sustainable and equitable manner for the benefit of all persons' (DWAF, 1999). According to the Act, the right to use water is granted to users, most of them have to be registered and licenced and they should pay for this right. Also, the core concept of water management under the new dispensation is decentralisation. Protective measures have to be taken to ensure

secure water allocation for ecological and basic human needs and development purposes (i.e. concept of Reserve and Schedule 1 use) (Perret, 2001).

Social development, economic growth, ecological integrity and equal access to water remain key objectives of the water resource management dispensation, under the new National Water Act. The Act also distinguishes national areas of water management from regional and local ones. New management entities, Catchment Agencies and Water Users Associations, have to be established in order to achieve the purpose of the Act. These institutions are implemented at regional and local level, respectively, emphasising a largely decentralised and participatory approach to water resources management (Perret, 2001). The core purpose of the Catchment Management Agencies (CMAs) is to assure sustainable use of water resources in their areas of operation, in line with the purpose of the WRMDA, with the National Water Resource Strategy, and with a Catchment Management Strategy. The CMAs provide the second tier of the water management structure set up by the Act and they operate within the framework provided by the Minister of Water Affairs and Forestry. Local implementation of the catchment strategies are carried out through institutions to which the CMA may delegate functions (e.g. Water Users Associations). WUAs form the third tier of water management that operates at a local level. The role of the WUAs is to enable a community to pool financial and human resources to more effectively carry out water-related activities. Irrigation, on a commercial or subsistence scale, is one of those activities (Perret, 2001).

At rural community and smallholder farming levels, all individuals users are authorised to take water for reasonable domestic use, gardens and stock watering' (though not for commercial purposes) without registration, licencing or payment, as stipulated by schedule 1 of the Act. The Act stipulates that farmers and rural communities should form WUAs, especially in smallholder irrigation schemes, and then apply for a licence. The licence will then determine their collective rights and duties on the water resource. It may also concern the community as a whole, when a WUA is to manage water beyond irrigation purposes (Perret, 2001).

## **4.7 Water security**

### **4.7.1 Water security in KwaZulu-Natal**

South Africa is recognised as a water-scarce country, in terms of a commonly used definition, namely that of the average "total actual renewable water resources" (TARWR) per person per year. Using this definition, South Africa is the 29th driest country out of 193 countries, with an estimated 1110 cubic metres (M<sup>3</sup>) of water per person in 2005. Most of the "drier" countries are either small islands or oil states in the Middle East (Muller et al., 2009).

For the purposes of this study, water security has been defined as "the reliable availability of an acceptable quantity and quality of water for health, livelihoods and production, coupled with an acceptable level of water-related risks (Grey and Sadoff, 2007:12). Water-use security includes, at the minimum: (1) consistent supply of water, (2) sufficient supply of

water, (3) good quality of water supplied (i.e. without associated risks), (4) excellent capacity to pay for water and (5) secure claim to water.

**Table 4.16:** Levels of water-use security among sampled women farmers

Indicator of water security	Level of satisfaction					p-value
	Strongly dissatisfied (%)	Dissatisfied (%)	Neutral (%)	Satisfied (%)	Strongly satisfied (%)	
<b>Sufficiency</b>						
Mooi River	<b>47.8</b>	38.2	8.3	4.5	1.3	0.001
Tugela Ferry	<b>53.8</b>	17.9	7.7	10.3	10.3	
Machunwini	<b>73.7</b>	12.1	2.0	8.1	4.0	
<b>Consistence</b>						
Mooi River	<b>48.7</b>	37.3	10.1	3.8	0.0	0.001
Tugela Ferry	<b>47.5</b>	27.5	2.5	15.0	7.5	
Machunwini	<b>58.7</b>	26.5	7.0	5.0	2.7	
<b>Quality</b>						
Mooi River	33.1	<b>40.8</b>	12.1	12.1	1.9	0.001
Tugela Ferry	<b>37.5</b>	17.5	15.0	15.0	15.0	
Machunwini	<b>72.0</b>	8.0	3.0	9.0	8.0	
<b>Capacity to pay</b>						
Mooi River	20.3	12.5	14.1	11.7	<b>41.4</b>	0.001
Tugela Ferry	<b>30.0</b>	10.0	20.0	20.0	20.0	
Machunwini	<b>45.1</b>	9.9	19.8	4.4	20.9	
<b>Claim to water</b>						
Mooi River	11.5	14.1	29.5	28.8	16.0	0.001
Tugela Ferry	17.5	15.0	12.5	35.0	20.0	
Machunwini	75.5	3.1	4.1	9.2	8.2	

Table 4.16 shows the levels of water-use security among women farmers in the studied areas of KZN. A larger proportion of women from MRIS (47.8%), TFIS (53.8%) and Machunwini (73.7%) indicated that they were strongly dissatisfied with the sufficiency of agricultural water. Machunwini had the largest number of people who were strongly dissatisfied by the sufficiency of agricultural water, while TFIS has a relatively larger number that they were satisfied with sufficiency of water for agricultural production. Likewise, the majority of women in the three study areas were dissatisfied with the consistency of water for agricultural production. As far as the quality of water was concerned, the majority of women in MRIS were dissatisfied (40.8%), while the majority of women in TFIS (37.5%) and Machunwini (72.0%) were very dissatisfied. The majority of women MRIS (41.4%) were very satisfied with their capacity to pay for water for agricultural production, while the majority of women from TFIS (30.0%) and Machunwini (45.1%) were very dissatisfied with their capacity to

pay for water. The majority of women from Machunwini indicated that they were very dissatisfied by their claim to water.

#### 4.7.2 Socio-demographic characteristics of water-use secure and non-secure women in Msinga

Grouping households into water-use secure and non-water-use secure, based on cluster analysis, showed that water-use insecure farmers (i.e. cluster 1) had larger-sized households than water-use insecure ones (i.e. cluster 2) (Table 4.17). They had also spent a relatively higher number of years in the irrigation scheme than water secure ones. A larger proportion of men (31.1%) were water-use secure, while a larger proportion of women (82.3%) were water use insecure. The majority of unemployed farmers (91.2%) were water-use insecure while the majority of employed farmers were water-use secure. A larger proportion of farmers from Tugela Ferry Irrigation Scheme (75.9%) were water-use secure, while the majority of farmers from Mooi River were water-use insecure (48.0%). The majority of farmers using gravity (45.1%) and electric pump (38.3%) for irrigation were water-use secure while the majority of diesel pump-fed farmers (27.0%) were water-use insecure. Likewise, the majority of farmers in the head-end (42.1%) and middle (36.1%) sections of the irrigations schemes were water-use secure while those in the tail-end (51.0%) were water-use insecure. Water-use secure farmers had a higher percentage contribution of their income from agriculture, while water-insecure farmers had higher percentage contribution from non-agricultural incomes.

**Table 4.17:** Water use security and socio-demographic characteristics of farmers in KZN

Characteristic	Water-use insecure (n = 133)	Water-use secure (n = 204)	Overall (n = 300)	P-value
Average age of farmer (years)	57.5	57.6	57.6	0.937
Household size	7.0	6.0	6.6	0.058
Education level (years).	3.2	3.1	3.1	0.889
Distance to irrigation scheme	3.4	3.2	3.3	0.739
Wealth index	2.7	2.7	2.7	0.774
Irrigated land size	0.3	0.3	0.3	0.885
Dry-land farm size	0.0	0.0	0.0	0.155
Years in irrigation scheme	25.6	16.1	21.9	0.0001
% contribution of agric. income	24.6	36.7	30.5	0.014
% contribution of non-agric. income	75.1	62.7	69.0	0.012
<b>Gender (%)</b>				
Male	17.7	<b>31.1</b>	23.0	0.04
Female	<b>82.3</b>	68.9	77.0	
<b>Marital status (%)</b>				0.151
Married	49.3	55.6	51.8	
Unmarried	50.7	44.4	48.2	
<b>Employment status (%)</b>				
Unemployed	<b>91.2</b>	82.3	87.7	0.013

Characteristic	Water-use insecure (n = 133)	Water-use secure (n = 204)	Overall (n = 300)	P-value
Employed	8.8	<b>17.7</b>	12.3	
<b>Irrigation Scheme (%)</b>				
Tugela Ferry	52.0	<b>75.9</b>	61.4	0.001
Mooi River	<b>48.0</b>	24.1	38.6	
<b>Scheme management membership (%)</b>				
Yes	98.8	100.0	99.4	0.46
No	1.2	0.0	0.6	
<b>Method of pumping water to plot (%)</b>				
Gravity	38.2	<b>45.1</b>	40.9	0.081
Electric pump	34.8	<b>38.3</b>	36.2	
Diesel pump	<b>27.0</b>	16.5	22.8	
<b>Location along the primary canal (%)</b>				
Head	20.6	<b>42.1</b>	29.1	0.001
Middle	28.4	<b>36.1</b>	31.5	
Tail	<b>51.0</b>	21.8	39.5	
<b>Pay water fees (%)</b>				
Yes	61.3	55.6	59.1	0.182
No	38.7	44.4	40.9	

**Source:** Survey data (2013)

### 4.7.3 Water security in North West Province

Most farmers (54.8%) indicated that they are not water secure. Respondents said that they belong to the Vaalharts Water Association and they get their water from the Vaalharts River. They mentioned that the Vaalharts Water Association is not representing their interest as black farmers. They pay high water bills when they have not even cultivated their fields. Most of the respondents mentioned that the Vaalharts Water Association have also introduced dry weeks and there was no proper consultation with the farmers to explain how water is released. It takes three week between pumping point and the last plot to receive water. The electricity bills for pumping water are allocated to them whether they receive water or not. They complained that high water and electricity bills could be due to linkages and damages of the canals, which are not maintained by the water Association leading to wastage and little water arriving at the plots, which makes it unaffordable to farmers. Farmers have resorted to leasing out their plots to private companies. In other irrigation schemes, like Nyetse, Molatedi, Disaneng and Lehurutshe, the farmers do not belong to any water user association, as none exists. They get their water from the dams, boreholes and wells, they also do not pay any electricity fees.

## **4.8 Food security**

South Africa is largely deemed a food secure nation, producing enough staple food, or having the capacity to import food, if needed, in order to meet the basic nutritional requirements of its population (De Cock et al 2013; FAO 2008). However, large numbers of households within the country are food insecure. There are distributional and accessibility problems that result in poor access to food (Altman et al., 2009). Although, in *per capita* terms, South Africa is an upper-middle-income country, the experience of most rural South African households is of outright poverty. The distribution of income and wealth in South Africa is among the most unequal in the world. Although employment has risen in the country, it has not attained the level where it can significantly address the issue of income poverty (Aliber & Hart, 2009). Further, while the national government provides social grants which help to minimize the rate and effect of food insecurity within the country, 40-50% of South Africans live in poverty (Machethe, 2004). Approximately 35% of the total South African population – about 14.3 million people – experience hunger and under-nutrition (Rose & Charlton, 2002), the majority being children, women and the elderly.

In 2008, an estimated 39.26% of the total South African population lived in rural areas (World Bank, 2010). Sixty-five percent of those identified as "poor" and 78% of those identified as "chronically poor" reside in rural environments (World Bank, 2010). In the studied rural areas of Msinga, households are probably more food insecure than in the rest of South Africa, since economic opportunities in Msinga are fewer, because the municipality is grossly underdeveloped, with poor infrastructure (most severely felt in the community's difficulty to access water), high unemployment and low levels of economic activity and education (Coan, 2009). According to a report by Dearlove (2007), Msinga Municipal area was rated as having the least employment and business opportunities compared to other municipalities in South Africa.

### **4.8.1 Food security in KwaZulu-Natal**

#### ***4.8.1.1 Socio-demographic characteristics of sampled women in KwaZulu-Natal***

Table 4.18 summarises the socio-demographic characteristics of four categories of household food security which were classified based on the HFIAS. The majority of women's households (44.3%) in the study area were severely food insecure, while a few (19.6%) were food secure. Primary female heads-of-households with food secure households were much older (mean of 55.4 years) than in the other three categories. They also had larger-sized households, but with a lower dependency ratio of about 0.9 compared to women in other categories.

Food secure households had the highest proportion (30.4%) of primary female heads-of-households, with formally employed husbands. The same category had more primary female heads-of-households (67.9%) who had never been to school, compared to the other three categories. None of the households with women who had received tertiary education were

food insecure. Likewise, all women with husbands that reached tertiary education were food secure.

Primary female heads-of-households who were from severely food insecure households had the highest mean household-dependency ratio and the majority of their husbands were unemployed. The majority of women (75.6%) in this group had no formal education and none of them had received tertiary education. Likewise, most (43.6%) of the sampled women's husbands in the severely food insecure group also had no formal education and none had also received tertiary education. There were also very few formally employed women (1.6%) among the food insecure households. Very few women (6.3%) in this group had formally employed husbands. The majority of food insecure household had primary female heads-of-households as the *de jure* household heads (single, widowed or divorced/separated).

**Table 4. 18:** Socio-demographic characteristics of primary female heads-of-households in the four categories of food security

<b>Characteristic</b>	<b>1 = Severely food insecure</b>	<b>2 = Moderately food insecure</b>	<b>3 = Mildly food insecure</b>	<b>4 = Food secure</b>
Percentage in each category	44.3	21.6	14.4	19.6
Average age of women	53.6	51.4	51.1	55.4
Household size	7.4	7.8	6.1	8.4
Mean dependency ratio	1.2	1.0	1.1	0.9
<b>Women's marital status (%)</b>				
• Married	37.8	51.7	34.1	38.6
• Single	18.9	10.0	36.6	14.0
• Widowed	40.2	38.3	29.3	47.4
• Separated/Divorced	3.1	0	0	0
<b>Women's employment status (%)</b>				
• Unemployed	89.1	96.8	92.9	93.0
• Informal employment	9.3	3.2	7.1	7.0
• Formal employment	1.6	0	0	0
<b>Husband's employment status (%)</b>				
• Unemployed	64.6	44.8	30.8	43.5
• Informal employment	29.2	31.1	46.2	26.1
• Formal employment	6.2	24.1	23.2	30.4
<b>Women's level of education (%)</b>				
• No formal education	75.6	74.6	69.0	67.9
• Primary education	13.4	14.3	11.9	10.7
• Secondary education	11.0	11.1	16.7	17.9
• Tertiary education	0	0	2.4	3.6

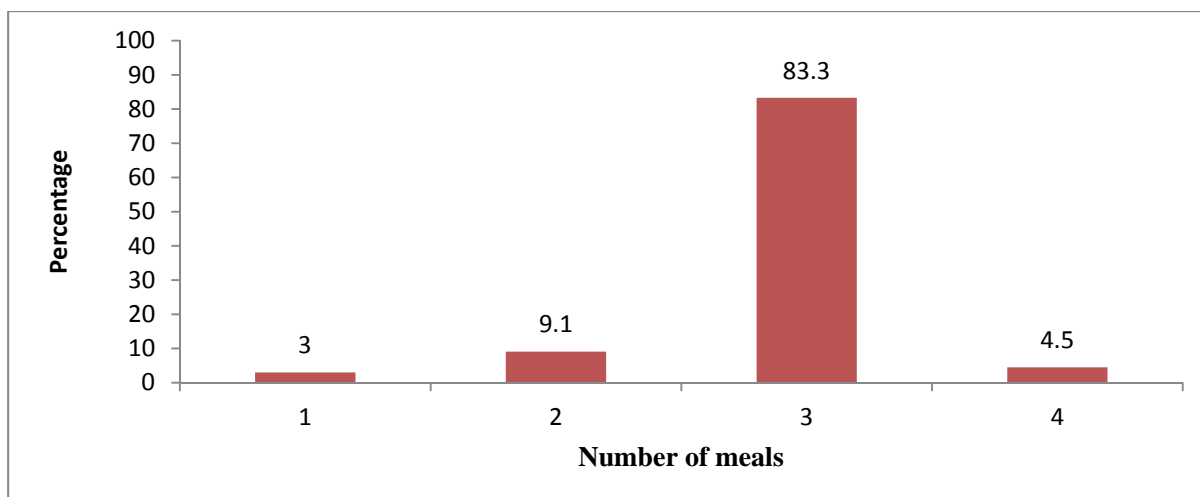


Characteristic	1 = Severely food insecure	2 = Moderately food insecure	3 = Mildly food insecure	4 = Food secure
<b>Husbands level of education (%)</b>				
• No formal education	51.1	31.0	38.5	40.9
• Primary education	10.6	44.8	23.1	18.2
• Secondary education	36.2	20.7	38.5	31.8
• Tertiary education	2.1	3.4	0	9.1
<b>Religion (%)</b>				
• Christianity	54.4	50.0	81.0	59.6
• African Traditions	28.0	32.3	11.9	28.1
• Shembe	17.6	17.7	7.1	12.3
<i>De facto</i> female-headed households (%)	2.3	13.9	7.9	11.7
<i>De jure</i> female-headed households (%)	62.3	48.3	65.9	61.4
<i>Both</i> male and female heads of households present	35.4	43.8	26.2	26.9

**Source:** Survey data (2013)

#### 4.8.2 Food security in North West Province

Figure 4.2 shows the food security status of households surveyed in the study areas of the North West Province. In this study, farmers were asked to indicate their household food security status, which was measured in terms of number of meals per day among famers. The results indicated that 83.3% of the respondents have access to food at least three times a day, while 3% of the respondents indicated that they only have one meal a day. Poor access to food in the study areas could be because of low financial status of the household, or the size of the household, as it appears that many of the families have above 10 members in the house with only one bread-winner or pensioner.



**Figure 4.2:** Distribution of women's households according to number of meals taken per day

## 4.9 Empowerment

### 4.9.1 Levels of empowerment among women in KwaZulu-Natal

Women living in traditional rural areas of South Africa, as in most other developing countries, are part of the most economically and socially disempowered groups (SAHO, 2012; Bob, 2002). This is despite the fact that various national and international bodies in South Africa have made a variety of efforts to address women's issues and empower them to enhance their livelihoods and to involve them in developmental activities (Gupta and Yesudian, 2006). The post-apartheid government has sought to correct inherited inequalities through various interventions designed to empower women (Oberhauser and Pratt, 2004). Although many interventions have been put in place to address their disempowerment plight, women continue to face immense challenges. Among the challenges are high rates of illiteracy, exclusion from decision-making processes, lack of resources and a host of socio-cultural bottlenecks (SAHO, 2012; Bob, 2002; Oberhauser & Pratt, 2004; McEwan, 2003).

In assessing the levels of empowerment among women in rural areas of South Africa, it was considered that 'empowerment' is a broad concept that is used differently by various writers, depending on the context or circumstance (Alkire et al. 2013). However, for the purposes of this study it was recognised that women or communities empowered in one dimension (e.g. economic) are not necessarily empowered in the other (Mayoux, 2006; Malhotra et al., 2002; Moore, 2001). Studies on empowerment (Mayoux, 2006; Malhotra et al., 2002; Mosedale, 2005; Kabear, 1999) have identified the following domains of women's empowerment: economic, social, political, legal, physical, familial/personal, informational, moral and psychological. Although other studies (e.g. that of Uphoff, 2003) have distinguished six or more dimensions of women's empowerment, this study categorises empowerment into four main dimensions (economic, social, agricultural and civic) into which sub-dimensions (physical, informational and moral) can be fitted. For example, physical assets are part of economic resources, while informational and moral assets are part of the social resources that individuals can have. Based on a multidimensional and resource-agency-outcome framework,

this study regards women's empowerment as the multidimensional process of increasing the capacity/capabilities (i.e. resources and agency) of individuals or groups to make choices and to transform those choices into desired actions and outcomes'.

Having defined empowerment, this study proposed a methodology to systematically measure the empowerment of women. Since empowerment occurs in four dimensions (economic, social, civic and agricultural), which can be divided into their respective sub-dimensions (cultural, familial/interpersonal, legal, political and psychological), PCA was proposed as a better tool to identify the underlying dimensions the empowerment of women, provided the PCs can be meaningfully interpreted (Koutsoyiannis, 1987). Each estimated PC would show a different dimension in, or interrelationship between, the p Xs in the data, as the PCs are orthogonal (i.e. uncorrelated). Moreover, since women empowerment is multidimensional, it has a large number of indicators and there is some possibility of redundancy in those variables (i.e. some of the variables are correlated with one another, possibly because they are measuring the same construct). Due to this redundancy, PCA is a more suitable data reduction technique for reducing the observed variables into a smaller number of PCs (artificial variables) that are not correlated (Koutsoyiannis, 1987).

#### ***4.9.1.1 Dominant dimensions of empowerment among rural women in Msinga***

Table 4.19 summarises the dominant dimensions of women empowerment that were obtained by applying PCA on primary female heads-of-household's level of economic, social, civic and agricultural capabilities (i.e. resources and agency). Economic agency, human capital empowerment, financial capital empowerment, empowerment in vocational skills and physical capital empowerment were identified as the dominant dimensions of economic empowerment. Social agency, social capital empowerment and informational resource empowerment were identified as the dominant dimensions of women's social empowerment. Crop management skills, farm financial management skills, water-use security, animal husbandry skills and weed and pest management skills were identified as the dominant dimensions of women's empowerment in agriculture. Lastly, the study identified legal resource empowerment, civic agency, political and psychological empowerment as the dominant dimensions in that category (Table 4.19). Overall, the PCs jointly explained 65.0%, 62.6%, 73.4% and 69.7% of the total variation in the variables used, respectively.

Table 4.19 also shows the percentage of women who were considered empowered in the study areas. Based on the PCA factor scores, more women were empowered than disempowered along each dimension of empowerment. Based on this analysis, more women (69.0%) were empowered with physical capital forms of empowerment. With respect to social empowerment, a larger proportion of women were empowered with social capital (62.0%). As far as empowerment in agriculture is concerned, many women (64.7%) in the study areas had better animal husbandry skills. With regard to civic forms of empowerment, the majority of women were psychological empowered (60%).

**Table 4.19:** Dimensions of women empowerment identified in Msinga

Main dimension	Sub-dimension	Empowered (%)	Disempowered (%)
<b>Economic empowerment</b>	Economic agency	64.7	35.3
	Human capital empowerment	60.7	39.3
	Financial capital empowerment	56.9	43.1
	Empowerment in vocational skills	66.3	33.7
	Physical capital empowerment	<b>69.0</b>	31.0
<b>Social empowerment</b>	Social agency	57.0	43.0
	Social capital empowerment	62.0	38.0
	Informational resource empowerment	59.6	40.3
<b>Empowerment in agriculture</b>	Empowerment in crop management skills	61.3	38.7
	Farm financial management skills	58.3	41.7
	Water-use security	62.0	38.0
	Empowerment in socio-cultural aspects	61.7	38.3
	Animal husbandry skills	64.7	35.3
	Weed and pest management skill	57.7	42.3
<b>Civic forms of empowerment</b>	Legal resource empowerment	51.3	48.7
	Civic agency	57.7	42.3
	Knowledge of legal rights	55.3	44.7
	Political empowerment	59.3	40.7
	Psychological empowerment	60	40

**Source:** Survey data (2013)

#### 4.9.2 Levels of women empowerment in North West Province

In this study, a modified Women Empowerment in Agricultural Index (WEAI) was used to access women's levels of empowerment. The empowerment indices covered in this study include the use of income, access to productive capital, access to credit, leadership roles and decision-making. From the scoring of the empowerment indices the mean was calculated for each of the indices and used as the cut-off point. Women with scores below the mean depict disempowerment, while those above the mean indicate empowerment. Table 4.20 shows that 73.8 % of women farmers participate in decision-making on cash crop farming. Galdwin (1992) reported that in Malawi hybrid cash crops are produced by males, while local variety crops are produced by women. About 57.2% of women do not participate in decision-making about which food crop to grow but, according to Pitcher (1996), in Malawi women participate in decision-making on which food crops to grow, because these are mainly for household

consumption. Women have the responsibility of feeding their families and only after that can they take a decision of engaging in non-farming activities. Table 4.20 shows that 83.4% of women do not participate in decision-making on non-farm economic activities. More women (66.7%) have less input in decision making in non-farm economic activities and also in the use of income generated in wage and salary employment, with 66.7%.

**Table 4.20:** Women’s role in household decision making on production and income generation

Activity	Participation in decision-making		Input in decision			Input in use of income		
	Yes	No	More	Less	Average	More	Less	Average
Food crop farming	36 (42.9)	48 (57.2)	3 (3.6)	39 (46.5)	42 (50)	12 (14.3)	40 (47.6)	32 (38.1)
Cash crop farming	62 (73.8)	22 (26.2)		45 (53.5)	39 (46.4)	3 (3.6)	38 (45.2)	43 (51.2)
Livestock raising	22 (26.2)	62 (73.8)	3 (3.6)	54 (64.3)	27 (32.1)	6 (7.1)	49 (58.4)	29 (34.5)
Non-farm economic activities	14 (16.7)	70 (83.4)	6 (7.2)	56 (66.7)	22 (26.2)	6 (7.1)	56 (66.6)	22 (26.2)
Wage and salary employment: in kind or monetary work, both in agriculture and other wage work	28 (33.3)	56 (66.7)	3 (3.6)	49 (58.4)	32 (38.1)		56 (66.7)	28 (33.3)

#### **4.9.2.1 Use of income**

Table 4.20 indicates that 56% of women, in terms of control over the use of income use, are below the mean score of 16.8. This implies that they are disempowered in the control of the use of income as an index of empowerment. According to FAO (2000), women tend to spend most of their income on basic household needs, such as domestic essentials, while men tend to retain more of the income they control for their personal use, such as buying alcohol, drinking and leisure. The study indicated that in certain parts of Uganda, such as Apac and Kumi, husbands are more likely than elsewhere to entrust the income to their wives, to prevent its misuse. But some men are afraid to do so, in case the women might be tempted to leave them.

#### **4.9.2.2 Access to productive capital**

Table 4.20 indicates the proportion of women below the mean (78.99) for access to productive capital as an index of empowerment is 60.2%. This shows that women are disempowered in terms of the access to productive resources as an index of empowerment. Lopi (2004) pointed out that, although policies aimed at creating enabling environments have been established in nearly all countries, for women to access, own, control, use and manage land for productive use still remains a challenge. According to Lopi (2004), promoting women's full access to, and control over, productive resources such as land, livestock,

markets, credit, modern technology, formal employment and a good quality of life in order to reduce the level of poverty among women, is a SADC declaration on gender and development. If women are disempowered they are very vulnerable and it impacts on their human dignity.

The lack of recognition of the role women play as decision-makers is one of the major reasons for women's poor access to productive resources. Gender-based farming systems, where men and women cultivate separate fields, are common in many parts of sub-Saharan Africa. This fact has often been ignored in irrigation development projects and led to gender inequity in access to productive resources. It has also resulted in the partial or total failure of irrigation schemes. Key decisions regarding site selection, beneficiaries, land (re)allocation and water rights are made during the planning phases of water-related investment projects and thus form the basis of gender inclusion or exclusion in the projects. The gender approach of agencies and projects, as well as the local class and gender hierarchies, is one of the causes of gender-related inequities in access to water resources in sub-Saharan Africa (Van Koppen, 1998).

#### **4.9.2.3 Access to credit**

Table 4.20 shows that 60.2% of women in terms of access to credit are below the mean score of 113.5, meaning that women are disempowered in terms of access to credit as an index of empowerment. Paradza (2012) ascertained that lack of collateral; low levels of education, with resultant lack of numeracy and access to information, factors contributing to the fact that only 10% of agricultural credit in the SADC (16 countries of southern Africa) region are accessed by women. In some instances, women need the consent of their spouses in order to access credit and this makes them lose confidence in themselves and become disempowered.

According to FAO (1995), a direct consequence of women's lack of access to land and membership in rural organizations is their lack of access to credit. Land is usually required as collateral for loans, on the one hand, and, on the other, credit schemes are often channelled through rural organizations to their members. This is a serious obstacle to improving women's agricultural productivity, as without credit women farmers are unable to buy inputs such as seed, fertilizers and improved technologies, or to hire labour. Paradoxically, numerous studies have shown that women are more likely than men to repay loans. Because men and women farmers often have different responsibilities in agricultural production and food security, both need credit according to their requirements. It is thus important for women to have not only access to credit, but also to control over the use of the credit so that it is not diverted to male-dominated production systems, at the expense of women's productive activities.

The FAO (1994) indicated that a study of credit schemes in Kenya, Malawi, Sierra Leone, Zambia and Zimbabwe showed that women received less than 10% of credit directed to smallholders and only 1% of the total credit to agriculture. Shortage of good quality agricultural land for smallholders is a problem in many regions of the world, due to

environmental degradation, conversion of land for non-agricultural purposes, population pressure and consolidation of land in the hands of fewer and fewer large landowners, including transnational corporations. Access to land through ownership or secure tenure is the *sine qua non* of improving agricultural productivity. Without secure land rights, farmers have little or no access to credit or the benefits of membership in rural organizations, which are often conduits of agricultural inputs and services. Moreover, with no stake in the land or assurance of access to it, farmers have few incentives to engage in sustainable agricultural practices or to consider the long-term environmental impact of the exploitation of the land.

#### **4.9.2.4 Leadership role**

Table 4.20 indicates that 51.8% of women, in terms of leadership roles, are above the mean score of 43.98. This means that in terms of women's engagement in leadership roles, the difference is marginal when compared with the mean score. This could be because, due to unequal gender norms and relations, women have a lower socio-economic status compared to their male counterparts, which limits their opportunities to access and participate in formal groups.

The World Bank (2009) and the FAO (2011) justify the fact that women's freedom is constrained by men's control over their mobility, by socio-cultural expectations that they are primarily responsible for all domestic work and, in relation to this, by their uneven reproductive, productive and community work burdens. Their restricted access to, control over, and ownership of land, credit and information, compared to men, disadvantage them from meeting conditions of formal group membership and leadership. Gizachew (2011) stated that, when women gain leadership positions, it helps them to build their self-confidence, exercise their political leadership and gain respect from their male and female peers. There is some evidence in the context of Ethiopia, that when there are women in leadership roles, there is a greater likelihood of other women participating in the organization (Oxfam International, 2013).

According to the FAO (1994), women's membership in rural organizations, such as co-operatives, agricultural producers' organizations and farmers' associations, is important for access to productive resources, credit, information, training and other support services. These organizations represent the interests of their members in relation to governments, project management and development policy makers and planners at different levels. When women farmers' access to membership and leadership positions in these organizations is restricted, by law or custom, their access to resources and their ability to make their views known to policy-makers and planners is also restricted. The obvious results are the inability of women farmers to carry out their roles in agriculture and food security to optimum potential.

The same agrarian reform programmes that have given land titles to male heads of households, and thus restricted women's ownership of land, have also restricted membership in agrarian reform organizations and co-operatives to male heads of household. Even where women do have access to membership in co-operatives and other rural organizations, they

make up a small minority of the leadership. In Benin, women make up 25 % of the cooperative members, but cover only 12 to 14 % of the leadership positions (FAO, 1994)

#### **4.9.2.5 Decision-making**

Table 4.20 indicates the proportion of women above the mean (38.29) for decision-making as an index of empowerment is 53%, which implies that they are empowered in decision-making. Most women are not married and this could be the reason they are actively involved in decision-making. Women have been facing huge challenges in the area of decision-making, firstly because of tradition, secondly men are not giving them the opportunity to make decisions especially when it comes to farming activities, thirdly because of their internal inferiority complex, which means they are not even sure if the decisions that they want to take will bear fruits and this makes them very averse to making decisions. When it comes to the sale of assets or crops it will be the prerogative of the women since most of them are not married. The Grameen Bank in Bangladesh and other microcredit institutions are exceptions, because they give small loans to poor men and women. Access to these resources helps the women or men use their labour more effectively, by enabling them to make decisions and adjustments in allocating resources under changing economic and climatic conditions (IFAD, 2004).

#### **4.9.2.6 Total empowerment score**

Table 4.21 indicates that 60.2% of women were below the mean of 291.61, which implies that women are disempowered. According to IFPRI (2012), an individual is identified as empowered in 5DE, the domains used as indices of empowerment, if there is an adequate achievement in four of the five domains or adequacy in some combination of the weighted indicators that add up to 80 % or more, or has an adequacy score of 80 or above. Women are reflecting empowerment adequacy in only two indicators, namely leadership and decision-making, and disempowerment in three indicators.

**Table 4.21:** Empowerment indices among women on smallholder irrigation schemes

Income	Use of income	Productive capital	Access to credit	Leadership	Decision	Total empowerment score
x	16.80	78.99	113.56	43.98	38.29	291.61
sd	8.55	35.41	38.24	10.85	10.64	84.48
low	47(56)	50(60.2)	50(60.2)	43(51.8)	44(53.0)	50(60.2)
high	36(44)	33(39.8)	33(39.8)	40(48.2)	39(47.0)	33(39.8)



#### **4.10 Summary and conclusions**

This survey was motivated by the fact that women in rural areas are the major players in household food production, processing and access and need to be empowered to ensure household food security. Thus, understanding the social, economic, political, institutional and cultural environment, they operate in is a crucial step in efforts to empower them. Based on the results obtained through focus group discussions, key informant interviews and questionnaire surveys and subsequent discussions, it can be concluded that women in the studied rural areas face a number of social, economic, political, institutional and cultural constraints to achieve their desired livelihood outcomes.

