TRENDS IN WOMEN'S PARTICIPATION IN AGRICULTURE AT TSHIOMBO IRRIGATION SCHEME, LIMPOPO PROVINCE

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DECLARATION

I, Mpfariseni Sylvia Thagwana, declare that "Trends in women's participation in agriculture at Tshiombo Irrigation Scheme, Limpopo Province," is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Mpfariseni Sylvia Thagwana November 2009

Signed:……..

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ABSTRACT

Trends in Women's Participation in Agriculture at Tshiombo Irrigation Scheme, Limpopo Province

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The study explores trends in women's participation in agriculture at Tshiombo Irrigation Scheme in Thulamela Municipality, Limpopo Province. The overall objective is to assess the trends in women's participation in agricultural activities and to find out if this enhances their livelihoods. The study seeks to answer four core questions: 1) To what extent do women at Tshiombo Irrigation Scheme participate in agriculture, and what is the nature of their participation, e.g. in respect of labour provision, decision-making, and determining who benefits? (2) What are the main factors that over time lead men to withdraw from agriculture and women's role in agriculture to become more prominent? (3) To what extent does women's increased participation in production activities contribute to a better and more secure livelihood for themselves? (4) What are the main challenges women experiences in agriculture at Tshiombo Irrigation Scheme?

Both qualitative and quantitative methods were employed in the collection and analysis of data, and a case study approach was used at three villages under study, namely Mutshenzheni, Matombotswuka and Maraxwe.

The main research findings are: 1) over time, women have come to dominate farming at Tshiombo Irrigation Scheme to prevent poverty and therefore their participation improves food security in their households; 2) men's decline in agriculture is attributed to water shortages, commitment to off-farm jobs and high production costs; 3) women are faced with a number of challenges in agricultural production which include amongst others water shortages, high input costs and lack of skill in marketing their products.

The following recommendations were made: 1) government should seek ways of lowering the cost of ploughing services, whether this means encouraging farmers to return to animal traction, or encouraging more providers of tractor services, so that the prices are reduced through competition; 2) extension officers should encourage farmers to make more use of cow dung or other natural fertilizers, because this would assist in lowering input costs as well as benefiting the soil; 3) in terms of water shortages, the government is installing the floppy irrigation systems through Revitalization of Irrigation Schemes; however, in the interim, farmers should try to upgrade and maintain the storage dams which are currently not in use; 4) the re-introduction of water bailiffs could help to supervise and manage water, which in turn could ease water shortages and prevent conflict among farmers; 5) the Department of Agriculture should train women farmers in marketing skills. The study will be of primary benefit to amongst others, policy makers, scholars, and civil society organisations.

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

Despite South Africa's self-sufficiency in food production, about 14 million people are said to be vulnerable to food insecurity, and 43% of households suffer from food poverty (National Treasury, 2003 cited in Machete, 2004). Women are known to be generators of food for their families and as such, they play a significant role in national agricultural production; however, they are particularly vulnerable to poverty (FAO, 1999). Since 1994, the South African government has embarked on massive reforms aimed at addressing rural poverty and inequalities resulting from the past apartheid regime (Nthai, 2007). Promoting agriculture in general and irrigation schemes in particular are seen as means of contributing to these efforts. Moreover, the government has committed itself to the economic and social empowerment of women, and this is no less true in the agricultural sector.

Most of South Africa's small-scale irrigation schemes are found in rural areas in the former homelands where poverty is concentrated (May, 2000). Limpopo Province is considered to be one of the driest and poorest provinces (Machete *et al.*, 2004), with water scarcity being problematic (Perret, 2002). This is presumably why Limpopo accounts for a large share of the country's irrigation schemes, which occupy 135 772 hectares (Machete *et al.*, 2004). According to Van Koppen (1999), the main aim of governmental and non-governmental agencies in irrigation schemes is the alleviation of poverty. Van Koppen further states that improved access to irrigated land and water is only one factor for poverty alleviation; and that poverty can only be alleviated if technical, financial and organisational support is focused in a coordinated manner, on poor women and men. This is supported by Hussain and Hanjra (2004), who indicate that access to reliable irrigation water contributes to improved socio-economic status of rural communities and alleviates poverty. Van Koppen *et al.* (2005) contend that poverty levels are worse where access to water is poor.

Historically, farmers, irrigators and water users were predominantly men. This was based on the assumption that traditional farming methods demand physical strength that men possess and women do not possess (Zwarteveen and Neupene, 1996). Keegan (1988)

describes the life histories of four men who participated in agriculture in the eighteenth and nineteenth centuries in South Africa. These men did quite well in farming, and relied on their families' labour for ploughing and production of crops, however the women of the families were less involved. At that time, women's roles were mainly weeding and harvesting, in support of their husbands or fathers. One can therefore argue that the roles assigned to women kept them at home and as result they participated in farming only occasionally and certainly not in a decision-making capacity. However, over the course of the twentieth century in developing regions, women became more actively involved in agriculture than men,. Scholars attribute this change to women's increasing responsibility for ensuring their households' survival (Lastarria-Cornhiel, 2006), and to the large-scale migration of men to cities (Schreiner and Van Koppen, 2001; Bastidas, 1999 and Lastarria-Cornhiel, 2006).

Presently in South Africa, as in many other developing countries, women are the major food producers for household consumption (Jacobson, 1992 cited in Maimela, 2002). This appears to be true for many, if not most, of Limpopo's irrigation schemes.

1.2 PROBLEM STATEMENT

Over time, women have emerged as the main farmers at Tshiombo Irrigation Scheme, yet at the main study area land is still held mainly by men. The study wants to find out as to how did this situation arise, and what are the livelihood consequences for women?

The above condition shows that land rights do not affect the participation of women in agricultural production. One could therefore argue that land ownership in this scheme does not affect women's participation in agriculture as they are doing well in agriculture despite the lack of land rights. However, women could be at risk of losing their user rights if their husbands die or if they get divorced, as they might be forced to leave the family or they might decide to leave due to the conditions in that particular family. Therefore, security of tenure could help in situations like these. It is therefore important for the researcher to document conditions in which women farmers participate in agriculture at Tshiombo Irrigation Scheme and to find out what encourages them to be involved in agriculture under these conditions.

At the same time, the decline of men in farming has been noted. During the focus group discussions with some women farmers, it was indicated that men's decline in farming is due to laziness. It was further explained that some men spend most of their time drinking alcohol. However, the results of this study do not support this explanation.

1.3 OBJECTIVES OF THE STUDY

The overall objective of the study is to understand trends in women's participation in agriculture, and to find out if their participation in agriculture enhances their livelihoods.

The specific objectives are:

- To examine the current status of women's participation in agriculture.
- To establish the main causes for men's withdrawal from production and women's increasing role in production.
- To understand the significance of these trends for women's livelihoods and well-being.
- To document the challenges that women farmers experience in relation to agriculture at the Scheme.

1.4 RESEARCH QUESTIONS

In light of the above objectives, the research has tried to answer the following questions:

- To what extent do women at Tshiombo Irrigation Scheme participate in agriculture, and what is the nature of their participation, for example in respect of labour provision, decision-making, and determining who benefits?
- What are the main factors that, over time, have reversed the domination of men in agriculture in favour of women?
- To what extent does an increased participation in agriculture contribute to a better and more secure livelihood for these women?
- What are the main challenges experienced by women in respect of farming at the Scheme, and how can these challenges be addressed or overcome by government or other role-players?

1.5 JUSTIFICATION FOR AND SIGNIFICANCE OF THE STUDY

In most irrigation schemes in sub-Saharan Africa, plots are allocated on the assumption that men are the main farmers, decision-makers and providers (Zwarteveen, 1996). As a result, plots are only allocated to men, and it is assumed that women will contribute to farming through their husbands or male relatives. Historically, men have controlled land through patrilineages, and therefore land is still substantially in their control (Goheen cited in Davison, 1988). Goheen further argues that customary practice allows men to own land, while women may only own crops and not fields. This is also the case at Tshiombo.

A study conducted at Dakiri Irrigation Scheme in Burkina Faso during 1994 shows that women are more motivated in irrigated production when plots are registered in their names, because they know that they benefit more in this situation. (Zwarteveen, 1996). However, women often cultivate land that belongs to their husbands or other male relatives. This finding has been supported by Carpenter (2000, cited in Maimela, 2002) who indicates that women are the providers of their families' basic diet in most rural cultures. However, men are reluctant to admit that their wives, mothers and daughters do most of the agricultural work, and as such, women's significant contribution to food production is under-acknowledged and their scope for decision-making is limited. Despite carrying substantial rural responsibility, women have generally been ignored by development officials and planners (UNDP, 1980). This study aspires to help fill this gap.

Various studies (Lahiff, 2000; Maimela, 2002 and Khumalo, 2002) have been done at Tshiombo Irrigation Scheme, but little has been done on women's participation in production-related activities. The researcher therefore feels that there is merit in examining recent trends in women's participation in production-related activities. It is also important to find out if women's predominance in agriculture has a significant impact on their livelihoods. The study will be of primary benefit to policy makers, scholars and civil society organisations.

1.6 CHAPTER OUTLINE

Chapter 1: Introduction

This chapter serves as an introduction where background information on women's participation in agriculture is provided. This chapter also discusses the statement of the problem, objectives, justification and significance of the study.

Chapter 2: Literature review

This chapter presents a review of literature on trends of women's participation in agriculture. In particular, it includes a review of books, journal articles and theses on irrigation schemes in Limpopo.

Chapter 3: Research methodology

This chapter describes research design, methodology used, the process of data collection, limitations of the study, ethical considerations and an outline of the analytical approach.

Chapter 4: Presentation of results

This chapter provides a summary of findings. Results are presented and analysed.

Chapter 5: Challenges in agricultural production at Tshiombo Irrigation Scheme

This chapter describes the challenges that farmers experience in agricultural production at Tshiombo Irrigation Scheme.

Chapter 6: Discussion, conclusions and recommendations

This chapter provides a discussion of the findings, summary of conclusions and recommendations.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter, the literature on women's participation in agriculture, and irrigated agriculture in particular, is reviewed. The review also considers control over land and resources, gender equity and power, in the context of agriculture, gender and water access, and division of labour.

2.1.1 THE ROLE OF AGRICULTURE IN LIVELIHOODS

Historically, agriculture played a prominent role in South Africa, despite the presence of a large mining sector. Lahiff (2000) points out that most households in the former homelands (Bantustan areas) depend on multiple sources of income, and amongst others, agriculture contributes a relatively insignificant part compared to wages from mining and pensions. Lahiff (2000) further states that agriculture plays an important role in providing supplementary income to a considerable number of households in the homelands. South Africa has a dual agricultural economy, comprising a well-developed commercial sector and a predominantly subsistence orientated sector.

A study conducted in 12 small schemes in Kenya and Zimbabwe, where the average plot size varied from 0.5 to 1.0 hectare, showed that irrigation contributed from 25% to 80% of total family income (FAO, 1999). A study conducted in Nepal (i.e. Asia)at Chhatis Mauja Irrigation Scheme, shows that when analysing livelihood strategies of households, irrigated agriculture is considered to be subsistence oriented (Zwarteveen and Neupane, 1996). Furthermore, Van Averbeke and Mohamed (2006) point out that smallholder irrigation schemes can be used to increase and diversify plant production, and as a result, the outcome of livelihoods dependent on plant production improves. In many African countries, smallholder irrigation is still considered the vital driving force for rural development and poverty alleviation, despite its problems and failures (Machete *et al.*, 2004).

Agricultural activities in South Africa range from intensive crop production and mixed farming in winter-rainfall and high summer-rainfall areas, to cattle-ranching in the

bushveld, and sheep-farming in the more arid regions (South Africa Yearbook, 2003/2004). Limpopo Province is a semi-arid area, in which the greater portion of the region receives less than 600 mm of annual rainfall and experiences high summer temperatures (Machete, *et al.*, 2004). Despite high temperatures, farming is widely practised in the area. However, the availability of water limits agricultural production.

2.1.2 IRRIGATED AGRICULTURE

In South Africa, some 1.3 million hectares are under irrigation, which amounts to about 1.5% of the country's agricultural land (SA Yearbook 2007/08). Furthermore, there are more than 300 smallholder irrigation schemes in South Africa, encompassing 50 000 hectares, the majority of which are found in the former homelands (Water Wheel, 2007; Machete *et al*., 2004)**.** In South Africa, irrigation schemes were developed by the government in the 1940s, with the objective of providing food security for rural communities. Schemes were managed by government agencies, and farmers were given subsidies for production until the 1990s (Machete *et al.*, 2004).