Women in the study areas are operating in environments characterised by high levels of poverty and lack of economic opportunities. They have low education levels and lack employment opportunities. Apart from agriculture, households rely on government grants as a source of income. There are also few opportunities to diversify household incomes away from agriculture due to the low levels of economic activities in the Msinga Local Municipality. Although agriculture could be the way out of poverty, women face a number of institutional constraints ranging from lack of support services to poor management, especially in irrigation schemes and socio-cultural constraints.

Women in the study areas work in an environment with poor institutional settings. In the irrigation schemes, although analysis of the conveyance efficiency of the canal shows that the system delivers enough water to irrigate the whole scheme, lack of institutional framework hinders water distribution within and among the blocks. Although rules were put in place initially, they had become obsolete over the years. The irrigation schemes have no management committees, or WUAs to take responsibility for managing them. The management of the irrigation schemes is dysfunctional, because the different sections of the irrigation schemes were being managed separately, with no overall co-ordination of a management committee. Extension is generally poorly equipped in terms of staff skills and financial resources for identifying and communicating technology needs and for managing local level interventions.

The political environment in which women operate presents a number of challenges to their livelihoods, especially in agricultural production. Lines in the political divide in Msinga are drawn between ANC and IFP. The tug-o-war undermines service delivery and infrastructural development. Although tensions within the two political movements have eased recently, the bloodshed and battles in the early 1990s continue to haunt these communities. This continues to affect people's trust, communication and co-operation, which are needed for collective management of the irrigation schemes.

The cultural environment in which women in the study areas operate appears to be the area presenting most difficulties to their livelihoods and survival. This is mainly because customary norms, including the customary marriage systems and the practice of primogeniture, prohibits women from being the legal holders of the most important resources

including land, livestock and machinery. Although women have access to these resources, they have little control over their purchase and transfer.

## CHAPTER FIVE: LOCALLY PREFERRED ADJUSTMENTS AND AGRICULTURAL TRAINING NEEDS

Mudhara, M. and Oladele, O. I.

### 5.1 Introduction

The smallholder farmers in many developing countries are underperforming, partly because women, who represent a crucial resource in agriculture and the rural economy through their roles as farmers, labourers and entrepreneurs, face severe constraints in accessing productive resources. FAO (2011) reported that resource-constrained women constitute between 70% and 90% of the agricultural labour force in many sub-Saharan African countries. They play a significant role in achieving food security, better nutrition and higher living standards at both household and country levels (IFAD, 2010). According to Hendriks (2005), rural smallholder agricultural production in South Africa is generally sufficient to meet their own food security needs. However, about one-third of the world's population do not have secure access to land and water resources, hindering their potential of ensuring food security.

Access to water cannot be considered independently from secure access to land (IFAD, 2010). Water without guaranteed access to land will not be sufficient and land without access to water will not be very effective for a farmer (FAO, 2009). Development has to take into consideration the interaction between the two important factors of production to improve food security (Bacha et al., 2011). There is still a need for analysing the mechanisms used for allocating these resources to farmers and the gender-disaggregated activities, for which the resources are used. It is also crucial to analyse the policies on land and water regarding resource allocation between genders and how the allocation regimes of these resources impact food security in smallholder farmers' households.

Gender inequality in access to resources hinders the potential of smallholder farming to reduce poverty and food insecurity. Limited access to land and water are the main constraints to women's contribution to food security. Another insight was that if women need to increase their agricultural productivity, there is a need for increased access to resources such as credit, agricultural inputs, information and knowledge. Another important aspect of the land issue pertains to land rights and tenure security. Women need access to land and secure rights to land.

This section looks at the current realities regarding land and water allocation and at access to skills. It then contrasts this with women's aspirations. This contributes to recommendations on locally preferred adjustments and adaptations to create a favourable environment for women to realise their aspirations, with specific reference to constitutional prescription *vis-a-vis* cultural realities. The knowledge gained from this chapter can assist in the future development of resource allocation policies with respect to gender.

Education, skills development and technical training are central to agricultural and rural employment. They prepare poor people in rural areas for work in the formal and informal sectors, including agriculture. They thus play important roles in poverty reduction. Training and skills development are some of the primary means to build the capacity of the poor to participate and benefit from mainstream economic development. Training can be in many forms, such as vocational and skills training, literacy (functional) training, training in specific capacities (e.g. gender training, management training), technical advisory training and extension services (including farmer field schools) (Hartl, 2009). Training activities include a large number of other approaches, spanning from demonstrations, peer-to-peer learning, exchange visits and mentoring, to vocational training, apprenticeship programmes and work placements (Hartl, 2011).

Besides being a tool for transferring the required technical skills to target populations, e.g. women, the youth and the uneducated, skills training is an essential component for advancing gender equality and women's empowerment. Bringing about gender equality is a transformative process which provides knowledge, techniques and tools to develop skills and changes in attitudes and behaviour and focuses on women. Such efforts seek to create inclusive societies that recognize the need to promote gender equality. It is a continuous and long-term process that requires political will and the commitment of the various stakeholders. Training is a tool, strategy and means to stimulate individual and collective transformation towards gender equality, by raising awareness and encouraging learning, knowledge-building and skills development. It facilitates women and men to understand the role gender plays and to acquire the knowledge and skills necessary for advancing gender equality in their daily lives and work (UN-Women, 2015).

With regards to technical skills, the better the training and the more refined the skills in terms of human capital, the higher the income and returns and the better the rural livelihood outcomes (Hartl, 2009). However, making the leap from individual learning to better development outcomes to have impact on capacity requires both good training design and appropriate organizational and institutional contexts, in which the learning acquired from training can be applied. Training materials are a necessary part of any programme or activity that involves knowledge acquisition and retention. The best approach to developing instructional materials is to start by examining the training needs, then developing a plan based on the available resources. Depending on the learning objectives and length of the training programme, training materials may include workbooks, manuals, computer-based lessons and audio-visual aids. Strategies are available for developing training materials.

Effective training programmes require designs, plans, organization and delivery of skills and entrepreneurial training programmes. According to Lanigan (2010), needs assessment is one of the most important processes to implement before designing or developing materials for effective skills training. The design of the training programme and material in the study areas should thus be based on prior, identified training needs. This chapter aims at investigating the constraints and opportunities in addressing the challenges facing the empowerment of

women, to improve gender equity and livelihoods through increased water productivity with crop cultivation and animal husbandry.

## **5.2 Locally preferred adjustments and adaptations to create a favourable environment for women**

### **5.2.1 Political environment**

The dominance of two major political parties in the KwaZulu-Natal means that the political tensions play out due to the mismatch of political power at different levels of government, national and local levels. Often the national government programmes and those of the local government are not synchronised. Such a scenario stifles development. Indeed, Msinga was recently voted the worst municipality in the country, in terms of development. If the political parties could co-operate on development issues, more could be realised, which would contribute to women's realisation of their aspirations.

### **5.2.2 Legal framework governing water use in irrigation schemes**

The NWA (Act 36 of 1998) specifies that government is the public trustee of the national water resources and must act in the public interest to ensure that water is 'protected, used, developed, conceived, managed and controlled in a sustainable and equitable manner for the benefit of all persons'. According to the Act, the right to use water is granted to users, most of them have to be registered and licenced and they should pay for this right. Also, the core concept of water management under the Act is decentralisation. Protective measures have to be taken to ensure secure water allocation for ecological and basic human needs and development purposes (Perret, 2001).

Social development, economic growth, ecological integrity and equal access to water remain key objectives of the water resource management under the new Act. At rural community and smallholder farming levels, all individual users are authorised to take water for 'reasonable domestic use', gardens and stock watering (though not for commercial purposes), without registration, licencing or payment, as stipulated by the Act. The Act, however, also states that farmers and rural communities should form WUAs, especially in smallholder irrigation schemes, and then apply for a licence. The licence will then determine their collective rights and duties concerning the water resource.

In both schemes in Msinga, the WUAs were not yet fully operational. It emerged that those representing the WUAs did not fully comprehend their functions. The WUAs were not addressing the needs of the irrigators. In fact, the water demands in the Mooi River Irrigation Scheme were not synchronised with the opening of the water flow in upstream dams.

There is a need to realign the WUAs with the aspirations of rural women so that they add value to their work in irrigation. At the moment the WUAs are likely to impose water management rules and schedules that are not accepted and which are likely to be a source of conflict and dissatisfaction in farmers' communities, to the detriment of the women.

### **5.2.3 Local institutional arrangements for managing water**

For irrigation agriculture to be socially viable, economically and environmentally, institutions must evolve. This study revealed that such institutions in the studied irrigation schemes were very weak and poorly monitored. Although the Water Act stipulates the formation of WUA to ensure that people use water wisely and that they pay for it, only 16.5% of the farmers in the irrigation schemes were members of the WUA. The impact of the WUA in the studied irrigation schemes appeared to be very limited.

None of the farmers in the irrigation schemes were paying any fee for accessing water and most farmers were not registered as water users. Payment for water on these irrigation schemes, which is supposed to have been linked to WUA membership, was inapplicable, because most farmers were not even aware of the existence of WUAs. Only farmers using either diesel or electric pumps to lift water into the main canals were supposed to pay for the energy costs. Those using electricity in Tugela Ferry were expected to pay R60 per plot while those paying for diesel in Tugela Ferry were expected to pay R50 per month. In Mooi River, farmers were expected to pay R20 per month for diesel. When asked about how much they would be willing to pay for improved water services, farmers indicated that they would be willing to pay service fees ranging from R30 to R200, with an average fee payment of R50. Therefore, the amounts that farmers are willing to pay are within the range that they are expected pay. Oddly though, the groups using the pumps are facing a problem of non-payment of the monthly contribution fees. The weakness of the local institutions is not only revealed by the low compliance of farmers in making payments towards diesel and electricity, but also in their failure to enforce the payment. Overall, 46% of those paying for diesel indicated that they were not always able to pay the required amounts, while 51.2% of those using electric-pumps sometimes failed to pay their electricity bills. In fact, the farmers using an electric pump in Tugela Ferry owed more than a million rands to Eskom by the time of the survey. Out of the estimated 360 farmers in the co-operative who were using diesel pumps in Mooi River, approximately 200 farmers were paying.

Due to lack of enforcement of the rules in the irrigation schemes, most of the farmers who were not paying the monthly fee for diesel or electricity continued irrigating their crops, despite the rules that prohibited defaulters from irrigating. Enforcement of rules was weak, because farmers knew each other and lacked the power and means to exclude non-paying farmers from irrigating. This should be indicative of the counter-productivity of social capital. On one hand it allows people to rely on each other, by on the other it can result in the dysfunctionality of local institutions. All the women using diesel or electricity indicated that they were experiencing shortage of water in their plots, despite having the pumps with the capacity to supply adequate water. The strengthening of local institutions is mandatory for functional irrigation schemes and the realisation of benefits to women.

### **5.2.4 Institutions for maintaining and operating irrigation infrastructure**

Irrigators should be given the mandate to manage irrigation scheme infrastructure. This should be done through viable, locally managed institutions, where woman play a more

meaningful role. In Mooi River, as in most irrigation schemes in South Africa, poor agricultural performance was associated with a range of factors, including poor maintenance of infrastructure and equipment. Although the divergency weir delivers enough water to irrigate the whole scheme, water shortages in the Mooi River Irrigation Scheme were partly due to lack of infrastructure maintenance. Twenty percent of the farmers experiencing water shortages in the Mooi River Irrigation Scheme perceived that water shortages were due to canal leakages and blockages. Inadequate routine maintenance of the canal resulted in reduced water delivery and shortening the life-span of the water distribution system, posing a threat to the sustainability of irrigated farming.

In the study it was evident that irrigation schemes are still dependent on the government, especially for repairing irrigation infrastructure. In both irrigation schemes, the deterioration of the infrastructure has been exacerbated by the fact that all farmers were not paying any infrastructure maintenance fee. As a result of such infrastructural collapse in 2011 (before they received a diesel pump), all the lower-end irrigation farmers in Mooi River Irrigation Scheme had been turned into dryland farmers and were no longer producing in winter due to leakages from the main and subsidiary canals. Similarly, at the time of the study in Tugela Ferry the scheme was going through a major infrastructural revitalisation programme sponsored by the national government through the Comprehensive Rural Development Programme. The government was also responsible for maintenance of the irrigation infrastructure (canal and fence) and the majority of the farmers in the two irrigation schemes (92.3%) perceived that it is the government's responsibility, due to the large capital maintenance of irrigation infrastructure. However, the majority of farmers believed that there are some activities, such as canal cleaning, that should be their own responsibility. The majority (72.3%) of farmers were involved in canal cleaning. However, the frequency of clearing was very low.

In the study areas, the fact that farmers played a limited role in the maintenance of irrigation infrastructure could also be attributed to the fact that they had not received any training on how to do so. No workshops were held in the scheme to raise awareness and educate people on the importance of repairing irrigation infrastructure. Knowhow on how to identify suppliers and how to order spares for irrigation pumps and pipes was lacking among farmers. In fact, farmers were ignorant of the need for servicing their pumps. Without knowhow on purchasing stocks of spares, it usually takes weeks or months before spares are ordered, let alone for them to be delivered. These delays result in shutdowns of the pumps, which lead to water cuts in areas or sections supplied by such pumps. The farmers using diesel pumps indicated that some training on the use and repairing of the pumps could positively contribute to the availability of water within the blocks. The pumps in Mooi River had gone for more than a year without a service, as the farmers were not aware of when to service them or who they could contact to do the service. It was also evident that there was an expectation that the males were the ones responsible for looking after the pump. The Mooi River co-operative had received a second pump from the government, but it had not been used as there were no pipes to connect it to the river.

### **5.2.5 Institutions for managing the irrigation schemes**

The study showed that the management of the irrigation schemes was very dysfunctional. There were few farmers who were registered as water users under the WUAs. Meetings of WUAs were irregular and there was little or no co-operation among the various sections of the scheme. The schemes are supposed to work as contiguous units, where the activities in one block are synchronised with those in other blocks. However, in reality, each section/block handled its own affairs as it saw fit and at their own time. There was no formal policy with regard to the general conduct of members of the management team. The role of government is a fascinating one. Government authority is fairly limited in the irrigation schemes because of the decentralisation policies. Farmers generally consider that it is government responsibility to maintain irrigation schemes, including paying the electricity bills for water pumps. Therefore, even though farmers are aware that their contributions are for paying for electricity or buying diesel to run the pumps, they always make an appeal for the government to take its full responsibility and come to the table. Such notions are then realised when government embarks on revitalisation programmes or public works programmes. In the latter, through a third party, government pays locals to clean irrigation canals. The Department of Rural Development and Land Affairs indicated that the Mooi River would be revitalised in 2014. Through focus group discussions and a survey, it was established that only a few members of the irrigation schemes were willing to join block committees, or be in any position of authority that pertains to water management. There was a strong fear among farmers that becoming a member of the committee means that one has to take tough stances against non-compliant members. This creates enemies and could actually lead to one being murdered. Thus fear of violence and insecurity appears to be a major problem preventing the development of sustainable water management practices in the studied irrigation schemes.

As management of the scheme was very dysfunctional, conflicts are commonplace, even though it was revealed that farmers do try to avoid conflicts. Most of the conflicts are water-related. Since the rules of the irrigation schemes instructed every farmer to guard their fields from livestock, crop damage from livestock had ceased to be a cause of conflicts. This is a sign that the conflicts are poorly managed.

### **5.2.6 Land related institutional settings in irrigation schemes**

Land in both irrigation schemes had been allocated to households more than 30 years ago. In both irrigation schemes no farmer had been allocated a new piece of land in recent times. The majority of women farmers were using land/plots owned by their households. Fourteen percent of the women were using rented land, 11.8% were using borrowed land while 9.4% were share-cropping. As a result of severe water shortages, demand for land had plummeted and accessing it had become relatively easy. Shortages of irrigation water were discouraging many farmers from using their plots. Normally a farmer wanting more land could approach the village head and ask for the identified piece of land. The farmer would pay a certain amount of money to the village head and use the land thereafter. Some farmers were



decreasing the number of plots they use in winter and then using their full allocation in summer (rainy season). As most of the plots were now being left idle in some blocks (especially the middle section blocks in Mooi River), it was now possible in these blocks to acquire more land by simply speaking to an extension officer, unlike in other blocks, where the village head had to be consulted.

The majority of the women (57.6%) indicated that they were the legal holders of the irrigation plots. However, all the women who were legal holders of land were not married. Women were becoming the legal holders of the irrigation plots, following the death of their husbands (89%) or after the death of both parents, in the case of daughters. The majority of the household plots for both male and female legal land owners had been inherited from parents. The scenario where women legally own land is a recent development, which seems to be associated with the advent of democracy and the gradual recognition of the national call to accord equal rights to males and females. However, the liberalisation of giving land to females does not seem to be happening beyond the household level. Women tend to acquire land through their households. There is no evidence that the traditional leadership have adopted the practice of allocating land directly to female heads of households.

An informal land rental market existed in the irrigation schemes. According to the informal rules of the Mooi River Irrigation Scheme, those owning plots or “beds” but not willing to use them, were free to rent/lend/lease them out to those farmers who were willing to use them. However, there were no formal rules or guidelines to allow some form of contractual agreements for those willing to lend, borrow or rent their land. However, selling the land was prohibited, as the land was owned by the traditional authorities (the Ingonyama Trust). Most farmers were reluctant to rent/lend out their idle plots because they regarded land with a certain sentimental value and take their plots as a form of inheritance from their forefathers. They believe that their ancestors would not tolerate them renting it out. It was also found that those who were renting out land were not willing to disclose it, with the fear that such land would be taken away from their tenants. This limited the development of the full potential of a land rental market, resulting in a large number of plots being left idle, especially in the Mooi River Irrigation Scheme.

In Mooi River, the main reason for leasing out land was the prevailing water shortages that had made agricultural production very unprofitable. Very few farmers were renting out their land in Tugela Ferry. The tenure system that is in the studied irrigation schemes precluded farmers from using their holdings as collateral to access loans from registered financial service providers.

### **5.2.7 Cultural environment**

The South African Constitution, Act 108 of 1996, makes provision for people to live according to their traditions and customs, provided they do not infringe on anyone else’s freedoms. However, rights to land and gender equality are not always synonymous. The Constitution protects women’s rights to property and affirms that everyone has a right to equality and freedom.

### ***5.2.7.1 Customary law in Msinga***

The study communities in Msinga are well known for being traditionalist and widely acknowledged as preservers of the old Zulu culture. Whilst South African law ratifies that women should be given equal access to important natural resources, especially land, this is not always socially practised and may be blocked through broader social discourses, structures and processes, which still tend to favour patriarchal organisations. That is, official law and social practice are not always reinforcing and, in some instances, may in fact be at a tangent with one another. On the other hand, women who were not married were also the legal holders of the land and could lend or lease it to others. Customary law treats women as minors, under the guardianship of a male figure (the woman's father, then later, the woman's husband and even their sons) who retains control of all assets. This is also evident in the fact that women face challenges accessing land rights. Therefore, social gendered practices may need to be changed to allow for effective laws to help manage customary marriages and access to land.

### ***5.2.7.2 Culture and livestock production***

There are clear-cut gender roles with respect to livestock management responsibilities. Cattle and goats are the responsibility of men, and household chickens are usually managed by women. Men may sometimes own chickens, which they may get in return for making or fixing items such as an axe-handle. Cattle are kept for prestige and status and not primarily for income, a system often referred to as the "cattle complex" of Africa. A distinction is made between indigenous chickens and so-called commercial chickens (broilers), which generally belong to men, although women may be involved in looking after them. This practice disempowers women, who might have wanted to own their own cattle. Women indicated that the culture even makes it impossible for them to own cattle. Traditionally, when a woman gets married, a live cow is paid to the mother-in-law. However, custom requires that the animal is slaughtered soon after it is received.

### **5.2.8 Land and water access**

The results suggest that males are more likely to have been to school and reached higher grades compared to females. This may be because, historically, school attendance was mostly for boys, while girls remained home to perform household chores. The farmers emphasised that when they grew up, it was mostly due to their culture that the few girls who attended school had to drop out of school when they reached puberty and got married, while boys continued to study. Culturally it is believed that there is no point in educating a girl who, one day, will leave the household and go to her new home. However, farmers said that this belief is no longer widely held. The survey results indicated that 92% of the children in the sample attended school and at least 65% of them were females.

The majority of the farmers interviewed were unemployed and the extent of unemployment is higher among females. This relationship between employment status and gender suggests that, if a household head is male, they are more likely to be employed and mostly under

formal employment, whereas a female is more likely to be unemployed, or at least be informally employed. Unemployment, especially of women, may be aggravated by their low levels of education, with very poor skills for the standard required by the industrial sector.

The focus group discussions revealed that females participate in informal employment to sustain their livelihoods. Some females disclosed that they looked for jobs as farm labourers in the Tugela Ferry Irrigation Schemes, where they help with irrigating, planting or weeding activities. These jobs normally pay about R20 a day. Even though this is not much, the farmers felt it was better than not working at all. This is an indication of the low opportunity cost of female labour.

This implies that government support to the smallholder farmers is inadequate, as it does not reach many of the farmers, especially women. The majority of the farmers do not have access to support services such as credit and training.

There was no association between gender and source of land among the interviewed households. This suggests that there is no particular land source that mostly applies to either males or females. The results also indicate that females are more involved in land related conflict, as 19% of them have been in conflicts over land, whereas none of the males in the sample have been involved. It was stressed during the focus group discussions that conflicts over land take place where there is no clear ownership, which is likely to happen within the family when the parents (or husbands) pass away and the household members fight over inheritance of the land. It was mentioned that women are likely to be involved in these conflicts, as they would be seeking to take over the land, so that they can feed the family, while male relatives refuse, as they believe they have a legal right to inherit the land. The chi-square test shows no statistically significant difference between gender of the household head and their likeliness to be involved in conflicts over land ownership.

Further analysis indicated that there were single women who were land “owners”. Most single women inherited the land from their parents, with very few having being allocated the land by the traditional authorities. This demonstrates that women are less likely to be allocated land through the traditional authorities. The change in such rules could contribute towards the empowerment of women.

Marital status of the household head has a significant influence on the total land size a household possesses. Married heads have more land than unmarried household heads. This points to the fact that, under traditional systems, females in general, and single female headed households, in particular, are disadvantaged regarding land ownership.

#### ***5.2.8.1 Water access***

Female-headed households are not discriminated against in terms of accessing water. The household head’s marital status, education level, training and extension access did not influence the household’s access to irrigation water. However, irrigation type influences water access. This implies that households under a gravity-fed scheme have access to water at least twice as much as households under pump irrigation receive.

The results indicate that farmers who do not pay water costs have more access to water per week than those who pay for costs such as diesel, electricity or pump maintenance. This may be because farmers who depend on diesel pumps for irrigation water can only have access to water when they have paid for diesel, compared to those who depend on gravity, as they do not have to pay to get water flowing to their plots. Farmers from Mooi River in the tail-end blocks, which depend on a diesel pump, mentioned that they can only irrigate their crops when they paid at least an average of R100 per 0.1 ha plot for fuel. They feel that the amount they pay is not enough for one plot, so they sometimes end up irrigating half of a plot. The problem is worsened by the fact that diesel pump delivers less water than gravity, such that the diesel pump-dependent irrigators need more days of accessing water than the gravity-reliant irrigators. Besides this, the diesel pump was now old and consumed more fuel.

Over half of the irrigators perceived breaking of irrigation rules as the major cause for water shortages in the scheme. Such irrigation rules include cleaning of the canal, paying for electricity and irrigating on the day allocated for that particular block. This reflects weaknesses in scheme institutions and local level water governance.

## **5.2.9 Land and water security**

### ***5.2.9.1 Land security***

In this study, land security is understood as being determined by whether a land holder can perform any activity on the land without feeling any threat. Threats of eviction are very rare in the area, as suggested by the low proportion of those who reported having experienced such threats in the past year. This suggests that the communal tenure system and its traditional leadership play a significant role in ensuring that households' rights to land are respected. The majority of the 8% of the respondents who experienced threats over land were female, and they reported that these threats were from male relatives. Married women feel more land secure than unmarried women. The unmarried, particularly the widowed, may feel land insecure due to the fact that there are possibilities of the late husband's relatives taking away the land from them. This is another indication of the vulnerability of females to insecurity of land access.

Non-irrigators feel more land secure than irrigators. During the focus group discussions the irrigating farmers stressed that it is the scheme rule that if a farmer has not been using a plot, it must be passed on to another community member who is willing to use it and this is not necessarily a family member. This creates a threat of a household losing that land permanently and this decreases their perceived land security. However, there were some plots which had been fallow and yet were not reallocated. This could suggest that the rule on reallocation was applied selectively. It is likely that land belonging to males may not be allocated, whereas land belonging to females might be reallocated.

Results show that as the household heads get older, they feel less land secure. This may be because as the household head grows older, the use of their land decreases as they are no

longer active. This exposes the older farmers to a threat of the land being taken away, to be allocated by the traditional authorities.

### **5.2.9.2 Water security**

To determine household heads' water security perception, farmers were asked if they perceived their water right as secure or not. As farmers grow older they perceive their water rights to be insecure. Farmers who have been in possession of land for longer feel water insecure, compared to those with fewer years. This result is in line with the ones by Sinyolo (2013), who found out that as the years of a household's possession of plots increase, their perceived water security decreases. One would have expected that farmers who have been in possession of plots for longer would feel more water secure, because they would have developed strategies of ensuring water security (e.g. watering at night) and better water use in their plots.

Sinyolo (2013) justified the negative impact of land ownership duration as being due to distrust, which has developed in farmers who have been members for a long time, caused by experiences of water problems and conflicts that might have been occurring over years. The new members in the plots might be feeling water secure because lately the water supply has been relatively reliable in the schemes, especially where pumps have been introduced and where pipes and waterways have been renovated.

Household heads that are married feel that their water right is secure, compared to the single ones. Irrigators that depend on gravity perceived themselves water secure compared to those that depend on pump-fed irrigation. The results may suggest that farmers who depend on pumps feel water insecure because of challenges they have been experiencing, such as pump breakdown and inability to pay for electricity or diesel.

Household heads who rated the irrigation scheme management as good are more water secure than those who rated it average or poor. This result suggests that, where scheme management is good farmers are having a constant supply of water and scheme issues such as pump breakdowns, canal leakages and blockages and conflicts in the scheme are addressed timeously, that farmers feel water secure.

Household heads who are satisfied with the irrigation scheme are likely to be more water secure than those who are not satisfied. The results show that farmers who are members of water users associations tend to feel water insecure. This could be a reflection of their awareness of the conditions that should prevail regarding access to water.

### **5.2.10 Preferred adjustments in North West Province**

To determine the locally preferred adjustments and adaptations to create a favourable environment for women, the influence of political, cultural and social institutions on land water access and use among women farmers were examined and the recommendations for preferred adjustments were documented, using the indicators for political, cultural and social institutions.

The study revealed that women want to improve their standard of living and live a good quality life (Table 5. 1). Those who could articulate their aspirations talked about constructing a better house and providing better education to their children. Except for the few women who are held back by religious constraints, all of them want to improve their income by engaging in some of the activities/occupations, which they currently see as relevant, such as non-farm business, including tuck/spaza shops and livestock, including dairy, piggery or poultry. Though many women in all the locations are keen on starting some non-farm business activity, none of them was able to suggest the kind of support and services they require for doing this, except credit. All believed that if they could get credit, they could engage successfully in these activities. This clearly reveals their lack of experience of setting up new activities and also the lack of awareness and knowledge about other kinds of services and support (technical training, entrepreneurial skills, market links). The specifics of the preferred adjustments include credit provision to be improved and adequate through banks (75.9%) and government subsidies (54.2%); human capital development in the areas of skill acquisition and improved competence on water management (56.6%); record-keeping (47%); marketing-related activities (61.4%); and linkage to markets without fraud is the main preference with respect to physical livelihood (65%), such that farmers have established relationships with market for their produce and sustain their positions in the value chain for their different agricultural enterprises.

Rural women often undervalue their knowledge and capabilities and do not volunteer to participate in irrigation farming projects, even though the projects interest them. One of the major factors that hinder women’s participation in irrigation projects is related to their low literacy, resulting in a lack of relevant skills for participation and low self-confidence. In cases where women do want to take up leadership positions, they are not allowed to do so, because of prevailing social norms (Chancellor, 1996).

Women in irrigation farming enjoyed a higher level of socio-economic status. Socio-economic status was measured as average cultural and material possession among women farmers in smallholder irrigation farming. From the list of indicators used in the measurement, the need for a higher proportion of women with ownership and control was expressed.

**Table 5.1:** Percentage of women who indicated preferred adjustments (n = 84)

<b>Preferred Adjustments</b>	<b>Percentage</b>
Engagement in non-farming business	52
Improvement in credit provision for farming	60
Adequacy of credit provision through banks	75.9
Adequacy of credit provision through government subsidies	54.2
Skill acquisition and improved competence on water management	56.6
Skill acquisition and improved competence on record-keeping	47
Skill acquisition and improved competence on marketing related activities	61.4
Linkage with direct market on value chain	65

<b>Preferred Adjustments</b>	<b>Percentage</b>
Higher level of possession of cultural and material possessions	52
Higher proportion of women with ownership and control of resources	60
Political institutions to assist more for higher access to land	81
Political institutions to assist for greater access to water	58
Higher level of water security	58
Land reform to peculiarly meet women's land's need	58
Establishment, monitoring and support for women social group	51
Institutionalisation collective action processes	55
Empowerment for control of the use of income	60.2
Empowerment through access to credit	60
Empowerment through leadership roles in society	51
Empowerment through decision-making	53

About 82% of the women expressed preference for political institutions that will assist them to have high access to land, as 58.3 % of the women indicated that the political institution did not assist them to have water access because of the water policies that have changed; 58.4 % of women indicated that the local, cultural and traditional authorities do not help them in any way to improve access to water and the need for change was expressed. Most farmers (54.8%) indicated that they are not water secure; 45.3 % of the farmers indicated that they have not benefitted from changes in land reform policies and that water reforms have affected them negatively. They have indicated these have affected their income-generating activities (51.5%)

The need for the establishment, monitoring and support for women's social groups in order to institutionalise collective action processes was expressed by women, as 50% do not belong to any social groups because they believe that they are not benefiting.

About 53.5% of women farmers indicated that they do not have any coping strategies to address the problem of land reform and they feel helpless, because the government process of land redistribution is very slow and not reaching them.

The level of empowerment among women in irrigation farming shows that 56% are disempowered in the control of the use of income; 60.2% are disempowered in terms of the access to productive resources and credit; 49% are disempowered in leadership roles and 47% disempowered in decision-making. According to IFPRI (2012), an individual is identified as empowered in these domains used as indices of empowerment if there are adequate achievements in four of the five domains or adequate in some combination of the weighted indicators that add up to 80% or more, or has an adequacy score of 80 or above. Women are reflecting empowerment adequacy in only two indicators, namely leadership role and decision-making, and disempowerment in three indicators.

## **5.3 Training Needs**

### **5.3.1 Linking skills with SAQA requirements**

The Level Descriptors were developed by SAQA and agreed to by the Quality Councils (Council on Higher Education; General and Further Education and Training Quality Council (Umalusi) and the Quality Council for Trades and Occupations. They were published in the government gazette in November 2011. Their primary focus is on qualifications experts who are involved in developing and implementing the South African National Qualifications Framework (NQF). Others who will benefit from the Level Descriptors are the users, including learners and skills development practitioners. The Level Descriptors focus on the challenges involved in taking the objectives of the NQF forward at national level.

The NQF Act, No 67 of 2008, makes provision for a 10-level framework, where levels of learning achievement are arranged in ascending order, from one to ten. One of the ways through which SAQA aims to advance the objectives of the NQF, in establishing a single integrated national framework for learning achievement, is the Level Descriptors. The Level Descriptors reflect a broad agreement on the potential benefits of the South African NQF for promoting lifelong learning. The purpose of Level Descriptors for Levels One to Ten of the NQF is to: ensure coherence in learning achievement in the allocation of qualifications and part qualifications; particular levels, and to facilitate the assessment of the national and international comparability of qualifications and part qualifications. The philosophical underpinning of the NQF and the Level Descriptors is applied competence, which is in line with the outcomes-based theoretical framework adopted in the South African context. Ten categories used in the Level Descriptors to describe applied competencies across each of the 10 levels of the NQF are: scope of knowledge, knowledge literacy, method and procedure, problem-solving, ethics and professional practice, accessing, processing and managing information and producing and communicating information.

### **5.3.2 Development of training manual and facilitation process**

From the identified training needs, it will be important to develop training manuals at the appropriate NQF level for farmers. Appropriate trainers will be identified from the list accredited by SAQA. The identified training need will constitute the areas for a training manual to be developed. In terms of the specifications, the manual will be tailor-made to the Level Descriptors, to describe applied competencies across each of the ten levels of the NQF: scope of knowledge, knowledge literacy, method and procedure, problem-solving, ethics and professional practice, accessing, processing and managing information and producing and communicating information.



### **5.3.3 Existing skills and training needs in North West Province**

#### ***5.3.3.1 Smallholder farmer's competency skills and training needs***

Table 5.2 shows competency skills and training needs among farmers. In relation to the prevailing/common agricultural enterprises among irrigation farmers, from a list of competencies in relation to agricultural enterprises of smallholder irrigation farmers who were asked to rate their competency levels on each of the skills for the identified enterprises. From 22 listed skills farmers were highly competent in soil preparation for ploughing, determining intra-row spacing and ability to determine seed depth (97%). From the results, about 66.7% of the farmers indicated that they still lack skills and knowledge of negotiating for market contracts, while 63.6% of the farmers indicated that one of their major constraints is their low literacy level, which disadvantages them in reading and interpreting market information.

While training opportunities may be available, they are often not appropriate for all farmers. Ngemtu (2010) noted that in the Eastern Cape, although farmers know about the training services that are normally offered by extension workers, not all of them attend these sessions and group meetings. Some farmers say that they cannot attend workshops because they are held far from their homes. It is thus important to find strategic areas to hold workshops, in order to accommodate all farmers. Some farmers indicated that they did not attend workshops because they are old, have knowledge on farming and are not willing to learn new things, while others indicated that they depend only on extension workers for training and skills development.

#### **5.3.4 Women skills capacity and training needs**

Table 5.2 indicates women farmers' skills competency. Based on the enterprises found on the irrigation scheme, a scale was developed to measure their competence in skills related to these enterprises. Table 5.2 indicates 23 competency skills and women were found to be competent in only four areas. These are: soil preparation for ploughing (51.6%), knowledge of crop rotation (55.2%), irrigation scheduling and frequency (54%) and knowledge on the amount of water to use (52.8%). Collet and Gale (2009) stated that the skills to improve productivity, increase adaptability to deal with changes and crisis and facilitate the diversification of livelihood to manage risks are at a premium in rural areas. Competence of women in agricultural production and marketing skills are very low, ranging from 1.2% to 8.4%. Integrating agricultural training with enterprise training can help women to manage and market their farm production more effectively, to take advantage of new agricultural opportunities. The implication of the low competence in the listed activities related to the enterprises in irrigation farming indicated areas for training needs.

**Table 5.2:** Needs assessment and existing skills among male and female farmers in irrigation farming

Skills	Gender (Male n = 66; Female n = 84)	Not Competent	Competent	Very Competent	Competency	Training needs	SAQA level	Training Provider
Soil preparation for ploughing	Male	2 (3.0)	64 (97.0)	0 (0)	C	NN	1	NWU, FSG, AT
	Female	36 (43.2)	43 (51.6)	4 (4.8)	C	NN	1	NWU, FSG, AT
Determine inter and intra row spacing	Male	2 (3.0)	64 (97.0)	0 (0)	C	NN	1	NWU, FSG, AT
	Female	37 (44.4)	41 (49.2)	5 (6.0)	NC	N	1	NWU, FSG, AT
Determine seeds depth	Male	2 (3.0)	64 (97.0)	0 (0)	C	NN	1	NWU, FSG, AT
	Female	39 (46.8)	40 (48.0)	4 (4.8)	NC	N	1	NWU, FSG, AT
Selecting appropriate planting methods for various crops	Male	8 (12.1)	58(87.9)	0 (0)	C	NN	1	NWU, FSG, AT
	Female	39 (46.8)	39 (46.8)	5 (6.0)	NC	N	1	NWU, FSG, AT
Evaluating farming land for soil and water conservation	Male	23 (34.8)	42 (63.6)	1 (1.5)	C	NN	1	NWU, FSG, AT
	Female	45 (54.0)	36 (43.2)	1 (1.2)	NC	N	1	NWU, FSG, AT
Recommending suitable soil and water conservation measures for specific farm lands	Male	4 (6.1)	62 (93.9)	0 (0)	C	NN	1	NWU, FSG, AT
	Female	48 (57.6)	32 (38.4)	3 (3.6)	NC	N	1	NWU, FSG, AT
Knowledge of crop rotation	Male	4 (6.1)	62 (93.9)	0 (0)	C	NN	1	NWU, FSG, AT
	Female	34 (40.8)	46 (55.2)	3 (3.6)	C	NN	1	NWU, FSG, AT
Calculating the amount of fertilizer to apply for various crops	Male	21 (31.8)	45 (68.2)		NC	N	1	NWU, FSG, AT
	Female	52 (62.4)	30 (36.0)	1 (1.2)	NC	N	1	NWU, FSG, AT
Appropriate application of herbicide and fungicide	Male	11 (16.7)	47 (71.2)	8 (12.1)	C	NN	1	NWU, FSG, AT
	Female	52 (62.4)	29 (34.8)	2 (2.4)	NC	N	1	NWU, FSG, AT
Calibrating planters and seeders for various crops	Male	10 (15.1)	44 (66.7)	12 (18.2)	NC	N	2	NWU, FSG, AT
	Female	55 (66.0)	25 (30.0)	3 (3.6)	NC	N	2	NWU, FSG, AT
Planning and carrying out harvesting appropriately for various crops	Male	9 (13.6)	53 (80.3)	4 (6.1)	C	NN	1	NWU, FSG, AT
	Female	49 (58.8)	31 (37.2)	3 (3.6)	NC	N	1	NWU, FSG, AT
Irrigation scheduling and frequency	Male	9 (13.6)	49 (74.2)	8 (12.1)	C	NN	1	NWU, FSG, AT
	Female	35 (42.0)	45 (54.0)	3 (3.6)	C	NN	1	NWU, FSG, AT
Knowledge on the amount of water to use	Male	6 (7.6)	52 (78.8)	9 (13.6)	C	NN	1	NWU, FSG, AT
	Female	32 (38.4)	44 (52.8)	7 (8.4)	C	NN	1	NWU, FSG, AT
Knowledge of the market for your	Male	9 (13.6)	48 (72.7)	9 (13.6)	C	NN	1	NWU, FSG, AT

Skills	Gender (Male n = 66; Female n = 84)	Not Competent	Competent	Very Competent	Competency	Training needs	SAQA level	Training Provider
produce	Female	57 (68.4)	24 (28.8)	2 (2.4)	NC	N	1	NWU, FSG, AT
Price determination for your produce	Male	12 (18.2)	38 (57.6)	16 (24.2)	NC	N	1	NWU, FSG, AT
Knowledge of reading and interpreting market information	Female	49 (58.8)	33 (39.6)	1 (1.2)	NC	N	1	NWU, FSG, AT
	Male	42 (63.6)	13 (19.7)	11 (16.7)	NC	N	1	NWU, FSG, AT
Knowledge of the marketing contracts	Female	64 (76.8)	17 (20.4)	2 (2.4)	NC	N	1	NWU, FSG, AT
	Male	44 (66.7)	22 (33.3)	0 (0)	NC	N	1	NWU, FSG, AT
Value adding	Female	67 (80.4)	16 (19.2)	0 (0)	NC	N	1	NWU, FSG, AT
	Male	16 (24.2)	36 (54.5)	14 (21.2)	NC	N	2	NWU, FSG, AT
Service provider for storage facilities	Female	65 (78.0)	17 (20.4)	1 (1.2)	NC	N	2	NWU, FSG, AT
	Male	16 (24.2)	50 (75.8)	0 (0)	C	NN	4	NWU, FSG, AT
Farm record-keeping	Female	56 (67.2)	23 (27.6)	4 (4.8)	NC	N	4	NWU, FSG, AT
	Male	20 (30.3)	46 (69.7)	0 (0)	NC	N	1	NWU, FSG, AT
Financial management	Female	49 (58.8)	39 (46.8)	4 (4.8)	NC	N	1	NWU, FSG, AT
	Male	17 (25.7)	49 (74.2)	0 (0)	NC	N	1	NWU, FSG, AT
Packaging	Female	49 (58.8)	30 (36.0)	4 (4.8)	NC	N	1	NWU, FSG, AT
	Male	20 (30.3)	46(69.7)	0 (0)	NC	N	4	NWU, FSG, AT
	Female	47 (56.4)	34 (40.8)	2 (2.4)	NC	N	4	NWU, FSG, AT

\*Figures in parentheses are percentages. N – need, NN – not a need, NC – not a need. NWU – North-West University Short Course programme, FSG – Farmers’ Support Group, AT – Accredited trainers to be identified.

### 5.3.5 Appropriate agricultural skills among sampled women in KwaZulu-Natal

This section presents the findings and discussions on the agricultural skills (farming and non-farming) among sampled primary female head-of-households. Firstly, the existing skills that were identified amongst women in the selected study sites are presented. A discussion on the skills that would improve the lives of women in the current reality follows. The skills identified are linked to SAQA requirements for future mainstreaming of training. Organisations that can facilitate and train were identified. Lastly, a report on a facilitation process of skills training, in cases where training material and trainers are available to render the training at the selected study sites, is provided.

### 5.3.6 Skills existing amongst women in the selected study sites

Table 5.3 shows the distribution of sampled women according to their attendance of the various vocational skills training. Forty-three point one percent (43.1%) of the sampled women had attended vocational skills training. The majority of women (42.7%) had attended skills training in agricultural production. Very few women had attended training in business enterprise management (1.0%), craftwork (2.0%), construction (1.7%) and driving (0.7%).

**Table 5.3:** Percentage of primary female head-of-households who attended vocational skills training

Vocational skills training	Area			
	Mooi River %	Tugela %	Machunwini %	Overall %
Attendance of any training	46.8	64.1	29	43.1
<b>Training attended</b>				
Agriculture	44.9	66.7	29	<b>42.7</b>
Business enterprise	0	2.6	1	1.0
Craftwork	0.6	0	4	2.0
Construction	2.5	0	0	1.7
Driving	0.7	0	0	0.7

**Source:** November 2013 survey

### 5.3.7 Competences in different vocational skills

The majority of women (52.9%) indicated that their skills in crop production were good (Table 5.4). The highest percentage of those who were good in agricultural skills (62.5%) was from Tugela; 33.1% of the women in the study areas indicated that they had poor skills in animal production and they were also mainly from the Tugela Ferry Irrigation Scheme. This could have been so because these households resided in a high density area and hence faced limited grazing areas and animal production, practised to a lesser extent around the town of Tugela Ferry. Such farmers lack knowledge in animal husbandry (Table 5.4).

With regard to business management skills, the 41.2% of the sampled rural women in Msinga indicated that they have skills (Table 5.4). The second majority group of women indicated that they have very poor business management skills. A very small proportion of the women (5.1%) had excellent business management skills. Machunwini communal area had the highest number of people, with poor business management skills. This suggests that women in irrigated areas have better exposure to training in business management. Some of the women (35.2%) in the three study areas had very poor craftwork skills. The second highest proportion of women (23.2%) had poor craftwork skills, a slight improvement on the first group. Machunwini area had the highest number of women who had excellent skills in craftwork. This is possibly because agriculture was not a viable source of income or food in Machunwini, since they had no access to irrigation compared to the other two study areas. Thus, craftwork, whose skills are acquired locally, was a valuable livelihood strategy for diversifying incomes in Machunwini (Table 5.4).

A very small percentage of women (4.1%) indicated having excellent skills in construction (Table 5.4). The division of labour in the Zulu culture, where construction-related jobs are reserved for males, means that women cannot acquire the skills. The majority of women (51.7%) had poor construction skills. Surprisingly, the majority of sampled women also had poor hair dressing (68.0%), sewing (61.1%) and cooking (48.8%) skills, despite the fact that, culturally, these are considered feminine skills (Table 5.4). This suggests that the women were assessing their skills from a formal business point of view.

**Table 5.4:** Levels of competence in various vocational skills

Vocational skill	Percentage of farmers at given levels of competence				
	Very poor	Poor	Moderate	Good	Excellent
<b>Crop production</b>					
Mooi River	3.1	6.1	10.5	52.9	27.5
Tugela	0.0	2.5	5.0	<b>62.5</b>	30.0
Machunwini	2.0	3.0	13.0	56.0	26.0
Overall	3.1	6.1	10.5	<b>52.9</b>	27.5
<b>Animal production</b>					
Mooi River	23.9	33.1	24.6	12.3	6.1
Tugela	20.0	40.0	20.0	15.0	5.0
Machunwini	25.0	21.0	33.0	15.0	6.0
Overall	23.9	<b>33.1</b>	24.6	12.3	6.1
<b>Business management skills</b>					
Mooi River	37.4	41.2	11.6	4.8	5.1
Tugela	20.0	50.0	20.0	5.0	5.0
Machunwini	<b>59.0</b>	18.0	13.0	3.0	7.0
Overall	<b>37.4</b>	<b>41.2</b>	11.6	4.8	5.1
<b>Craftwork skills</b>					
Mooi River	35.2	23.2	13.0	14.3	14.3
Tugela	30.0	32.5	12.5	12.5	12.5
Machunwini	37.0	13.0	17.0	8.0	25.0
Overall	<b>35.2</b>	<b>23.2</b>	13.0	14.3	14.3
<b>Construction skills</b>					
Mooi River	51.7	24.5	11.9	7.8	4.1
Tugela	50.0	50.0	27.5	12.5	10.0
Machunwini	62.0	17.0	8.0%	3.0	10.0
Overall	51.7	24.5	11.9	7.8	4.1
<b>Hairdressing skills</b>					
Mooi River	68.0	18.4	7.5	3.1	3.1
Tugela	60.0	22.5	12.5	0	5.0
Machunwini	67.0	9.0	13.0	4.0	7.0
Overall	68.0	18.4	7.5	3.1	3.1
<b>Sewing</b>					
Mooi River	61.1	20.5	11.3	4.8	2.0
Tugela	60.0	27.5	5.0	2.5	5.0
Machunwini	60.0	13.0	17.0	8.0	2.0
Overall	61.1	20.8	11.3	4.8	2.0
<b>Cooking skills</b>					
Mooi River	48.8	12.3	20.1	8.9	9.9
Tugela	55.0	12.5	22.5	2.5	7.5
Machunwini	39.0	7.0	28.0	14.0	12.0
Overall	48.8	12.3	20.1	8.9	9.9

### 5.3.8 Agricultural skills training attended

Table 5.5 shows the agricultural skills training that the primary female head-of-households in Msinga had attended. The table shows that 36.5% of the women had attended training on crop production. Only 0.7% of the women had attended training in mushroom, pig, or poultry production (Table 5.5). There is an over-emphasis on crop production, at the expense of other agricultural skills that could be more appropriate for improving livelihoods.

**Table 5.5:** Percentage of primary female head-of-households who attended selected agricultural skills training

Specific training attended	Study area			
	Mooi River	Tugela	Machunwini	Overall
Mushroom production Yes	0.6	0	1.0	0.7
Pig production Yes	0.6	2.7	0.0	0.7
Poultry production	0.6	2.7	0	0.7
Crop production	41.7	45.9	25.0	36.5

### 5.3.9 Farmer competences in specific agricultural skills

#### 5.3.9.1 Crop management skills

Table 5.6 shows the skills levels that women have in crop production. The majority of sampled women had moderate to good skills in determining seed depth. The Tugela Ferry Irrigation Scheme had the highest percentage of women who were good at determining seed depth. None of the women had poor skills in determining seed depth in Tugela and Machunwini. Overall, a relatively high percentage (26.6%) of the women had excellent skills in determining seed depth (Table 5.6).

Some 47.8% of women also had good skills in selecting appropriate planting methods (Table 5.6). The Tugela Ferry Irrigation Scheme also had the highest percentage of women who were good in selecting appropriate planting methods. A significant proportion of the women (43.7%) indicated that they were good at determining plant spacing. The majority of people with good skills of determining plant spacing were from Tugela Ferry (57.5%).

The majority of women indicated that they had excellent water conservation skills (e.g. mulching). Although the highest percentage of women with good water conservation skills was from Tugela (46.2%), the highest percentage of women with excellent water conservation skills was from Machunwini (21.0%) (Table 7). Use of water conservation is more critical in Machunwini, where farming is rainfed.

**Table 5.6:** Farmer competences in crop management skills

Crop management skills	Percentage of women with level of competence				
	Very poor	Poor	Moderate	Good	Excellent
<i>Determining seed depth</i>					
Mooi River	3.2	7.0	22.9	39.5	27.4
Tugela	0	5.0	12.5	<b>57.5</b>	25.0
Machunwini	0	3.0	27.0	44.0	26.0
Overall	1.7	5.4	22.9	<b>43.4</b>	26.6
<i>Appropriate planting method</i>					
Mooi River	4.5	7.0	21.7	47.8	19.1
Tugela	0	2.5	22.5	<b>57.5</b>	17.5
Machunwini	2.0	3.0	23.0	44.0	28.0
Overall	3.0	5.1	22.2	<b>47.8</b>	21.9
<i>Determining plant spacing</i>					
Mooi River	1.3	6.5	32.3	45.2	14.8
Tugela	0	2.5	20.0	57.5	20.0
Machunwini	2.0	6.0	25.0	36.0	31.0
Overall	1.4	5.8	28.1	43.7	21.0
<i>Water conservation methods</i>					
Mooi River	9.1	13.6	27.9	39.6	9.7
Tugela	2.6	12.8	20.5	<b>46.2</b>	17.9
Machunwini	2.0	17.0	26.0	34.0	<b>21.0</b>
Overall	5.8	14.7	26.3	<b>38.6</b>	14.7
<i>Fertility management methods</i>					
Mooi River	6.4	17.2	29.9	39.5	7.0
Tugela	5.0	10.0	15.0	<b>52.5</b>	<b>17.5</b>
Machunwini	9.0	17.0	22.0	39.0	13.0
Overall	7.1	16.2	25.3	<b>41.1</b>	10.4
<i>Determining nutrient deficiency</i>					
Mooi River	3.8	13.5	35.9	38.5	8.3
Tugela	5.0	7.5	27.5	<b>40.0</b>	<b>20.0</b>
Machunwini	7.1	18.2	20.2	<b>40.4</b>	14.1
Overall	5.1	14.2	29.5	<b>39.3</b>	11.9

Overall, 41.1% of women indicated that they had good skills and knowledge of fertility management methods. The Tugela Ferry Irrigation Scheme had the highest percentage of women who answered good (52.5%); 17.5% had excellent knowledge of fertility management methods (Table 5.6).

Some 39.3% of women had good knowledge and skills of determining nutrient deficiency in plants (Table 5.6). However, the highest proportion of women with good skills of



determining nutrient deficiency in plants was from both Tugela (40.0%) and Machunwini (40.0%). However, the highest proportion of women with excellent skills of determining nutrient deficiency in plants was from Tugela (20.0%).

### 5.3.9.2 Weed and pest control techniques

According to Table 5.7, 26.7% of women had very poor knowledge and skills in herbicide and pesticide application and 36.7% had knowledge in the use of a knapsack sprayer. Women generally had a poor knowledge of herbicide and pesticide application. The highest proportion of women who had excellent knowledge of herbicide and pesticide application were from Tugela Ferry (17.5%). Likewise, the highest proportion of women (15.0%) had excellent skills in the use of knapsack sprayers were also from Tugela Ferry Irrigation Scheme. The extensive knowledge of pesticides and herbicide use in Tugela is probably due to the commercialization of crop production, which forces farmers to meet the expected quality standards on produce by large wholesale buyers and supermarkets.

**Table 5.7:** Farmer competences in specific agricultural skills

Weed & pest control techniques	Percentage of women with level of competence				
	Very poor	Poor	Moderate	Good	Excellent
<i>Herbicide/Pesticide application</i>					
Mooi River	26.3	21.2	26.9	19.2	6.4
Tugela	20.0	22.5	30.0	10.0	<b>17.5</b>
Machunwini	30.0	21.0	14.0	20.0	15.0
Overall	<b>26.7</b>	21.3	23.0	18.2	10.8
<i>Use of knapsack sprayer</i>					
Mooi River	33.8	22.7	22.7	16.2	4.5
Tugela	30.0	27.5	20.0	7.5	<b>15.0</b>
Machunwini	44.0	20.0	9.0	15.0	12.0
Overall	<b>36.7</b>	22.4	17.7	14.6	8.5

### 5.3.9.3 Post-harvesting techniques

For post-harvest techniques, 29.5% of women had good knowledge on appropriate harvesting for various crops. Machunwini dryland area had the highest proportion of people (30.3%) who had very poor skills in carrying out appropriate harvesting for various crops, while Tugela Ferry Irrigation Scheme had the highest proportion of people with excellent skills in planning and carrying out harvesting appropriately for various crops (15.0%) (Table 5.9). Some 31.1% of women indicated that they had good skills and knowledge of the different produce packaging methods. Machunwini had the largest proportion of women who had very poor knowledge of the various produce packaging methods, while Tugela Ferry Irrigation Scheme had the highest proportion of women who had excellent knowledge in produce packaging methods. Machunwini rain-fed area had the highest proportion of women (28.0%)

with poor knowledge of produce storage, while the highest proportion of women (12.5%) with excellent knowledge of produce storage were from Tugela Ferry Irrigation Scheme.

**Table 5.8:** Farmer competences in specific agricultural skills

Post-harvesting techniques	Percentage of women with level of competence				
	Very poor	Poor	Moderate	Good	Excellent
<i>Planning and carrying out harvesting appropriately for various crops</i>					
Mooi River	13.5	16.0	28.2	34.6	7.7
Tugela	17.5	25.0	17.5	25.0	<b>15.0</b>
Machunwini	<b>30.3</b>	26.3	8.1	23.2	12.1
Overall	19.7	20.7	20.0	<b>29.5</b>	10.2
<i>Produce packaging methods</i>					
Mooi River	10.9	18.6	25.6	35.3	9.6
Tugela	10.0	27.5	17.5	30.0	<b>15.0</b>
Machunwini	<b>30.0</b>	28.0	10.0	25.0	7.0
Overall	17.2	23.0	19.3	<b>31.1</b>	9.5
<i>Produce storage knowledge</i>					
Mooi River	12.3	26.6	22.7	28.6	9.7
Tugela	15.0	27.5	20.0	25.0	<b>12.5</b>
Machunwini	<b>28.0</b>	27.0	14.0	22.0	9.0
Overall	18.0	26.9	19.4	25.9	9.9

**Source:** November 2013 survey

#### 5.3.9.4 Farm financial management skills

According to Table 5.9, the sampled women, in general, had poor farm financial skills. The majority of women (61.5%) indicated that they had very poor skills in record-keeping, financial management (58.5%), price determination (47.5%), marketing contracts (66.8%) and knowledge of product markets (53.9%). The highest proportion of women with very poor skills in these areas of farm financial management were among those from Machunwini. Women from the same area of Machunwini area exhibited lower levels of formal education, literacy and numeracy levels.

**Table 5.9:** Farmer competences in specific agricultural skills

Farm management skills	Percentage of women with level of competence				
	Very poor	Poor	Moderate	Good	Excellent
<b><i>Record-keeping</i></b>					
Mooi River	52.6	32.1	8.3	3.8	3.2
Tugela	55.0	35.0	2.5	5.0	2.5
Machunwini	<b>78.0</b>	9.0	5.0	7.0	1.0
Overall	<b>61.5</b>	24.7	6.4	5.1	2.4
<b><i>Financial management skills</i></b>					
Mooi River	46.8	37.8	9.0	2.6	3.8
Tugela	50.0	42.1	5.3	0	2.6
Machunwini	<b>80.0</b>	9.0	8.0	2.0	1.0
Overall	<b>58.5</b>	28.6	8.2	2.0	2.7
<b><i>Knowledge of marketing contracts</i></b>					
Mooi River	60.3	26.9	7.7	1.9	3.2
Tugela	61.5	25.6	7.7	0	5.1
Machunwini	<b>79.0</b>	11.0	8.0	1.0	1.0
Overall	<b>66.8</b>	21.4	7.8	1.4	2.7
<b><i>Price determination skills</i></b>					
Mooi River	39.1	23.7	16.0	11.5	9.6
Tugela	42.5	25.0	7.5	17.5	7.5
Machunwini	<b>62.6</b>	17.2	4.0	13.1	3.0
Overall	<b>47.5</b>	21.7	10.8	12.9	7.1
<b><i>Knowledge of product markets</i></b>					
Mooi River	45.2	25.2	18.7	6.5	4.5
Tugela	40.0	27.5	15.0	10.0	7.5
Machunwini	<b>73.0</b>	16.0	4.0	6.0	1.0
Overall	<b>53.9</b>	22.4	13.2	6.8	3.7

### 5.3.9.5 Animal husbandry skills

Table 5.10 shows that women in the study areas generally had lower levels of animal husbandry skills. Farmers with very poor knowledge of animal health constituted 33.8%, poor knowledge of animal nutrition made up 35.0%. Farmers with very poor knowledge of animal welfare requirements and meat processing skills comprised 50.8% and 75.8%, respectively. Machunwini, the rain-fed area, had the highest proportion of women with very poor animal husbandry skills.

**Table 5.10:** Farmer competences in specific animal husbandry skills

Animal husbandry skills	Percentage of women with level of competence				
	Very poor	Poor	Moderate	Good	Excellent
<b><i>Knowledge of animal health</i></b>					
Mooi River	33.3	35.3	18.6	10.3	2.6
Tugela	32.5	30.0	20.0	12.5	5.0
Machunwini	<b>35.1</b>	22.3	18.1	16.0	8.5
Overall	<b>33.8</b>	30.3	18.6	12.4	4.8
<b><i>Knowledge of animal nutrition</i></b>					
Mooi River	29.3	38.2	18.5	11.5	2.5
Tugela	32.5	30.0	15.0	17.5	5.0
Machunwini	38.0	32.0	15.0	9.0	6.0
Overall	<b>32.7</b>	<b>35.0</b>	16.8	11.4	4.0
<b><i>Knowledge of animal welfare requirements</i></b>					
Mooi River	44.6	32.5	14.6	5.1	3.2
Tugela	55.0	22.5	12.5	7.5	2.5
Machunwini	<b>59.0</b>	15.0	17.0	4.0	5.0
Overall	<b>50.8</b>	25.3	15.2	5.1	3.7
<b><i>Meat processing skills</i></b>					
Mooi River	75.2	21.7	1.9	0.6	0.6
Tugela	75.0	22.5	0	0	2.5
Machunwini	<b>77.0</b>	17.0	4.0	1.0	1.0
Overall	<b>75.8</b>	20.2	2.4	0.7	1.0
<b><i>Access to extension</i></b>					
Mooi River	64.8	18.1	15.2	1.0	1.0
Tugela	46.9	28.1	25.0	0	0
Machunwini	<b>92.1</b>	5.6	2.2	0	0
Overall	<b>73.0</b>	14.6	11.5	0.4	0.4

### 5.3.9.6 Business management skills

Analysis of women's business management skills indicate that the majority of sampled women in the study communities had very poor levels of numeracy (34.7%), literacy level (49.8%), operations management skills (55.3%), financial knowledge (47.6%) and marketing skills (61.8%). The largest proportion of women with very poor skills in these business management skills were from Machunwini (Table 5.11).

**Table 5.11:** Farmer competences in specific business management skills

Business management skills	Percentage of women with level of competence				
	Very poor	Poor	Moderate	Good	Excellent
<b>Numeracy</b>					
Mooi River	24.0	32.0	22.7	11.3	10.0
Tugela	36.4	21.2	18.2	6.1	18.2
Machunwini	<b>51.6</b>	12.1	9.9	8.8	17.6
Overall	<b>34.7</b>	24.1	17.9	9.9	13.5
<b>Literacy level</b>					
Mooi River	42.0	33.3	12.0	5.3	7.3
Tugela	50.0	18.8	12.5	6.3	12.5
Machunwini	<b>62.6</b>	11.0	5.5	9.9	11.0
Overall	<b>49.8</b>	24.2	9.9	7.0	9.2
<b>Operations management skills level</b>					
Mooi River	50.0	28.0	14.7	3.3	4.0
Tugela	40.6	31.3	18.8	0	9.4
Machunwini	<b>69.2</b>	11.0	9.9	2.2	7.7
Overall	<b>55.3</b>	22.7	13.6	2.6	5.9
<b>Financial knowledge</b>					
Mooi River	42.7	32.7	16.7	4.0	4.0
Tugela	40.6	28.1	12.5	0	18.8
Machunwini	<b>58.2</b>	11.0	15.4	2.2	13.2
Overall	<b>47.6</b>	24.9	15.8	2.9	8.8
<b>Marketing skills</b>					
Mooi River	52.7	32.7	9.3	2.7	2.7
Tugela	53.1	25.0	9.4	0	12.5
Machunwini	<b>80.0</b>	8.9	4.4	1.1	5.6
Overall	<b>61.8</b>	23.9	7.7	1.8	4.8

### 5.3.9.7 SAQA ratings of the identified farm and non-farm skills

Tables 5.12 to 5.15 show the proposed National Qualification Framework (NQF) ratings of the identified farm and non-farm skills identified among the women in the three study areas of Msinga. Most of the identified agricultural skills were NQF level 01, according to SAQA ratings (Table 5.12).

Most of the animal husbandry as well as the farm financial management skills that the women in the study areas possessed were all NFQ level 1 and all had a maximum number of credits below 10 (Table 13).

**Table 5.12:** SAQA ratings of the identified crop production skills among sampled women

Skills	Percentage of women with level of competence					SAQA	Competence	Facilitating organisation	Training organisations
	Very poor	Poor	Moderate	Good	Excellent				
<b>Crop management skills</b>									
<i>Determining seed depth</i>	1.7	5.4	22.9	43.4	26.6	NQF Level 01	C	UKZN	Cedara
<i>Appropriate planting method</i>	3.0	5.1	22.2	47.8	21.9	NQF Level 01	C		
<i>Determining plant spacing</i>	1.4	5.8	28.1	43.7	21.0	NQF Level 01	C		
<i>Water conservation methods</i>	5.8	14.7	26.3	38.6	14.7	NQF Level 01	C		
<i>Fertility management methods</i>	7.1	16.2	25.3	41.1	10.4	NQF Level 01	C		
<i>Determining nutrient deficiency</i>	5.1	14.2	29.5	39.3	11.9	NQF Level 01	C		
<b>Weed and pest control techniques</b>									
<i>Herbicide/pesticide application</i>	26.7	21.3	23.0	18.2	10.8	NQF Level 01	NC	UKZN	Cedara
<i>Use of knapsack sprayer</i>	36.7	22.4	17.7	14.6	8.5	NQF Level 01	NC		
<b>Post-harvesting techniques</b>									
<i>Planning and carrying out harvesting appropriately for various crops</i>	19.8	20.7	20.0	29.5	10.2	NQF Level 01	NC	FSG	Cedara
<i>Produce packaging methods</i>	17.2	23.0	19.3	31.1	9.5	NQF Level 04	NC	FSG	
<i>Produce storage knowledge</i>	18.0	26.9	19.4	25.9	9.9	NQF Level 04	NC	FSG	
<i>Apply grain storage hygiene</i>	-	-	-	-	-	NQF Level 02	NC	FSG	
<i>Apply basic safety principles in the context of conservation</i>	-	-	-	-	-	NQF Level 01	NC	FSG	

**Source:** November 2013 survey

**NB:** C means competent; NC means not-competent; FSG means Farmer Support Group

**Table 5.13:** SAQA ratings of the identified animal husbandry and farm financial management skills among sampled women

SKILLS	Percentage of women with competence					SAQA NQF Level	Competence	Proposed facilitators	Suggested training organisations
	Very poor	Poor	Moderate	Good	Excellent				
<b>Pig production</b>									
<i>Knowledge of animal health</i>	33.8	30.3	18.6	<b>12.4</b>	<b>4.8</b>	01	NC	UKZN	Cedara
<i>Knowledge of animal nutrition</i>	32.7	35.0	16.8	<b>11.4</b>	<b>4.0</b>	01	NC		
<i>Knowledge of animal welfare requirements</i>	50.8	25.3	15.2	<b>5.1</b>	<b>3.7</b>	01	NC		
<i>Meat processing skills</i>	75.8	20.2	2.4	<b>0.7</b>	<b>1.0</b>	01	NC		
<b>Poultry production</b>									
<i>Knowledge of poultry health</i>	33.8	30.3	18.6	<b>12.4</b>	<b>4.8</b>	01	NC	UKZN	Cedara
<i>Knowledge of poultry nutrition</i>	32.7	35.0	16.8	<b>11.4</b>	<b>4.0</b>	01	NC		
<i>Knowledge of poultry welfare requirements</i>	50.8	25.3	15.2	<b>5.1</b>	<b>3.7</b>	01	NC		
<i>Chicken processing skills</i>	75.8	20.2	2.4	<b>0.7</b>	<b>1.0</b>	01	NC		
<b>Farm financial management skills</b>									
<i>Record keeping</i>	61.5	24.7	6.4	<b>5.1</b>	<b>2.4</b>	01	NC	UKZN	Cedara
<i>Financial management skills</i>	58.5	28.6	8.2	<b>2.0</b>	<b>2.7</b>	01	NC		
<i>Knowledge of marketing contracts</i>	66.8	21.4	7.8	<b>1.4</b>	<b>2.7</b>	01	NC		
<i>Price determination skills</i>	47.5	21.7	10.8	<b>12.9</b>	<b>7.1</b>	01	NC		
<i>Knowledge of product markets</i>	53.9	22.4	13.2	<b>6.8</b>	<b>3.7</b>	01	NC		
<b>Mushroom production</b>									
<i>Preparations for mushroom production</i>	100	0	0	0	0	01	NC	UKZN	Cedara
<i>Mushroom management skills</i>	100	0	0	0	0	01	NC		
<i>Mushroom harvesting techniques</i>	100	0	0	0	0	01	NC		
<i>Mushroom storage techniques</i>	100	0	0	0	0	01	NC		

An analysis of the SAQA rating of the non-farm skills that were identified among the sampled women showed that the skills with the highest rating were construction, salon skills and sewing skills, which were NQF Level 03, 04 and 03, respectively (Table 5.14).