Irrigation can be categorised into private irrigation farms, comprising 40% of irrigated land; and Irrigation Board and State Irrigation Schemes, each of which comprise about 30% of irrigated land. Irrigation Board Schemes have been established through local initiatives in the commercial farming areas, where group of farmers have grouped together and applied to the Department of Water Affairs and Forestry for water allocation (Vaughan, 1997). Farmers at Irrigation Boards have large farms, access to credit and well established markets, and farming is their main source of livelihood (Machete *et al.*, 2005). State Irrigation Schemes include the White Settlement Schemes dating from the 1930s and the Bantustan Schemes dating from the early 1950s, and for these schemes, the government provided subsidies.

Irrigation and irrigation development are both the responsibility of the Department of Water Affairs and Forestry, which, amongst other tasks, oversees the development of national water infrastructure and devises systems for the allocation and control of scarce water resources (Vaughan, 1997). Furthermore, smallholder irrigation schemes across the country are in transition from government ownership to farmer ownership and from

subsistence to commercial farming. Since 1994, the government has been engaged in restructuring state-owned assets, which negatively affects farmers (Machete *et al.*, 2004).

Small-scale irrigation schemes contribute a major share of income to the rural poor who are engaged in farming (Bembridge, 2000 cited in Khumalo, 2002). Irrigated agriculture contributes more than 30% of the gross value of the country's crop production. However, unavailability of water is the most limiting factor in agricultural production (SA Yearbook 2007/08). Access to reliable irrigation water can enable farmers to intensify cultivation, and in turn this allows them to improve their incomes, livelihoods and quality of life (Hussain and Hanjra, 2004).

The government introduced a system of Irrigation Management Transfer (IMT), which came into existence after the withdrawal of state support for the irrigation schemes. Initially, water was considered a common pool resource, which resulted in a number of problems; for instance, ineffective state management due to inadequate local cooperation or participation in incentives for successful systems (Machete *et al.*, 2004). IMT refers to the transfer of responsibility of managing, operating and maintaining irrigation schemes from the state to farmers (Van Averbeke and Mohamed, 2006). It is through IMT that a number of basic irrigation management responsibilities are being shifted away from a centralized government irrigation agency to financially autonomous local-level non-profit organisations (Khumalo, 2002).

2.1.3 WATER ACCESS

Water is one of the most important natural resources, and many people depend on it for their livelihoods (Hussain and Hanjra, 2004). South Africa has limited water resources and few opportunities for economically enhancing water supplies by building works. The dominant influence on the availability of water in South Africa is its physical position in the Southern mid-latitudes and the high pressure meteorological systems associated with dry, descending air masses (Backeberg *et al*., 1996).

Irrigation uses about 51% of South Africa's surface water resources, and all the large irrigation schemes are supplied from storage dams (Backeberg *et al*., 1996). Water is intensively needed for food production and it is considered to be a major limiting factor

in many parts of Asia and sub-Saharan Africa. This is also supported by , Hussain *et al.* (2004) who indicates that water plays an important role in, hygiene, sanitation, food production, and food security. Unavailability of water has a negative impact on farming and Wenhold *et al.* (2007) argues that farmers' failure to achieve anticipated productivity gains is due to unreliable water delivery which is beyond their control.

Van Koppen and de Lange (1999) estimated that 90% of the water users and farm decision-makers in the Arabie/Olifants Scheme are women. Van Koppen (2002) contends that from both developmental and equity perspectives, it is desirable that there are no gender-related differences between men and women farmers in water access, inclusion in forums, and inclusion in leadership positions. Schreiner and Van Koppen (2001) argue that gender equality in irrigation schemes improves the income of both men and women and therefore it needs to be ensured, especially in light of the fact that there is a tendency to ignore women's needs as producers. Similarly, Zwarteveen and Neupane (1996) argue that the absence of women from water associations and other institutions leads to inefficiencies in management performance. Interestingly, the South African National Water Act 36 of 1998 provides scope to vest water rights and membership in the real water user regardless of the type of land rights (Schreiner and Van Koppen, 2001).

A study done in Nepal's Chhattis Mauja Irrigation Scheme revealed that *de facto* female heads of farms at Chhattis Mauja receive less water, or poorer quality irrigation services, or have greater difficulty in obtaining their share of water than farms that are jointly managed by men and women (Zwarteveen and Neupane, 1996). During water shortages, women in this scheme were seen as the ones stealing water. Due to water scarcity, women and men in the scheme tend to irrigate at night, however, many village irrigation leaders criticise night irrigation by women for security reasons (Zwarteveen and Neupane, 1996).

Mehra and Esim (cited in Merrey and Baviskar, 1998) mention that there is a growing concern that in different regions of the world, the area under irrigation has actually declined in recent years; and this is attributed to increased competition for irrigation water for urban and industrial utilization, and the depletion of ground water.

2.2 WOMEN AND AGRICULTURE

2.2.1 HISTORICAL PERSPECTIVE ON THE ROLE OF WOMEN IN AGRICULTURE

Historically, agriculture was under the control of men, even in situations where women did most of the work (Goody and Buckley, 1973). It has been evidenced that women play a more significant role in agriculture than men (Williams, 1994; Mutangadura, 2004 and Bastidas, 1999). Over the past 20 years, significant changes in women's roles in food production have occurred (Booth and Protais, 2000).

In many African countries, rural women produce 80% of total food production (Majake, no date; Staudt, 1988 and Ikdahl *et al.*, 2005) and they account for 60% of overall agriculture production (Chana Majake, no date and Staudt, 1988). This was also supported by Agarwal (cited in Jackson, 2003), who noted the higher value outputs produced on women's fields in Burkino Faso. According to Schroeder (1996), in Gambia women who were engaged in communal gardens along the Gambia River Basin have been doing well as compared to their husbands. However, women's absence from their homes while working in their gardens was widely criticized, but this has changed over time and women gardeners were praised by their husbands for generating a greater benefit than the peanut crop men. In Gambia, male peanut crop was the primary source of income for many years. According to Mtshali (2002), in KwaZulu-Natal, women have had to take on more responsibilities for agriculture due to social changes such as male migration and children being less available because of attending school. This suggests that women's predominance in agriculture is due to men's migration, and therefore women are compelled to expand their role in farming out of necessity. Furthermore, Chancellor (no date) argues that in southern Africa the women have become more responsible for irrigated agriculture as urbanisation has proceeded, and also in response to the HIV/AIDS epidemic.

The increasing involvement of women in agricultural production in Africa is sometimes explained by the nature of colonialism, whereby African men were actively and often coercively recruited for wage labour away from their homes, for example in mines or settlers' farms. This is effectively supported by Bundy's argument that the African

peasantry declined due to the 'mineral revolution' (Bundy, 1972). This is also supported by Rwelamira *et al.* (2000), who pointed out that women farmers dominate the agricultural sector, while men are in the industrial sector. As a result, women have no other options but to take up the role of provider for food security (Mushunje, 2001).

The degree to which women participate in agricultural work is not the same throughout the continent. It is indicated that women in Congo and in East, Central and South Africa, play a predominant role in agricultural work, but there are a few societies in these regions where the contribution of men equals or exceeds that of women.

A study done in Latin America, in the province of Carchi, Ecuador, found that women's participation in irrigated agriculture varied according to the extent of their participation, that is: no participation, semi-participation and full participation. Women in the no participation category (20%) do not participate in production activities, but only participate by preparing food for paid workers. The semi-participation category (60%) participates only when labour is scarce, whereas the full participation category (20%) participates in field activities almost every day (Bastidas, 1999). Poverty and lack of jobs are believed to be the main causes of women's engagement in agricultural production (Makhura and Moroko, 1996 cited in Maimela, 2002).

However, a study conducted in 1991 at Keiskammahoek Irrigation Scheme in the former Ciskei homeland showed that both men and women participated in farming, but men tended to do most of the physically intensive tasks (Williams, 1994). Although it was not indicated as to whether women participated more than men, it was pointed out that women in this scheme played an important role in households and on also on farms. One could therefore argue that the participation of men and women in agriculture differs from place to place and for different reasons.

According to the March 2007 Labour Force Survey, there were just over 1 million Africans engaged in farming in Limpopo in the previous 12 months, of whom about 746 000 (69%) were women (Stats SA, 2007). Of these women, 95% indicated that their main reason for farming was to procure an extra source of food; 2% to provide their main source of food; 2% to derive an extra source of income; and 1% to derive a main source

of income (Stats SA, 2007). Unfortunately, there are no comparable historical data that would allow us to determine the extent of change over time.

2.3 CONTROL OVER LAND AND RESOURCES

The majority of rural women depend on land for their livelihoods, yet their relationship to it is characterised by insecurity and lack of control (Shezongo, 2005). Lack of ownership and control over land creates differences between men and women in relation to economic well-being. To support this, Rasavi (2003) pointed out that in recent years, there has been an increasing emphasis by academics and development practitioners on secure property rights as a solution to women's unequal access to land, female poverty and women subordination. The analysis that the absence of secure property rights for women is the cause of unequal gendered access to land is premised on the assumption that individual legal ownership is an automatically better way of guaranteeing claims to subsistence resources.

Despite carrying substantial rural responsibility, women have been generally ignored by the planners (UNDP, 1980). For example, in her study *A Plot of One's Own*, in Dakiri Irrigation Scheme in Burkina Faso, Zwarteveen (1996) states that the allocation of irrigated plots to women is often resisted by policy makers and project planners, who assume that women do not produce as much as men. However, the study conducted in Dakiri has rejected the assumption and revealed that almost 60% of the respondents think that there is no difference in agricultural production performance between men and women.

Agarwal (cited in Jackson, 2003) argued that in many cases rural women are demanding land rights, but acknowledges that there are some instances where women have not identified this as a priority. She further indicates that production inefficiency is associated with tenure insecurity and women with land rights and control of produce would be motivated to put greater effort and investment into the land. Agarwal encouraged a view that a voiced concern is a sufficient indicator of needs and preferences and an adequate basis for social policy. Moreover, Agarwal is of the opinion that it is wrong to assume

that men's need for land is the same as women's because women's access to labour and to cash or other resources to mobilise labour are more important than access to land.

Goheen (cited in Davison, 1988) points out that land remains substantially in control of men through patrilineages, and as a result, women cannot own land but they often have secure usufruct rights. When women have equal access to resources as men, their maize output per acre surpasses that of men (Staudt, 1988).

A study done in Dakiri Irrigation Scheme shows that women are more confident in irrigated agriculture when plots are registered in their names, knowing that they benefit more under this condition (Zwarteveen,1996). A study done at Tshiombo Irrigation Scheme shows that during the early years of the scheme, almost all the land was allocated to male household heads, however this later changed and women were then allocated plots in their own right (Lahiff, 2000). Schreiner and van Koppen (2001) argue that if women could be given land rights, productivity would increase.

2.4 GENDER EQUITY AND POWER IN THE CONTEXT OF AGRICULTURE

However, Blackladen *et al.* (2006) contend that it is difficult to generate quantitative evidence on the efficiency effects of gender inequalities in access to land, inputs, and control over resources. The reason for this is that in many African countries, women and men work together on agricultural production by each providing certain inputs and thus it is very difficult to determine the efficiency of these inputs quantitatively. Moreover, for agricultural growth in Sub-Saharan Africa, it is crucial to invest in both women and men farmers and to remove gender obstacles that women face in farming.

In Sub-Saharan Africa, the gender division of labour is a common pattern of production, where women are primarily responsible for food or subsistence crops, while men grow cash crops with a share of labour offered by women (Mehra and Esim, in Merrey and Baviskar, 1998). Newland (1980) talks about the sexual division of labour and the division of labour into paid and unpaid work. He further indicates that the sexual division of labour is probably the oldest one in human history, whilst the division of labour into

paid and unpaid work is a more recent invention which often coincides with boundaries drawn according to sex. Furthermore, Guy (1990) argues that the labour of women in agriculture, supported by their domestic labour in the homestead provided the subsistence base upon which the society depended and the surplus upon which it is structured. According to Moore (1988), in many African societies men's role is clearing the land for cultivation whilst women are the ones who cultivate the crops.

Community survey data from Africa and Asia reveals that women constitute a much greater proportion of the total family labour force in Africa than in Asia (Deere, 1982). However, the gender division of labour dictated women's work during the pre-colonial era and as such, men were required to perform heavy duties of land preparation whilst women were responsible for lighter activities like weeding, planting, harvesting and food processing (Olusi, 1997). Cultural notions have an influence on the division of tasks and activities amongst household members (Zwarteveen and Neupene, 1996). A study done in Peru indicates that where women are the head of household, they tend to carry men's tasks, which include, amongst others, contracting for oxen (Deere, 1982).

In Latin America, Boserup (1970) first classified farming systems as "male farming systems" which contrasts with the African countries where women farmers are the major food producers. However, this classification has been attributed to men doing more work by plough as compared to women.

Other scholars like Deere and Leon De Leal (1982) challenge Boserup and conclude that these systems should rather be called "family farming systems", since women participate in agriculture as much as men. Furthermore, Bradford (2000) criticises Bundy who omits women from his book *The Rise and Fall of the South African Peasantry*. Bradford argues that women were the typical peasant producers.