**Table 5.14:** SAQA ratings of the non-farm skills among sampled women

Skills	Percentage of women with competence					SAQA NQF Level	Competence	Suggested facilitating organisations	Suggested training organisations
	Very poor	Poor	Moderate	Good	Excellent				
<b>Business management skills</b>								UKZN	Cedara
Numeracy	37.4	41.2	11.6	<b>4.8</b>	<b>5.1</b>				
Literacy level	34.7	24.1	17.9	<b>9.9</b>	<b>13.5</b>	01	NC		
Operations management skills level	49.8	24.2	9.9	<b>7.0</b>	<b>9.2</b>	01	NC		
Financial knowledge	55.3	22.7	13.6	<b>2.6</b>	<b>5.9</b>	01	NC		
Marketing skills	47.6	24.9	15.8	<b>2.9</b>	<b>8.8</b>	01	NC		
Craftwork	61.8	23.9	7.7	<b>1.8</b>	<b>4.8</b>	01	NC	UKZN	N/A
Construction skills	35.2	23.2	13.0	<b>14.3</b>	<b>14.3</b>		NC		N/A
Saloon skills	51.7	24.5	11.9	<b>7.8</b>	<b>4.1</b>	03	NC		FET College
Sewing skills	68.0	18.4	7.5	<b>3.1</b>	<b>3.1</b>	04	NC		
Cooking skills	61.1	20.8	11.3	<b>4.8</b>	<b>2.0</b>	03	NC		
	48.8	12.3	20.1	<b>8.9</b>	<b>9.9</b>	01	NC		

**Source:** November 2013 survey

**NB:** C means competent; NC means not-competent; UKZN means University of KwaZulu-Natal

### 5.3.10 Suitable facilitating and training organizations

This section presents the findings of the three FGDs that were conducted in the study areas to verify the findings of the main study and allow the women to rate their training needs in order of importance. The training that will be facilitated and provided to the women in the study areas is based on the training needs from these FGDs. The exercise showed that there are area-specific differences in the importance attached to various skills that women require. Tables 5.12 to 5.14 show the list of identified organizations that can facilitate and train rural women in the identified skills.



### 5.3.10.1 Training needs and the organisations offering the services

Table 5.15 shows some of the crop production training needs of women in Msinga. Farmers in all three study sites indicated that they needed assistance with determining seed depth (nursery production). In Tugela Ferry, women also wanted to be educated on water conservation methods, as part of a solution to the water shortages they were experiencing. In Tugela Ferry and the lower blocks of Mooi River, farmers indicated that they want training on identifying nutrient deficiencies in crops. This could be covered together with soil fertility management.

**Table 5.15:** Suitable organisations to facilitate and train crop production skills among sampled women

Sub-dimension	Specific skill	Mooi River upper blocks	Mooi River upper blocks	Tugela Ferry	Organisation providing training previously in area
Crop management skills	Determining seed depth	I	I	I	None
	Appropriate planting method	NI	NI	NI	Extension officers
	Determining plant spacing	NI	NI	NI	Pannar Seeds
	Water conservation methods	NI	NI	I	None
	Fertility management methods	NI	NI	NI	Extension officers
	Determining nutrient deficiency	I	NI	I	Extension officers
Weed and pest control techniques	Herbicide/pesticide application	I	I	I	None
	Use of knapsack sprayer	I	I	I	Extension officers
Post harvesting techniques	Planning and carrying out harvesting appropriately for various crops	NI	NI	I	Extension officers
	Produce packaging methods	NI	NI	NI	None
	Produce storage knowledge	NI	NI	NI	None
	Apply grain storage hygiene	NI	NI	NI	None
	Apply basic safety principles in the context of conservation	NI	NI	NI	None
Weed and pest control techniques	Herbicide/pesticide application	NI	NI	NI	None
	Use of snapsack sprayer	NI	NI	NI	None

**NB:** NI means not interested and I mean interest in that skill

There was a consensus among the women in the three areas with regards to the need for training in weed management and pest control techniques. All groups of farmers agreed that they needed some training on herbicide and pesticide application, as well as on use of knapsack sprayers. However, only women from Tugela Ferry indicated that they would be interested in being trained on post-harvesting techniques to minimize losses. They wanted training on value addition for their produce and on how to avoid post-harvesting losses.

**Table 5.16:** Suitable organisations to facilitate and train crop production skills among sampled women

<b>Sub-dimension</b>	<b>Specific skill</b>	<b>Mooi River upper blocks</b>	<b>Mooi River Lower blocks</b>	<b>Tugela Ferry</b>
Pig production	Knowledge of animal health	NI	NI	NI
	Knowledge of animal nutrition	NI	NI	NI
	Knowledge of animal welfare requirements	NI	NI	NI
	Meat processing skills	NI	NI	NI
Poultry production	Knowledge of poultry health	I	I	I
	Knowledge of poultry nutrition	I	I	I
	Knowledge of poultry welfare requirements	I	I	NI
	Chicken processing skills	NI	NI	NI
Mushroom production	Preparations for mushroom production	NI	NI	NI
	Mushroom management skills	NI	NI	NI
	Mushroom harvesting techniques	NI	NI	NI
	Mushroom storage techniques	NI	NI	NI
Farm financial management skills	Record-keeping	I	I	I
	Financial management skills	I	NI	I
	Knowledge of marketing contracts	NI	I	I
	Price determination skills	NI	NI	I
	Knowledge of product markets	NI	NI	I

**NB:** NI means not interested and I mean interested that skill

Table 5.16 shows the animal and mushroom production training needs of women in the three main study areas of Msinga. There is no interest in pig and mushroom production. The majority of people in the study areas do not consume pork. As a result, producing pork might have problems of lack of markets. Mushroom production in the rural areas of Msinga is unheard of. There are no success stories in the area which the women can emulate in mushroom production, despite the fact that several training sessions have been conducted in the area. Women in the three study areas are interested in poultry production. However, the women are not interested in learning poultry processing skills, beyond stating that their knowledge was adequate.

Another area where women needed skills training was in farm financial skills management (Table 5.17). Women in the three areas would like to receive training in farm record-keeping, farm financial management and knowledge of marketing products. Due to the greater practice of commercial farming in Tugela Ferry than in Mooi River, the women farming in the former were much more interested in receiving training on farm management skills than those from the latter.

For off-farm business skills, women in Tugela Ferry were much more interested in receiving some education to improve their numeracy and literacy levels. Women in the three areas are interested in receiving training in financial management. They indicated how such training can help them save money and to budget for the following agricultural season. Although most authors have indicated how unimportant some feminine-centred vocational skills (e.g. sewing and cooking) are in bringing women into the mainstream of the economy, women in Tugela Ferry indicated their desire to gain cooking and sewing skills for their day-to-day family domestic duties.

**Table 5.17:** Suitable organisations to facilitate and train crop production skills among sampled women

Sub-dimension	Mooi River upper blocks	Mooi River upper blocks	Tugela Ferry
<b>Business management skills</b>			
Numeracy	NI	NI	I
Literacy level	NI	NI	I
Operations management skills levels	NI	NI	NI
Financial knowledge	I	I	I
Marketing skills	NI	I	I
Craftwork	I	NI	NI
Construction skills	NI	NI	NI
Saloon skills	NI	NI	NI
Sewing skills	NI	NI	I
Cooking	NI	NI	I

**NB:** NI means not interested and I mean interested in that skill

### 5.3.11 Women's rating of the most important training needs

Table 5.18 shows the most important areas in which women in the study communities require training. These were ranked from the most important to the least important, according to each area. Cedara College of Agriculture and its associated FET Colleges were identified as possible training institutions for the courses. The list of all the possible areas women can be trained was compiled using training modules from Msunduzi FET, Cedara College of Agriculture and Wanyuka Training Consultants. Women were also asked to indicate any other areas needing training during focus group discussions in order to complete the list.

**Table 5.18:** Most important areas in which women require training

<b>Mooi River upper blocks</b>	<b>Mooi River lower blocks</b>	<b>Tugela Ferry</b>
1. Determining nutrient deficiency	i. Determining seed depth	1. Cooking/processing
2. Chicken/poultry production	ii. Poultry production	2. Crop protection (pests and diseases)
	iii. Sewing	3. Produce packaging; Post-harvesting techniques
	iv. Cooking	4. Financial management
		5. Pricing; finding markets; negotiating skills

### **5.3.12 Progress on facilitating the process of skills training in KZN**

The project team has approached and reached an agreement with the Cedara College of Agriculture, which indicated that it would train the women in the selected study sites in a variety of skills. The identified training institution is highly regarded, as it already has training materials and the qualified trainers. The College has the training modules already rated according to SAQA NQF levels. Cedara prefers to give whole courses according to its training modules, rather than focussing on specific topics which are part of a module. For example, the module on entrepreneurship is supposed to address the women's training needs on financial skills and pricing of produce. Similarly, the course on nursery management will cover how to determine seed planting depth and soil nutrient deficiency. Crop protection will be covered under the module called crop production and cover a few crops that are mainly grown in the study areas, namely green maize, tomatoes, potatoes and cabbage, which were selected for the purposes of the training.

To allow Cedara to provide the training, UKZN agreed to facilitate the process. This will entail development of a list of the people who will attend the training and submitting these to the College. The list of names will include their demographic information, such as age, gender, marital status and levels of education. The College indicated that the women will be trained in groups of about 25-30, which they consider an ideal size. The training was conducted early in 2015. Before the training, the project team made an arrangement for the trainers Cedara Agricultural College to visit the women groups to assess, first hand, the women's skills levels. During training, UKZN provided the venues, transport to carry the people to the training areas and meals. The training institution provided the training material and the trainers. A list of the training modules covered to meet the training needs of the farmers are shown in Table 5.19. Cedara undertook to arrange for FET colleges to conduct training in cookery and sewing.

**Table 5.19:** Modules provided by the training institutions covering women’s training needs

<b>Modules</b>	<b>Area needing training</b>	<b>Institution</b>
Nursery Management	<ul style="list-style-type: none"> <li>• Determining nutrient deficiency</li> <li>• Determining seed depth</li> </ul>	Cedara College
Crop production	<ul style="list-style-type: none"> <li>• Management of certain crops, e.g. green maize, potatoes</li> <li>• Crop protection</li> <li>• Herbicide/pesticide application</li> <li>• Use of knapsack sprayer</li> </ul>	
Chicken/poultry production	<ul style="list-style-type: none"> <li>• Knowledge of poultry health</li> <li>• Knowledge of poultry nutrition</li> <li>• Knowledge of poultry welfare requirements</li> <li>• Chicken processing skills</li> </ul>	
Post-harvesting techniques	<ul style="list-style-type: none"> <li>• Planning and carrying out harvesting appropriately for various crops</li> <li>• Produce packaging methods</li> <li>• Produce storage knowledge</li> <li>• Apply grain storage hygiene</li> </ul>	
Entrepreneurship	<ul style="list-style-type: none"> <li>• Pricing; finding markets and negotiating skills</li> <li>• Financial management</li> </ul>	
Sewing Cooking	<ul style="list-style-type: none"> <li>• Sewing</li> <li>• Cooking</li> </ul>	FET College

### 5.3.13 Progress on facilitating the process of skills training in North West

In North West province a focus group discussion was organised with men and women separately on irrigation farming around Taung, at a central location. The results of the competence on the skills of activities identified among women on various agricultural enterprises were presented and the areas of low competence were listed as those requiring training. The list of skills was sieved, with the level of competence indicated by the majority of the women.

From the identified list of skills requiring training, women were asked to rank them in order of priority for the training to take place. Table 5.20 presents the results of the ranking. It is important to know that irrigation water scheduling was reintroduced as an area requiring training. The trend of the ranking was unanimous for men and women, though in separate meetings. It should be noted that skills with bold-faced ranking were suggested to go jointly with the non-bold face rankings, due to the relatedness of the issues and the one serving as a prerequisite to the other.

Financial management and farm record-keeping was identified as the most prominent training need among the farmers. This was followed by knowledge of the marketing contracts, packaging and knowledge of reading and interpreting market information. It is evident from the sequence of the ranking of training needs by the farmers that skills related to farm management and marketing are highly required by the farmers.

Trainers identified providing training to the farmers on the skills listed above at the appropriate NQF level, including short courses by the School of Agricultural Sciences of North-West University Short Course Programme, Farmers' Support Group and Kgora Farmers' Training Centre, which is a Provincial Department of Agriculture training centre for farmers.

#### 5.4 Summary and conclusions

This study was motivated by the fact that women make up the majority of the smallholder agricultural sector in South Africa; yet their productivity is constrained by a lack of appropriate skills training. Based on a needs assessment, this study specifies the appropriate agricultural (farming and non-farming skills) of women in rural areas of Msinga, KwaZulu-Natal. It established the existing, as well as other relevant skills that can make a difference to the lives of women in the selected study sites under the Msinga Local Municipality.

**Table 5.20:** Prioritization of training needs among irrigation farmers

Skills	Gender (Male n = 66) (Female n = 84)	Training needs	SAQA level	Ranking	Training provider
Determine inter and intra row spacing	Male	NN	1	13 <sup>th</sup>	NWU, FSG, AT
	Female	N	1	13 <sup>th</sup>	NWU, FSG, AT
Determine seeds depth	Male	NN	1	13 <sup>th</sup>	NWU, FSG, AT
	Female	N	1	13 <sup>th</sup>	NWU, FSG, AT
Selecting appropriate planting methods for various crops	Male	NN	1	13 <sup>th</sup>	NWU, FSG, AT
	Female	N	1	13 <sup>th</sup>	NWU, FSG, AT
Evaluating farming land for soil and water conservation	Male	NN	1	14 <sup>th</sup>	NWU, FSG, AT
	Female	N	1	14 <sup>th</sup>	NWU, FSG, AT
Recommending suitable soil and water conservation measures for specific farm lands	Male	NN	1	14 <sup>th</sup>	NWU, FSG, AT
	Female	N	1	14 <sup>th</sup>	NWU, FSG, AT
Calculating the amount of fertilizer to apply for various crops	Male	N	1	11 <sup>th</sup>	NWU, FSG, AT
	Female	N	1	11 <sup>th</sup>	NWU, FSG, AT
Appropriate application of herbicide and fungicide	Male	NN	1	11 <sup>th</sup>	NWU, FSG, AT
	Female	N	1	11 <sup>th</sup>	NWU, FSG, AT
Calibrating planters and seeders for various crops	Male	N	2	12 <sup>th</sup>	NWU, FSG, AT
	Female	N	2	12 <sup>th</sup>	NWU, FSG, AT
Planning and carrying out harvesting appropriately for	Male	NN	1	15 <sup>th</sup>	NWU, FSG, AT
	Female	N	1	15 <sup>th</sup>	NWU, FSG, AT

Skills	Gender (Male n = 66) (Female n = 84)	Training needs	SAQA level	Ranking	Training provider
various crops					
Knowledge of the market for your produce	Male	NN	1	6 <sup>th</sup>	NWU, FSG, AT
	Female	N	1	6 <sup>th</sup>	NWU, FSG, AT
Price determination for your produce	Male	N	1	3 <sup>rd</sup>	NWU, FSG, AT
	Female	N	1	3 <sup>rd</sup>	NWU, FSG, AT
Knowledge of reading and interpreting market information	Male	N	1	5 <sup>th</sup>	NWU, FSG, AT
	Female	N	1	5 <sup>th</sup>	NWU, FSG, AT
Knowledge of the marketing contracts	Male	N	1	2 <sup>nd</sup>	NWU, FSG, AT
	Female	N	1	2 <sup>nd</sup>	NWU, FSG, AT
Value adding	Male	N	2	7 <sup>th</sup>	NWU, FSG, AT
	Female	N	2	7 <sup>th</sup>	NWU, FSG, AT
Service provider for storage facilities	Male	NN	4	8 <sup>th</sup>	NWU, FSG, AT
	Female	N	4	8 <sup>th</sup>	NWU, FSG, AT
Farm record-keeping	Male	N	1	1 <sup>st</sup>	NWU, FSG, AT
	Female	N	1	1 <sup>st</sup>	NWU, FSG, AT
Financial management	Male	N	1	1 <sup>st</sup>	NWU, FSG, AT
	Female	N	1	1 <sup>st</sup>	NWU, FSG, AT
Packaging	Male	N	4	4 <sup>th</sup>	NWU, FSG, AT
	Female	N	4	4 <sup>th</sup>	NWU, FSG, AT
Water scheduling	Male	N	4	10 <sup>th</sup>	NWU, FSG, AT
	Female	N	4	10 <sup>th</sup>	NWU, FSG, AT

\*. N – need, NN – not a need. NWU – North-West University Short Course programme, FSG – Farmers’ Support Group, AT – Accredited trainers to be identified.

It was found that rural women pursue multiple livelihood activities and have different levels of the different livelihood skills. In general, most women in the study areas have high levels of agricultural skills, but generally low levels of off-farm skills. In agriculture, the sampled women farmers were competent in determining seed depth, appropriate planting method, plant spacing, water conservation methods and fertility management methods, but they were incompetent in weed and pest control techniques. The sampled women farmers were incompetent in animal husbandry skills. They have poor knowledge of animal health, animal nutrition, animal welfare requirements and meat processing skills. The sampled women are very incompetent in farm management skills. They had little knowledge of farm record-keeping, farm financial management skills, marketing contracts, knowledge of product markets and had poor price determination skills. Mushroom production was identified as a relevant skill that could make a difference to the lives of women in the current situation. Lastly, in agriculture, women in rural Msinga would need more training in post-harvesting techniques, to increase profitability of their agricultural activities by preventing post-harvesting losses.

Rural women generally have low levels of off-farm skills. Their enterprise/business management skills are poor, because they have poor numeracy and literacy levels, operations management skills, financial knowledge and marketing skills. Because of the lack of economic opportunities in the Msinga rural areas, most women with vocational skills (e.g. saloon, cooking, and sewing) out-migrate to find opportunities elsewhere.

Focus group discussions that were done after the survey further supported the results of the study although women in different areas rated differently in their most important training needs. The project team had chosen Cedara College of Agriculture and its affiliated FET colleges to train women because the institution is one of the most reputable institution, with both material resources and qualified personnel to train the women in the selected areas in the identified areas of incompetence.

Considering that women in South African rural areas form part of the most disempowered section of society, investment in their agricultural and non-agricultural skills training is one effective strategy to improve their livelihoods. Lastly, the facilitation process of skills training has been started. It is hoped that the training will make a significant contribution in the selected study disciplines.



## **CHAPTER SIX: SKILLS TRAINING FACILITATION PROCESSES FOR RURAL WOMEN'S EMPOWERMENT**

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### **6.1 Introduction**

This chapter on the facilitation process of skills training for women in KwaZulu-Natal and North West Provinces is organised into sections. The first part presents the general literature background and the empirical results from KwaZulu-Natal and North West Provinces.

### **6.2 Significance of skills training among rural women**

Training in vocational skills plays an important role in equipping young people and adults with the capability to work and for social integration (IIEP, 2006). Education, skills development and technical training are central to agricultural and rural employment. They prepare people for work in the formal and informal sectors in rural areas and play important roles in poverty reduction. The better the training and the more refined the skills are in terms of human capital, the higher the income and returns and the better the rural livelihoods (Hartl, 2009).

In many developing nations, agriculture holds the key to reducing poverty and increasing the security of livelihoods. In attempting to deal with these issues, the importance of training cannot be underestimated. The skills to improve productivity, increase adaptability to deal with change and crises and facilitate the diversification of livelihoods to manage risks are central in rural areas. In many cases, these skills are critical for survival. It is ironical that, whereas more than half of the world's agricultural producers are women, men tend to receive more and better training, while women's training is often inappropriate to meet their needs (Collett & Gale, 2009).

Integrating agricultural training with enterprise training can help women smallholders to manage and market their farm production more effectively and to take advantage of new agricultural opportunities. Enterprise training can help farmers take and manage the risks involved in introducing progressive production technologies. It can also help women diversify their productive activities by venturing out into non-farm enterprises, an important mechanism for reducing susceptibility and developing a more stable income. Successfully integrating enterprise development into the women's lives involves an integrated approach (Collett & Gale, 2009).

#### **6.2.1 Women and agricultural skills training**

Collett & Gale (2009) pointed out that agricultural education and training in general within sub-Saharan Africa has continually failed to deliver the needs of farmers, because the range of skills needed by part-time farmers, subsistence producers and, above all, by rural women,

are often ignored or are poorly addressed (Collett & Gale, 2009). Only training which specifically and accurately addresses the needs of women smallholders, and which takes into account their productive processes and their needs, in terms of accessing and applying training, offers serious prospects for raising women's productivity and improving their livelihoods. While this is uncontested, theoretically, the issue of agricultural extension for women nevertheless highlights one of the fundamental challenges that development faces. Specifically, there has been a strong recognition of the need to draw on the knowledge of local communities to deliver effective development programmes in the past decade (Mansuri & Rao, 2003). Drawing on the insights of Sen's capability approach, there is increased recognition of the value of freedom for communities to shape development programmes to ensure that training reflects their values and priorities (Alkire, 2005). It is clearly valuable for training to contain input and direction from outside of the community, just as it is important to draw on community capacity to orientate training to local needs (Collett & Gale, 2009).

### **6.2.2 Women and non-agricultural skills training**

Rural households access food mainly through three sources, markets, subsistence production and transfers from public programmes or other households (Du Toit et al., 2011). Studies in this regard revealed that, historically, rural households produced most of their own food, whereas urban households purchased most of their food. This has changed over time. While farming still remains important for rural households, people are looking for diverse opportunities to increase and stabilise their income (Baiphethi & Jacobs, 2009).

As is widely recognised in the literature on small-scale farming in South Africa, the majority of individuals that describe themselves as farmers do not, in fact, rely exclusively on farming (Baiphethi & Jacobs, 2009). Ensuring that women, who typically do a substantial proportion of the work in smallholder agricultural production and food security, in Africa, receive technical training can be key to improving agricultural productivity. Non-farm sources of income are important for the rural poor and require skills to strengthen them. First, the direct agricultural income obtained by the poor is not enough to sustain their livelihoods, either because of landlessness or because the land they own or lease is insufficient. Second, wage employment in agriculture is highly seasonal, so that the poor value non-farm sources as income supplementation. Rural non-farm activities are especially suitable for poor households, because they require little capital and generate more employment per unit of capital than do farm activities (IFAD, 2005). The rural non-farm economy plays a significant role in providing employment and income for the poor in rural areas. As population pressure grows in the land-scarce developing countries, the growth in agricultural production cannot absorb the increasing rural labour force in agricultural employment. At the same time, the urban industrial sector cannot grow fast enough to absorb the surplus labour released from agriculture. This leaves the rural non-farm sector to absorb those released from agriculture, but not absorbed in the urban industries. The rural non-farm sector emerges as a very important source of income and employment and, consequently, as a critical factor in rural poverty reduction. Non-farm employment is differentiated into casual and regular wage employment; and self-employment (IFAD, 2005).

### **6.3 Skills training among rural women in South Africa**

In South Africa, rural women's extension services are frequently based on the ideology of a woman's place being in the private or domestic sphere of the home. As a result, almost all extension services directed at women have a home economics feature, which advocates the teaching of domestic skills, such as sewing, crocheting, knitting, cookery and child care. Most of the home economics extension services offered to rural women are inappropriate and ineffective in relation to women's triple role pertaining to reproductive, economic and community management activities. Furthermore, most of the extension services are irrelevant to the real conditions of poverty prevailing in rural areas. Much of the planning of extension services is based on the needs of rural communities, as decided by policy-planners. Even where participatory approaches have been adopted, the monitoring and evaluation of progress made in achieving the objectives are often neglected (Mtshali, 2000).

Skills are central to improving women's employability and livelihood opportunities, reducing poverty, enhancing productivity and promoting environmentally sustainable development. Many rural people do not have basic education, which hampers their ability to access technical, vocational training or other skills development programmes. Co-ordinated efforts are needed to develop an integrated approach that improves access to relevant, quality education and training to all rural women and men (ILO, 2011).

### **6.4 The process of skills training in KwaZulu-Natal**

Two groups of women attended the skills training courses in KwaZulu-Natal in the year 2015. These courses were facilitated by the University of KwaZulu-Natal's project team, as part of the WRC project. The two skills training workshops were conducted at Sampofu Primary School in Msinga, which lies in the Umzinyathi District. The first group attended training on 'cooperative management' and the second group attended training on 'vegetable production'. These two skills training sessions were conducted by Wanyuka consultants, who are well experienced in training.

#### **6.4.1 Identification of women for the training**

Women who attended the training were drawn from the three study areas that had been identified following the criterion which was in the contractual requirements of the WRC project that have been explained in section 1.2. Extension officers from all the wards in the three areas were requested to submit names of only five women farmers to attend training. The inclusion/exclusion criterion was simply on a first-come first-served basis. However, there were also a considerable number of women farmers who 'gate-crashed' the training, while others withdrew.

### 6.4.1.1 Involvement in agricultural activities

Table 6.1 show the distribution of trained women according to their main occupations and farming systems they are involved in. The majority of the women (63.6%) were full-time farmers. None of the trained women were employed in a full-time job. A moderate percentage of women were employed in seasonal or temporary jobs. As far as agricultural systems are concerned, the majority of women (77.3%) were involved in vegetable production. Since the majority of trained women were from the dry-land areas, the largest proportions were involved in community gardens. More women from the dry-land areas (70.6%) than the irrigation schemes were involved in field crop production. In general, the majority of women were keeping or owning some livestock (cattle, sheep, goats, pigs and chickens).

**Table 6.1:** Distribution of trained women according to their involvement in agricultural activities

Characteristic	Tugela Ferry	Machunwini	Overall
<b>Main occupation (%)</b>			
Full-time farmer	64.7	60.0	63.6
Seasonal/temporary job	17.6	20.0	18.2
Unemployed	11.8	20.0	13.6
<b>Farming systems (%)</b>			
Field crop production (%)	40.0	70.6	63.6
Vegetable production (%)	76.5	80.0	77.3
Community gardens (%)	60.0	82.4	77.3
Livestock production (%)	88.2	80.0	86.4

### 6.4.1.2 Previous skills training attended

Table 6.2 shows that the women had previously attended only three types of training before. The majority of women (50.0%) had previously attended training in crop production. This is followed by business management skills, which had previously been attended by 40.9% of the women. The lowest percentage of women had attended training in animal production.

**Table 6.2:** Percentage distribution of women according previous training attended

Training previously attended	Tugela Ferry	Machunwini	Overall
Crop production skills	47.1	60.0	50.0
Animal production skills	11.8	0	9.1
Business management skills	41.2	40.0	40.9

## 6.5 Areas covered by the project-facilitated training in Msinga

The women in the study areas were trained in two major areas, namely co-operative management and organic vegetable production. A total of 46 women attended the two training sessions, run over two consecutive weeks. The first training session on co-operative management was conducted from the 2 to 6 February 2015. The second training session on organic vegetable production was conducted from the 9 to the 13 of February 2015. Based on the preliminary assessment of skills training needs in the study areas, Table 6.4 shows the most important areas in which women in the study communities required training. These were ranked from the most important to the least important, according to each area.

Looking at Table 6.3, and considering that the trainer's modules were structured differently, and could only offer a whole module instead of a single course, co-operative management and organic vegetable production were chosen as the better options that would cover a number of topics and meet the women's training needs. Co-operative management was chosen as a better option, as it addressed most of the management principals, while vegetable production covered most of the crop production skills training that they required.

**Table 6.3:** Critical areas in which women in the study communities required training

<b>Mooi River upper blocks</b>	<b>Mooi River upper blocks</b>	<b>Tugela Ferry</b>
1. Determining nutrient deficiency <i>(Training by extension officers)</i>	1. Determining seed depth <i>(Training by extension officers)</i>	a. Cooking/ processing <i>(Training by Siyazisiza Trust's)</i>
2. Chicken/poultry production <i>(Training by LIMA)</i>	2. Poultry production <i>(Training by LIMA)</i>	b. Crop protections (pests and diseases) <i>(Training by extension officers)</i>
3. Crop protection (pests and diseases) <i>(Training by extension officers)</i>	3. Sewing <i>(Training by Siyazisiza Trust)</i>	c. Produce packaging; Post harvesting techniques; <i>(Training by LIMA)</i>
	4. Cooking <i>(Training by Siyazisiza Trust's)</i>	d. Financial management <i>(Training by FSG)</i>
		e. Pricing; finding markets and negotiating skills <i>(Training by FSG)</i>

Table 6.4 shows the modules that were covered on co-operative management and their NQF levels

**Table 6.4:** Modules covered in co-operative management training

Area covered	No. of credits	NQF level
Benefits of co-operative management	10	01
Challenges to co-operative management	10	01
Financial management	120	04
Leadership skills	12	04
Business management principles	120	03

Table 6.5 shows the modules that were covered on organic vegetable production and their NQF levels.

**Table 6.5:** Modules covered in cooperative management training

Area covered	No. of credits	NQF level
Fertility management	5	01
Seedling management	4	02
Weed and pest control techniques	5	01
Harvesting and packaging	10	04

## 6.6 Women's satisfaction with training rendered

Evaluations were done after each training session to determine the women's satisfaction with the training rendered. Table 6.6 shows the distribution of women according to their satisfaction levels, based on each evaluation indicator. In general, the women were satisfied with the training they had received. They all received certificates for attending the skills training.

Training evaluations showed that the training that was rendered to the women in Msinga met their expectations and could contribute to the improvement of their livelihood needs, since the majority of them indicated that they were impressed by the training. It was realised that since women in rural areas pursue diversified livelihoods, efforts should be made to provide them with both farm and off-farm skills.

In North West province a focus group discussion was organised with men and women separately on irrigation farming separately around Taung, at a central location. The results of the competence on the skills of activities identified among women on various agricultural enterprises were presented and the areas of low competence were consequently listed as those

requiring training. The list of skills was sieved, with the level of competence indicated by the majority of the women.

**Table 6.6:** Levels of satisfaction with training rendered

Comment	Rating				
	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
I'm glad I came	0	0	0	2.4	97.6
I learnt something useful	0	0	0	4.9	95.1
The content was organized and easy to follow	0	0	0	4.9	95.1
The training will be useful for my farming	0	0	0	0	100
I will be able to apply the knowledge learned	0	0	0	2.4	97.6
I found out new things	0	4.9	4.9	2.4	87.8
This course helped me improve my skills	0	0	0	2.4	97.6
How do you rate the training overall?	0	0	0	9.8	90.2

From the identified list of skills requiring training, women were asked to rank them in order of priority for the training to take place. Table 6.7 presents the results of the ranking. It is important to know that irrigation water scheduling was reintroduced as an area requiring training. The trend of the ranking was unanimous for men and women, though in separate meetings. It should be noted that skills with bold-faced ranking were suggested to go jointly with the non-bold face rankings, due to the relatedness of the issues and the one serving as a prerequisite to the other.

Financial management and farm record-keeping were identified as the most prominent training need among the farmers. This was followed by knowledge of the marketing contracts, Packaging and knowledge of reading and interpreting market information. It is evident from the sequence of the ranking of training needed by the farmers that skills related to farm management and marketing are strongly required by the farmers.