Within the context of agriculture, there are two specific issues that tend to arise from this perspective, namely women's control of land (that is, their tenure status), and their participation in decision-making. The question of participation in decision-making itself has various aspects, for example investment decisions, production choices and marketing strategies. However in the context of irrigation schemes, it evokes a particular issue,

namely women's participation in decision-making at the level of the scheme, for instance the water allocation structures that usually govern or manage these schemes.

According to Gorman (2006), gender roles and relations are of particular importance in the process of livelihood decision making. He further explains decision making as the conscious choosing among alternative courses of action. Furthermore, he indicates that persons with access to or control over certain resources may have greater influence and control in decision making.

The study conducted in Peru among Cajamarcan women shows their greater role in decisions over product disposition than in the other facets of agricultural decision-making (Deere, 1992). However, Machete *et al.* (2004) argue that women's participation in decision-making has been limited. Contrary to this, various authors (Van Koppen, 2002, and Safilios-Rothschild and Namara, 2005), state that women more often become the decision-makers in formerly male-managed fields due to men's growing migration to urban labour markets which are highly gender-segregated. A study done in the Volta region of Ghana found that men and women had equal rights to choose the types of crops to grow.

Research on African agricultural systems shows that the failure of government and other agencies to recognise the importance of gender relations can have a negative impact on agricultural productivity (Carney, 1988; Jones, 1986 and Zwarteveen and Neupane, 1997 cited in Bastidas, 1999). This could be the reason why the South African government is currently embarking on mainstreaming gender in rural development and other sectors. Similarly, it is important for policymakers and implementers to recognise gender issues in the context of irrigation schemes without considering only men (Van Koppen, 2002).

2.5 CONCLUSION

Relevant literature on the subject of women's participation in agriculture was discussed. Different authors reveal that women play a major role in agriculture, despite being undermined, and that they account for 60% of agriculture production overall in many African countries. Historically, agriculture was under the control of men even though women did most of work. The sexual division of labour created boundaries according to

sex and in many African societies men's role is clearing the land for cultivation whilst women are the ones who cultivate the crops. There is an increase of women participation in agriculture and this is attributed to the migration of men to cities for work opportunities and children's involvement in education.

It was pointed out that the irrigation schemes in South Africa were developed with the aim of reducing poverty and providing food security in rural areas and the majority of them are found in the former homelands. The research methodology is discussed on the next chapter.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

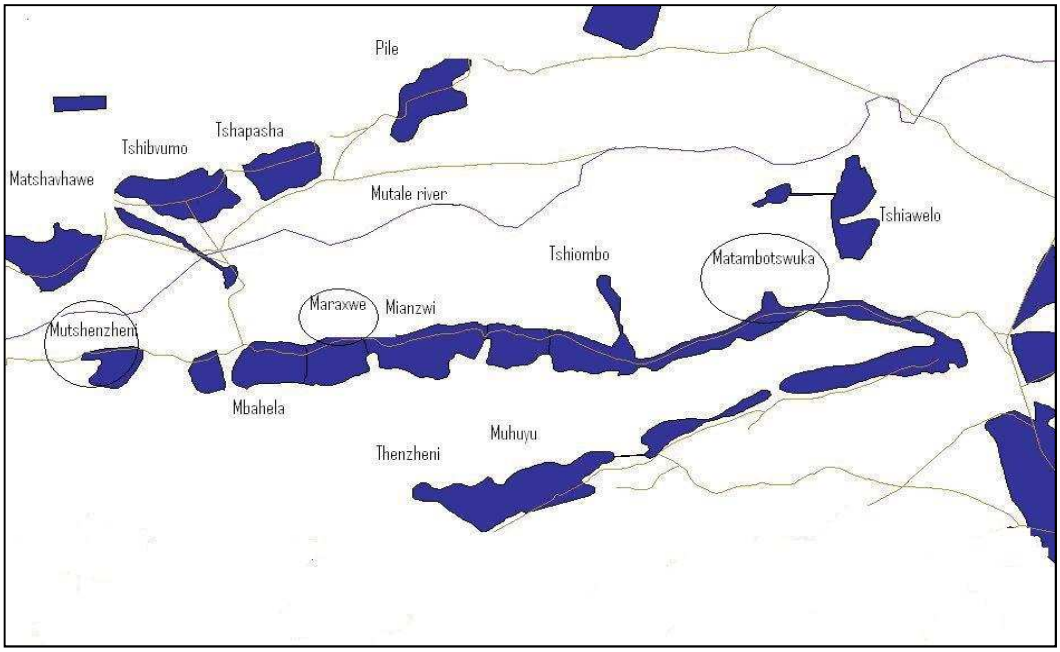
This chapter discusses the research methodology of the thesis. The various issues discussed in this chapter include the qualitative and quantitative methodological nature of the research, the study design, the data collection methods, the method of analysis, limitations of the study and ethical considerations. The chapter begins with a description of the study area, where map and satellite images were used for better understanding of the area under study. The background of Tshiombo Irrigation Scheme is provided.

3.2 DESCRIPTION OF THE STUDY AREA

The study was conducted at Tshiombo Irrigation Scheme, Limpopo Province, South Africa. The Scheme is located about 40 kilometres from Thohoyandou and falls under Thulamela Municipality of Vhembe District. This Scheme is situated at the western end of Tshiombo valley and covers an area of 1 196 hectares (Lahiff, 2000). There are seven villages under the Scheme, which are bordered by mountains to the south and fields to the north. A road runs along the length of the Scheme just to the south of the fields.

The map in Figure 3.1 shows the villages that make up the Scheme. These villages are very close together, and as such, they depend on one another for communal services. The three villages whose names are circled are those which were the focus of the fieldwork for this thesis. The blue line passing horizontally through the area is the Mutale River, which is the water source for the Scheme. The main access to the area is via Thohoyandou, which is to the southeast. Most of the farmers purchase their household needs (e.g. groceries, farming tools and inputs) at Thohoyandou town, which is also where most of the banks are found. Moreover, the majority of farmers at the Scheme prefer to sell their produce in this town.

Figure 3.1 Map of Tshiombo Irrigation Scheme



The satellite image in Figure 3.2 shows the villages and fields at Tshiombo Irrigation Scheme. The fields are the small, contiguous rectangular patches that appear to the north of the villages.

Figure 3.2 Satellite image of Tshiombo Irrigation Scheme

Source: Google Earth

Figure 3.3 is a satellite image showing more detail of part of Maraxwe Village, together with some of its fields.

Figure 3.3 Detail showing Maraxwe Village and fields

Source: Google Earth

The main focus for this study is Maraxwe village. However, for comparative purposes some fieldwork was also conducted at the villages of Mutshenzheni and Matangari. Matangari is subdivided into two villages and each has its own extension officer. The village under study is Matombotswuka, which is the larger of the two. Maraxwe comprises 96 plots whereas Mutshenzheni comprises 47 plots and Matombotswuka comprises 201 plots. The main distinction between Mutshenzheni, Maraxwe and Matombotswuka is that, being closer to the source of water from the weir, farmers at Mutshenzheni do not encounter water shortages. Maraxwe less frequently encounters difficulties with water shortages, whereas Matombotswuka is the furthest away and therefore its farmers encounter difficulties with greatest frequency. The choice of these villages for the study was purposeful: to the extent that their farmers encounter water problems to different degrees, we expect farming to be significantly more remunerative in better located villages than in others, which in principle should allow us to examine the

extent to which trends in women's participation in farming can be linked to differences in the returns to farming.

The researcher decided to select Maraxwe village as a primary research site due to the fact that the village is situated at the centre of the scheme and is intermediate in accessing water. Furthermore, Maraxwe village was purposively selected due to the fact that it went through a process of revitalisation in 2005 which was not finalised. The main canal, furrows and dam were damaged during the process of revitalisation and it was interesting to understand women's participation in agricultural production through these conditions.

3.2.1 BACKGROUND OF TSHIOMBO IRRIGATION SCHEME

Tshiombo Irrigation Scheme was developed by the state between 1959 and 1964 (Lahiff, 2000). During the establishment of Tshiombo Irrigation Scheme, some people relocated to other areas due to rumours that the scheme was being initiated by Italians who intended to use them as slaves. However, it attracted many people from neighbouring villages and other regions in Limpopo province who had a passion for farming (interview with members of the Scheme committee, 2008). The three villages under study are dominated by Venda-speaking people. There are a few Shangaan-speaking households whose culture is suppressed by Venda culture (interviews with local residents, 2008).

The main objective of developing the Scheme was for food security, with the average plot size of 1.28 hectares per family (Gouws, 2008). After 1994, funding for maintenance and operation of the Scheme was reduced and the Scheme became dormant (Gouws, 2008). Most notably, government tractors were taken away, subsidies on inputs such as seed and fertilizer were withdrawn, and maintenance of the irrigation and road infrastructure was reduced. Due to poor road maintenance, customers had difficulty when buying directly from the land. Currently, farmers have to maintain roads to their respective plots to ensure accessibility.

Around 2005, the South African government embarked on a process of revitalising smallholder irrigation schemes in the former homelands (van Koppen *et al*., 2005). This mainly involves a process of repairing and upgrading the physical infrastructure (Denison and Manona, 2007). At some schemes, including Tshiombo, there was a major attempt to

switch from flood irrigation to drip irrigation as a way of saving water. The farmers were not happy about the system and some stated that the system takes a long time to water the plants, but this could not stop the government. After all its efforts, the government halted the installation of the drip system citing that the system could be easily vandalised (interviews with extension officers, 2008) and it decided to stop the contractor. The revitalisation process has been halted since early 2008, and a switch to a floppy sprinkler system is being considered.

Apart from changes to the infrastructure, it is intended that through the Revitalisation of Smallholder Irrigation Scheme (RESIS), ownership of the land will be transferred to the beneficiaries. Whether these beneficiaries are the nominal land-holders (predominantly men), or the actual land users (predominantly women) at Tshiombo, is not clear.

3.2.2 MARAXWE VILLAGE

The village of Maraxwe is situated at the centre of the Scheme and is about 10 kilometres from the end of the Scheme (Tshiawelo Village) in the Tshiombo Valley, and as such forms part of the Tshiombo Irrigation Cluster (Limpopo Department of Agriculture, 2007).

Irrigation water is obtained from the Mutale River by means of a weir and canal system. The former farming practices in operation were mainly flood irrigation systems via lei-dams along the canal and via furrows through the fields. In 2005, the community was consulted about RESIS, which had started that year and ended in mid-2006. The Limpopo Department of Agriculture (LDA) employed Unie-Tech (Pty) Ltd as a service provider to install the drip system, and their contracted ended in 2006 but without finishing their work.

LDA considered the floppy irrigation method and Unie-Tech was commissioned to re-design the drip irrigation system to a floppy irrigation system (unpublished document, Limpopo Department of Agriculture). However, the majority of farmers criticize the floppy system of irrigation because it requires them to pay for electricity. Farmers also blamed the contractor for damaging the lei-dams during the installation of the drip

irrigation system because the contractor did not repair some dams he damaged during installation. For instance, the dam at Maraxwe is damaged and this is problematic to farmers as they are unable to store water. At present they use water directly from the canal and as a result farmers often fight for water.

3.2.3 MATOMBOTSWUKA VILLAGE

The village of Matombotswuka is located about 8 kilometres east of Maraxwe. Matombotswuka is at the end of the Scheme and compared to the other villages, its farmers encounter the worst water shortages for irrigation. This part of the Scheme comprises 164 plots, and is not yet affected by the RESIS programme.

3.2.4 MUTSHENZHENI VILLAGE

The village and its fields are situated at the extreme west of the Scheme and thus are at the head of the canal, and are about 5 kilometres west of Maraxwe. This part of the Scheme includes 47 plots. The village does not have a water storage dam, so farmers rather use water directly from the canal. The village is also not affected by the RESIS programme. Surprisingly, this is where the scheme begins, but RESIS did not start there.

3.3 STUDY DESIGN

Both primary and secondary data were obtained. The main purpose of collecting primary data was to gain an in-depth understanding of women's participation in agriculture, specifically Tshiombo's women farmers. The researcher obtained primary data from the field. Secondary data were collected through reviewing existing documents, both published and unpublished.

In terms of the collection of primary data via fieldwork, the researcher conducted a survey of individuals who reside in the three villages, using a semi-structured interview process that allowed for the capture of factual and quantified information as well as responses to open-ended questions. Although some quantitative data were collected, it was for the purpose of allowing for some descriptive statistics (no statistical inferences are reported in this thesis), however the focus of the survey was on qualitative data, as

this was intended as primarily a qualitative study. Qualitative research methods are rich in detail (Neuman, 2000). In addition to the survey of individuals (about whose selection more is said in the next section), a number of key informant interviews were conducted, as were two focus group discussions in villages at the Scheme.

3.4 SAMPLING SIZE AND METHOD

The researcher used purposive sampling to select the respondents for the study. Newman and McNeil (1998) argue that purposive sampling is used to select respondents based on some special purpose. This is also supported by Bernard (2002:183), who says that "purposive sampling is used in the selection of a few cases for intensive study". In this study, purposive sampling was useful in ensuring a desirable balance between women and men, between farmers and non-farmers, and between residents of the three different villages. The researcher selected the respondents from the list of farmers provided by the extension officers. Furthermore, extension officers also assisted through providing the names of other farmers who are not recorded in the registration book, but are also engaged in farming. Non-farmers were selected through the assistance of farmers participants from all villages under study as it was difficult for the extension officers to know people who are no longer farming.

In total a sample of 45 respondents was selected. Of these, 25 are women, of whom 20 are actively farming and five have stopped farming. Twenty men were also interviewed, of whom 13 are actively farming and 7 have stopped farming. Men and women who no longer farm were interviewed to understand their reasons for stopping.

Key informants interviews were conducted with three extension officers from the three study sites and one from the other village of Tshiawelo, as well as with the chairperson of block and central committees at Maraxwe, and two former water bailiffs. The reason for interviewing the other extension officer for Tshiawelo village, was that all the extension officers indicated that they have less experience of Tshiombo Irrigation Scheme as compared to this officer who has worked at the Scheme for more years than they have. Furthermore, focus group discussions were conducted in two villages; one group comprised eight women farmers at Maraxwe and another group comprised of both men (3) and women (2) farmers at Matombotswuka.

Table 3.1 below shows the number of respondents from each village.

Table 3.1 Respondents per village

Village	Women farmers	Men farmers	Women Stopped	Men stopped	Total
Mutshenzheni	5	4	0	1	10
Maraxwe	12	5	0	5	22
Matombotswuka	5	4	3	1	13
Total	22	13	3	7	45

It has already been mentioned that Maraxwe is the main focus for this study, and for that reason the researcher decided to conduct more interviews there than in the other two villages. It soon became apparent that it is difficult to find men or women who have stopped farming in this Scheme. This is because it appears that either farmers do not stop farming entirely, but rather carry on at lower levels of activity (especially older farmers); or that they do stop farming, but in so doing leave the areas, in which case they were not available to be interviewed.

Both men and women farmers sometimes stop farming for a short period of time due to illnesses or lack of funds to pay for inputs. But when they are able, they carry on with their activities. One women farmer at Matombotswuka indicated that she deserted farming in 2007 due to financial problems as she is unemployed, but intended to resume farming later if she happens to get a job. It appears that some farmers at the Scheme have an interest in agriculture to such an extent that, even when they are old, they do not want to leave farming. However, for most of those who have stopped farming, it is because of old age and illness.

3.5 DATA COLLECTION TECHNIQUES

In an attempt to achieve the objectives of the study, a number of techniques were employed. Personal interviews constituted one of the most important and valuable sources of information. A digital voice recorder was used to assist with the data collection, because it allowed the researcher to conduct interviews in a more normal, conversational manner than if she had to keep detailed notes during the course of each

interview. Semi-structured interviews were led by means of an interview schedule, but because of the depth of these interviews, they were usually completed over two sittings, starting firstly with preliminary interviews, and following these with in-depth interviews. The majority of respondents were interviewed in their respective homes, but if not at home, they were interviewed at their plots. The researcher conducted all the fieldwork herself. Field visits to Tshiombo Irrigation Scheme were undertaken in April 2008 (two weeks), and in August/September 2008 (two weeks), making a total of four weeks. Other visits were done when necessary. The first visit (excluded from the four weeks indicated above) was to conduct preliminary interviews to check if the questions were researchable, and this helped the researcher to be familiar with the research site.

In-depth interviews were conducted with selected individuals. Semi-structured interviews were useful in that they lead discussions. In order to obtain information from individual interviews, semi-structured interviews were administered and open-ended questions were asked, since they do not limit respondents. Researchers use semi-structured interviews to gain a detailed picture of participants' beliefs about, or perceptions or accounts of, a particular topic (de Vos *et al.*, 2002). Taylor and Bogdan (1984) indicate that open-ended or in-depth interviews are "…repeated face-to-face between the researcher and informants directed towards understanding informants' perspectives on their lives, experiences or situations as expressed in their own words". The researcher re-visited the respondents to excavate more information for clarification and to substantiate the available information obtained from previous interviews.

Information obtained through the use of the above-mentioned techniques helped the researcher to understand how the Scheme functions, learn about its history, and to find out about recent developments.

Focus-group discussions with men and women farmers were also conducted to supplement information obtained from the individual interviews. Fieldwork observations were useful to augment information obtained through interviews.

3.6 DATA ANALYSIS

Both the qualitative and quantitative data were analysed, though as mentioned above the qualitative data were used primarily for sake of descriptive statistics. The quantitative data were initially captured into and manipulated in Microsoft Excel. The qualitative data was analysed through thematic content analysis. According to Patton (1990) thematic content analysis involves a flexible, semantic unit of analysis (e.g. phrase, paragraph, sentence etc.) based on decisions about themes of meaning. This is supported by Burns (2000) who argues that content analysis is used to identify themes, concepts and meanings. During the data analysis, the researcher focused on identifying themes from the interview data. Through identifying themes, the researcher was able to code the data, for example, land rights, agricultural production activities, livelihood strategies contribution of agriculture to households and extension support. This process was facilitated by means of summarizing the interviews in a matrix format whereby each column referred to a single respondent and the information related to the main themes/domains was organized in their respective rows.

3.7 LIMITATIONS OF THE STUDY

The study has been limited by a number of factors. During the first fieldwork visit, the researcher relied upon public transport from Thohoyandou to the Scheme, which was time-consuming and unpredictable. As a result, the researcher often arrived late at the research site. The same visit was characterised by high temperatures. Moreover, the researcher had to walk around the area, from the village to the field (scheme) and back again, looking for the respondents, due to the fact that some respondents start working on their plots from early morning. Furthermore, interviews were conducted over a short period of time but managed to obtain information successfully.

Budgetary constraints were also a challenge during the preliminary interviews, and this problem was resolved after the researcher was offered some funds from FANRPAN. At the field, the researcher was faced with a difficult situation where respondents wanted to be compensated for participating in this research despite being told that participation is done voluntarily. Some respondents raised this because some other researchers, who were

also in the area during the fieldwork for this study, paid their respondents. However, the researcher managed to deal with the situation without paying them. The scope of the study is minimal as it is a mini-thesis. Only three village schemes were studied, therefore the results cannot be generalized.

3.8 ETHICAL CONSIDERATIONS

The permission to conduct this study was obtained from the agricultural office in Thohoyandou. The research proposal was also submitted and approved by the Senior Degrees Committee at the University of Western Cape. Headmen in three villages under study were informed about the study before conducting interviews with the respondents. Informed consent was sought from the respondents before interviewing them. All participants were informed about the importance of the study to encourage them to participate, and they were informed that their participation is voluntarily. The respondents were assured about anonymity and confidentiality.

3.9 CONCLUSION

This chapter described the study area, which broadly consists of Tshiombo Irrigation Scheme, including a brief account of the Scheme's history. The chapter then described the three villages within the Scheme upon which the study focused. The chapter further explained the methodology adopted when undertaking the study and this included the study design, sample size and methods, data collection techniques, data analysis approach, limitations of the study and ethical considerations.

Both quantitative and qualitative data were collected and analysed. The primary data largely consisted of a survey of women and men farmers and ex-farmers, who were purposively selected into the sample. Permission to conduct a study at Tshiombo Irrigation Scheme was obtained from the Agricultural Office at Thohoyandou, whereas at a village level, permission to conduct interviews was obtained from headmen and participants. Moreover, key informants and focus group discussions were conducted. A digital recorder was helpful in recording both individual, key informants and focus group interviews. The next chapter discusses the results of the research.

CHAPTER 4: PRESENTATION OF RESULTS

4.1 INTRODUCTION

This chapter presents and analyses the trends of women's participation in agriculture. A village overview, demographics, livelihood activities, production activities and challenges faced by women in the three villages is discussed.

4.2 DEMOGRAPHY AND LIVELIHOODS PROFILE AT TSHIOMBO

Table 4.1 below shows the populations of the villages that make up Tshiombo Irrigation Scheme in 2001. The three shaded rows indicate the three villages upon which this study focuses. The table shows that women outnumber men in each of the villages. Among the three focus villages, Matangari has the highest number of women (2 300), followed by Maraxwe (996) and Mutshenzheni (376).

Table 4.1 Population per village in 2001

Village	Women	Men	Total
Matangari	1 869	2 300	4 169
Tshiombo	2 311	2 883	5 194
Mutshenzheni	354	376	730
Mianzwi	831	963	1 813
Maraxwe	783	996	1 779
Muhotoni	245	330	575
Total	6 393	7 848	14 260

Source: Statistics South Africa from census 2001

Table 4.2 below shows that out of 22 women farmer respondents, one third (seven) are older women (61+) who are still participating in agriculture at the scheme, followed by six middle-aged women (41–50), five 51–60 year-old women, and three 31–40 year-old women. Respondents indicated that women have more family responsibilities as compared to men. It was further indicated that household members depend on women for food. The table further shows that young people (younger than 20 years) are not involved in agriculture. As such, older people are concerned that young people do not have an interest in farming and that this might mean that there is no future for the Scheme, or that maybe people from neighbouring villages will come and take over the land. The majority of older farmers are worried that young people prefer off-farm jobs.

Table 4.2 Age structure per sampled villages

Village	<20	21–30	31–40	41–50	51–60	61+	Total
Matombotsuka							
- Women	0	0	0	1	1	4	6
- Men	0	1	0	0	0	3	4
Mutshenzheni							
- Women	0	0	1	2	2	0	5
- Men	0	0	0	1	0	3	4
Maraxwe							
- Women	0	0	2	4	2	3	11
- Men	0	0	1	2	1	1	5
Total							
- Women	0	0	3	7	5	7	22
- Men	0	1	1	3	1	7	13

Source: Fieldwork, 2008

Agriculture contributes to women and men farmers' livelihoods at Tshiombo Irrigation Scheme in different ways. Table 4.3 shows that the old-age and child support grants are the most important sources of income for 4% of the respondents, followed by farming (37%) and formal paid employment (23%). The main reason for this is to supplement household income such as child support grants and old-age pension grant, which otherwise is not enough to satisfy households' needs. To support this finding, some farmers indicated that they have managed to pay for their children's education from primary to tertiary level with the revenue derived from agriculture. Besides being the main sources of income, the majority of respondents are still pursuing farming as one of their important sources of income.

Examining the income sources for women household heads in all villages, it is clear that none of the women have paid formal employment; but instead, they depend on child support grants, old-age grants or selling crops. Without having other livelihood sources, farmers indicated that the social grant alone is insufficient to meet the household's needs and for that reason the majority of elderly farmers are keen to carry on farming. Hence farming is seen as a main source of income for those who are unemployed. To support this, at Maraxwe, some four women and two unemployed men indicate that they rely on farming as their main source of livelihood. One of the men indicated that he is able to cultivate his entire plot (24 acres) and depends solely on selling crops from his land. This relatively young man, aged 38, is doing well in farming. During fieldwork, the researcher

went to the field at Maraxwe and found the young man loading a customer's bakkie with vegetables. Two unemployed women farmers at Mutshenzheni also reported that their households depend solely on agriculture as there is no other source of income. One of these women indicated that she still has school-going children as well as one child at tertiary level.

Table 4.3 Main sources of household income per sampled village

Income source	Matombots-wuka	Mutshenzheni	Maraxwe	Total	Percentage
Old-age grant/ child support grant	4	4	6	14	40%
Formal paid job	1	2	5	8	23%
Farming	4	3	6	13	37%
Total	9	9	17	35	100%

Source: Fieldwork, 2008

Table 4.4 below shows men and women-headed households per sampled village. Out of 22 women farmers, only 10 are household heads, and the other 12 are male-headed households. Furthermore, out of ten women household heads, eight are divorced, widowed or never married. Only two married women are *de facto* household heads, and they head the household because their husbands are currently staying elsewhere. However, in African culture, women can only be considered household heads if they are divorced, single, or if their husband has passed away.

Table 4.4 Women and men headed households (HHH) per sampled village

Village	Women household heads	Men household heads	Total
Matombotswuka	2	3	5
Mutshenzheni	1	4	5
Maraxwe	7	5	12
Total	10	12	22

Source: Fieldwork, 2008

For analytical purposes, women have been categorized into four groups: married, divorced, widowed, and never married. This can be seen in Table 4.5 below. The table

shows that the majority of women respondents are married (48%), then widowed (28%), followed by divorced (16%), and never married (8%), respectively. Out of 12 married women, 11 have other sources of household income as their husbands have paying jobs; only one woman at Mutshenzheni indicated that her husband is retired and the household depends entirely on farming for its livelihood. For widowed, divorced and never married women, agriculture makes a larger relative contribution to their livelihoods when compared to married women. Furthermore, some of the widowed, divorced and never married women depend on social grants, especially pensioners or those with young children who qualify for child support grants.