**Table 6.7:** Prioritization of training needs among female farmers in irrigation farming

Skills	SAQA level	Ranking	Training Provider
Determine inter- and intra-row spacing	1	13 <sup>th</sup>	NWU, FSG, AT
Determine seeds depth	1	13 <sup>th</sup>	NWU, FSG, AT
Selecting appropriate planting methods for various crops	1	13 <sup>th</sup>	NWU, FSG, AT
Evaluating farming land for soil and water conservation	1	14 <sup>th</sup>	NWU, FSG, AT
Recommending suitable soil and water conservation measures for specific farm lands	1	14 <sup>th</sup>	NWU, FSG, AT
Calculating the amount of fertilizer to apply for various crops	1	11 <sup>th</sup>	NWU, FSG, AT
Appropriate application of herbicide and fungicide	1	11 <sup>th</sup>	NWU, FSG, AT
Calibrating planters and seeders for various crops	2	12 <sup>th</sup>	NWU, FSG, AT
Planning and carrying out harvesting appropriately for various crops	1	15 <sup>th</sup>	NWU, FSG, AT
Knowledge of the market for your produce	1	6 <sup>th</sup>	NWU, FSG, AT
Price determination for your produce	1	3 <sup>rd</sup>	NWU, FSG, AT
Knowledge of reading and interpreting market information	1	5 <sup>th</sup>	NWU, FSG, AT
Knowledge of the marketing contracts	1	2 <sup>nd</sup>	NWU, FSG, AT
Value adding	2	7 <sup>th</sup>	NWU, FSG, AT
Service provider for storage facilities	4	8 <sup>th</sup>	NWU, FSG, AT
Farm record-keeping	1	1 <sup>st</sup>	NWU, FSG, AT
Financial management	1	1 <sup>st</sup>	NWU, FSG, AT
Packaging	4	4 <sup>th</sup>	NWU, FSG, AT
Water scheduling	4	10 <sup>th</sup>	NWU, FSG, AT

NWU-North-West University Short Course programme, FSG-Farmers' Support Group, AT – Accredited trainers to be identified.

### 6.7 Opportunities to women farmers for training in North West province

In this section, the opportunities for training of women farmers were explored. These organisations represent different government departments, with different focus, mandate and mode of operations. A synergy is being worked out to jointly address the training needs of women farmers. The opportunities covered the use of extension centres, farmers, training schools and colleges of agriculture.



### 6.7.1 Extension service centres

The North West province is divided into four districts, namely Ngaka Modiri Molema, Bojanala Platinum, Dr Kenneth Kaunda and Dr Ruth Segomotso Mompati districts, with Mafikeng (previously Mafeking) as the capital. Each of the districts has an extension service centre which co-ordinates and provides extension services to farmers at the municipal and village levels.

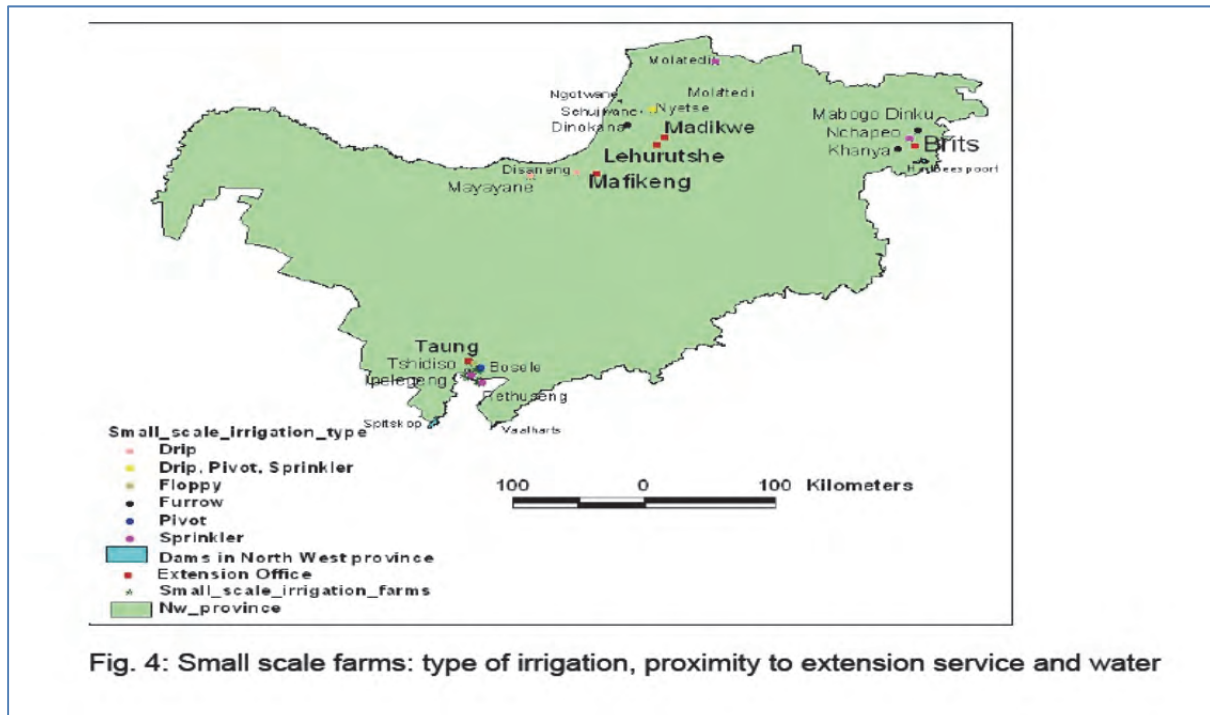


Fig. 4: Small scale farms: type of irrigation, proximity to extension service and water

**Figure 6. 1:** Small-scale farms: types of irrigation, proximity to extension services and water

### 6.7.2 Kgora Farmers’ Training Centre

The training centre has been renewed to serve as a world class, accredited centre that should provide training and capacity building for subsistence and smallholder farmers. This will include training on household food security, primary production and agro-processing/value adding, to reduce poverty, create decent employment and to improve rural livelihoods. “The priority to divert skills to our people is inevitable, because the problem of access to food affects about 32. 9% of the population of the Province and only 23, 6% of the households in the province are involved in agricultural activities,” the Premier stressed. The centre has 74 bed dormitories, 100 seat capacity lecture halls, a 100 seater hall and other training support facilities. It will serve as a world class, accredited, income-generating farmer training centre that emulates “learning by doing”. Optimism and commitment to support the Provincial Food Security Project was expressed by various stakeholders, including the representatives of South African National Comprehensive African Agriculture Development Programme Team, The National Emergent Red Meat Producers’ Organisation (NERPO), Agri SETA, Agri North West, African Farmers’ Association of South Africa (AFASA), North West African Farmers’

Union, SA Essential Oil Business Incubator (SEOBI), Milk South Africa and the International Water Management Institute (IWMI). Training and capacity-building programmes to be offered at the centre include household food security, primary production and agro-processing/value adding. As part of the broad government agenda the programme will be aimed at reducing poverty, creating decent employment and improving rural livelihoods.

### **6.7.3 Agricultural colleges**

Taung Agricultural College is situated in the North West Province at Taung, on the border of the Northern Cape Province. The College has excellent facilities for the efficient training of prospective agriculturalists. The College provides training ranging from NQFL 1 to 4 for Irrigation Farming, Farm Managers, Agricultural Extension Practitioners (Irrigation), Agriculturalists, Research Technicians, Irrigation Technicians, training, assessors, moderators, and full-time students for the award of a Diploma in Agriculture in Irrigation. The Potchefstroom College provides training ranging from NQFL 1 to 4, for specialized short courses on greenhouse management, artificial insemination, problem animal control, livestock judging selection, irrigation and labour management. The College awards a Diploma in Agriculture in animal production, plant production, agricultural management, information technology and agricultural engineering. In response to demand-driven training, the College provides skills programmes on fruit production, vegetable production, artificial insemination, cattle processing, pig production, poultry production and welding.

### **6.8 Provision of training to women**

A major approach has been to inform the extension officer covering the locations to focus on the identified needs of women in irrigation farming. From the list of the ranked training needs by women, as stated in Table 6.1, the process of formalization, signing MOUs and SLA has delayed the process of using the identified training providers. The training needs covered were farm record-keeping and financial management at the NQF level 1, which will be re-emphasised at a later training session. Legwetla Farming and Training, an accredited training provider in North West, will be providing subsequent training and facilitation for women on irrigation farming.

### **6.9 Development of training material used in Msinga and Taung**

The training provided to the women in the study communities of Msinga and Taung were provided through a service provider. The service provider had worked with rural communities in KwaZulu-Natal for the past 20 years and the provider for North West had engaged in community services training for more than 10 years. Their work entails education of learners, adult literacy, general upgrading situations, rural development and business administration and training. In the study areas, the assigned trainers had over 20 years of experience conducting training in rural communities in the province. As a result, the service provider developed the training materials based on the requirements identified by the project.

The project team was responsible for facilitating the development of the training materials. It also monitored the training sessions to check that standards were adhered to, as well as making sure that all the considerations had been accommodated during the development of training materials.

According to the International Labour Organization (2009), the identification and selection of trainers/instructors is a key part of the training programme. Instructors or potential instructors must understand the flexibility of the requirements when designing and implementing courses for smallholder farmers, especially the less educated. The identified trainer has considerable experience in conducting similar training workshops and also had available courses which could be adapted to meet the needs of the target women.

### **6.9.1. Steps in developing the training material**

Training materials were drafted following guidelines from a manual on developing training materials for skills development in rural areas, by the International Labour Organization (2009). The project team and the training consultants developed the training material and programme to meet the women's needs. These considerations are discussed in the sections below (Lanigan, 2010).

#### ***6.9.1.1 Identifying the type of training***

The first important consideration was to identify and categorise the type of training to be provided to the target women. Training in rural areas takes place at all levels and includes many forms and methodologies (Hartl, 2011). A compilation of definitions of training reveals that it can be compartmentalised into several categories, including capacity building, skills in development/training and vocational education and training. Capacity building refers to any type of learning and change activity that includes research and development, human resource development, training for project staff, training beneficiaries, capacity-building in various sectors such as health, agriculture, environment, trade and education.

In parallel, some developmental texts refer to skills development for poverty reduction, where the term "skills development" is generally used to describe a wide range of activities influencing employment and earnings. It is one of the primary means to build the capacity of poor people to participate and fully benefit from mainstream economic development. It involves strengthening the individual or collective capabilities of the rural poor, the youth and adults that contributes to fostering new economic opportunities in rural areas. It is motivated by understanding that investing in the skills of rural people is crucial in building their capacities to cope with crises and confront food and environmental challenges (Hartl, 2011).

Training in rural areas can also be offered in the form of vocational education and training. Bennell (1999) found that vocational education and training (VET) was largely absent in most government and donor poverty reduction strategies in developing countries. This marginalisation of VET was attributed to a lack of donor investment and inaction by many

governments. While there is a need to adjust development efforts and build the human assets and capabilities of the poor, attention to VET has been decreasing. The literature on the different types of trainings in rural areas and the training needs assessment from the study communities (Table 6.8), the training provided in the study areas was categorised as ‘skills development’.

### 6.9.1.2 Identifying the objectives of the training programme

The second consideration was to identify the main objectives of the training programme. This was based on earlier exercises, which identified and prioritized farmers’ training needs. The objectives of the training had been identified through a needs assessment done in the three study communities. Table 6.8 shows the most important areas of training in which women in the study communities required training. These were ranked from the most important to the least important, according to each area. The also shows the organisations initially proposed to conduct the training base on their competences and proximity to the target communities. The organisations were proposed following consultations with the farmers and other stakeholders, such as non-governmental organisations and government extension personnel.

**Table 6.8:** Critical areas in which women in the study communities require training

Rank	Tugela Ferry	Mooi River upper blocks	Mooi River lower blocks
1	Cooking/ processing (Training by Siyazisiza Trust)	Determining seed depth (Training by extension officers)	<b>Determining nutrient deficiency</b> (Training by extension officers)
2	Crop protection (pests and diseases) (Training by extension officers)	Poultry production (Training by LIMA)	Chicken/poultry production (Training by LIMA)
3	Produce packaging; post-harvesting techniques; (Training by LIMA)	Sewing (Training by Siyazisiza Trust)	Crop protections (pests and diseases) (Training by extension officers)
4	Financial management (Training by FSG)	Cooking (Training by Siyazisiza Trust)	
5	Pricing; finding markets and negotiating skills (Training by FSG)		

After consideration of the needs listed in Table 6.8 and the structure of the training materials available to the trainer, it was resolved to offer a whole module instead of a single course. Co-operative management and organic vegetable production were chosen as the content that could allow coverage of a broad range of topics and act towards meeting a significant proportion of the women’s training needs. Co-operative management was chosen for its possibility to address most of the desired management principals, such as financial management, pricing and marketing. Vegetable production would cover the crop production

skills training that the women required, such as crop production and determination of seed planting depth. Table 6.9 shows the modules that were covered on co-operative management and their NQF levels. These modules were combined to make two separate courses, called co-operative management and organic vegetable production (Table 6.8 & 6.9).

**Table 6.9:** Content of the co-operative management training

Area covered	No. of credits	NQF level
i. Benefits of co-operative management	10	01
ii. Challenges to co-operative management	10	01
iii. Financial management	120	04
iv. Leadership skills	12	04
v. Business management principles	120	03

Note: NQF = National Qualification Framework

Table 6.10 shows the content of the organic vegetable production training and their respective NQF levels.

**Table 6.10:** Contents of the organic vegetable production training

Area covered	No. of credits	NQF level
Fertility management	5	01
Seedling management	4	02
Weed and pest control techniques	5	01
Harvesting and packaging	10	04

### ***6.9.1.3 Identification of training materials***

A list of material to be used during training was identified, during consultation between the project team and the trainer. It was realised that participants in the training programme needed hands-on access to the agricultural practical activities, videos, pamphlets and a training manual that had step-by-step details on the courses. Most manuals on training in rural areas recommend that the training materials and techniques be modified to make them accessible to people of low literacy levels (Hill & Pashtoonzai, 1997; UNDP, 2001; Danida, 2004). The educational, literacy and numeracy levels of the women in the study areas was considered in designing the pamphlets and other training materials. More visual material and less text was the main principle in developing the training materials, on account of the literacy levels.

#### 6.9.1.4 Core skills to be covered

An overview of the training areas that participants could expect to learn on completing the training was provided in the list of contents of the training manual. The table of contents page provided the areas/topics to be covered in the training, under the module organic production, as shown in Table 6.11. The list gave an indication of the time to be spent on each area.

**Table 6.11:** Contents page of the areas topics covered under the training on organic vegetable production

<b>Area covered</b>	<b>Estimated duration of sessions (hours)</b>
Definition of organic farming	2
Soils in organic farming	3
Bioclimatic conditions	4
Vegetable production	6
Land/seed bed preparation	2
Sowing/planting techniques and practices	2
Plant nutrition	2
Water for irrigation	3
Plant protection	4
Crop rotation	4
Conservation	2
What is organic farming/review	3

The table of contents for the areas/topics covered under the module on co-operative management are shown in Table 6.12.

**Table 6.12:** Contents page of the areas/topics covered under the training on co-operative management

<b>Area covered</b>	<b>Estimated duration of sessions (hours)</b>
Vision	2
Kinds of dreams	3
Good leadership	4
Effective managerial leadership	6
Goal setting	2
Action steps	2
Goals	2
Time controls	3
Leadership qualities	4

In North West province, a similar range of topics was covered. The topics are listed in Table 6.13.

**Table 6.13:** Contents of topics for training covered in North West province

<b>Topic</b>	<b>Issues Covered</b>
Evapotranspiration	<ol style="list-style-type: none"> <li>1. Definition of evapotranspiration</li> <li>2. Factors influencing the rate of evapotranspiration <ul style="list-style-type: none"> <li>• Meteorological factors</li> <li>• Plant factors</li> <li>• Soil conditions</li> </ul> </li> </ol>
Measurement and prediction of water requirement	<ol style="list-style-type: none"> <li>1. Direct methods</li> <li>2. Indirect methods of determining CWR <ul style="list-style-type: none"> <li>• Scientific methods</li> </ul> </li> </ol> Empirical methods
Measurement of evaporation	<ol style="list-style-type: none"> <li>1. The Symons Tank</li> <li>2. The U.S. Weather Bureau class A pan</li> <li>3. Operation of the class A pan</li> <li>4. Reading and adjustment</li> <li>5. Maintenance</li> </ol>
Application of class A pan data in determining crop water requirements	
Influence of crop characteristics on crop coefficients	<ol style="list-style-type: none"> <li>1. Expected effective rainfall</li> <li>2. Expected rainfall</li> <li>3. Effective rain</li> </ol>
Estimate of effective rainfall when scheduling Irrigation	<ol style="list-style-type: none"> <li>1. Leaching needs</li> <li>2. Gross Irrigation Requirement</li> <li>3. Calculation of G.I.R. in irrigation planning</li> </ol>

#### ***6.9.1.5 Dedication of each separate section to each learning objective***

Each section of the two courses was allocated an approximate time in hours to cover it. Each lesson focused on a different objective, as shown in Tables 6.13 & 6.14. For example, one lesson was introducing learners to the definition of organic farming. The next lesson was concentrating on soils needed in organic farming and so on.

#### ***6.9.1.6 Review exercises***

To stimulate learning and discussion, review exercises in various formats were incorporated at the end of each section. For example, training materials that include true or false, or multiple choice, questions were incorporated to reinforce the content. The class was asked to break up into small groups to discuss the content, after watching an instructional video.

### ***6.9.1.7 Assessment and feedback component***

Training participants were assessed after watching videos or presentations by asking them to write down their impressions of the sessions. No test, examinations or quizzes were used to assess the participants' level of understanding. The participants were, however, asked to evaluate the effectiveness of the training by requiring them to express their opinions individually. Training material feedback forms asked participants to evaluate the training with respect to clarity, variation of delivery methods and usefulness.

### ***6.9.1.8 Other crucial considerations in the delivery of training***

A number of issues were taken into consideration during the training programme. It was designed, bearing in mind that it should be:

- Flexible and adaptable to people's specific needs.
- Trainee-centred, by taking into account their background, age, education, experience, skill levels and immediate employment possibilities.
- Based on a trainee needs assessment. The assessment was used to analyse the skills level and management ability of the individual as the basis for designing the curriculum. These issues, including constraints of the target group and skill gaps, were identified beforehand.
- Based on curriculum content tailored-made to provide requisite skills in co-operative management and organic vegetable production.
- Use informal skills development methodologies such as discussions, demonstrations, role playing, case studies, practical exercises, group practical field visit, and experience sharing.
- Practical hands-on training, rather than theory, was emphasized. Eighty percent of the time was allocated to practical sessions, while 20% was for the theoretical content.

### ***6.9.1.9 Ways of delivering the training***

Training can be offered to an individual client or offered to a group. In the study communities, training was offered to a group. However, most of the resources, including pamphlets, booklets and the training manual, were not shared.

## **6.10 Conclusions and Summary**

The service provider developed the training materials in consultation with the project team. The project team provided the trainer with guidelines to be considered when developing the training materials. The trainer already had some training material that was ready to meet the training needs of the women in the study areas. A nearby community garden was used for practical demonstrations on vegetable production. The women were trained as a group and not as an individual client. The training material that was developed was believed to offer effective training for the women in the study areas. Evaluation of rendered training showed



that women in rural areas appreciate the importance of skills training in improving their livelihood opportunities. In general, younger women, who presumably are looking for new opportunities in their lives, are more willing to attend such training. The trainers noted that the biggest challenge of running training workshops for such heterogeneous groups is that they comprise people with different levels of education, literacy and numeracy. This creates the need to have a variety of training materials for people in the same group. Further training sessions were conducted as the sessions that were conducted, generated demand for training by other female farmers.

## **CHAPTER SEVEN: SUMMARY AND CONCLUSIONS AND FUTURE RESEARCH**

**Oladele, O. I. and Mudhara, M.**

This study, on empowerment of woman in rural areas through water use security and agricultural skills training for gender equity and poverty reduction in KwaZulu-Natal and North West Province, was commissioned by the WRC to North-West University, Mafikeng Campus and University of KwaZulu-Natal, Pietermaritzburg Campus. This was to ensure effective coverage of the provinces and thorough research to influence policy changes for improved livelihoods in the study areas. The study, conducted between 2012 and 2015, was sub-divided into several phases, addressed through deliverables. The aim of the project is to investigate the constraints, opportunities and challenges to achieve empowerment of women,<sup>2</sup> to improve gender equity and livelihoods through increased water productivity with crop cultivation and animal husbandry, in selected traditional rural areas.

The literature review established that the agricultural productivity is low in many developing countries, for a myriad of reasons. Among these is the fact that women lack the resources and opportunities to make the most productive use of their time. It was reasoned that woman's lower levels of human and physical capital result in lower agricultural productivity. In poor areas, where men have been forced to migrate in search of work, women often have the responsibility for farming and raising children. Women as smallholder farmers are marginalized and face significant challenges to engaging productively in agricultural activities. Rural women are vulnerable to economic and social shocks, and stresses such as indebtedness due to economic, food insecurity, health problems, lack of access to inputs and gender discrimination in the ownership of productive assets, and that women experience problems of inadequate farming knowledge and skills.

Close to half of South Africa's population (45%) resides in rural areas. In KwaZulu-Natal, 56.7% of the total population and 54% of women reside in rural areas. In South Africa, an estimated four million people engage in smallholder agriculture and the majority of these people are in rural areas. The most common reason given for engaging in agriculture is to procure "an extra source of food". More than half of the rural households in South Africa are headed by women and are among the poorest. Women make up a substantial majority of the agricultural workforce and produce most of the food that is consumed locally. In developing countries, about 43% of women are working in agriculture. The large proportion of agricultural production that is attributable to woman makes them the principal agents of food security and household welfare in rural areas. However, lack of skills, especially agricultural, among rural women results in poor performance and negatively affects their livelihoods and that of their households.

The New Growth Path for South Africa identified employment creation as possible, both within economic sectors as conventionally defined and in cross-cutting activities, and analysed the policies and institutional developments required to take advantage of these

opportunities. The agricultural value chains were identified as job drivers through the restructuring of land reform to support smallholder schemes with comprehensive support around infrastructure, marketing, extension, upgrade employment in commercial agriculture, especially through improved worker voice and supporting growth in commercial farming, while addressing price fluctuations in maize and wheat. This will target 300 000 households in smallholder schemes by 2020; agro-processing anticipates creation of 145 000 jobs by 2020; upgrading employment on commercial farms will create a total of around 660 000 jobs. It is expected that these projections will adequately cover women farmers, since they form the bulk of the smallholder farmers.

Gender issues are now mentioned in most national and regional agricultural and food-security policy plans, but they are usually relegated to separate chapters on women, rather than treated as an integral part of policy and programming. Many agricultural policy and project documents still fail to consider basic questions about the differences in the resources available to men and women, their roles and the constraints they face, and how these differences might be relevant to proposed interventions. As a result, it is often assumed that interventions in areas such as technology, infrastructure and market access have the same impacts on men and women, when in fact they might not.

Women's access to productive resources, such as land, modern inputs, technology, education and financial services, is a critical determinant of agricultural productivity. Agriculture is important to women, but female farmers have less access to the productive resources and services required for agricultural production. Women are less likely than men to own land or livestock, adopt new technologies, use credit or other financial services, or receive education or agricultural extension advice. In some cases, women do not even control the use of their own time. While the size of the gender gap differs by resource and location, the underlying causes for the gender asset gap are repeated across regions, social norms systematically limit the options available to women. Regardless of cause or magnitude, however, the gender asset gap reduces the agricultural productivity of women and thus involves broader economic and social costs (FAO, 2010).

Women become farmers for various reasons, some become farmers because they inherited land from their parent(s), who have either passed away or are old and cannot carry out farm practices. Others assume the role because their partners either passed away, migrated or they have separated. Women are also farmers because some have genuine interest in the field. They are gradually assuming their role in the farming sector. Nevertheless, in some places it might be taboo for women to be farmers.

The Sustainable Livelihood Approach (SLA) allows the analysis of the relationship between people's access to resources, their diverse livelihoods activities and factors, at micro, intermediate and macro levels. It is also a framework for assessing and prioritizing interventions (Adato & Meinzen-Dick, 2002). The SLA draws attention to the activities that take place within the broader policy and institutional context at different times and how they support or undermine livelihood strategies (DFID, 2000, cited in Hart, 2009). Households and communities must have access to, and exploit, livelihood assets in order to be food secure.

The SLA recognizes that households require assets to enhance their livelihood strategies. The assets are categorized into human, natural, physical, financial and social capital. Households adjust to their social, physical, economic and political environments, by using their assets for livelihood strategies designed to strengthen their wellbeing (Timmer, 2003 and Bryceson, 2005, cited in Matshe, 2009). Households are viewed as sustainable if they can adjust to threats without compromising their future ability to survive shocks to their livelihoods. This approach suggests that adequate ownership of livelihood assets is essential for pursuing a range of livelihood opportunities and is a key determinant of livelihood performance and the ability to accumulate assets for optimal production and for consumption smoothing, in the face of seasonal climatic and market risks (Matshe, 2009).

Women play a critical and potentially transformative role in agricultural growth in developing countries, but they face persistent obstacles and economic constraints, limiting further inclusion in agriculture. The Women's Empowerment in Agriculture Index (WEAI) tool measures the empowerment, agency and inclusion of women in the agricultural sector in an effort to identify ways to overcome those obstacles and constraints. The Index aims to increase understanding of the connections between women's empowerment, food security and agricultural growth. It measures the roles and extent of women's engagement in the agriculture sector in five domains: (1) decisions about agricultural production, (2) access to and decision-making power over productive resources, (3) control over use of income, (4) leadership in the community, and (5) time use. It also measures women's empowerment relative to men within their households. According to IFPRI (2012), the WEAI is a composite measurement tool that indicates women's control over critical parts of their lives in the household, community and economy. It helps in identifying women who are disempowered and understands how to increase autonomy and decision-making in key domains. The WEAI is a useful tool for tracking progress toward gender equality, which is one of the Millennium Development Goals. The WEAI is composed of two sub-indexes. One measures the five domains of empowerment for women and the other measures gender parity in empowerment within the household. It is an aggregate index reported at the country or regional level that is based on individual-level data on men and women within the same households.

In terms of household and intra-household food insecurity, according to Statistics South Africa (Stats SA, 2000), currently about 35% of the total population, or 14.3 million South Africans, are vulnerable to food insecurity. Among these, women, children and the elderly are particularly vulnerable (Stats SA, 2000). In 1996, nearly a third, or 2.8 million households, spent less than R1 000 per month, while only 18%, or 1.63 million households, spent more than R3 500 per month. These figures disguise the bi-polar mode of income distribution that characterizes South Africa, which has many poor, food-insecure people and a few wealthy ones. The distribution of poverty in the country is uneven in its spread and intensity. Gauteng and the Western Cape are wealthier provinces, with the least number of poor households at less than 12% each. At the other extreme, the Free State, Eastern Cape and Limpopo provinces have the worst poverty in South Africa. In the middle group are Mpumalanga, KwaZulu-Natal, Northern Cape and North West Provinces. The average

household in Gauteng spends about R7 742 per month, compared to R2 665 in the Eastern Cape (STATS SA, 2011).

With reference to land reforms and policies in South Africa, reforms covered in the review include the land redistribution programme, land restitution programme, land reform proposal by the National Planning Commission, reforms and policies on water, constitutional protection of the right to water, water institutional reforms in South Africa and linkages between water and agricultural policy and the impact of such policies on gender. Literature that examines the impact of irrigation on agricultural performance, household income and poverty has mixed opinions. While few studies have found no linkage between irrigation and household welfare, many others have found irrigation to be of great significance for household welfare. Poverty is often used as an indicator of household welfare. Linkages between irrigation, total productivity, input use, the productivity of farming practices, agricultural productivity, household income and alleviating rural poverty and the reduction of food prices were explored. This helps very poor households meet the basic needs associated with improvements in household overall economic welfare, protection against risks of crop loss due to erratic, unreliable or insufficient rainwater supplies, promotion of greater use of yield-enhancing farm inputs and creation of additional employment, which, together, enable people to move out of the poverty cycle.

Water security was an important component of the study by Grey and Sadoff (2007) which comprehensively defined water security, highlighting the importance of ensuring water access for livelihoods and productive uses, not just consumptive use. Water security was conceptualised as “the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies.” In simple terms, water security involves harnessing the productivity of water, while limiting the negative impact of its use. Although informative, this definition applies at the national level and fails to address the requirements at local or household level for achieving water security for irrigating households. It could be argued that, while it was widely recognized that food security needs to be considered at both household and national level, water security should also be considered in a similar way, particularly in the rural context. The key aspects of water-use security are access to a reliable and adequate supply of water with acceptable quality, the ability of the household to pay for the water and their right or entitlement to the water, which they are able to assert against other parties. Water supply is a function of bio-physical and engineering aspects (physical, hydrological and water resources aspects of water security), while rights and entitlements are a function of water governance, institutions and capacity building. It can be argued that ensuring smallholder farmers’ access to irrigation is critical for addressing the many dimensions of agricultural production, poverty and food security in developing countries. However, participation in an irrigation scheme, although a necessary condition, is not sufficient to ensure improved household welfare. Investments to achieve water security, not just irrigation participation, remain at the heart of the struggle for economic growth and poverty reduction. Participation in smallholder irrigation results in income and food benefits

only to those farmers with secure access to irrigation. Therefore, it is important that individual farmers have secure access to adequate and reliable water.

The review of the literature looked at agricultural skills and training needs among women farmers. Relevant agricultural training, socio-economic conditions and extension services were identified as determinants of smallholder farmers' market access. In most instances, these factors have a direct positive or negative impact on the level of farm income. Low levels of education and lack of farmer support have a negative impact on the emerging farmers' access to markets. Education plays a key role in the agricultural industry, where competition in the market between the previously disadvantaged smallholder farmers and previously advantaged large-scale commercial farmers is high. High levels of education among rural farmers may help them to understand and interpret market information better. Education also assists them to have better farm management principles and marketing skills and to develop financial intelligence. Direct relationship between the level of education and successful performance in farming can be inferred. The training received by small-scale farmers was found to have improved the possibility of the farmers to sell livestock which, in turn, created income for them.

The selected study sites In North West and KZN provinces and the adjacent dryland areas are suitable to acquire a representative sample of women needed to discuss the issues related to the core themes and objectives of the project. The household and social dynamics of the male and female-headed households involved in rain-fed and irrigation agriculture are similar to other households that are in a similar agricultural setting as the study sites. The sample of women can give a true reflection of food security issues and challenges facing female smallholder farmers to attain food security and agricultural productivity in the study areas. The findings can be extrapolated to other areas, in similar settings.

The sample of female-headed households, together with male-headed households from the selected study sites, would allow the researchers to investigate the constraints to water-use security and its consequences, including access to productive resources (bias in land allocation, access to credit, access to rural organisations, marketing channels and agricultural services) that are being faced by women. The sites display most of the contemporary issues of local customs and governance that hinder female-headed households from achieving higher levels of agricultural productivity and food security, especially related to water-use security. The study offers a chance to investigate a broad range of water-use security issues and their impacts. The two irrigated areas allow researchers to investigate the factors affecting households (especially female-headed households) to achieve a higher level of water-use security. Both the male and female-headed households can be used to make comparisons and carry out impact assessments between households producing in rain-fed agriculture and those using irrigation.

This survey was motivated by the fact that women in rural areas are the major players in household food production, processing and access, who need to be empowered to ensuring household food security. Thus, understanding the social, economic, political, institutional and cultural environment they operate in, is a crucial step in efforts to empower them. Based

on the results obtained through focus group discussions, key informant interviews and questionnaire surveys and the subsequent discussions, it can be concluded that women in the studied rural areas face a number of social, economic, political, institutional and cultural constraints to achieving their desired livelihood outcomes.

Based on a needs assessment, this study specifies the appropriate agricultural (farming and non-farming skills) of women in rural areas of Msinga, KwaZulu-Natal. It also established the existing and other relevant skills that can make a difference to the lives of women in the selected study sites under the Msinga Local Municipality.

It was found that rural women pursue multiple livelihood activities and have different levels of the different livelihood skills. In general, most women in the study areas have high levels of agricultural skills, but generally low levels of off-farm skills. In agriculture, the sampled women farmers were competent in determining seed depth, appropriate planting methods, plant spacing, water conservation methods and fertility management methods, but were incompetent in weed & pest control techniques. The sampled women farmers were incompetent in animal husbandry skills. They have poor knowledge of animal health, animal nutrition, animal welfare requirements and meat processing skills. The sampled women are also very incompetent in farm management skills. They had little knowledge of farm record-keeping, farm financial management skills, marketing contracts, knowledge of product markets and had poor price determination skills. Mushroom production was identified as a relevant skill that could make a difference to the lives of women in the current situation. Lastly, in agriculture, women in rural Msinga would need more training in post-harvesting techniques to increase profitability of their agricultural activities by preventing post-harvesting losses.

Rural women generally have low levels of off-farm skills. Their enterprise/business management skills are poor, because they have poor numeracy and literacy levels, operations management skills, financial knowledge and marketing skills. Because of the lack of economic opportunities in the rural areas, most women with vocational skills (e.g. saloon, cooking and sewing) out-migrate to find opportunities elsewhere.