The majority of the married women in this study mentioned that they participate in agriculture to supplement their husbands' income; and some farmers, both women and men, are involved in agriculture to supplement the old-age pension grants and child support grants in their households. This supports the idea that farming is an important source of income for poor rural households, contributing approximately 28% to total household income (Machete, 2004).

However, for unmarried women, participating in agriculture is their only option, because they do not have anyone or any wage income to rely on. By contrast, married women are better off as they have other sources of income besides farming. This suggests that married women are advantaged compared to unmarried women, especially in terms of household food security. This is because if agricultural production fails, for example due to bad weather, their husbands can provide income.

One of the women respondents put it in this way: "I participated in agriculture after realizing that the household's demands are increasing since my children are growing and my husband could not meet all the demands as a policeman, I generate more money than my husband's salary".

Out of 21 respondents who depend on social grants in the sampled villages, 15 are involved in farming and six have stopped farming. Out of 15 respondents who are still farming, eight are women. Despite having grants as their main source of income, women strive for other livelihood sources that would provide food security for their households. It is also evident that employed people participate in farming: nine respondents who have

or whose spouses have a formal paid job are also involved in agriculture. The majority of the respondents (31) mentioned that they supported their children with the money generated from agriculture.

Table 4.5 Categories of women respondents per village

Village	Categories of women				Total
	Married	Divorced	Widowed	Never married	
Matombotswuka	4	1	2	1	8
Mutshenzheni	4	0	1	0	5
Maraxwe	4	3	4	1	12
Total	12 (48%)	4(16%)	7 (28%)	2 (8%)	25

Source: Fieldwork, 2008

4.3 COMPARISON OF THE THREE VILLAGES

The three villages under study differ in various ways. For our purposes, the main distinction between the study sites is water access. Compared to farmers in the other villages, Matombotswuka's farmers are poor because they face water shortages which significantly impede their ability to produce crops. By contrast, due to Mutshenzheni's proximity to the weir, its farmers have the advantage of being able to grow any kind of crops. As such, much of the land at Mutshenzheni is used for production, as compared to the other two villages studied; at Matombotswuka in particular, much of the land is left idle.

In all three villages under study, there are agricultural offices. Farmers gather in these offices for meetings and advice. Moreover, there is a small house built for the extension officers as most of them come from afar.

There are primary schools at Maraxwe and Mutshenzheni, and a secondary school at Mutshenzheni. Children from the former two villages go to neighbouring villages for their secondary education. There are water pipes for domestic use at Maraxwe and Matombotswuka, however the pipes are often dry and as such, the local people are forced to use irrigation water for human consumption. Moreover, of the three sampled villages, the Maraxwe community has experienced problems of damage to the main canal and the

furrows because of the Revitalisation of Small Irrigation Schemes (RESIS) programme; whereas Mutshenzheni and Matombotswuka do not have such problems because the programme was never initiated in those areas.

Public transport is also more of a challenge at Mutshenzheni village as compared to the other two study sites, because it is served by a poorly maintained road.

4.4 GENDER AND LAND TENURE

Tenure arrangements in communal areas are known as 'permission to occupy' (PTO) and this means that one does not have a title for the particular piece of land, but is given permission to use it. Table 4.6 below shows plots registered according to gender and age.

Table 4.6 Land rights according to gender

Village	Women	Men	Female youth	Male youth	Total	% Female
Matombotsuka	116	30	5	13	164	74%
Mutshenzheni	23	20	3	1	47	55%
Maraxwe	35	47	6	10	98	42%
Total	174	97	14	24	309	61%

Source: Records accessed via the extension officers, 2008

This information was obtained from the extension officers from all villages and was also confirmed by the manager of the agricultural office at Makwarela. According to the records at the agricultural office (which only indicate the number of youth and not their names), extension officers defined youth as all people under the age of 38. However, it was a challenge to trace young people at any of the villages under study due to the fact that they are using their parents' land. In all villages, farmers are complaining about lack of an interest in farming amongst young people. Some young people are focused on their education, however others are dropouts due to financial problems, but in any event show little interest in farming.

At Matombotswuka, land is overwhelmingly held by women. The total number of farmers in this scheme is 164. Women and female youth together hold 74% of the plots. Initially, most of the plots were registered in men's names, and when they passed away, women often registered plots in their own names. This also applies to Mutshenzheni,

where the majority of plots (55%) are registered in the names of women or female youth. However, non-plot holders are able to lease land from those who have land.

In his 1996 study at Tshiombo Irrigation Scheme, Lahiff indicated that plots were officially allocated mainly to household heads who were understood or defined to be married men; however women were sometimes allocated land in their own right (Lahiff, 2000; Maimela, 2002).

Compared to the other two villages, much of the land is still held by men at Maraxwe. The majority of men farmers at Maraxwe are middle aged and the reason is that they are not employed or have other sources of income, therefore, they are more involved in farming. At Matombotswuka, only one young man is involved in farming and four are pensioners.

It has already been indicated that the total number of plots at Tshiombo Irrigation Scheme is 930. During 1999, the total number of women plot-holders was 290. As of now, there are 423 women plot-holders at Tshiombo Irrigation Scheme.

During the 1980s, there were 16 women plot-holders at Mutshenzheni, 25 women plot-holders at Maraxwe, and 82 women plot-holders at Matombotswuka respectively. Compared to Table 4.6, it is shown that the current number of women plot-holders at Mutshenzheni is 23, Maraxwe 35, and Matombotswuka 116, respectively. The total number of the plot holders is 47 at Mutshenzheni, 98 at Maraxwe, and 164 at Matombotswuka. The scheme was not extended after the 1980s, and as such, the total number of plots never changed, but the number of women plot-holders changed over time. This is shown in Table 4.7 below.

Table 4.7 Comparison of women plot-holders at study sites

Year	Matombotswuka	Mutshenzheni	Maraxwe
1980	82 (50%)	16 (34%)	25 (26%)
2008	116 (71%)	23 (49%)	35 (36%)

Source: Fieldwork, 2008

The table shows that there is a significant change over time of women plot-holders in all three villages under study. Moreover, farmers at Tshiombo Irrigation Scheme cannot sell, mortgage or subdivide the land. This has been supported by Lahiff (2000) who mentions that since farmers at Tshiombo Irrigation Scheme use PTOs, they are not allowed to sell land but they can pass it on from one generation to another. However, farmers can lease their land regardless of whether or not the lessee is a member of the neighbouring villages at Tshiombo Irrigation Scheme. Farmers are also not allowed to make any development on the land, such as drilling a borehole, as the land is owned by the state. One young man, aged 38, indicated that his main problem is that farmers are not allowed to drill their own boreholes in the scheme. Some farmers indicated lack of access to credit for their inability to use all of their land.

According to Table 4.6 above, the majority of the land in the main study site, Maraxwe, is still owned by men. In some instances, no changes have been made in land ownership. One women respondent at Maraxwe village confirmed that land is still registered in her husband's name, although he passed away some years ago. She is still undecided as to who should inherit the land, as her four sons are not interested in farming and have decent jobs in Gauteng. Extension officers advise farmers to register their names as plot-holders after the death of the previous land-holder but some farmers seem to be ignoring this advice.

4.5 RANGE OF LAND SIZES

Farmers at Tshiombo Irrigation Scheme have different sizes of land. The plots range from one to more than 24 acres. Table 4.8 below shows the number of farmers per village with their respective plot sizes.

Table 4.8 Distribution of plot sizes per village

Village	12 acres	24 acres (12 acres × 2)	More than 24 acres	Total
Matombotswuka	4	3	1	8
Mutshenzheni	9	0	0	9
Maraxwe	12	3	0	15
Total	25	6	1	32

Source: Fieldwork, 2008

The majority of farmers in this scheme have 12 acres and they pay R12 annually. However, some farmers were given more land than others. Out of 32 plot-holder respondents in the three study sites, the majority of respondents (25) have 12 acres each, while six respondents have 24 acres each (that is 12 acres × 2 acres) and only one respondent has more than 24 acres. It was indicated that, during the early years of the scheme, hard workers or people who were able to produce well were given more plots than others. Respondents indicated that during that time, plots were taken from farmers who were regarded as lazy and given to those who were regarded as productive. It is currently not the case. As of now, all farmers with more than 12 acres leave some of their land untilled. The situation is worse at Matombotswuka, as farmers here are faced with multiple challenges, including severe shortages of water. Moreover, farmers in all the villages are faced with the similar challenge of high tractor costs. This suggests that those who are financially capable would be able to maintain their plots more easily than those who are less financially capable.

One of the men with more than two plots (each plot is 12 acres) of land mentioned that he is lending some of his plots to people who do not have land on the scheme due to their late arrival in the village. Interestingly, those who hire land have to pay rent to the agricultural officers on behalf of the plot holders for the plot in use.

4.6 WOMEN'S PARTICIPATION IN AGRICULTURE

Women become involved in agricultural production for different reasons. The majority of women-headed households participate in agriculture to prevent poverty. However, a few women participate out of their own choice as their households are better-off in terms of income and food security. This is applicable to women whose husbands or other household members have a reliable non-agricultural income. Their engagement in farming is to supplement their households' livelihoods. Some women get involved in agriculture once they get married; they became involved in farming as their new household has land. However, there are those women whose households are worse-off and thus who participate in farming to fight or prevent poverty and put their households in a better position. Farmers were asked why and when they became active in agriculture, and the response revealed poverty prevention or reduction, supplementation of household's income and farming interest.

The Department of Agriculture also encourages women to participate, through competitions like 'Female farmer of the year'. The majority of women show some interest in farmers competitions and they indicated that it is through women's competitions where most of the women are developing farming interest. A woman at Maraxwe won the competition in 2007 and this has played an important role in encouraging other women to be actively involved in agriculture. Another woman at Mutshenzheni won a 'Best farmer' award for her sweet potato crop, and this has also encouraged other women to participate in farming. Some married women farmers indicated that they are increasingly involved in agriculture because they see other women progressing in agricultural production, and they decide to participate in farming rather than to stay at home. However, there are some women who have been participating in farming since the early years of the Scheme.

4.7. NATURE OF WOMEN'S PARTICIPATION IN AGRICULTURE

4.7.1. LABOUR PROVISION

The majority of women in the Scheme are responsible for all activities in agricultural production, including planting, weeding, watering, harvesting and ploughing. The division of labour within the household differs from one to another. In some instances, women carry all farming activities in cases where men have other off-farm jobs or in households headed by women. Family labour plays an important role in agricultural production within households. However, the majority of farmers hire labour as family labour is not always available due to other commitments or too few family members.

Only one man at Maraxwe village mentioned that he works the land with his wife, but she is responsible for activities such as weeding and sowing. This man indicated that he does not want his wife to carry heavy duties. Some farmers (about 17) indicated that they do not have any family labour to assist them with agricultural activities, and for this reason, they work alone or hire labour. Most of the hired labourers are immigrants from Zimbabwe, the majority of whom are men. The farmers complain that the immigrants steal their crops but they prefer to hire them because they are considered cheap labour.

Most of the farmers pay R400 for hired labour on a monthly basis. They also hire people to work on a temporary basis, and payment depends upon the agreement between the two.

4.7.2 DECISION MAKING AND DETERMINING THE BENEFITS

In this study, it has been revealed that all unmarried women participants are able to make their own decisions regarding the cultivation of crops and the usage of revenue. Furthermore, married women whose husbands are not actively involved in agriculture due to other work commitments are able to make same decisions as unmarried women. This study has two categories of farmers, namely: the employed and unemployed. The unemployed farmers are more committed in farming compared to the employed ones. For unemployed farmers agriculture is their main source of livelihood while the employed farmers are engaged in agriculture to supplement their livelihood.

All married women farmers whose husbands have off-farm employment, revealed that their husbands gave them power to make decisions in the management of the farm and the use of the revenue. This is not the case for the married women whose husbands are unemployed; men indicated that they are responsible for the management of farm including what to farm and the use of revenue. This shows that unemployed men are actively participating in farming and have control in all farming activities including the use of benefits. They further indicated that as household heads it is their duty to ensure food security within their households. However, they require women's labour in agricultural production.

4.8 MEN'S PARTICIPATION IN AGRICULTURE

Both employed and unemployed men participate in agriculture, although their levels of participation differ, in that unemployed are more involved in agriculture as compared to those who have other jobs. This supports the impression that, in the greater scheme of things, agriculture is a residual economic activity; if a male household head is unemployed but has land at the scheme, then he will use that land; if he is employed, he will leave the bulk if not all of the farming responsibilities to his wife. While agriculture may be the main source of income for unemployed men, the production costs remain a large challenge for them.

Table 4.9 below shows employed and unemployed men farmers at the three villages under study.

Table 4.9 Men's employment status per village

Village	Employed	Unemployed	Total
Matombotswuka	0	4	4
Mutshenzheni	1	3	4
Maraxwe	2	3	5
Total	3	10	13

Source: Fieldwork, 2008

Out of 13 men farmers in the three villages under study, only three are employed. Out of these three employed men, two are at Maraxwe and one at Mutshenzheni. Of the two employed men at Maraxwe, one man works as an educator and the other is a builder. These two men indicated that they hire people to assist with farm work during the course of the week, but in their free time, they themselves work on the land. In comparison, unemployed men farmers are fully involved in agriculture as they have no other sources of livelihood. Other unemployed men at the villages under study largely depend on old age pension grants as another source of their livelihood.

Out of four men farmers at Mutshenzheni, only one is employed (as an educator) and three are pensioners (above 80 years) but still doing well in agriculture. Two of these men mentioned that they still have school-going children, so they are left with no other option but to practice farming for the survival of the family. Those men who have other off-farm jobs indicated that they participate in agriculture to supplement their salaries. At Matombotswuka all farmers are pensioners. One can therefore say that the level of participation in agricultural activities, between employed and unemployed farmers, varies according to the sources of livelihood they have. The findings reveal that the unemployed farmers have no choice but to be fully involved in agriculture for their livelihood. It has been evidenced that agriculture plays a major role in households' livelihoods, and as such, people are engaged in agriculture either as their only source of livelihood or to supplement their salary income.

4.9 FACTORS CONTRIBUTING TO THE DECLINE OF MEN'S DOMINATION OF AGRICULTURE

Various scholars (Bastidas, 1999; Schreiner and Van Koppen, 2001, and Lastarria-Cornhiel, 2006) indicated that men's decline in farming is due to their migration to cities, and this is the reason why women's role in agricultural production has increased. Evidently, however, some male respondents indicated that during the early years of the Scheme they left their jobs in the cities, to join farming. They indicated that farming was productive at that time, as compared to their jobs. Probably, due to copious state support on the Scheme, farming was lucrative enough that men did not want to migrate or seek work elsewhere. The changes in the gender composition of farming at Tshiombo seems to have happened far later than the general pattern due to male migration. Moreover, men withdrew from farming for different reasons, including high production costs, water shortages and old age. Table 4.2 shows that the majority of men farmers are old. While there are few middle-aged men who are participating in agriculture because they prefer farming compared to other off-farm jobs.

Although agricultural production is becoming expensive to such an extent that farmers feel that they should look for other off-farm jobs, it becomes difficult for farmers to leave farming. Machete *et al.* (2004) show that some farmers have stopped cultivating their land, or only cultivate a portion, due to the withdrawal of state support services. To support this, the findings show that the withdrawal of state support is also a challenge. At Mutshenzheni, the total number of men farmers is 21, whilst there are 26 women farmers. It has already been mentioned that during the establishment of the scheme, plots were mainly allocated to men. The figures above show the decline of men farmers at Mutshenzheni village. One could therefore say that the decline of men farmers at Tshiombo is aggravated by the withdrawal of state support services. However, availability of water makes them stay in farming.

These men indicated that they decided to withdraw from farming due to increasing problems in agriculture, and they want to focus on their jobs as they are educated. Their main reasons for withdrawal are the costs and unavailability of tractors, and shortage of water for irrigation. This suggests that the withdrawal of men from agriculture does not imply that these men are choosing to stay at home.

It was also indicated that sometimes, when men become old they stop farming and in many cases old women take over, but the problem is that these old women are not strong enough to cultivate the land alone, and as a result they hire migrants to help them. In addition, the researcher has seen more old women cultivating the land than old men. It is interesting to note that men leave farming before women, and anecdotal evidence shows that this is because women outlive their husbands more frequently than men outlive their wives. The findings for this study show that there are some widowed women in two villages: there are two widows at Maraxwe, one at Mutshenzheni and none at Matombotswuka.

Out of seven men farmers who have stopped farming, two indicated that they have other paying jobs, but they started to participate in farming when they were unemployed. However, they carried on with farming even after they got employed with the aim of supplementing their salaries as farming was lucrative by then. When they started to face challenges in farming, such as water shortages and high production costs, they decided to leave farming.

Unemployed male farmers indicated that under-pricing is another reason for men's withdrawal from agriculture. For example, from 1997 up to the time of writing, the price for one fresh mielie cop is still R1. Some of the employed male farmers, who have incomes other than from farming, indicated that they do not want to invest their salaries into farming, due to the challenges they face in agricultural production.

The withdrawal of men from agriculture has been attributed to a number of reasons. At Maraxwe village, two out of five men are employed as educators, but one of the men indicated that he stopped farming due to continued conflicts over water for irrigation. Farmers at Maraxwe and Matombotswuka confirmed the disputes over water, and indicated that unless the government reinstates the water bailiffs, water will remain a problem in the Scheme.

The findings reveal that men stopped farming due to old age, and they gave their plots to their children or their wives. One youth at Maraxwe indicated that he had an interest in farming, but failed to pursue it due to financial problems. Initially his mother assisted him

by buying inputs like fertilisers and seeds, and also paying for tractor services. The respondent was a student at the local university, but he could not go further as he was financing his education with revenue from farming. According to him, low returns and high production costs were the main challenge that led him to withdraw from agriculture. This was supported by one of the other male respondents who is also an educator at Maraxwe, and who indicated that he decided to stop farming due to high production costs. However, considering that the majority of farmers indicated that farming is their main source of income, of which they support their family and pay for their children's education; one could argue that high production costs with low returns could not be justified as the reason for leaving farming, as women also experience the same challenges as men. The fact of the matter is that the majority of women are unemployed and they don't think they can get better jobs, because most of them did not pass Grade 12 and thus they have poor employment prospects.

4.10 CONCLUSION

In this chapter, women's and men's participation in agriculture has been discussed. The study finds that agriculture plays a prominent role for farmers at Tshiombo Irrigation Scheme. However, for many households who have historically based their livelihoods on the opportunities offered by the Scheme, in recent years agriculture has diminished in importance relative to off-farm income earning opportunities. This is largely because of the state's withdrawal of support to the Scheme and its farmers, one consequence of which is the disrepair of some of the Scheme's infrastructure. The diminishing returns from agriculture – both absolutely and relatively – is the main reason why many working-age men in particular have withdrawn from active involvement in agriculture at the Scheme, often leaving their wives to carry on with the farming on their own or with modest help. This over time has contributed to the fact that women now tend dominate the scheme in terms of being responsible for most of the farming, and for at least some of the villages being recognised as the main rights holders.

CHAPTER 5: CHALLENGES IN AGRICULTURAL PRODUCTION AT TSHIOMBO IRRIGATION SCHEME

5.1 INTRODUCTION

This chapter surveys the main challenges associated with agricultural production at Tshiombo Irrigation Scheme. Among other things, the chapter helps add perspective to the farmers' complaints to the effect that farming at the Scheme has become more difficult over the years. The chapter also helps clarify the multiple distinct was in which farmers are challenged, including the securing of mechanisation services, the procurement of purchased inputs, the management of the irrigation water itself, and various issues around marketing and transport.

5.2 MECHANIZATION SERVICES

During the early years of the Scheme, farmers preferred to used hand tools and draught animals for cultivation rather than government tractors. At that time, it was relatively cheap to plough, as most farmers used their cattle or donkeys. The majority of farmers (both men and women) from three study areas stated that they struggled to optimally cultivate their plots due to unbearable costs. At Tshiombo Irrigation Scheme, farmers relied on privately owned tractors which, according to them, were not only expensive but also unreliable. Farmers had difficulties in getting the tractors when they need them and as a result, they ended up not growing their crops at the right time, especially the seasonal crops. One of the respondents indicated that tractor owners had less interest in servicing the scheme farmers than dry land farmers, due to the fact that plots at the Scheme were smaller as compared to dry land plots where the tractors generated more income.

It was revealed that, since the withdrawal of state support services, the cultivation of land has become a serious challenge. The majority of farmers abandoned at least some of their plots due to soaring production costs. In the 1970s, farmers paid 50c to plough one acre; in 2008 they paid R60 to plough one acre; in today's terms, that 50c is worth about R13, so this is largely a real increase, not merely a reflection of inflation. However, one could say that when this study was undertaken in 2008; production costs were being

exaggerated by farmers; the main problem is that farmers at this Scheme were accustomed to state support services, and after the withdrawal of those services, they felt that farming had become too expensive. The cost increase of ploughing does not necessarily mean that production costs are high. On the other hand, the issue of the high fuel price should not be overlooked, as it has affected the increase of production costs.

Furthermore, farmers are no longer willing to plough by hand as compared to the past, and as such, they hire labour for some activities. The use of hand hoes could save them money, especially if they could do production activities such as making ridges. The majority of farmers no longer prefer draught animals for ploughing, therefore tractors remain one of their most important tool or equipment for ploughing because as they mainly use hand hoes for weeding or making trenches.

Presently, farmers have limited options for ploughing as compared to past years when they were being subsidized by the Scheme, due to the fact that initially, they had the option of either using draught animals or government tractors. However, only one respondent always use draught animals and hoes for ploughing, whereas a few make use of draught animals occasionally, i.e. when they cannot afford to hire tractors. The majority of farmers argue that their harvests are better when they use tractors because one can plough more deeply with tractors than with draught animals. In addition, it takes longer for water to evaporate on land ploughed by a tractor. It was also explained that land ploughed by draught animals requires more labour for levelling afterwards. This suggests that those who use draught animal are doing it out of poverty.

The production costs have changed over time, and the main challenge is that most of the farmers cannot afford to cultivate their entire plots, as compared to past years when they used government tractors. Table 5.1 below also shows the cost differences among villages. All the above costs are charged per acre. According to one of the extension officers, there were two service providers (private tractors) at Mutshenzheni, while there were four service providers at Maraxwe, and another four at Matombotwuka. In total, there were eight service providers at the study sites, and production costs are the same at Maraxwe and Matombotswuka. However, one male farmer criticized the private tractors for not doing a good job. Typically, the tractor starts with discing, then ploughing, and discing again, and lastly it makes ridges. All these activities are done in each acre,

meaning that a plot of 12 acres at Mutshenzheni, would cost a total of R2880. For unemployed farmers, it is a huge amount of money, and as a result most farmers struggle to plough all of their land. Increased production costs are a challenge to both men and women farmers who do not have other sources of income. Table 5.1 below shows the tractor costs per activity.

Table 5.1 Current tractor costs per activity

	Matombotswuka	Mutshenzheni	Maraxwe
Discing	R50	R60	R50
Ploughing	R60	R60	R60
Discing	R50	R60	R50
Ridging	R50	R60	R50
Total	= R210	= R240	= R210

Source: Fieldwork, 2008

In 1996, production costs at Tshiombo were regarded as affordable as the government tractors were still operating. Table 5.2 below shows the production costs in 1996–97 at Tshiombo Irrigation Scheme.

Table 5.2 Production costs for one bed of tomatoes

Item	Description	Price, 1997 (Rand)	Price, 2008 (Rand)
Ploughing	Government tractor	12	20
Discing	Government tractor	8	13
Seed	200 g	60	101
Fertiliser (first application)	50 kg 2:3:2	59	99
Fertiliser (top dressing)	25 kg KAN	27	46
Agro-chemical	2 *l* Bravo	60	101
	2 *l* Nuvacron	76	128
Total		302	509

Source: Lahiff, 1999; prices in 2008 Rand are own calculations

5.3 ACCESS TO CREDIT AND OTHER INPUTS

Prior 1994, Smallholder irrigation schemes relied on state support services, and upon the withdrawal of government's support, the majority of farmers complained about lack of money to buy inputs. One of the male respondents indicated that there are some conditions which inhibit farmers from obtaining credit to buy inputs.

However, in the past, farmers were able to borrow money from agricultural institutions. This is supported by Lahiff (1999), who pointed out that Agricultural Development Corporation of Venda (Agriven parastatal) used to provide short-term credit to farmers at Tshiombo Irrigation Scheme through the Tshiombo Co-operative. This was around the 1980s and early 1990s, but this facility was withdrawn in 1991–92, and later Agriven was shut down.

Due to the lack of credit, some farmers borrow money from money lenders whose interest rates are high, and as a result the farmers use much of their revenue to pay back the loan. At Maraxwe, one widow said that she sometimes borrows money from informal lenders to buy inputs and pays back the money after selling some crops. She also sometimes had to work on other farmers' plots to earn enough money to hire tractors to plough her land.