Focus group discussions that were done after the survey supported the results of the study, although women in different areas rated differently their most important training needs. The project team has chosen training of women to be done by Cedara College of Agriculture, and its affiliated FET colleges, as it is the most reputable institution, with both material resources and qualified personnel to train the women in the selected area in the identified areas of incompetence.

Considering that women in South African rural areas form part of the most disempowered groups, investment in their agricultural and non-agricultural skills training is one effective strategy to improve their livelihoods. Lastly, the facilitation process of skills training has been started and it is hoped that the training will make a significant contribution in the selected study sites.

Training evaluation showed that the training that was given to the women in Msinga met their expectations and could contribute to the improvement of their livelihood needs, since the majority of them indicated that they were impressed by the training. It was realised that, since women in rural areas pursue diversified livelihoods, efforts should be made to provide them with both farm and off-farm skills.

This report recommends that:

- The groups that deliver skills training workshops to rural people should consider the women's levels of education, literacy and numeracy, rather than their training needs alone.
- Practical demonstrations, rather than theoretical sessions, are valuable to rural women with low levels of education.
- Government and non-governmental organisations should continue to fund programmes aimed at training rural women with the skills to successfully pursue their livelihoods strategies.
- Rural women should be offered opportunities to improve their numeracy and literacy levels, since their low levels of education is a major hindrance to the acquisition of new skills.
- Further training sessions should be conducted, as the sessions that were conducted generated demand for training by other female farmers.
- There is need for specific women programmes that will emphasize women's issues in the policy and stipulate concessions for women through policy and reforms. This will define the specific interventions targeting women, as well as specify the monitoring and implementation of interventions targeting women.
- The main recommendation from the study areas is that government authority needs to be increased, since it is losing money through the revitalisation and maintenance of irrigation schemes.
- There is a need for the government to lay down rules and guidelines that have to be followed, especially in irrigation schemes.
- The Department of Agriculture should resuscitate, monitor and mentor management committees within the blocks, to monitor the distribution of water.
- It is recommended that seasonal infrastructure inspection and the repair of damaged components be regularly carried out.
- Replacement of the distributary canal with pipes may assist in improving delivery performance and monitoring water use.



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## APPENDICES

### Appendix 1: Publications emanating from the project

The following are publications that have emanated from the project.

1. Balarane A. & O. I. Oladele (2014) The impact of irrigation farming on livelihood strategies among smallholder farmers in the North West Province, South Africa Proceedings of the Sustainable Irrigation and Drainage V: Management, Technologies and Policies, CA Brebbia and H. Bjornlund (Editors). Poznan, Poland June 17-20, 2014. pp223-234
2. Mthembu, S.A and Mudhara, M. Effects of gender-differentiated access to resources on household food security in Msinga, KwaZulu-Natal. (Submitted to *The Journal of Developing areas*)
3. Mthembu, S.A. and Mudhara, M. Gendered determinants of land allocation and water access in Msinga, KwaZulu-Natal. (Submitted to *Development Southern Africa*).
4. Mthembu, S.A. and Mudhara, M. Gendered land security and water security determinants for rural households in Msinga, KwaZulu-Natal. (Submitted to *Agriculture and Human Values*)
5. Njoko, S. and Mudhara, M. Determinant of farmers' ability to pay for improved irrigation water supply in rural KwaZulu-Natal, South Africa. (*Water SA* – Accepted)
6. Njoko, S. and Mudhara, M. Determinants of willingness to pay for improved irrigation water supply in rural KwaZulu-Natal, South Africa. (Submitted to *Agrekon*)
7. Palamuleni, L., Tekana, S. S. and Oladele, O. I. (2013) Mapping smallholder irrigation schemes utilizing GIS technology for improving livelihoods among farmers in the North West Province, South Africa. *Journal of Food, Agriculture & Environment* Vol.11 (3&4): 1281-1285.
8. Sharaunga S, Mudhara M & Bogale A (2015). Dimensions of empowerment influencing self-reliance among rural women in Msinga, South Africa. *International Journal of Sustainable Development* (Accepted)
9. Sharaunga S, Mudhara M & Bogale A (2015). The Impact of 'Women's Empowerment in Agriculture' on Household Vulnerability to Food Insecurity in the KwaZulu-Natal Province, *Forum for Development Studies*, 42 (2): 195-223.

10. Sinyolo S.; M. Mudhara and E. Wale (2014) The impact of smallholder irrigation on household welfare: The case of Tugela Ferry irrigation scheme in KwaZulu-Natal, South Africa. *Water SA* 40:1 (145-155)
11. Sinyolo S.; M. Mudhara and E. Wale (2014) Water security and rural household food security: Empirical evidence from the Mzinyathi district in South Africa. *Food Security* 6(4): 483-499
12. Tekana S. S. & O. I. Oladele (2014) Factors affecting women's empowerment on irrigation schemes in the North West Province, South Africa. Proceedings of the Sustainable Irrigation and Drainage V: Management, Technologies and Policies, CA Brebbia and H. Bjornlund (Editors). Poznan, Poland June 17-20, 2014. pp245-258

### **Conference Presentations**

13. Sharaunga S., M. Mudhara and A. Bogale (2014) Dimensions of empowerment and their influence on self-reliance among women in Msinga, South Africa. Paper presented at the 52<sup>nd</sup> Conference on the Agricultural Economics Association of South Africa (AEASA) held at Mkwepeni Beach Resort; South Africa from 28 Sep-1 October 2014.
14. Mudhara M. and S. Sharaunga, Measurement of food security in rural households: A theoretical perspective. A paper presented at the Measuring and Monitoring Household Food Security in South Africa Workshop during the 51<sup>st</sup> Conference on the Agricultural Economics Association of South Africa (AEASA) held at Bela-Bela, Limpopo; South Africa from 30 Sep-3 October 2013.

## **Appendix 2: Abstracts of dissertations**

### **IMPACT OF IRRIGATION FARMING ON WOMEN EMPOWERMENT, FOOD SECURITY AND POVERTY STATUS IN NORTH WEST PROVINCE, SOUTH AFRICA**

**SIBONGILE SYLVIA TEKANA            20561083**

**PhD AGRICULTURAL ECONOMICS**

#### **ABSTRACT**

This study examined the impact of irrigation farming on women empowerment, food security and poverty status in the North West Province of South Africa. This is because women are marginalised because of social and cultural A probability sampling method involving simple random sampling techniques was adopted to select the respondents and a sample of 120 farmers was randomly selected to obtain a representative sample from the participating farmers on the schemes.

A structured questionnaire with open and closed ended questions was used to collect demographic information on their socio-economic status, women empowerment, food security, competency and training needs, institutions that support women. Data was analysed by using the Statistical Packages for Social Science (SPSS). Descriptive statistics such as frequency distribution, percentages, mean and standard deviation were used while Linear regression, Probit and FGT model were used as inferential statistics.

The results show that most of the respondents were in the age bracket of 41 to 50 years (72%), married (42.2 %), primary education (32.5%). 66.3% of farmers have farming experience ranging from 1-10 years. With regard to income sources pension is the greatest non-farm contributor (30%). Fifty % of the women had low SES scores, 40% low in competency skills and more than 50% get support from different institutions for their farming productivity. Significant determinants of empowerment were expenditure ( $t = 1.68$ ), drip irrigation type ( $t = 1.71$ ). In the Probit model to analyse food security the results showed that the significant variables included household expenditure ( $t = -1.9$ ), marital status ( $t = -2.37$ ), non-farming activities ( $t = 1.53$ ), farming expenditure ( $t = 1.76$ ), income, central pivot ( $t = -2.71$ ), sprinkler irrigation ( $t = 0.77$ ), micro ( $t = -3.44$ ) and drip irrigation ( $t = -2.19$ ). The study also examines the empowerment indices to show different areas where women are empowered and this covered in this study include the use of income (53%) are disempowered, about 60.2% of women are disempowered in access to productive capital and access to credit, while about 50% are empowered in leadership and decision making.



# **IMPACT OF IRRIGATION FARMING ON LIVELIHOOD STRATEGIES AND FOOD SECURITY STATUS OF SMALLHOLDER MAIZE FARMERS IN THE NORTH WEST PROVINCE**

**MSc Agricultural Economics**

**Abongile Balarane**

**1800666**

## **ABSTRACT**

The study was designed to assess the impact of irrigation schemes on livelihood strategies and food security status of smallholder maize farmers in North West Province of South Africa and covered three districts of the North West Province namely: Dr Ngaka Modiri Molema district, Bojanala district and Dr Ruth Segomotsi Mompati district. In this study, a descriptive survey design was used and a sample of 66 farmers was interviewed from the list of farmers obtained from the extension workers. The targeted group was male farmers in irrigation farming and those who farm within the radius of the irrigation scheme. A questionnaire was designed as the primary tool for data collection and the process of collecting data involved face to face interviews and group discussions. Data collected were coded and entered into Microsoft Excel and then transferred to Statistical Package for Social Scientists (SPSS). To analyse data, descriptive and inferential statistics were used.

The results of multiple regression analysis of relationship between irrigation farming and livelihood strategies showed that the independent variables were significantly related to livelihood strategies of the farmers with an F value of 8.067,  $p < 0.05$  and R value of 0.788 showed that there was strong correlation between the independent variable and the household livelihood strategies. Significant determinants were marital status ( $t = 2.43$ ), number of household ( $t = 5.41$ ), nonfarm activity ( $t = 1.73$ ) and income ( $t = 6.59$ ).

The probit model was used to determine the influence of the socio-economic variables on household food security status. The model has a good fit and significant with two explanatory variables being significant while eleven variables were insignificant. The significant variables were Income and Land. The results of Forster Greer Thorbecke showed that about (1.5%) of the respondents are living below the threshold of (R9.2) per day, while the per capita income of respondents that are below the poverty line needed to be increased by (0.5%) to meet the level of poverty line. The results also showed severity of (0.1%), this implied that the gap of respondents from the poverty line is very small.

# **DETERMINANTS OF LIVELIHOOD STRATEGIES AMONG SMALLHOLDER FARMERS ON IRRIGATION SCHEMES IN THE NORTH WEST PROVINCE, SOUTH AFRICA**

**ABONGILE BALARANE: 18006663**

PhD in Agricultural Economics

## **ABSTRACT**

The study assessed determinants of livelihood strategies among smallholder farmers involved in irrigation schemes in the North West Province of South Africa. The study was conducted in three districts of the North West Province namely: Dr Ngaka Modiri Molema District, Bojanala District and Dr Ruth Segomotsi Mompoti District. A structured questionnaire and a descriptive survey design was used to collect data from 149 farmers involved in all the irrigation schemes of the North West province and those practising irrigation farming adjacent to the schemes. The data was entered into Microsoft Excel and later transferred to the Statistical Package for Social Sciences (SPSS) for analysis. Frequency counts, percentages, mean standard deviation, Multinomial Logit and Probit regressions were used to analyse the data. The results of the study revealed that majority of respondents were females and aged above 50 years, married, christians. Their highest level of education is primary school. The most preferred livelihood option among respondents is agriculture (42.3%), followed by non-farm (36.9%) and a combination of agriculture and non-farm strategies (20.8%).

Significant variables for the choice of agriculture as a livelihood strategy from agriculture, non-farm and a combination of agriculture and non-farm livelihood strategies using Multinomial Logit regression were age, farm size, financial index, extension contact and gender. Significant variables for the choice of agriculture as a livelihood strategy from non-farm and agriculture using probit regression were age ( $Z = 2.814$ ), social index ( $Z = 2.004$ ) and extension contact ( $Z = -3.056$ ). Significant variables for the choice of non-farm as a livelihood strategy from agriculture and non-farm using probit regression were age ( $Z = 4.679$ ), input ( $Z = -2.747$ ), total income ( $Z = -5.113$ ), expenditure ( $Z = -2.116$ ) and education ( $Z = -1.883$ ). Ten variables were insignificant.

**Keywords:** Smallholder farmers, irrigation schemes, livelihood strategies, diversification, livelihood capitals

**AN ASSESSMENT OF AGRICULTURAL SKILLS AND THEIR EFFECT ON  
HOUSEHOLD FOOD SECURITY WITH FOCUS ON WOMEN: A CASE OF  
TUGELA FERRY IRRIGATION SCHEME IN KWAZULU-NATAL PROVINCE OF  
SOUTH AFRICA**

**MBONGENI MAZIYA**

**M Agriculture**

**ABSTRACT**

Agriculture is a crucial sector of the economy in many developing countries as it significantly contributes to domestic production and hence household food security. Lack of technical and managerial skills have been cited as the main reasons for poor performance among smallholder farmers. This study assessed the contribution of agricultural skills and knowledge to agricultural productivity, on one hand, and household food security, on the other hand. By identifying agricultural skills that are critical to agricultural productivity, the study seeks to find out ways of improving the level of competency in farmers' agricultural skills, hence, food security. Data was collected from a random sample of 250 smallholder farmers (67% women) in the Tugela Ferry irrigation scheme and Machunwini area in Msinga, KwaZulu-Natal Province of South Africa. A structured questionnaire was administered through face-to-face interviews for data collection. Descriptive statistics were used to present the results of the relationship between gender, age, level of education, access to extension services and agricultural skills and knowledge. Descriptive statistics were also used to present the results of the relationship between agricultural skills and knowledge, and agricultural productivity.

The results of the descriptive statistics show that age of household head, gender, level of education and access to extension services had a significant effect on the level of competence in agricultural skills. It was also observed that agricultural skills and knowledge significantly affected agricultural productivity and household food security. The Ordinary Least Squares regression model was used to determine maize productivity and its results showed that competency in determining planting depth, irrigation scheduling and frequency, education level, farming practice and farming experience had a significant effect on maize productivity. Gender, education level, farming practice, competency in determining planting depth and nutrient deficiency in crops, goat ownership and total income had a significant effect on household food security. These findings of the regression models suggest that adjustment of the respective significant variables can influence agricultural productivity and household food security.

In view of the research findings, the study identified weaknesses in the provision of extension services. Farmers experienced few extension visits and the study recommends that extension services be improved by increasing the number and effectiveness of extension agents in rural areas.

**DOES GENDER AFFECT LAND-ACCESS, WATER-ACCESS AND FOOD SECURITY AMONG SMALLHOLDER FARMERS? A CASE OF MSINGA LOCAL MUNICIPALITY, KWAZULU-NATAL, SOUTH AFRICA**

**SITHEMBILE AMANDA MTHEMBU**

**M Agriculture**

While South Africa may be food secure as a country, large numbers of households within the country, particularly female-headed households, are food insecure. Unequal distribution of agricultural production resources between men and women has been identified as one of the main causes of household food insecurity in developing countries. However, information on how the social, economic, cultural and institutional factors affect access to production resources across household head's gender is limited. Therefore, this study set out to understand the disparities in women's access to land and water resources and, how these differences impact the food security status of different households. A random sample of 159 households was selected in Msinga local municipality, KwaZulu-Natal province in South Africa. Data were analysed using both descriptive statistics and econometric analysis (OLS, Tobit, binary and ordered logit models).

The study results indicated that gender of the household head determines access to land, perceived water and land security, and household food security. The results indicated that female-headed households always have smaller sizes of land and their frequency of access to irrigation water is less than that of male-headed households. This implies that there is gender discrimination against women with regards to access to production resources, which leads to their worsened food insecurity. Marital status was also found to be an important determinant of households' access to both land and water, implying that women gain or improve their access to resources through marriage. The Tobit model results indicated that land access was also influenced by factors such as the source of land and livestock head size. Water access was also determined by age of the household head, membership to farmer associations, irrigation type and extension services. Results indicate that level of education, water security and access to irrigation improved household food security. Therefore, there is need for a multifaceted approach, where some interventions will improve access to water security while others will improve land security. Improved water security improves food security via its impact on irrigation. Moreover, women should be empowered through farming education, opening formal job opportunities and access to support services such as extension, credit and farming inputs to close the gender gap.

**SMALLHOLDER FARMERS' WILLINGNESS AND ABILITY TO PAY FOR  
IMPROVED IRRIGATION: A CASE OF MSINGA LOCAL MUNICIPALITY,  
KWAZULU-NATAL PROVINCE**

**SINENHLANHLA L. NJOKO**

**MSc Agricultural Economics**

Water is the essence of life for humankind. Due to water scarcity from increased population and increased demand for the resource, there is a need to allocate the water efficiently. Economists have proposed water pricing as a mechanism for allocative efficiency, arguing that this will prompt the farmers to use the water on crops with relatively high returns as well as make farmers value the resource. That is, water can no longer be considered a free good, but rather an economic good. However, the willingness and ability of the smallholder farmers to pay for water use in irrigation need to be an integral parts of policy formulation to enhanced agricultural production. This study sought to determine farmers' willingness to pay (WTP) and ability to pay (ATP) for improved irrigation in rural areas of KwaZulu-Natal, South Africa using the farm gross margins and to also identify factors affecting farmers' WTP and ATP. The analysis was based on a sample of 161 irrigators. The binary and ordered probit models were used to investigate factors affecting WTP, which was generated through the contingent valuation method. Empirical results indicate that factors such as extension services, training, use of motorized pump (diesel), farmer perceptions of scheme management, duration of farmer in the scheme, livestock ownership and road conditions positively influence WTP. In contrast, factors such as conflicts, household size and total land holdings influence WTP negatively. Production data was collected from the irrigators and the residual imputation method (RIM) was then used to calculate gross margins/profits received by the farmers. An OLS regression was used to investigate factors affecting ATP. Factors such as labour, training, household assets and road conditions were found to have a positive influence on ATP. The study concluded that farmers are willing and able to pay for improved irrigation water supply. Furthermore, the study concluded that support services and institutions could be manipulated through policy to enhance both WTP and ATP. It is, therefore, recommended that if government had to formally introduce water charges, it could start with a charge of R50 per month per bed, and then increase the charge gradually over time.

**THE IMPACT OF SMALLHOLDER IRRIGATION AND WATER SECURITY ON  
HOUSEHOLD WELFARE: THE CASE OF TUGELA FERRY IRRIGATION  
SCHEME IN KWAZULU-NATAL, SOUTH AFRICA**

**SIKHULUMILE SINYOLO**

**MSc Agricultural Economics**

Smallholder irrigation has been promoted across the developing world as a means of poverty reduction and rural development. The potential of smallholder irrigated agriculture in alleviating rural poverty has led the South African government to prioritise and invest in irrigation establishment, rehabilitation and revitalisation. However, the extent to which smallholder irrigation has been able to reduce poverty in the rural areas of South Africa is not well understood. This study, therefore, aimed to contribute to smallholder irrigation literature in two ways. The first objective of this study was to conduct an in-depth impact evaluation of the Tugela Ferry smallholder irrigation scheme on household welfare using the treatment effect and propensity score matching (PSM) methods. Secondly, the study sought to investigate the determinants of household water security, and how the level of water security subsequently affects the farmers' household welfare. A stratified random sampling technique was used to obtain a sample of 186 irrigators and 70 non-irrigators in the Tugela Ferry area. Descriptive analysis highlighted that although the demographic characteristics of the farmers were not significantly different, the irrigators were characterized by better welfare indicators compared to non-irrigators. The Foster Greer Thorbecke (FGT) poverty indices also indicated that poverty incidence was more pronounced among non-irrigators than among irrigators. The results from the econometric models indicated that irrigation access plays an important role in the welfare of rural households, with irrigators consuming about R2,000 per adult equivalent per year more than the non-irrigators. While irrigation access is important, this study concluded that the poverty reduction effectiveness of smallholder irrigation can further be enhanced by ensuring that the irrigators are water secure. Factors such as age, off-farm income, duration of scheme membership, occurrence of conflicts, method of pumping water, location in the scheme and access to agricultural training influenced household water security. The study recommends that investments in smallholder irrigation should continue for poverty reduction, and that priority should be in ensuring water security not just irrigation participation. The study also recommends the introduction of small motorised pumps among the gravity-reliant irrigators and farmer training on water conservation techniques to improve the farmers' water security in the smallholder irrigation schemes. Although the study highlighted how perceptions of irrigators could be used to generate the water security index, the water security concept needs further investigation.

# **THE EFFECT OF WOMEN EMPOWERMENT ON RURAL LIVELIHOOD OUTCOMES AMONG IRRIGATION AND DRY-LAND FARMING HOUSEHOLDS IN MSINGA, SOUTH AFRICA**

**Stanley Sharaunga**

**PhD Agricultural Economics**

Women are major players in ensuring households' wellbeing in most rural areas of developing countries, including South Africa. The capacity to improve the livelihoods of their households is hampered because they are disempowered economically, socially, in agriculture and in civic arenas. Women need a sense of agency and more access and control of resources, which together constitute the empowerment capabilities, to improve their livelihoods. Thus, women empowerment is considered important to provide them with the means to meet their needs and desired livelihood outcomes. Since empowerment is multi-dimensional, and women empowered in one dimension are not necessarily empowered in the other, it is essential to evaluate the significance of the various forms of women empowerment on their livelihood outcomes, in order to inform policy. This study investigates the various dimensions of women empowerment that are critical to the improvement of their livelihood outcomes in rural areas.

The study proposes a concise definition and develops a methodology to systematically measure women empowerment. It uses capabilities (i.e. comprising of resources and agency) as indicators of empowerment. Principal Component Analysis (PCA) was then applied to the levels of capabilities at each of the four main dimensions of women empowerment (i.e. economic, social, civic and agricultural), to quantitatively measure levels of women empowerment (i.e. represented by PC factor scores) and identify the dominant dimensions of women empowerment (i.e. represented by the dominant PCs). Multinomial logit model was used to identify the dominant dimensions of empowerment influencing women's self-reliance status. Women's self-reliance status had been established by applying k-means cluster analysis to the four main sources of women's incomes. Ordered logit model was used to identify the dimensions of women empowerment influencing household food security status. The household food security status had been established using the Household Food Insecurity Access Scale (HFIAS). Binomial logit model was used to determine the dimensions of 'women's empowerment in agriculture' that reduce household's vulnerability to food insecurity. The households' vulnerability status had been established using the Vulnerability as Expected Poverty approach. All the analyses were based on a cross section data that were collected from 300 women practicing either irrigation or dry-land farming in Msinga rural areas of KwaZulu-Natal province.

Application of PCA to indicators of economic empowerment (i.e. levels of resources and agency) identified economic agency, human, financial and physical capital forms of empowerment as well as 'empowerment in vocational skills' as the dominant dimensions of women's economic empowerment. Social agency, social capital empowerment and informational asset empowerment were identified as the dominant dimensions of women's

social empowerment. Dominant dimensions of women's empowerment in agriculture included empowerment in crop management skills, farm financial management skills, water-use security, animal husbandry skills and weed and pest management skills. The dominant dimensions of civic empowerment identified in this study, include legal resource empowerment, civic agency, knowledge of legal rights, political and psychological forms of empowerment.

Further analysis found that certain dimensions of women's empowerment and other household socio-economic characteristics (e.g. husband's income, household size, dependency ratio, etc.) are critical for women to attain desired livelihood outcomes. Women with high levels of financial and human capital forms of empowerment were more likely to be self-reliant. Moreover, women with higher levels of informational resource empowerment and water-use security are more likely to be self-reliant. On the other hand, primary female head-of-households who are young, educated, with vocational skills as well as those who are psychologically empowered are less likely to rely on independent/self-driven rural livelihood activities (i.e. farm and off-farm) because they perceive such manual activities are 'dirty' jobs suitable for the low social class groups. Although access to irrigation is believed to be key to self-reliance among rural South Africans, women with access to irrigation were not significantly more self-reliant than those without.

The study showed that income of husband is the most significant determinant of household food security among rural women's households in Msinga. Furthermore, the likelihood of a household becoming food secure also increases with higher levels of economic agency, physical capital empowerment, farm financial management skills and psychological empowerment. Moreover, older women's households are more likely to be food secure than those with younger primary female-head of households. On the other hand, women with higher levels of socio-cultural hindrances to agriculture and those with high levels of social capital were less likely to have food secure households.

The probability of a household becoming vulnerable to food insecurity in Msinga decreases with increasing levels of women's economic agency, physical capital empowerment, socio-cultural empowerment and husband's income. However, women with high levels of financial capital empowerment, because they earned more social grants and remittances were more likely to be vulnerable to food insecurity. Such women depended more on social grants and remittances, and invested less in livelihood assets. As a result, they were less likely to be resilient to shocks threatening their agricultural production or off-farm incomes in the future. Likewise, women from households with high dependency ratios and women experiencing more socio-cultural hindrances to agricultural production were also more likely to be vulnerable to food insecurity. Most importantly, household vulnerability to food insecurity in the study areas of KwaZulu-Natal is not significantly improved by getting access to irrigation water alone but by having higher levels of water-use security.

It was concluded that taking a holistic approach that considers the multidimensional aspects of women empowerment is a more appropriate way to measure women empowerment. Since



capabilities (i.e. both resources and a sense of agency) are pre-requisites for women to achieve their desired livelihood outcomes, they are the most appropriate indicators of empowerment. Moreover, it was concluded that specific dimensions of empowerment are critical for the achievement of each specific livelihood outcome. The dimensions of women empowerment that influence self-reliance are not necessarily the same as those that improves household food security or reduce vulnerability to food insecurity. Thus, certain empowerment interventions are needed to achieve a specific livelihood outcome.

Financial and human capital resources are the most important economic forms of empowerment important for women to achieve self-reliance as they facilitate the attainment of most, if not all the other forms of capital empowerment. In agriculture, women need to be freed from customary and cultural bondages that hinder their full participation in agricultural production to achieve self-reliance. Moreover, access to irrigation alone should not be considered a panacea for women to achieve self-reliance through agriculture. Women need, most importantly, secure access to the right quantity and quality of water for productive purposes (i.e. water-use security) to pursue independent/self-driven livelihoods in agriculture. Women also need higher levels of informational resources to pursue independent/self-driven livelihoods. Access to information enables the acquisition of knowledge and other factors of production needed for both agricultural production and off-farm investments. The stereotype perceptions of regarding agriculture as a dirty job, which are common among primary female head-of-households who are young, educated, with vocational skills as well as those who are psychologically empowered, are a major hindrance to the attainment of self-reliance through women empowerment in agriculture in rural South Africa.

To achieve household food security, primary female head-of-households need a sense of economic agency and higher levels of physical capital empowerment. A higher sense of agency enables women to define their own goals and act upon them. Higher levels of physical capital resources among primary female heads-of-households help improve household food security by ensuring consistently high levels of agricultural production and more off-farm income opportunities. They also allow households to diversify incomes, thereby, ensuring stability of access to food. Improving the farm financial management skills of the primary female heads-of-households improves the food security status of their households. Farm financial management skills are necessary for running a successful farming enterprise. However, increasing women's capabilities alone is not a panacea for household food security; other socio-economic factors have to be addressed. This includes increasing husband's income earning opportunities and reducing households' dependency ratios. Since income is the most significant determinant of food security in South Africa, improving income opportunities for both women and their husbands improves their household food security.

To reduce rural households' vulnerability to food insecurity, women need to increase their sense of economic agency and physical capital empowerment to ensure stable off-farm incomes and giving households the capacity to survive shocks affecting food security. Physical capital empowerment (i.e. equipment and infrastructure) is essentially needed to enable households to resist shocks threatening food security in future. Moreover, socio-

cultural inhibitions affect women's participation in agriculture and make their households vulnerable to food insecurity. Therefore, empowering women in socio-cultural aspects that might create hindrances to agricultural production among women can reduce household vulnerability to food insecurity. However, empowerment in agriculture alone is not adequate to reduce household vulnerability to food insecurity.

### Appendix 3: Capacity building

The capacity building activities in this project covered postgraduate students, community and related organizations.

#### Community level

Community members in the area of study included irrigators and non-irrigators particularly women were trained and also capacitated through continuous interactions with the project team. The capacity building activities covered areas of production, marketing, livelihood diversifications, and financial management skills.

#### Organizational level

The project in the two provinces interacted with Provincial Department of Agriculture, Directorate of Extension and Farmers Support Services, Water User Associations, Farmer Training organizations such as CEDARA and KGORA in KwaZulu-Natal and North West provinces respectively. Links and synergies were developed and used to meet farmers training needs. Areas where support services were required were provided to provincial departments, while areas of training needs and contents were provided to farmer training institutions in the two provinces.

#### Post graduate level

The list of postgraduate students at Masters and Doctoral levels that were engaged in the project, including their gender, race and degree of study is presented below.

<b>Student Name and Surname</b>	<b>Gender</b>	<b>Race</b>	<b>Degree</b>	<b>University</b>	<b>Country of Origin</b>	<b>Status as at February 2016</b>
Sibongile Sylvia Tekana	Female	Black	PhD	North West (MFK Campus)	South African	Passed dissertation
Abongile Balarane	Male	Black	MSc	North West (MFK Campus)	South African	Passed Dissertation
Abongile Balarane	Male	Black	PhD	North West (MFK Campus)	South African	Dissertation under examination
Stanley Sharaunga	Male	Black	PhD	KwaZulu-Natal (PMB)	Zimbabwe	Passed Dissertation
Sikhulumile Sinyolo	Male	Black	MSc	KwaZulu-Natal (PMB)	Zimbabwe	Passed Dissertation

Mbongeni Maziya	Male	Black	M Agric	KwaZulu- Natal (PMB)	South African	Passed Dissertation
Sithembile Mthembu	Female	Black	M Agric	KwaZulu- Natal (PMB)	South African	Passed Dissertation
Sinenhlanhla Njoko	Female	Black	MSc	KwaZulu- Natal (PMB)	South African	Passed Dissertation

## **Appendix 4: Stakeholders' reports**

Report of the Stakeholder meeting held at Taung Irrigation Scheme on the 10<sup>th</sup> July 2012 at Rethuseng Co-Operative Offices, Taung

### **Objective**

The objective of the meeting was to get overview knowledge on irrigation farming in Taung for WRC project research and to understand challenges faced by farmers.

### **Methodology**

The Meeting was arranged by the Department of Agriculture and Rural Development (DARD), Taung. North-West University researchers, Department of Agriculture and Rural Development Extension Officer, Rethuseng Co-Operative Committee Members, irrigation Scheme female farmers and individual male farmers were present at the meeting. There were six Committee members, fourteen female farmers and one extension officer in charge of three irrigation schemes in Greater Taung.

The meeting was chaired by the Extension Officers and farmers expressed their challenges.

### **Outcomes of the meeting**

- Water and irrigation pipes

Farmers in this irrigation scheme receive water from Vaal Harts channeled by pipes. Each farmer present has 7 or 10 ha of land and each farmer has pipes passing their plots for irrigation. Farmers expressed that pipes not working and they need to be maintained on a regular basis. Water is not always available. At the time when the meeting was held there were municipal strikes on service delivery taking place in that area, and this has affected water supply. Farmers had just planted and they are unable to water their crop due to the municipal strike taking place and pipes not working. The Extension officer advised that their department (DARD) cannot maintain pipes for farmers and that they should be in a position to get quotes from contractors and fix pipes themselves. This should be a joint effort among farmers because if one outlet is not working it affects numerous farmers on the scheme.

- Water bills and contractors

Farmers got municipal water bills of more than R20 000 per farmer. They do not have an idea of how water is charged. Farmer who did not plant in the previous season also got the bill. There is no explanation as to how this water bill is calculated. Contractors who used their land left without paying them instead they left them with a burden of debt. These contractors cannot be contacted because they are not from Greater Taung but are from Brits and other places. One female farmer cried that her family is dying of hunger and nobody is doing a thing about it. The committee chairman suggested that with new contractors coming to rent their land, to be on the safe side they should not lease out their whole plot, to allow other potential contractors to use the remaining plot to ensure that they generate income.

Sometimes farmers do not get paid by contractors because they find them in debt; this means that they pay farmer's debt leaving farmers with little or no income at all.

- Straying animals and theft

Due to worn out and low fencing animals are able to graze and destroy their crops. Some community members come to the farm to get grass and sometimes they steal Lucerne from farms. Thieves also cut the fence and steal farm produce.

- Markets

Farmers do not have knowledge of markets. They also do not have options as to where they supply their produce. A bale of Lucerne in Taung is bought at a cheaper price than it in Vryburg which is 60 KM from Taung. Due to lack of transportation farmers have no choice but to settle for low prices paid by the buyers.

- Storage facilities

They have poor storage facilities and this also encourages theft.

## Conclusion

This stakeholder meeting enlightened us on numerous challenges faced by farmers and extension officers. It also gave points that must be tackled and find solutions for within the framework of the WRC research objectives. Farmers gave consent to work with researchers who will draft recommendations that may be helpful especially to empower female farmers. Government should also try to invest in farmers skills training so that they do most of the work and have little reliance on contractors.

## **Report of the Stakeholder meeting held at Tugela Ferry Irrigation Scheme on 26 July 2012 at the Department of Agriculture Offices, Tugela Ferry**

### **1. Objective**

The workshop objectives were, on one hand, to introduce the WRC-funded project and the project researchers, and on the other, to get an indication of the relevance of issues to be covered during project.