High production costs were not only related to mechanization, but also to other inputs such as fertilisers and seeds. The majority of farmers preferred to buy fertilisers from cooperatives, hence few farmers bought at the nearby shops. One of the old men indicated that around 1973, a farmer could purchase a bag of fertiliser for 74c. Farmers indicated that before the withdrawal of state support in the early years of the Scheme, farmers were sometimes given bags of fertiliser and lime for free. However, due to lack of knowledge, some women used the lime for decorating their homes. At that time, 2 000 kg of fertilizer cost R75. In early 2007, farmers could buy a 50 kg bag of fertiliser for R220 and an 80 kg bag of fertilizer for R380. Presently, farmers buy an 80 kg bag for R540, and they attribute this high cost of fertilisers to the increasing price of diesel and oil. As a result, some farmers use manure such as dry cow dung and chicken waste as fertilisers.

Interestingly, Tshiombo farmers were known to be the first emerging farmers to produce and register their own certified maize seed in South Africa, i.e. 'Zuza vhusiwana'. This practice was introduced by extension officers around 2006 as part of an initiative of the provincial department of agriculture. Farmers were sent to Madzivhandila Agricultural College for training in maize seed production. Farmers acknowledged that extension officers gave them support, but it was insufficient. This is because farmers compare the current extension support to what was available during the early years of the Scheme.

Initially, extension officers visited farmers at their respective plots to observe whether they were producing well, and to give advice. Farmers indicated that, presently, extension officers no longer visit them at their plots; instead farmers have to go to the extension officer's office whenever they need advice. However, some farmers do not want to take extension officers' advice. This is because initially, extension officers had advised them to make their own maize seeds and promised that there was an international market for the seeds, but at the end no such marketing opportunities materialized. The result was that farmers had to look for markets to sell the seeds on their own, and most of them indicated that they still have those seeds and have decided to use them themselves.

5.4 WATER FOR IRRIGATION

According to the management of the scheme, all villages are given equal water access. Each village has been allocated days for irrigation of crops (see Table 5.3 below). However, the village next to the weir disregards the water schedule and irrigate as they wish. This results in water shortages in the other villages, especially those towards the far end of the Scheme, which in turn leads to conflicts over water. Hence, the majority of men resort to irrigating at night, as does a few women farmers who are accompanied by their children for safety reasons.

Table 5.3 Time table for irritation

Village	Days per week
Matombotswuka	Monday and Tuesday
Mutshenzheni	Friday and Saturday
Maraxwe	Friday and Saturday

Source: Records accessed via extension officers, 2008

Figure 5.1 below shows the main canal at Mutshenzheni, which is always full of water.

Figure 5.1 Main canals at Mutshenzheni

Source: Fieldwork, 2008

The majority of farmers indicated that the problem has been aggravated by the abandonment of the water bailiffs. Initially, water bailiffs were responsible for managing the water schedule for the farmers, and for admonishing those who washed or swam in the canal since this water were meant only for agricultural uses. Farmers recall that the situation was under control when the water bailiffs were still present. It was also revealed that, at that time, both men and women farmers had equal access to water. However, this study revealed that the situation has changed over time after the withdrawal of Water Bailiff; both men and women farmers experienced the same problem of water shortages, but men were more likely to irrigate at night as they were not afraid of anything, whereas some women could only irrigate at night if accompanied by men. Most farmers who irrigated at night had their plots situated at the end of the Scheme, and they found it difficult to get access to the water when needed. However, irrigation at night did not ease water shortages during the day, because only a few farmers irrigated at night. Those who irrigated at night indicated that water was abundant at night, and this was their way of avoiding conflicts for water during the day. However, irrigating at night was a serious problem for women. As a result, they were left without any option but to hire men to irrigate for them, and this meant spending the little money they got from farming to pay the men.

Currently, farmers depended on block and central committees for water access. However, these committees have failed to resolve the problems caused by the greediness of some farmers who did not give other farmers a chance to irrigate. Despite the time table, farmers frequently fight for water to irrigate, and this is because the main canal at Matombotswuka is often empty so that it takes time for them to get water. The main challenge is the mal-distribution of water: farmers do not want to share water, and as such the time table is often not followed. Amongst other things the service rendered by the water bailiffs was important as their duties were to oversee that all the farmers received water on their expected days. Figure 5.2 below shows the near-empty canal at Matombotswuka.

Figure 5.2 Main canal at Matombotswuka

Source: Fieldwork, 2008

It was indicated that if the farmer do not abide by the irrigation rules he or she is reported to the block (village) committee, and if this committee fails to resolve the problem it would be referred to the central committee. However, this system is ineffective because the committee members are unable to persuade farmers to adhere to irrigation rules and regulations as they too are farmers at the same scheme, and as such, they are afraid of being threatened by the farmers who do not follow the rules.

During fieldwork, the researcher found that farmers at Mutshenzheni do not care about farmers at other villages who are also in need of water, in that they often do not bother to close the sluice gates after watering their plants, but rather allow water flow down to the bushes and be wasted leading water shortages in other villages. As a result, some farmers at Matombotswuka indicated that they had to discontinue growing some crops, such as onions, carrots and beetroot, due to water shortages in the area. This was unfortunate because they tended to make more money selling these crops as compared to other crops they are growing.

At Matombotswuka village, farmers hired a person to check for water blockages during their turn to irrigate, and they paid him monthly. The challenge faced by the hired person was that he had to walk through all the villages and this was not an easy task to do. Only those farmers who contributed money to pay him were allowed to use water. However, this system was also ineffective due to the fact that some farmers in the upper villages were stubborn and did not adhere to the irrigation rules. As such, it was difficult for farmers to get water at the expected time and they sometimes received water after two weeks or so, whereas according to the water schedule they should have access to water twice a week.

Moreover, some farmers hired migrants to irrigate during the day, but this caused a problem because the migrants did not follow the time-table. Instead, they diverted water for their own use and undermined other farmers, and when questioned they stated that their employers had instructed them to irrigate, failing which, they would not be paid.

Water shortage is seen as a challenge and this will only be solved after the installation of the floppy irrigation system, which is underway. Farmers believe that through this system, there will be enough water for everyone as the system saves water and this might solve the problem of conflicts over water. However, some farmers are unhappy about this system due to the fact that it uses electricity for which they will have to pay.

Comparing this situation to the previous years when water bailiffs were in charge, one can see the gap in water management. This is a clear indication that, for good agricultural production, there is a need for better water management for the Scheme.

Indeed, the majority of respondents at Maraxwe and Matombotswuka mentioned that water was a serious problem. Being the second village from the weir, Maraxwe experiences less severe water problems as compared to Matombotswuka. During the fieldwork (August 2009) much of the land in that village was fallow and some of the farmers indicated that they had planted crops, such as sweet potato, which were drought resistant. Crops such as maize would be grown in summer, which was rainfall season. Despite the challenge of production costs to all the farmers in the study area, the situation was worse at Matombotswuka, where water was the main challenge compared to the

other two villages under study. As such, most of the land at Matombotswuka was left idle (see Figure 5.3 below).

Figure 5.3 Uncultivated land at Matombotswuka

Source: Fieldwork, 2008

5.5 MARKETING

In her study, Maimela, (2002) indicated that farmers at Tshiombo practised both subsistence and commercial farming. This was confirmed by this research, which indicates that farmers sell their crops and use the surplus for household consumption. Before the withdrawal of state support services, farmers used to take their crops to commercial farmers at Levubu and Makhado; who further export them to Johannesburg market and received income for the crops. This was an agreement between small scale and commercial farmers. However, farmers at Tshiombo felt that commercial farmers were giving them little income than they expected.

Farmers use different marketing strategies for their crops. For the majority of women farmers, marketing is a challenge as they depend on customers who buy directly from the land, or by the side of the road where farmers come to sell their crops. Only a few women

farmers sell their crops at Malamulele and Giyani, which requires them to hire vans (bakkies) for transport which costs about R400 for a return trip.

By contrast, some men farmers routinely search for markets around Thohoyandou Shopping Complex, where they sell their crops to chain stores such as Pick ‘n Pay, Shoprite and Spar. However, the majority of respondents indicated that marketing is one of their major problems, citing that extension officers do not assist them to find markets. In addition, women farmers appear to be more reluctant than men to look for markets, due to a relative lack of marketing experience and/or skills. Moreover, broadly speaking men and women farmers conceptualise farming differently: men tend to regard farming as a business, whereas women see farming to be mainly about ensuring household food security.

Respondents indicate that the part of the challenge of marketing relates to transport. Most farmers do not own cars or bakkies, rather most depended on hired transport.

5.6 MAIN CROPS CULTIVATED BY WOMEN IN THE THREE VILLAGES UNDER STUDY

The crops cultivated by women at Tshiombo Irrigation Scheme are mainly maize, sweet potato and groundnuts. This section discusses the main crops grown at Tshiombo Irrigation Scheme.

5.6.1 SWEET POTATO

The majority of respondents indicated that they like to grow sweet potato as it requires little fertiliser and water compared to other crops like maize. Also, respondents confirmed that currently, sweet potato is selling well. They cultivate different types of sweet potato, for example, madivha tsiwana and ‘carrot type’. Respondents confirmed that the majority of customers for this crop are people in Malamulele. Farmers indicated that sweet potato was their staple food. One advantage of sweet potato is that farmers do not spend money to buy seedlings, but instead they ask for cuttings from other farmers who have previously planted the crop, as it is a year-round crop. In fact it is difficult for farmers to

keep their own cuttings because they needed to be planted before they dry, thus they encourage a certain amount of reciprocity.

5.6.2 MAIZE

The majority of farmers grow maize on their farms. They indicated that maize requires intensive care, fertilisers, and pesticides for good production. Respondents confirmed that maize has a good market, especially fresh maize. One of the women respondents at Mutshenzheni indicated that she grows eight acres of maize each March, and only sells fresh maize from three acres, for which she earns about R4 500. The maize crop from the remaining five acres is used to make mealie meal for household consumption. For fresh maize (mielies), the majority of customers buy directly from the land, although some farmers take their fresh mielies to Thohoyandou Shopping Complex to be sold. A farmer can sell one 80 kg bag of maize grain for R250, but the majority of farmers indicated that they only sell when they have a bumper harvest.

5.5.3 GROUNDNUTS

The majority of older women farmers like to grow groundnuts. Groundnuts have good revenue: an 80 kg bag sells for R350. Customers buy directly from the land or in some cases they buy from farmers' homes. Most hawkers at Thohoyandou purchase fresh groundnuts and re-sell them as dry nuts or cooked salted nuts.

By contrast, men farmers in the study villages prefer to grow crops such as cabbage, black nightshade and tomatoes. However, these crops need intensive care, and farmers have to buy pesticides to control pests and crop diseases. Male farmers sell cabbage for R5 each, tomatoes for R35 per crate, and a small bundle of black nightshade for R7. However, they prefer not to sell black nightshade to individuals, but rather to shops as they receive more profit.

5.7 CONCLUSION

Women farmers face a number of challenges at the Tshiombo Irrigation Scheme. These include water shortages, the high cost of tractor services and inputs, and marketing. Farmers prefer to use tractors for cultivating land, although those who are cash-constrained may rather hire draught animals. However, farmers are negatively affected by high production costs, and they blame the government for withdrawing support services. Moreover, lack of access to credit services limits farmers' progress in this Scheme. Water has been allocated according to villages and the Scheme has a time table for irrigation, but the majority of farmers do not adhere to it and this result in water conflicts amongst farmers. In terms of marketing, farmers sell their crops directly from their land, at the Thohoyandou Complex as street vendors and also delivering their crops to chain stores. All these changes had a negative impact on farming production at Tshiombo Irrigation Scheme and as a result farming tended to be less lucrative as compared to previous time before the withdrawal of state support services. These changes contributed to the withdrawal of men in farming.

CHAPTER 6: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

This chapter discusses the results for the study, draws conclusions according to the objectives of the study, and offers some recommendations.

6.1. WOMEN'S PARTICIPATION IN AGRICULTURE

The study confirmed a significant increase in women's participation in agriculture at Tshiombo Irrigation Scheme, irrespective of whether they own the land or not. This increase can be attributed to the fact that, they would want to prevent or reduce poverty within their household's and also to supplement the household income. This is in agreement with Jackson (2003) who indicated that women in Gambia used to rely on their husbands peanut cash crop for households livelihoods but overtime women in Gambia decided to become gardeners and their income surpasses that of their husband. Moreover, our interpretation is that men at Tshiombo Irrigation Scheme have diversified into non-farm livelihoods later than men in other places in Limpopo; for a while, the returns to farming at the Scheme were attractive and competitive, but as the returns to farming declined, men increasingly sought non-farm income earning opportunities, leaving their wives and other women to carry on with farming at the Scheme. The reduction of direct government support to the Scheme is a major reason why the returns to farming at the Scheme have deteriorated.