### **2. Methodology**

The University of KwaZulu-Natal, Department of Agriculture, Women in Agriculture and Rural Development (WARD), representatives of the Irrigation Scheme Committee and individual farmers were represented in the meeting. The Department of Land Affairs and Rural Development was not represented because of other commitments. The Department of Agriculture arranged the logistics for the workshop. Block 7 was represented by a member of the Irrigation Executive Committee. In total, thirteen farmers attended the meeting; four men and nine women who represented blocks 3, 4, 5 and 7. There were no representatives from Blocks 1 and 2.

Problems facing the irrigation scheme were identified through a discussion in plenary. The problems that were similar were then clustered to a set of five distinct ones. A pair-wise ranking process was undertaken so to determine the relative importance of the problems. Discussions were carried out about the cause and implications of each problems. Afterwards, the farmers discussed the problems that the facilitating team thought should have been mentioned, but had been left out.

### **3. Findings**

The following five problems, in their order of importance, emerged.

<b>Ranking</b>	<b>Problem</b>
1	Water access and/or reliability
2	Fencing
3	High electricity bills
4	Poor roads
5	Forming a co-operative

#### **i. Water access and/or reliability**

- Access to irrigation water emerged as the major problem in the scheme. Canal leakages were cited as causing the problem as they no longer deliver water to all blocks. The leaks and dirt which has accumulated in the canals means that only blocks 1, 2 and 5 currently have water delivered through canals. Blocks 1 and 2 receive adequate water

from the canal because they are located at the upper end of the canal. Block 3 is currently dry as it is not receiving the water through the canal nor does it have water pump. The infrastructure development by government is cleaning the canal to improve conveyance and could see water reaching Block 3 and more water, than is currently the case, reaching Block 5. The failure to receive water has made some blocks resort to using electric and diesel pumps, i.e. Blocks 4A, 4B and 7.

- Blocks using pumps cited frequent breakdowns of the pumps as a major problem. It also emerged that farmers cannot differentiate engine service from repairs. Apparently, they only receive attention when the pumps have broken down. At this point it becomes necessary for the engine to be taken in for major repairs at workshops. This means that the repair bill is high, and they have to wait for long periods before the service done. By the time the pumps are returned, crops would have become stressed.
- Overnight water storage dams were no longer operating as they are now filled with grass, logs and soil. This means that people in block 3, who still rely on the canal but are blow blocks 1 and 2, are unable to store water at night for irrigating during the day. All blocks do not have water storage facilities. As such water pumps have to deliver directly to the plots for irrigation, meaning that pumps have to run all the time people are working in the plots. This leads to engine wear and tear, and consequently frequent breakdowns.
- The shortage of water reaching the blocks is not necessarily due to limited delivery in all cases. In Block 7, it emerged that water is inefficiently used, resulting in severe losses. Water is sometimes left flowing back into Tugela Ferry river. In all blocks it was reported that over irrigation results in water damaging access roads. Evidently, the irrigators do not quite understand the linkage between the amount of water they use, their production and the profitability of their operations. The water shortages occurring within the block are also mistakenly thought to be due to low pump capacity when in fact they are due to wastage of water by the irrigators.

## **ii. Broken fences**

- After some deliberations, farmers cited poor or lack of fencing as the second major problem in the scheme. Goats and other animals were entering the blocks and eating farmers' crops, resulting in considerable losses. Farmers pointed out that without fixing the fences, all the efforts of restoring availability of water and improving agronomic practices will come to naught if livestock can enter the blocks. The fences are old in some blocks and require considerable repairs.
- The breakdown of the fences is the sign that the leadership within the blocks are weak. The strengthening of the leadership would allow them to mobilize their members to make contributions financially and manually.

## **iii. High electricity bills**

- Farmers using an electric pump cited that they have problems paying for the electricity bills. They allege that the bills go beyond what they can afford. Farmers in Block 7 contribute R50.00 per month per 0.1ha towards electricity fees. However, this has proved inadequate as they are in arrears of above R28 000.00 for unpaid electricity



bills. However, people in block 4A, who also use an electric driven pump, only pay R60.00 per irrigator (instead of per 0.1ha) and seem to be managing. The highest payments were in Block 4B where each irrigator pays R30.00 per each irrigation day. If a farmer comes to irrigate for four times in a month, then it would pay R120.00. These costs are so high that one farmer ended up buying his own diesel pump for personal use.

- In all cases, the energy costs are too high. This could be due to over-irrigation and wastage of water. The farmers' understanding of the implications of their various practices around irrigation on energy costs and ultimately the viability of their individual operations are not well understood. This could be indicative of an area in which the farmers require skills.

**iv. Poor roads**

- Farmers reported that the roads within blocks were in a bad state. As a result they struggle to get transport to carry their produce to the market. Access roads are washed away by water flowing after over irrigation. This is another example of the vicious relationship between poor practices and negative effects on infrastructure, marketing and ultimately, productivity, incomes and food security.

**v. Forming a co-operative**

- Farmers desired to form and register co-operatives. In fact, in Block 7 a co-operative had been formed but was not yet registered as the members are too many. The government officials have advised the farmers to register as a company since their number, i.e. more than 300, is beyond the numbers recommended for co-operatives. Farmers want to form the co-operative without a clear understanding of what benefits it would bring. It is likely that they perceive it as a way of getting government support.

#### **4. Gender Dimensions**

- The majority of the participants in the scheme are women, and they were the majority in the meeting. The interests of women are represented by WARD (Women in Agriculture and Rural Development). WARD receives government support such as tractors managed by government. Women have to register as WARD members to access the services available to the group. WARD members also indicated that they support each other in times of crisis, e.g. shortage of production inputs or in the event of sickness. Overall it did not appear that WARD is strong enough for women to depend on it. However, the setting up of the organization is indicative of realization within the communities that there are specific challenges facing women, which have to be addressed. Further exploration of these issues will be conducted during the project.

#### **5. General Comments**

Extension support was not mentioned as one of the areas that was in the farming activities. The farmers felt that they have the knowledge and skills on production to improve their yields, and emphasized that water access was the limiting factor in the scheme

It is clear that extension concentrates its efforts on the provision of production inputs, particularly seedlings and tillage. However, the preliminary discussions pointed to the fact that there are other non-agronomic practices causing inefficiencies in production at the scheme. As pointed out earlier, this includes over irrigation (accompanied by denial of access to water for some members in the irrigation). Indeed over irrigation makes the farmers lose the nutrients they would have applied, through leaching. Some blocks have resorted to the use of diesel and electric pumps due to the non-delivery of water to their blocks. One block is not operating due to lack of water.

- Access to the market was not mentioned as a pressing. Farmers felt that although it is an important issue they would want addressed, it was not a big problem now because their production levels are still low. Farmers currently use various informal marketing channels. Some buyers from urban areas buy directly from the plots. Others local traders purchase and then resale in the local town of Tugela Ferry. There could be a possibility that markets could be challenging if production were to improve significantly. It is alleged that people in Blocks 1 and 2 intentionally deny water to people in lower blocks as a way of ensuring that the market does not get saturated. This seems to suggest that solutions to some of the water-related challenges experienced in the scheme might be addressed indirectly by ensuring that farmers are assured of reliable produce markets. Farmer also have to be made to understand that the production from Tugela Ferry scheme on its own, might not affect the market as it is a small player on the market. It is the competition from the commercial farmers that can make prices fall. One strategy they could look at would be to diversify their production so that they do not compete with large scale producers.

## **Conclusion**

The stakeholder meeting allowed the representatives to realize that despite the many research activities that might have been conducted around the irrigation scheme, there are many challenges that they still confront and that further research is necessary. It was noted that government assistance had been promised, and could indeed be delivered over the next five years. The meeting noted that this would only be temporary a reprieve as they are likely to slide back into the same problems that they are experiencing currently once the support ends. Farmers' skills and knowledge have to be improved concurrently if the government intervention were to bear fruit.

## Appendix 5: Questionnaires used in the study

### QUESTIONNAIRE ON EMPOWERMENT OF WOMEN IN RURAL AREAS THROUGH WATER USE SECURITY AND AGRICULTURAL SKILLS TRAINING FOR GENDER EQUITY POVERTY REDUCTION IN THE NORTH WEST PROVINCE

Dear Respondents

This questionnaire is for data collection on research on EMPOWERMENT OF WOMEN IN RURAL AREAS THROUGH WATER USE SECURITY AND AGRICULTURAL SKILLS TRAINING FOR GENDER EQUITY POVERTY REDUCTION IN THE NORTH WEST PROVINCE. The information provided will be treated as confidential as no name is required and the analysis will be group referenced. Could you please spare some of your valuable time in responding to questions. Thanks for your anticipated cooperation

#### Personal characteristics

Age: \_\_\_\_\_

Marital status: Single                  Married                  Widowed                  Divorced

Race: African                  White                  Coloured                  Indian                  other: \_\_\_\_\_

Religion: Christianity      Bahai      Hinduism                  Islam                  Other: \_\_\_\_\_

Number of dependant(s): \_\_\_\_\_

Number of household: \_\_\_\_\_

Total number of people in the household: Male                  Female

Highest educational level: Primary school      Secondary School      High School                  College      University

No formal education

Number of months /years in farming: \_\_\_\_\_

Tenure status: Personal      Rented      Allocated

Farm size: \_\_\_\_\_

Are you a member of farmers group?      Yes, No

Do you have contact with extension agent? Yes, No

If yes how often? Regularly Occasionally Rarely

Is the extension officer from: Government/Non-governmental NGO/Parastatals (CASIDRA/ARC)

Number of workers: \_\_\_\_\_

What are your labour sources: Self Family Hired

How long have you been farming \_\_\_\_\_years?

How long have you been part of an irrigation scheme? \_\_\_\_\_Years?

Name of the irrigation scheme \_\_\_\_\_

Number of workers in the scheme: Female Male

Do you engage in non-farming activities? Yes No

If yes name them: \_\_\_\_\_

Indicate the farming enterprises in which you are engaged? (Mark with an X)

Crops	Ha	Income
Maize		
Wheat		
Sunflower		
Sorghum		
Groundnut		
Barley		
Lucerne		
Tomatoes		
Potatoes		
Cabbage		
Spinach		
Pumpkins		

Green pepper		
Onion		
Garlic		
Green beans		
Citrus		
Carrots		
Beetroot		
Mushroom		
Lettuce		
Cucumber		

Type of irrigation systems

Central pivots irrigation systems	
Flood irrigation systems	
Sprinkler irrigation systems	
Micro irrigation systems	
Drip irrigation systems	
Other:	

Source of water for the irrigation scheme

Dam	
River	
Reservoir	
Bore hole	
Municipal water	
Fountain	

Other	
-------	--

Irrigation is owned by

Privately owned		
Community		
Government department		
Private stakeholders		
Other:		

Total income annually

Source of income	Rand (R)
Leasing farm equipment	
Rent	
Remittances	
Government grants	
Animal Production	
Other:	

Total expenditure annually: Production purposes

Expenses	Rand (R)
Maintenance of irrigation technology	
Seeds	
Water	
Electricity	
Transportation	
Workers salary	
Fungicides, pesticides	

Fertilizers	
Other farm expenses:	

Expenses: personal use

Expenses	Rand (R)
School fees	
Transportation/ fuel	
Food	
Electricity	
Water	
Clothes	
Entertainment	
Saving (funeral, society, bank, etc.)	
Other:	

Reasons for involvement in the scheme please tick. You may tick more than one

Personal interest	
Only source of income	
Husband / partner has migrated	
Community development	
Other:	

Indicate your source of information

	Use	
	Use	Non use
Television		
Radio		

Newspaper		
Cell phones		
Internet		
Community library		
Extension workers		
SMS		
Other		

### LIVELIHOOD ASPIRATIONS

FINANCIAL CAPITAL	Availability	Very adequate	Not adequate
Access to Credit from:			
Banks			
Cooperatives			
Money lenders			
Relatives			
Personal savings			
Contractors			
Government subsidies			
HUMAN CAPITAL			
Training	Yes, No		
Vocational training	Yes, No		
Extension service	Yes, No		
Skills training			
Record keeping	Yes, No		
Water management	Yes, No		



Equipment handling	Yes, No		
Financial management	Yes, No		
Soil management	Yes, No		
Crop protection	Yes, No		
Any other (Specify)	Yes, No		
How often do extension officers visit you?	Frequently	1	
	Sometimes	2	
	No Visits	3	
<b>PHYSICAL CAPITAL</b>			
Transport	Yes, No		
Water supply	Yes, No		
Markets	Yes, No		
Road accessibility	Yes, No		
Electricity	Yes, No		
Storage	Yes, No		
Irrigation types	Sprinkler		
	Pivot		
	Dragline		
<b>NATURAL CAPITAL</b>			
Land	Yes, No		
Type of tenure	Leased	1	
	Permission to occupy	2	
	Communal land	3	
	Others	4	

If rented, how much do you pay?			
The size of the land cultivated			
Total size of the land			

## WOMEN EMPOWERMENT

Role In household decision making around production and income generation.

Activity	Did you participate in [activity] in the past 12 months  YES  NO	How much input did you have in making decision about [ activity]	How much input did you have in decisions on the use of income generated from [activity]
Food crop farming			
Cash crop farming			
Livestock raising			
Non-farm economic activities			
Wage and salary employment: in kind or monetary work both in agriculture and other wage work			

Access to productive capital

Productive capital	Do you have  Yes  No	How many do you have?	Who owns most	Who decide to give away most of the time?	Who decide to mortgage or rent?	Who keeps majority if marriage is dissolved	Who decides a new purchase

Agricultural land							
Large livestock( cattle)							
Small livestock (goats, sheep)							
Poultry							
Farm equipment (non-mechanized)							
Farm equipment (mechanized)							
Nonfarm business equipment							
House (and other structures)							
Large consumer durables (fridge, TV, sofa)							
Small consumer durables (radio, cookware)							
Cell phone							
Other land not used for agricultural purposes (pieces, residential or commercial land)							
Means of transportation (bicycle, motorcycle, car)							

Access to credit

Lending source	Has anyone in your household taken any loans or borrowed	Who made the decision to borrow from [SOURC	Who makes the decision about what to do with	If more credit had been available from	Why would you not have borrowed more	Did you want to borrow or get a loan from	Why were you not able to borrow from [SOURC
----------------	--	---	--	--	--------------------------------------	---	---

	cash/in-kind from [SOURCE] in the past 12 months?	E]?	the money/ item borrow from [SOURCE]?	this source, would you have used it?	from [SOURCE]?	[SOURCE] in the last 12 months but did not?	E]?
	Yes, cash			Yes			
	Yes, in-kind			.			
	Yes, cash and in-kind			No.....		Yes	
	No			..		.	
	Don't know.....					No.....	
	.....					.	
	.						
Non-governmental organization (NGO)							
Informal lender							
Formal lender (bank/financial institution)							
Friends or relatives							

Individual leadership and influence in the community.

Do you feel comfortable speaking in public to help decide on infrastructure (roads, water supplies) to be built in the community?	Yes , but with great deal of difficulty
	Yes , but with little great deal of difficulty

	Yes , fairly comfortable Yes, very comfortable No, not at all
Do you feel comfortable speaking in public to ensure proper payment of irrigation services, or other similar programs?	Yes No
Do you feel comfortable speaking in public to ensure protest the misbehaviour of authorities or elected officials in the scheme?	Yes No

### Group membership

Group categories	Is there a [GROUP] in your community?	Are you an active member of this [GROUP]?	How much input do you have in making decisions in this [GROUP]?	Why are you not a member of this [GROUP]?
	Yes No	Yes No		
Agricultural / livestock/crop producer's group (including marketing groups)				
Water users' group				
Credit or microfinance group				
Mutual help or insurance group (including burial societies)				
Trade and business association				
Civic groups (improving				

community) or charitable group (helping others)				
Local government				
Religious group				
Other (specify)				

#### Decision making

Category	Who normally takes decision?	To what extent do you make personal decisions
Agricultural production		
What inputs to buy for agricultural production?		
What types of crops to grow for agricultural production?		
When or who would take crops to the market?		
Livestock raising?		
Non-farm business activity?		
Your own (singular) wage or salary employment?		
Major household expenditures? (Such as a large appliance for the house like refrigerator)		
Minor household expenditures? (Such as food for daily consumption or other household needs)		

#### Competency and Training needs

Skills and training needs	No competent	competent	Very competent
Soil preparation for ploughing			
Determining inter and intra row spacing			
Determining seed depth			
Selecting appropriate planting methods for various			

crops			
Evaluating soil profile in farming areas			
Evaluating farming land for soil and water conservation			
Recommending suitable soil and water conservation measures for specific farm lands			
Knowledge of crop rotation			
Calculating the amount of fertilizer to apply for various crops			
Appropriate application of herbicide and fungicide			
Calibrating planters and seeders for various crops			
Planning and carrying out harvesting appropriately for various crops			
Irrigation scheduling and frequency			
Knowledge on the amount of water to use			
Knowledge of the market for your produce			
Price determination for your produce			
Knowledge of reading and interpreting market information			
Knowledge of the marketing contracts			
Value adding			
Service provider for Storage facilities			
Farm record keeping			
Financial management			
Packaging			

Political , Economic, social Institutional, and cultural environments within which women operate

Access to resources

How has land reform affected your access to land?.....  
.....

How has land reform affected land availability?...  
.....  
.....

How has land reform affected productivity?...

How has water reform affected your access to water?  
.....  
.....  
.....

How has water reform affected water availability  
.....  
.....

How has water reform affected productivity?...

How has the local and traditional authorities affected your access to land.....  
.....

How has the local and traditional authorities affected land availability?.....  
.....



How has the local and traditional authorities affected land productivity?.....

.....  
.....  
.....

How has the local and traditional authorities affected access to water?

.....  
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.....  
.....  
.....

How has the local and traditional authorities affected water productivity?

.....  
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.....

What are the available infrastructures?...

.....  
.....  
.....

Do you have access to markets? Yes, No

Do you belong to any social group? Yes, No

If yes, how do you benefit from the group?

.....  
.....  
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.....  
.....

What are the water use security do you have?.....

.....  
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.....

What are the adjustments/ changes you desire to see concerning land reforms

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What are the adjustments/ changes you desire to see concerning water reforms

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What are the adjustments/ changes you desire to see concerning income generating activities.

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.....  
.....

What are your coping strategies in term of the land reforms?.....

.....  
.....  
.....

What are your coping strategies in term of the water reforms?.....

.....  
.....  
.....

What are your coping strategies in term of the income generating activities?.....

.....  
.....

## INSTUTIONS

### Political institutions

How does the of the local political institution influence the control of land in terms of production?.....

.....  
.....

How does the of the local political institution influence the control of water resources in terms of production?

.....  
.....

How does the local political institution affect the access to land resources?

.....  
.....  
.....  
.....

How does the local political institution affect the access to water?

.....  
.....

#### Institutional linkages

How are your linkages with the following institutions?

INSTITUTIONS	STRONG	MEDUIM	WEA K	NO LINKAGE
ARC				
NGO				
EXTENSION				
Others				

What are the benefits that you get from such linkages?

.....  
.....  
.....  
.....

How do these linkages support you to improve your livelihood?

.....  
.....  
.....  
.....

#### Cultural institution

What are the societal perceptions about your participation in farming?.....

.....  
 .....

What are the societal perceptions about your income generating activities?.....

.....  
 .....

What are the societal norms and values in your income generating activities?

.....  
 .....

Economic institutions : What are your financial sources?

Sources	Yes	No
Banks		
cooperatives		
Relatives		
Friends		
Social clubs		
Burial society		
Micro finances		
Moneylenders( mashonisa)		

How are these sources supporting your livelihood?.....

.....  
 .....

How are these sources improving your livelihood?.....

.....  
 .....  
**Food security**

How many meals do you and your household eat per day?.....

Did you and your household ever cut the size of your meals or skip meals? Yes, No

How often did this happen?.....  
 .....

Did you and your household not eat for the whole day because there wasn't enough money for food?

Yes, No

How often did this happen?.....  
 .....

Did you and your household ever eat less than you felt you should because there wasn't enough money to buy food? Yes, No

Do you afford to buy food for your household? Yes, No

How much do you spend on food per month?.....  
 .....

List of food items consumed by the household	quantity	Price/unit	Total
Maize			
Mabele			
Sample			
Mielies rice			
Rice			
Flour			
Vegetables			
Oil			

Fish			
Beans			
Meat			
Beverages			

### Poverty status

Do you consider your household to be	Yes	No
Very poor		
averagely poor		
Not poor		

### What do you think has led your household to be in poverty?

What has led your household to be in poverty?	Yes	No
Cannot afford/ lack of agricultural inputs( fertilizers, seeds)		
Prices of inputs high		
Unavailability of agricultural inputs		
Late delivery of inputs by suppliers		
Low agricultural production		
Drought		
Lack of adequate land		
Prices of agricultural produce too low		
Lack of buyers for agricultural produce		
Lack of capital to start or expand agricultural business		
Lack of credit to start agricultural production or buy inputs		

Lack of employment opportunities		
Prices of commodity too high		
Salary/ wages too low		
Business to doing too well		
Too much competition		
Decline in the economy		

### Household coping strategies against poverty

Household coping strategies against poverty	Yes	No
Piece jobs		
Relief food from the government		
Substituting ordinary meals		
Reducing the number of meals		
Government grants		
Reducing other household items ( soap, tissues)		
Informal borrowing from friends, neighbours		
Formal borrowing in cash or kind		
Pulling children out of school		
Vending		
Sales of assets		
Begging from streets		
Asking from friends, neighbours or relatives		
Help from religious or charitable organization		

QUESTIONNAIRE ON DETERMINANTS OF LIVELIHOOD STRATEGIES AMONG SMALLHOLDER IRRIGATION FARMERS IN THE NORTH WEST PROVINCE

Dear respondent,

This questionnaire is designed to collect data for the study entitled: "DETERMINANTS OF LIVELIHOOD STRATEGIES AMONG SMALLHOLDER FARMERS ON IRRIGATION SCHEMES IN THE NORTH WEST PROVINCE, SOUTH AFRICA". The information provided will be treated as confidential as possible. You are requested not to write your name on the questionnaire and the analysis will be group referenced. Could you please spare some minutes to complete the questionnaire? Thanks for your cooperation.

Personal characteristics

Gender: 1 = Male 2 = Female

Age: \_\_\_\_\_

Marital status: Single                  Married                  Widowed                  Divorced

Race: African                  White                  Coloured                  Indian                  other:

\_\_\_\_\_

Religion: Christianity      Bahai                  Hinduism                  Islam                  Other: \_\_\_\_\_

Number of dependent(s): \_\_\_\_\_

Number of household: \_\_\_\_\_

Total number of people in the household: Male                  Female

Highest level of educational: Primary school      Secondary School      High School                  College  
University

No formal education

Number of months /years in farming: \_\_\_\_\_

Tenure status: Personal                  Rented                  Allocated

Farm size: \_\_\_\_\_



Are you a member of farmers' group? Yes, No

Do you have contact with an extension agent? Yes, No

If yes, how often? Regularly Occasionally Rarely

Is the extension officer from: Government Non-governmental NGO Parastatals  
(CASIDRA/ARC)

Number of workers: \_\_\_\_\_

What are your sources of labour?: Self Family Hired

How long have you been farming? \_\_\_\_\_years?

How long have you been part of an irrigation scheme? \_\_\_\_\_Years?

Please mention the irrigation scheme\_\_\_\_\_

Number of workers in the scheme: Female Male

Do you engage in non-farming activities? Yes No

If yes, please mention them:\_\_\_\_\_

Indicate the farming enterprises in which you are engaged in? (Mark with an X)

Crops	Ha	Income
Maize		
Wheat		
Sunflower		
Sorghum		
Groundnut		
Barley		
Lucerne		
Tomatoes		
Potatoes		

Cabbage		
Spinach		
Pumpkins		
Green pepper		
Onion		
Garlic		
Green beans		
Citrus		
Carrots		
Beetroot		
Mushroom		
Lettuce		
Cucumber		

Type of irrigation system

Central pivots irrigation system	
Flood irrigation system	
Sprinkler irrigation system	
Micro irrigation system	
Drip irrigation system	
Other:	

Sources of water for the irrigation scheme

Dam	
River	
Reservoir	
Bore hole	
Municipal water	
Fountain	
Other	

Nature of ownership of irrigation scheme

Privately-owned		
Community		
Government department		
Private stakeholders		
Other:		

Total annual income

Source of income	Rand (R)
Leasing farm equipment	
Rent	
Remittances	
Government grants	
Animal production	

Other:	
--------	--

Total annual expenditure: Production purposes

Expenses	Rand (R)
Maintenance of irrigation technology	
Seeds	
Water	
Electricity	
Transportation	
Workers' salary	
Fungicides, pesticides	
Fertilizers	
Other farm expenses:	

Expenses: personal use

Expenses	Rand (R)
School fees	
Transportation/ fuel	
Food	
Electricity	
Water	
Clothes	
Entertainment	

Saving (funeral, society, bank, etc.)	
Other:	

Reasons for involvement in the scheme, please tick. You may tick as many as possible

Personal interest	
Only source of income	
Husband / partner has migrated	
Community development	
Other:	

#### LIVELIHOOD ASPIRATIONS

FINANCIAL CAPITAL	Availability	Very adequate	Not adequate
Access to credit from:			
Banks			
Cooperatives			
Money lenders			
Relatives			
Personal savings			
Contractors			
Government subsidies			
HUMAN CAPITAL			
Training	Yes, No		

Vocational training	Yes, No		
Extension service	Yes, No		
Skills training			
Record-keeping	Yes, No		
Water management	Yes, No		
Equipment handling	Yes, No		
Financial management	Yes, No		
Soil management	Yes, No		
Crop protection	Yes, No		
Any other (Specify)	Yes, No		
How often do extension officers visit you?	Frequently	1	
	Sometimes	2	
	No Visits	3	
<b>PHYSICAL CAPITAL</b>			
Transport	Yes, No		
Water supply	Yes, No		
Markets	Yes, No		
Accessibility of roads	Yes, No		
Electricity	Yes, No		
Storage	Yes, No		
Irrigation types	Sprinkler		
	Pivot		
	Dragline		
<b>NATURAL CAPITAL</b>			

Land	Yes, No		
Type of tenure	Leased	1	
	Permission to occupy	2	
	Communal land	3	
	Others	4	
If rented, how much do you pay?			
The size of the land cultivated			
Total size of the land			

What do you think constrained the choice of your livelihood?

What has contributed to the poor nature of your household?	Yes	No
Cannot afford/ lack of agricultural inputs (fertilizers, seeds)		
Prices of inputs high		
Unavailability of agricultural inputs		
Late delivery of inputs by suppliers		
Low agricultural production		
Drought		
Lack of adequate land		
Prices of agricultural produce too low		

Lack of buyers for agricultural produce		
Lack of capital to start or expand agricultural business		
Lack of credit to start agricultural production or buy inputs		
Lack of employment opportunities		
Prices of commodity too high		
Salary/ wages too low		
Business not doing too well		
Too much competition		
Decline in the economy		

Abo MSc

QUESTIONNAIRE ON EMPOWERMENT OF MALE FARMERS IN RURAL AREAS THROUGH WATER USE SECURITY AND AGRICULTURAL SKILLS TRAINING FOR GENDER EQUITY POVERTY REDUCTION IN THE NORTH WEST PROVINCE

Dear Respondents

This questionnaire is for data collection on research on EMPOWERMENT OF WOMEN IN RURAL AREAS THROUGH WATER USE SECURITY AND AGRICULTURAL SKILLS TRAINING FOR GENDER EQUITY POVERTY REDUCTION IN THE NORTH WEST PROVINCE. The information provided will be treated as confidential as no name is required and the analysis will be group referenced. Could you please spare some of your valuable time in responding to questions. Thanks for your anticipated cooperation

Personal characteristics

Age: \_\_\_\_\_

Marital status: Single          Married          Widowed          Divorced

Race: African          White          Coloured          Indian          other: \_\_\_\_\_



Religion: Christianity      Bahai      Hinduism      Islam      Other: \_\_\_\_\_

Number of dependant(s): \_\_\_\_\_

Number of household: \_\_\_\_\_

Total number of people in the household: Male      Female

Highest educational level: Primary school      Secondary School      High School      College      University

No formal education

Number of months /years in farming: \_\_\_\_\_

Tenure status: Personal      Rented      Allocated

Farm size: \_\_\_\_\_

Are you a member of farmers group?      Yes, No

Do you have contact with extension agent?      Yes, No

If yes how often? Regularly      Occasionally      Rarely

Is the extension officer from: Government      Non-governmental NGO      Parastatals  
(CASIDRA/ARC)

Number of workers: \_\_\_\_\_

What are your labour sources: Self      Family      Hired

How long have you been farming \_\_\_\_\_years?

How long have you been part of an irrigation scheme? \_\_\_\_\_Years?

Name of the irrigation scheme \_\_\_\_\_

Number of workers in the scheme: Female      Male

Do you engage in non-farming activities? Yes      No

If yes name them: \_\_\_\_\_

Indicate the farming enterprises in which you are engaged? (Mark with an X)

Crops	Ha	Income
Maize		

Wheat		
Sunflower		
Sorghum		
Groundnut		
Barley		
Lucerne		
Tomatoes		
Potatoes		
Cabbage		
Spinach		
Pumpkins		
Green pepper		
Onion		
Garlic		
Green beans		
Citrus		
Carrots		
Beetroot		
Mushroom		
Lettuce		
Cucumber		

Type of irrigation systems

Central pivots irrigation systems	
Flood irrigation systems	

Sprinkler irrigation systems	
Micro irrigation systems	
Drip irrigation systems	
Other:	

Source of water for the irrigation scheme

Dam	
River	
Reservoir	
Bore hole	
Municipal water	
Fountain	
Other	

Irrigation is owned by

Privately owned		
Community		
Government department		
Private stakeholders		
Other:		

Total income annually

Source of income	Rand (R)
Leasing farm equipment	
Rent	
Remittances	

Government grants	
Animal Production	
Other:	

Total expenditure annually: Production purposes

Expenses	Rand (R)
Maintenance of irrigation technology	
Seeds	
Water	
Electricity	
Transportation	
Workers salary	
Fungicides, pesticides	
Fertilizers	
Other farm expenses:	

Expenses: personal use

Expenses	Rand (R)
School fees	
Transportation/ fuel	
Food	
Electricity	
Water	
Clothes	
Entertainment	

Saving (funeral, society, bank, etc.)	
Other:	

Reasons for involvement in the scheme please tick. You may tick more than one

Personal interest	
Only source of income	
Husband / partner has migrated	
Community development	
Other:	

Indicate your source of information

	Use	
	Use	Non use
Television		
Radio		
Newspaper		
Cell phones		
Internet		
Community library		
Extension workers		
SMS		
Other		

## LIVELIHOOD ASPIRATIONS

FINANCIAL CAPITAL	Availability	Very adequate	Not adequate
Access to Credit from:			
Banks			
Cooperatives			
Money lenders			
Relatives			
Personal savings			
Contractors			
Government subsidies			
HUMAN CAPITAL			
Training	Yes, No		
Vocational training	Yes, No		
Extension service	Yes, No		
Skills training			
Record keeping	Yes, No		
Water management	Yes, No		
Equipment handling	Yes, No		
Financial management	Yes, No		
Soil management	Yes, No		
Crop protection	Yes, No		
Any other (Specify)	Yes, No		
How often do extension officers visit you?	Frequently	1	
	Sometimes	2	

	No Visits	3	
<b>PHYSICAL CAPITAL</b>			
Transport	Yes, No		
Water supply	Yes, No		
Markets	Yes, No		
Road accessibility	Yes, No		
Electricity	Yes, No		
Storage	Yes, No		
Irrigation types	Sprinkler		
	Pivot		
	Dragline		
<b>NATURAL CAPITAL</b>			
Land	Yes, No		
Type of tenure	Leased	1	
	Permission to occupy	2	
	Communal land	3	
	Others	4	
If rented, how much do you pay?			
The size of the land cultivated			
Total size of the land			

## Competency and Training needs

Skills and training needs	No competent	competent	Very competent
Soil preparation for ploughing			
Determining inter and intra row spacing			
Determining seed depth			
Selecting appropriate planting methods for various crops			
Evaluating soil profile in farming areas			
Evaluating farming land for soil and water conservation			
Recommending suitable soil and water conservation measures for specific farm lands			
Knowledge of crop rotation			
Calculating the amount of fertilizer to apply for various crops			
Appropriate application of herbicide and fungicide			
Calibrating planters and seeders for various crops			
Planning and carrying out harvesting appropriately for various crops			
Irrigation scheduling and frequency			
Knowledge on the amount of water to use			
Knowledge of the market for your produce			
Price determination for your produce			
Knowledge of reading and interpreting market information			
Knowledge of the marketing contracts			



Value adding			
Service provider for Storage facilities			
Farm record keeping			
Financial management			
Packaging			

Political , Economic, social Institutional, and cultural environments within which women operate

Access to resources

How has land reform affected your access to land?.....  
 .....

.....  
 .....

How has land reform affected land availability?...  
 .....

.....  
 .....

How has land reform affected productivity?...  
 .....

.....  
 .....

How has water reform affected your access to water?  
 .....

.....  
 .....

How has water reform affected water availability  
 .....

.....  
 .....

How has water reform affected productivity?...

.....  
.....  
.....

How has the local and traditional authorities affected your access to land.....

.....  
.....

How has the local and traditional authorities affected land availability?.....

.....  
.....  
.....

How has the local and traditional authorities affected land productivity?.....

.....  
.....  
.....

How has the local and traditional authorities affected access to water?

.....  
.....  
.....  
.....  
.....

How has the local and traditional authorities affected water productivity?

.....  
.....  
.....  
.....  
.....

What are the available infrastructures?...

.....  
.....  
.....

Do you have access to markets? Yes, No

Do you belong to any social group? Yes, No

If yes, how do you benefit from the group?

.....  
.....  
.....  
.....  
.....

What are the water use security do you have?.....

.....  
.....

What are the adjustments/ changes you desire to see concerning land reforms

.....  
.....  
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.....

What are the adjustments/ changes you desire to see concerning water reforms

.....  
.....  
.....  
.....

What are the adjustments/ changes you desire to see concerning income generating activities.

.....  
.....  
.....  
.....

What are your coping strategies in term of the land reforms?.....

.....  
.....

What are your coping strategies in term of the water reforms?.....

.....

.....  
.....

What are your coping strategies in term of the income generating activities?.....

.....  
.....

## INSTUTIONS

### Political institutions

How does the of the local political institution influence the control of land in terms of production?.....

.....  
.....

How does the of the local political institution influence the control of water resources in terms of production?

.....  
.....

How does the local political institution affect the access to land resources?

.....  
.....  
.....  
.....  
.....

How does the local political institution affect the access to water?

.....  
.....  
.....  
.....  
.....

### Institutional linkages

How are your linkages with the following institutions?

INSTITUTIONS	STRONG	MEDUIM	WEA K	NO LINKAGE
ARC				
NGO				
EXTENSION				
Others				

What are the benefits that you get from such linkages?

.....

.....

.....

.....

.....

How do these linkages support you to improve your livelihood?

.....

.....

.....

.....

.....

Cultural institution

What are the societal perceptions about your participation in farming?.....

.....

.....

What are the societal perceptions about your income generating activities?.....

.....

.....

What are the societal norms and values in your income generating activities?

.....

.....

.....

.....

.....

**Food security**

How many meals do you and your household eat per day?.....

Did you and your household ever cut the size of your meals or skip meals? Yes, No

How often did this happen?.....  
.....

Did you and your household not eat for the whole day because there wasn't enough money for food?

Yes, No

How often did this happen?.....  
.....

Did you and your household ever eat less than you felt you should because there wasn't enough money to buy food? Yes, No

Do you afford to buy food for your household? Yes, No

How much do you spend on food per month?.....

List of food items consumed by the household	quantity	Price/unit	Total
Maize			
Mabele			
Sample			
Mielies rice			
Rice			
Flour			
Vegetables			
Oil			
Fish			
Beans			

Meat			
Beverages			

Poverty status

Do you consider your household to be	Yes	No
Very poor		
averagely poor		
Not poor		

What do you think has led your household to be in poverty?

What has led your household to be in poverty?	Yes	No
Cannot afford/ lack of agricultural inputs( fertilizers, seeds)		
Prices of inputs high		
Unavailability of agricultural inputs		
Late delivery of inputs by suppliers		
Low agricultural production		
Drought		
Lack of adequate land		
Prices of agricultural produce too low		
Lack of buyers for agricultural produce		
Lack of capital to start or expand agricultural business		
Lack of credit to start agricultural production or buy inputs		
Lack of employment opportunities		
Prices of commodity too high		

Salary/ wages too low		
Business to doing too well		
Too much competition		
Decline in the economy		

#### Household coping strategies against poverty

Household coping strategies against poverty	Yes	No
Piece jobs		
Relief food from the government		
Substituting ordinary meals		
Reducing the number of meals		
Government grants		
Reducing other household items ( soap, tissues)		
Informal borrowing from friends, neighbours		
Formal borrowing in cash or kind		
Pulling children out of school		
Vending		
Sales of assets		
Begging from streets		
Asking from friends, neighbours or relatives		
Help from religious or charitable organization		



## Appendix 1: Questionnaire used for data collection

The Water Research Commission in conjunction with the University of KwaZulu-Natal is conducting a research on, 'Empowerment of women in rural areas through water use security and agricultural skills training for gender equity and poverty reduction in KwaZulu-Natal Province'. They wish to investigate issues on women empowerment, livelihoods diversification strategies and food security among irrigating and non-irrigating women in KwaZulu-Natal.



**Please be informed that your participation in this study is strictly voluntary, and if you do not wish to answer any particular question, please feel free to say so. You are also assured that the information obtained from this study will be kept confidential and will only be used by Stanley Sharaunga, for the purposes of his PhD study, under the Water Research Commission in conjunction with the University of KwaZulu-Natal. Thank you for your participation in this study.**

### RESPONDENT IDENTIFICATION

<b>Enumerators Name</b>	
<b>Respondent No.</b>	
<b>Date</b>	
<b>Area</b>	
<b>Gender of respondent</b>	

### 1: RESPONDENT'S SOCIO-ECONOMIC AND DEMOGRAPHIC DETAILS

1.1 Can you please tell me your age/ year of birth?

1.2 What is your employment status?

1. Unemployed
2. Informal / non-permanent employment
3. Formal/permanent employment

1.3 If you are employed, what is your monthly income range?

1. Less than R2000
2. more than R2000 but less R5000
3. More than R5000 but less than R10000
4. More than R10000

1.4 What is the highest educational level that you attained so far?

1. No formal education
2. Primary education
3. Secondary education
4. College/University

1.5 What is the highest level of education for the most educated member of your household?

1. No formal education
2. Primary education
3. Secondary education
4. College/University

1.6 How many people live in your household?  
(.....)

1.7 How many people in your household are?

1. Below 14  
(.....)
2. Have disabilities or chronic illnesses  
(.....)
3. Above 65  
(.....)

1.8 How many people in your household contribute to the household income? (.....)

1.9 Are any of your household members receiving a government grant?

0. No
1. Yes

1.10 If yes in 1.9, how many are on the following:

Type of grant	No of people receiving it	Amount per person/month
Old Age grant		
Child grant		
Disability grant		

1.11 What religion does your household follow?

1. Christianity
2. Muslim
3. African Traditions

4. Shembe

1.12 What is your marital status?

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

1.13 If you are a married woman, does your husband reside at home for at least 4 days in a week?

0. No
1. Yes

1.14 How many wives does your husband have?

- 0 = one wife  
1 = more than one wives

1.15 How were you married?

- 0 = traditional, 'proper', sense (known as Ugidile)  
1 = traditional, (known as Uganile)  
2 = white wedding  
3 = others specify (.....)

1.16 [Enumerator could you possibly check if the respondent is a Binca or Amakholwa]

- 0 = Binca  
1 = Amakholwa

1.17 If married, how old is your husband? (.....)

1.18 What is the highest educational level that your husband has reached so far?

- 1 = Never been to school  
2 = Primary education  
3 = Secondary education  
4 = College/University

1.19 What is your husband's employment status?

1. Unemployed
2. Informal / non-permanent employment
3. Formal/permanent employment

1.20 What is your husband's monthly income range?

0. Less than R2000
1. more than R2000 but less R5000
2. More than R5000 but less than R10000
3. More than R10000

**WOMEN'S SOCIAL EMPOWERMENT**

**1.18 Social participation (networks)**

1.18.1 Indicate which of the following cultural, leisure and social groups you belong to?

Group	Y/N	Group	Y/N	Group	Y/N
Farmers association		Trade/labour union		Cultural association	
Farmers' cooperative		Village committee		Burial society	

Other production group		Religious group		Credit/savings group	
Traders/Business Assoc.		NGOs /civic group		Professional Assoc. (doctors, teachers, veterans).	
Water users' Assoc.		Political/party/movement		Other.....	

1.18.2 To what extent do the following statements apply to you? (Where 0 = Not at all; 1= To a limited extent; 2 = To a moderate extent; 3= to a large extent; 4 = Fully).

Indicators of social participation (networks)	Responses				
	0	1	2	3	4
a. I frequently and intensively involved in social groups?					
b. I frequently and intensively involved in voluntary activities? (e.g. canal cleaning; health-related programs)					

### 1.19 Social networks and social support (networks)

1.19.1 Indicate whether you agree or disagree with the following statement measuring your social networks and social support systems? (Where; 0 = strongly disagree; 1 = disagree; 2 = neutral; 3 = Agree; 4 = strongly agree).

Indicators	Responses				
	0	1	2	3	4
a. When emergency arises, and I need <b>money</b> , my <b>family</b> assists me.					
b. When emergency arises, and I need <b>money</b> , my <b>friends</b> assist me.					
c. When emergency arises, and I need <b>money</b> , my <b>neighbours</b> assist me.					
d. When emergency arises, and I need <b>money</b> , the <b>group I am a member of</b> (specify.....) assist me.					
e. When emergency arises, and I need <b>food</b> , my <b>family</b> assists me.					
f. When emergency arises, and I need <b>food</b> , my <b>friends</b> assist me.					
g. When emergency arises, and I need <b>food</b> , my <b>neighbours</b> assist me.					
h. When emergency arises, and I need <b>food</b> , the <b>group I am a member of</b> (specify.....) assist me.					
i. When emergency arises, and I need <b>extra labour</b> , my family assists me.					
j. When emergency arises, and I need <b>extra labour</b> , my friends assist me.					
k. When emergency arises, and I need <b>extra labour</b> , my neighbours assist me.					
l. When emergency arises, and I need extra labour, <b>the group I am a member of</b> (specify.....) assist me.					

### 1.20 Reciprocity and trust (shared norms and values)

1.20.1 To what extent do the following statements apply to you? (Where 0 = Not at all; 1 = To a limited extent; 2 = To a moderate extent; 3 = to a large extent; 4 = Fully).

Indicators	Responses				
	0	1	2	3	4
a. I trust in other people who are within my social organizations?					
b. I trust in other people who are not within my social organizations?					
c. I trust in other people who do favours to me?					
d. I regularly/frequently do favours to other people					

### 1.21 Civic participation (co-operation)

1.21.1 To what extent do the following statements apply to you? (Where 0 = Not at all; 1 = To a limited extent; 2 = To a moderate extent; 3 = to a large extent; 4 = Fully).

Indicator	Score				
	1	2	3	4	5
a. I am confident to approach institutions (e.g. banks, police) at any given time					
b. I have the ability to influence events/others					
c. I am well informed about local & or national affairs/events					
d. I regularly meet with public officials or political representatives & also get involved in local developmental meetings;					
e. I always vote to elect my leaders					

### 1.22 Views of the local area (shared norms and values)

1.22.1 To what extent do the following statements apply to you? (Where 0 = Not at all; 1 = To a limited extent; 2 = To a moderate extent; 3 = to a large extent; 4 = Fully).

Indicator	Score				
	1	2	3	4	5
a. I am happy with the social customs/norms in this area I live in					
b. I am happy with service delivery in this area					
c. I enjoy living in this area					
d. I am happy with the level of crime in this area					

### 1.23 Informational assets

1.23.1 How often do you listen to the radio?

1. Never
2. Very rarely
3. Rarely
4. Often
5. Very often

1.23.2 How often do you watch television?

1. Never
2. Very rarely
3. Rarely
4. Often
5. Very often

#### 1.24 WOMEN'S FAMILIAL EMPOWERMENT

1.24.1 To what extent do the following statements apply to you? (Where 0 = Not at all; 1 = To a limited extent; 2 = To a moderate extent; 3 = to a large extent; 4 = Fully).

Indicator	Score				
	1	2	3	4	5
<b>Household level</b>					
a. I participate in making decisions in my household					
b. I also make decisions on child-bearing & use contraception/family planning					
c. I had all the freedom to choose my husband					
d. I am free from domestic violence					

#### 1.25 WOMEN'S POLITICAL EMPOWERMENT

1.25.1 To what extent do the following statements apply to you? (Where 0 = Not at all; 1= To a limited extent; 2 = To a moderate extent; 3 to a large extent; 4 = Fully).

Indicator	Score				
	1	2	3	4	5
a. I have knowledge of political system (those in power)					
b. I have freedom to exercising the right to vote					
c. I have interest to participate in voting					
d. I am involved in the political activities (campaigns; pol. post)					
e. I think the electoral process is fair					
f. I know the people with political posts in this community					
g. I think there is freedom of participation in politics					

#### 1.26 WOMEN'S LEVEL OF PSYCHOLOGICAL EMPOWERMENT

1.26.1 To what extent do the following statements apply to you? (Where 0 = Not at all; 1= To a limited extent; 2 = To a moderate extent; 3= to a large extent; 4 = Fully).

Indicator	Score				
	1	2	3	4	5
<b>Household level</b>					
a. I have high self-esteem/ I always feel that I am worth when I am with others					
b. I always believe that I can accomplish specific goals I have set (i.e. self-efficacy)					
c. Generally, I am happy and well					
d. I don't feel isolated or lonely in my life					

e. I participate in meetings					
f. I think I am not excluded from community activities					
g. I interact & socialize well with people from different social groups					
h. I am hopeful about a better life in future					
i. I always desire/long for peace					
j. I believe that I can control events that affect my life/ carry out his or her intentions (personal control).					

### 1.27 LEVEL OF WOMAN'S LEGAL EMPOWERMENT

1.27.1 To what extent do the following statements apply to you? (Where 0 = Not at all; 1= To a limited extent; 2 = To a moderate extent; 3= to a large extent; 4 = Fully).

Indicator	Score				
	1	2	3	4	5
a. I know my legal rights (i.e. guaranteed power/claims)					
b. My rights to use, alienate, or exclude others from my land are quite secure					
c. I am able to exercise my rights over land (i.e. the rights to use, alienate, or exclude others from land)					
d. There are no threats of eviction from my land					
e. I always find it easy to approach the police					
f. I always find it easy to approach the courts					
g. I will be treated fairly by the police at any given moment					
h. I will be treated fairly by the courts in any given court case					

### 1.28 LEVEL OF WOMEN'S EMPOWERMENT IN AGRICULTURE

1.28.1 To what extent do the following statements apply to you? (Where 0 = Not at all; 1= To a limited extent; 2 = To a moderate extent; 3= to a large extent; 4 = Fully).

Domains	Indicators	Score				
		1	2	3	4	5
Production	I make decisions concerning crop production					
	I am free to choose what to produce on my plot					
Resources	I am involved in purchasing, sale and transfer of agricultural assets					
	I have access to and make my own decision on credit					
Income	I have control over use of household income					
Leadership	I am confident to speak in public					
Time	I am satisfied with the time available for leisure activities					
	My agricultural work is not affected by the workload in my domestic tasks					
Legal	Customary laws do not govern my ability to acquire and use agricultural resources					
	I am satisfied with the laws and institutions governing acquisition					

	and security of use of agricultural resources					
Agency	I am motivated to pursue agricultural activities					

### 1.29 LEVEL OF WOMEN'S AGENCY

1.29.1 To what extent do the following statements apply to you? (Where 0 = Not at all; 1= To a limited extent; 2 = To a moderate extent; 3= to a large extent; 4 = Fully).

Domains	Indicators	Score				
		1	2	3	4	5
Power to aspire	I aspire/aim for better things in life.					
Bargaining/negotiating power	I always find myself bargaining/making a deal to achieve livelihood outcomes					
Manipulation power	I sometimes manipulate/influence/exploit other people in order to achieve livelihood outcomes?					
Subversion power	I become rebellious when people try to sabotage my livelihood strategies?					
Resistance power	I resist moves by other people who try to sabotage my livelihood strategies					
Reflection power	I always reflect/redirect my thoughts on how best to meet my survival needs (i.e. serious thought or consideration).					
Analysis power	I always analyse/scrutinise/explore better ways to meet my survival needs?					
Level of motivation	I am motivated to work and feed my family					
Level of determination	I am so determined to succeed in life, in general					
Level of resilience	I have the capacity/spirit of working hard to pursue my livelihood goals					

## 2 CROP PRODUCTIONS

2.1 Does your household engage in any crop production?

0. No
1. Yes

2.2 If yes to 1.14, how do you perceive the profitability of your crop production enterprise?

0. Very unprofitable
1. Unprofitable
2. Break-even
3. Profitable
4. Very profitable

2.3 Indicate the crops grown, output/yields, quantity sold and the selling price of each crop in the past summer (rainy) season.

Type of Crop	Quantity harvested (kg, tons, buckets, etc.)	Quantity sold (kg, tons, buckets, etc.)	Price per unit
a. maize			



b. potatoes			
c. onions			
d. cabbage			
e. tomatoes			
f.			
g.			
h.			

2.4 Indicate the crops grown, output/yields, quantity sold and the selling price of each crop in the past winter (dry) season.

Type of Crop	Quantity harvested (kg, tons, buckets, etc.)	Quantity sold (kg, tons, buckets, etc.)	Price per unit
a. maize			
b. potatoes			
c. onions			
d. cabbage			
e. tomatoes			
f.			
g.			
h.			

### **3 PHYSICAL/MATERIAL ASSET EMPOWERMENT**

#### **3.1 Land ownership**

3.1.1 How much land under the various ownership statuses does your household have?

<b>Land</b>	<b>Total household quantity</b>	<b>Quantity or level of control</b>
<b>Dry</b>		
a. Arable dry land (Ha) (Owned)		
b. Arable dry land (Ha) (Rented)		
c. Arable dry land (Ha) (no formal lease agreement)		
<b>Irrigated</b>		
d. Arable irrigation land (Ha) (Owned)		
e. Arable irrigation land (Ha)		
f. Arable irrigation land (Ha) (no lease formal agreement)		

3.1.2 How much decision-making power do you have over use of household agricultural land in general?

0 = no power

1 = little power

2 = moderate power;

3 = much power;

4 = full power.

3.1.3 How much power to transfer land (i.e. selling, renting, and giving it to other people) do you have?

- 0 = no power
- 1 = little power
- 2 = moderate power;
- 3 = much power;
- 4 = full power.

3.1.4 Overall, indicate the quality of land you are using for agricultural production? (Where; 0 = very poor quality; 1 = poor; 2 = average; 3 = good quality; 4 = very good quality).  
(.....)

### 3.2 Livestock Ownership

3.2.1 How much of the following livestock does your household have? Indicate on a five point scale, the amount of control you have on these types of livestock. (Where; 0 = no control; 1 = little control; 2 = moderate control; 3 = much control; 4 = full control).

Livestock type	Number currently owned	Woman's level of control	Number sold in the past 12 months	Price per unit	Number slaughtered for family purpose in the past 12 months
1. Cattle					
2. Goats					
3. Sheep					
4. Pigs					
5. Chickens					
6. Other (specify)					

### 3.3 Agricultural machinery

3.3.1 How many of the following agricultural machinery does your household have?

3.3.2 Also indicate the price you would buy it.

3.3.3 Rate on a five point scale, the amount of control you have on these types of machinery. (Where; 0 = no control; 1 = little control; 2 = moderate control; 3 = much control; 4 = full control).

Types agricultural machinery	2.4.1 No.	2.4.2 Asset price	2.4.3 Level of women's control
a. Trucks			
b. Animal-drawn Ploughs			
c. Tractors			
d. Hoes			
e. Wheelbarrow			
f. Garden fork			
g. Knapsack sprayer			
g. Spades			
h. Tractor-drawn plough			
i. Animal drawn cart			

j. Rake			
---------	--	--	--

### 3.4 Household Asset Ownership

3.4.1 Do you own the following assets? (Indicate number owned in the appropriate box, zero if not owned. Also indicate the price you would charge if you were to sell the asset).

Asset	No.	Asset value	Asset	No.	Asset value
a. Block, tile house			j. Cell phone		
b. Block, zinc house			k. TV		
c Round, thatch house			l. Radio		
d. Round pole and mud or shack house			m. Telephone		
e. Tap			n. Bicycle		
f. borehole			o. Car		
g. Protected well			q. Motorcycle		
h. Water tank			r. Other (specify)		
i. Other Specify.....			.....		
.....			.....		
.....			.....		

### 3.5 Infrastructural support

3.7.1 Please rate the extent to which you agree with the following statements (Tick appropriate box).

Indicator	Responses				
	0	1	2	3	4
a)					
b) Road access is good					
c) Communication infrastructure is good					
d) Electricity is reliable					
e) Storage dams are well maintained					
f) Domestic water supply is reliable					

### 3.6 Water-use security for household uses

3.6.1 Indicate whether you agree or disagree with the following statement measuring your household water-use security levels? (Where; 0 = strongly disagree; 1 = disagree; 2 = neutral; 3 = Agree; 4 = strongly agree).

Indicator	Responses				
	0	1	2	3	4
1. I am satisfied with the consistency of water availability for my household uses					
2. I am satisfied with the quality of water for my household uses					
3. I am satisfied with the amount I pay for water for my household uses					
4. I am satisfied with the distance covered to walk to source water for my household uses					

**(NB: IF THE RESPONDENT IS A DRY-LAND FARMER IN MACHUNWINI JUMB TO QUESTIONS 4.1)**

**3.7 Water-use security for agricultural purposes**

3.7.1 Indicate whether you agree or disagree with the following statement measuring your water-use security levels? (Where; 0 = strongly disagree; 1 = disagree; 2 = neutral; 3 = Agree; 4 = strongly agree).

Indicator	Responses				
	0	1	2	3	4
1. I am satisfied with the consistence of water supply					
2. I am satisfied with the maintenance of the canal					
3. I am satisfied with the sufficiency of water supply					
4. I am satisfied with the quality of water supplied					
5. I am confident with my capacity to pay for water					
6. I am satisfied with my plot's position along the canal (lower/upper end)					
7. I would be happy if there were improvements in the current water supply and water related services					
8. My right or claim to water is secure					

**4. Human capital empowerment**

**4.1 Health status**

4.1.1 How do you rate your state of health over the past year on a five point scale (where; 0 = very poor; 1 = poor; 2 = moderate; 3 = fine; 4 = very fine).

4.1.2 How far is your household to the nearest health institution?

**4.2 Vocational skills**

4.2.1 Have you ever attended any vocational skills training courses?

- 0. No
- 1. Yes

4.2.2 If yes, in what field did you take your vocational skills training in?

- 1. Agriculture
- 2. Business/Enterprise management
- 3. Craftwork
- 4. Construction industry

Any other specify: a.....

- 5. b. ....
- 6. c. ....
- 7. d. ....

**4.3 Vocational work skills**

Rate your knowledge and skills on the following vocational work skills on a five-point scale. (Where; 0 = very poor; 1 = poor; 2 = moderate; 3 = good; 4 = excellent/very good)

Vocational work skills	Responses				
	0	1	2	3	4

a. Crop production skills					
b. Animal production skills					
c. Business management skills					
d. Craftwork skills					
e. Construction industry skills					
f. Barber/Saloon skills					
g. Garment making/ sewing					
h. Cooking/baking skills					
i. Any other.....					
j. ....					

#### 4.4 Business management skills

4.4.1 Have you received any business management skills training?

0. No

1. Yes

4.4.2 Whether yes or no, rate your business management knowledge and skills on the following aspects on a five point scale. (Where; 0 = very poor; 1= poor; 2 = moderate; 3 = good; 4 = excellent/very good)

Business management skill	Responses				
	0	1	2	3	4
a. Level of numeracy					
b. Level of literacy					
c. Business management skills					
d. Financial knowledge					
e. Trading/marketing/merchandising skills					

#### 4.5 Agricultural skills training

4.5.1 Have you attended any agricultural skills training courses?

0. No

1. Yes

4.5.2 If yes, what agricultural skills training have you acquired so far?

1. Mushroom production

2. Pig production

3. Poultry production

4. Crop production

5. Any other, specify.....

6. a. ....

7. b. ....

4.5.3 How many times have you engaged an extension officer(s) in the past 12 months?

.....

#### 4.6 Crop production skills/ Farmer competence

4.6.1 Rate your competence on the following crop production aspects on a five point scale. (Where; 0 = very poor; 1= poor; 2 = moderate; 3 = good; 4 = excellent/very good).

Crop production skills	Responses				
	0	1	2	3	4
<b>Crop management</b>					
a. Determining seed depth					
b. Selecting appropriate planting methods for various crops					
c. Determining inter and intra row spacing					
d. Soil and water conservation measures for specific farm lands					
<b>Fertility management</b>					
a. Determining the amount of fertilizer to apply for various crops					
b. Determine nutrient deficiency symptoms in crops					
<b>Weed &amp; pest control techniques</b>					
a. Application of herbicide and fungicide					
b. Calibration and use of sprayer					
<b>Post-harvesting techniques</b>					
a. Planning and carrying out harvesting appropriately for various crops					
b. Packaging of produce					
c. Storage of produce					
<b>Farm management skills</b>					
a. Farm record keeping					
b. Financial management					
c. Knowledge of marketing contracts					
d. Price determination for your produce					
e. Knowledge of the market for your produce					
f. Maintenance of a water pump					

#### 4.7 Animal husbandry skills

4.7.1 Rate your knowledge and skills of animal husbandry on a five point likert scale. (Where; 0 = very poor; 1= poor; 2 = moderate; 3 = good; 4 = excellent/very good).

Animal husbandry skills	Responses				
	0	1	2	3	4
a. Animal health (e.g. vac, disease prevention)					
b. Animal feeding & nutrition					
c. Animal welfare requirements					
d. Meat processing skills					

#### 4.8 Livelihood diversification and control over financial capital

4.8.1 What is the main reason for engaging in any of the following livelihood activities? Where; (1 = main source of food; 2 = additional source of food; 3= main source of income; 4 = source of additional income).

4.8.2 How much income does your household receive from these activities in a past year?

4.8.3 In a chronological order, rate which activities take much of your time, starting with the one that u spent much of your time?

4.8.4 How much or what fraction of that money is under your control? Where (0 = no control at all, 1 = very little control; 2 = moderate control; 3 = much control; 4 = full control).

Activity	Main reason for engaging in the following	Order of time spent in such activity	Income per given time (R)	Frequency in a year (e.g. 4 times; 5 times, etc.) per month	Number of times in the past 12 months	Amount of woman's control of that income
<b>Agricultural activities</b>						
a. Crop production						
• Irrigation farming						
• Dry-land farming						
b. Livestock production						
c. Agricultural wage labour						
d. Vending of agricultural products						
e. Hiring agricultural equipment						
f. Any other ( <i>specify...</i>						
g. ....						
h. ....						
<b>Non-agricultural activities</b>						
i. Formal employment						
j. Wage employment						
k. Dress-making						
l. Own business						
m. Petty trade/hawking						
n. Vending/marketing						
o. Forestry product sales						
p. Craft-work/Arts						
q. Construction related job						
r. Any other ( <i>specify...</i>						
s. ....						
<b>Donations</b>						

t. Government grants						
u. Pensions						
v. Remittances						
w. Aid						
x. Any other ( <i>specify...</i> )						
y. ....						

4.8.5 Have you received credit or loan facility in the past 12 months?

0 = No

1 = Yes

4.8.6 If yes, can you name the institutions/organizations that have provided you with some credit in the past twelve months and indicate how much they lent to you?

0 = Relative/friend (.....)

1 = Savings club/stokvel (.....)

2 = Money lender (.....)

3 = Input supplier (.....)

4 = Financial institution (.....)

5 = Other, specify.....

#### 4.9 Household consumption status

4.9.1 List all the foodstuffs that you buy in a typical month and how much you spent on every item.

Commodity	Quantity	Price
a. Maize meal		
b. Rice		
c. Chicken		
d. Beef		
e. Pork		
f. Cooking oil		
g. Vegetables		
h. Other, specify		
i. ....		
j. ....		
k. ....		
l. ....		
m. ....		

4.9.2 How much does your household spent on the following commodities and services in a month? Rate how much you (as the primary woman) contribute to these expenditures. (Where; 0 = nothing; 1 = very little; 3 = moderate contribution; 4 = most of the contribution; 5 = all the contribution).

Commodity/services	Monthly expenditure	Contribution score
Electricity		



Water		
Rent		
Health		
Education		
Transport		
Clothes		
Entertainment		
Any other ( <i>specify...</i> )		

## 5. HOUSEHOLD'S FOOD SECURITY STATUS

### 5.1 The HFIAS to measure the food security status of households

#### Example

1. In the past year, did you worry that your household would not have enough food?

0 = No (skip to Q2)

1 = Yes

1.a. How often did this happen? Also name the months when that happened.

0 = Never

1 = Rarely (one to three months in the past year)

2 = Sometimes (four to eight months in the past year)

3 = Often = more than eight months in the past year

4 = Throughout the year

No.		Ye s	No
1	In the past year, did you worry that your household would not have enough food? If yes, in which months?.....		
2	In the past year, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources? If yes, in which months?.....		
3	In the past year, did you or any household member have to eat a limited variety of foods due to a lack of resources? If yes, in which months?..... .....		
4	In the past year, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food? If yes, in which months?.....		
5	In the past year, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?		

	If yes, in which months? .....		
6	In the past year, did you or any household member have to eat fewer meals in a day because there was not enough food? If yes, in which months?..... ..		
7	In the past year, was there ever no food to eat of any kind in your household because of lack of resources to get food? If yes, in which months?..... ..		
8	In the past year, did you or any household member go to sleep at night hungry because there was not enough food? If yes, in which months?..... ..		
9	In the past year, did you or any household member go for a whole day and night without eating anything because there was not enough food? If yes, in which months? .....		



**Household survey questionnaire**

You are invited to participate in this survey and please respond to all questions in this questionnaire honestly. The purpose of the survey is to assess the impact of the Tugela Ferry irrigation scheme on household welfare. The information supplied is strictly confidential and it cannot be traced back to you, and it's going to be used by Sinyolo Sikhulumile, a master's student at the University of KwaZulu-Natal, for academic purposes only. Please be informed that your participation in this survey is voluntary, and you may withdraw/decline participation at any time you wish to do so.

All the information provided here will be treated as **STRICTLY CONFIDENTIAL**.

<b>General Information</b>
Name of interviewer.....
Date:.....
Scheme:.....
Block:.....
Household reference number:.....

**1. Household composition** (Record respondent details in first row)

Household member	Position in the household	Age	Gender	Marital status	Education level ( <i>Specify, e.g. Grade 5</i> )	Main occupation

<u>Household position</u>	<u>Gender</u>	<u>Marital status</u>	<u>Main occupation</u>			
1 Household head	1 Male	1 Single	1 Retired	6 School/pre-school		
2 Spouse farmer	2 Female	2 Married	2 Unemployed	7 Fulltime		
3 Daughter /son		3 Divorced	3 Regular salaried job			
4 Other (specify, e.g. cousin)		4 Widowed	4 Seasonal/ temporary job			
.....			5 Self employed			

**2. Land**

2.1 What is the total area of your farming land in the irrigation scheme? ha

2.2 Indicate the number of plots you have, their sizes and their specific tenure system by completing the table below (Include both irrigated and dry land plots).

Plot number	Means of ownership	Size of plot (ha)	Tenure system
	1 Allocated 2 Inherited 3 Borrowed/leasing 4 Bought		1 Communal/ PTO (Permission to occupy) 2 Shareholding 3 Free holding 4 Leasing 5 Borrowing 6 Other (specify)
2.3 Do you pay fees for land? Yes=1 No=0			
2.4 If yes in 2.3 (above), how much per 0.1ha plot per year?			
2.5 Are you satisfied with the present security of land Yes=1 No=0			
2.6 Do you think your irrigated land size is: 1=Too small? 2=Just right? 3=Too large?			

2.7 Do you feel people should be able to sell their plots to others? Yes=1 No=0	
2.8 Give reasons for your answer in 2.7 above..... ..... ..... .....	

**3. Cropping and marketing system**

3.1 Complete the table below about crops produced last season?.

Crop name	Area planted (ha)	Quantity harvested (specify units, e.g. tons, kg)	Quantity sold	Price per unit	Quantity consumed, bartered or donated	Market outlet	Market distance from plot (km)
1=Maize 2=Tomatoes 3=Potatoes 4=Sugarcane 5=Spinach (specify).....	6=Cabbage 7=Beans 8=Onions 9=Butternut 10=Other					<u>Market outlet</u> 1=Local shop    5=Shop in town 2=Neighbours    6=Others (specify) 3=Contractor ..... 4=Hawkers	

3.2 What is your main or favourite market outlet in 3.1 above?	
3.3 Which crops in 3.1(above) are grown for mainly household consumption and are hardly sold?	
3.4 What problems do you face with crop production in the scheme?..... ..... .....	