According to Sigenu (2006:52), women tend to be more vulnerable to poverty as they often stay in the rural areas, while men look for jobs in urban areas. He further indicated that women are poor, and for this reason they depend on land, water and forests for subsistence and income. Because women's economic opportunities are relatively limited, women are left with no option but to exploit land for the survival of their families. The decline of marriage rates also encourages women to participate in agriculture as a means of securing their livelihoods, especially among unemployed women.

In the literature reviewed, Shezongo (2005) indicated that, despite their dependence on land for livelihoods, women lacked security and control over it. However, in Tshiombo Irrigation Scheme, land ownership did not discernibly affect the use of land. The majority of women farmers at Maraxwe village utilized land still owned by men, whether their

fathers or husbands, and they did not feel that that was a problem for them. This is in agreement with Jackson (2003), who indicates that if women farmers do not raise land ownership as a concern, it should not necessarily be considered a problem by others. Despite the lack of land ownership, these women farmers had control over production-related decisions and the use of farming revenues. The real difference between those women who farmed on plots that they owned versus women who farmed on plots owned by others, was that the latter were typically married to men who had other income sources.

In the past, women's level of participation in farming activities was lower as compared to the current situation, where most men have left farming to their wives. Socio-economic factors have played a large role in influencing women to participate in agriculture. Moreover, findings for this study show that women are more engaged in agriculture as compared to men to prevent poverty and also as a way of supplementing their husbands' inadequate incomes.

According to the traditional social setting, women were not allowed to make any decisions in the household while their husbands were still alive. However, the findings for this study reveal that most women are able to make decisions related to farming activities, including the use of revenues, despite men's presence at home. Some married women still experience problems in terms of the use of revenue; however, it is easy for unmarried women to make their own decisions as they head their households.

6.2 WITHDRAWAL OF MEN FROM AGRICULTURE

Different factors have contributed to the withdrawal of men from farming at the three villages under study. Due to the men's other commitments, women have had to take over the responsibilities for farming. Men are leaving agriculture to their wives, sisters and daughters while they look for other work opportunities, whether this requires them to move away from Tshiombo or not. High production costs, old age and water shortages have contributed to men's withdrawal, although some remain indirectly involved in agriculture by providing financial support to their wives.

6.3 CHALLENGES THAT WOMEN FARMERS EXPERIENCE IN RELATION TO AGRICULTURE

Despite their increasing involvement in agricultural production, women at Tshiombo Irrigation Scheme are faced with a number of challenges, including lack of water for irrigation, expensive inputs, and high costs of tractor services. Until the early 1990s, the government provided subsidized services such as tractors and fertilisers.

However, farmers are now in a situation where they have to hire private tractors, which are more expensive and not always readily available. As a result, land preparation is one of the constraints that hinder agricultural production at the Scheme. The study shows that the majority of women farmers do not have formal employment, and as such they mainly depend on the money from social grants for ploughing and buying inputs, except for those who are married and who therefore can rely on their husbands. In addition, the lack of money to pay for tractor services leads to more untilled land.

The unavailability of water negatively affects agricultural production at Tshiombo Irrigation Scheme. Water was properly managed by water bailiffs until they were withdrawn by the government. Water bailiffs played an important role in controlling the allocation of water for irrigation, and in their absence there has been a great deal of conflict amongst the farmers. When there were water bailiffs, the farmers adhered to water schedules and everyone got a fair share, even if there was a shortage overall. The absence of the water bailiffs has put Mutshenzheni village at an advantage because now the farmers there irrigate their farms at anytime they wish. Ironically, in a country with high unemployment, the RESIS programme is effectively making water bailiffs redundant but will ease water shortages at the Scheme.

Being at the other end of the Scheme, Matombotswuka has the worst water shortage as compared to the other villages, and as a result their land use is low. Due to water shortages at Tshiombo Irrigation Scheme, some farmers irrigated during the night because they could not get water during the day. However, night irrigation is risky for women farmers, thus in a sense the dysfunctional water allocation system favours men. Notably, farmers at Matombotswuka preferred to grow sweet potato as it does not require a lot of water.

Farmers at Tshiombo Irrigation Scheme lack access to markets. Most farmers rely on customers who purchase crops directly from the land. Nevertheless, farmers work hard to find customers for their crops. Those farmers who are able to pay for transport costs sell their crops at places as far as Malamulele and Giyani.

6.4. CONCLUSIONS

The main objective of this study was to understand the trend whereby women have come to dominate farming activities at Tshiombo Irrigation Scheme, and to understand the implications of this trend for women's well-being. Farming plays an important role in women's lives through the provision of food and sometimes income, and is especially important for those who have no other sources of sustenance. However, farming also makes an important contribution to the livelihoods of those who have other, off-farm sources of income.

Until about 20 years ago, women at the Scheme tended to depend on their husbands' incomes for their livelihoods. But in recent years, there has been a trend whereby women have become more independent. Women's participation in agriculture has played an important role of keeping their households food secure. Moreover, they are able to finance their children's education. As others have noted (Makhura and Moroko, 1996, cited in Maimela, 2002), poverty and lack of jobs are the main causes of women's involvement in agricultural production, but this research demonstrates the equal importance of men's withdrawal from agriculture.

6.5. RECOMMENDATIONS

To reduce the challenges that women farmers experience at Tshiombo Irrigation Scheme, the researcher recommends the following:

- Government should seek ways of lowering the cost of ploughing services, whether this means encouraging farmers to return to animal traction, or encouraging more providers of tractor services, so that the prices are reduced through competition.

- Extension officers should encourage farmers to make more use of cow dung or other natural fertilisers, because this would assist in lowering input costs as well as benefiting the soil.

- In terms of water shortages, the government is installing the floppy irrigation systems through RESIS; however, in the interim, farmers should try to upgrade and maintain the storage dams which are currently not in use.

- The Scheme would benefit from the reinstatement of water bailiffs. The re-introduction of water bailiffs would ease water shortages and prevent conflict among farmers.

- Women farmers in the villages under study seem to be lacking marketing skills. Therefore it is important for the Department of Agriculture to train farmers in marketing, and this will help them to identify markets before they make decisions as to what crops to grow.

REFERENCES

Backeberg, G.R., Bembridge, T.J., Bennie, A.T.P., Groenewald, J.A., Hammes P.S., Pullen R.A. and Thompson, H. (1996). Policy Proposal for Irrigated Agriculture in South Africa. *Discussion Paper.WRC Report N0. KV96/9.*

Bastidas, E. P. (1999). Gender Issues and Women's Participation in Irrigated Agriculture: The Case of Two Private Irrigation Canals in Carchi, Ecuador. International Irrigation Management Institute, *Research Report No.31*. Colombo: IWMI.

Bernard, R. (2002). *Research Methods in Anthropology: Qualitative and Quantitative Approaches.* Third Edition, Altamira Press, USA.

Bradford, H. (2000). Peasants, Historians, and Gender: A South African Case Study Revisited 1850–1886 *History and Theory, 39,* 86–110. Wesleyen University.

Booth, J. G. and Protais,. M. J. (2000). The Economic Role of Women in Agricultural and Rural Development: Promoting Income-Generating Activities. *Technical Center for Agricultural and Rural Cooperation (CTA). Seminar Paper, Athens*. 18–22 Oct, 1999.

Boserup, E. (1970). *Women's Role in Economic Development.* New York: St. Martin's Press.

Bundy, C. (1972). The Emergence and Decline of a South Africa Peasantry. *African Affairs, 71, (285)* 369–388.

Burns, R.B. 2000. Introductions to Research methods. New Delhi: Sage.

Chancellor, F. (no date). Sustainable Irrigation and the Gender Question in Southern Africa. UK: HR Wallingford Ltd. http://www.csafe.org.za/ doclibrary/2004/01_January/16%20Fri/briefcases/water/Sustainable%20irrigation%20and%20gender.pdf. Accessed 29/12/2007.

Deere, C. D. (1982). The Division of Labor by Sex in Agriculture: A Peruvian Case Study, *Economic Development and Cultural Change, 30 (4)* 795–811.

Deere, C. and León de Lea, M. (1982). Women in Andean Agriculture: Peasant Production and Rural Wage Employment in Colombia and Peru. Geneva: International Labour Office.

Denison, J. and Manona, S (2007). Principles, Approaches and Guidelines for the Participatory Revitalisation of Smallholder Irrigation Schemes, Concepts and Cases. *Volume 2 of 2.* Water Research Commission.

De Vos, A. S., Strydom, H., Fouche C.B. and Delport, C. S. L. (2002). *Research at Grassroots: For the Social Sciences and Human Service Professions*. Pretoria: Van Schaik Publishers.

FAO, (1999). Poverty reduction and Irrigated Agriculture, International Programme for Technology and Research in Irrigation and Drainage (IPTRID). Issues Paper No.1

Goheen, M. (1988). Land and the Household Economy: Women Farmers of the Grassfields Today. In: Davison, J. (Ed) *Agriculture, Women, and Land: The African Experience*. Boulder, CO: Westview Press.

Goody, J. and Buckley, J. (1973). Inheritance and Women's Labour in Africa. *Africa: Journal of the International Africa Institute, (43) 2* 108–121.

Gorman, M. (2006). Gender Relations and Livelihood strategies, In: Bock, BB., and Shortall, S. 2006. (Eds) Rural Gender Relations: Issues and Case Studies. London: CABI

Gouws, M. (2008). Revitalisation of Smallholder Irrigation Scheme (RESIS). Presentation made 21 October, 2008 at Polokwane.

Guy, J. (1990). Gender Oppression in Southern Africa's Precapitalist Societies, In: Walker , C., and Phillip, D. 1990. (Eds) *Women and Gender in Southern Africa to 1945*. United Kingdom: South Africa and and James Currey Ltd.

Hussain, I. and Hanjra M.A. (2004). *Irrigation and Poverty Alleviation: Review of the Empirical Evidence*. Colombo, Sri Lanka: International Water Management Institute.

Ikdahl, I., Hellum, A., Kaarhus, R., Benjaminsen, R. T. A., and Kameri-Mbote, P. (2005). Human rights, formalisation and women's land rights in Southern and Eastern Africa, University of Oslo, Oslo.

Jackson,C. (2003). Gender Analysis of Land: Beyond Land Rights for Women? Journal for Agrarian Change, 3 (4) pp453-48.

Keegan, T. (1988). *Facing the Storm. Portraits of Black Lives in Rural South Africa*. Cape Town: David Phillip.

Khumalo, T. A. (2002). Allocation Management of Water on Small-scale Irrigation Schemes in South Africa. Masters dissertation (Rural Engineering Technology) in the Faculty of Natural and Agricultural Sciences, University of Pretoria.

Lahiff, E. (2000). *An Apartheid Oasis? Agriculture and Rural Livelihoods in Venda*. London: Frank Cass Publishers, London.

Lastarria-Cornhiel, S. (2006). Feminization of Agriculture: Trends and Driving Forces. *Background Paper for the World Development Report 2008.*

Limpopo Department of Agriculture (2007). Planning, Design, Supply and Installation infrastructure for Floppy Irrigation system for Maraxwe project. Prepared by Unie-Tech Development Initiative.

Machete, C., Mollel, N., Ayisi, K., Mashatola, M., Anim, F. and Vanasche, F. (2004). Smallholder Irrigation and Agricultural Development ;n the Olifants River Basin of Limpopo Province: Management, Transfer, Productivity, Profitability and Food Security Issues. *Report to the Water Research Commission on the project entitled "Sustainable Local Management of Smallholder Irrigation*", University of the North.

Maimela, N. V. (2002). Agricultural Production and Marketing Activities and Knowledge among Women Farmers: The Case of Tshiombo Irrigation Scheme, Limpopo Province of South Africa. *Masters Thesis*, University of Venda for Science and Technology.

Majake, C. (no date). Women and the Agricultural Sector. http://www.cge.org.za/userfiles/documents/womenagric.pdf. Accessed 05/12/2007.

May, J. (2000). The structure and composition of rural poverty and livelihoods in South Africa. In : Cousins, B (Ed). *At the Crossroads: Land and Agrarian Reform in South Africa into the 21st century*. PLAAS. University of Western Cape, Bellville.

Mehra, R. and Esim, S. (1998). What Gender Analysis can contribute to Irrigation Research and Practice in Developing countries, In: Merrey, D. and Baviskar, S. 1998. (Eds) *Gender Analysis and Reform of Irrigation Managemen: Concepts, Cases, and Gaps in Knowledge*. Paper presented at the Proceedings of the workshop on Gender and Water, 15-–9 September 1997, Habarana, Sri Lanka.

Mohamed, S. S. (2006). Livelihoods of Plot Holder Homesteads on a Smallholder Canal Irrigation Scheme. *D. Tech. Agric.* Thesis, Department of Crop Science, Tshwane University of Technology.

Moore, H.L. (1988). Feminism and Anthropology. UK: Polity Press.

Mtshali, S. M. (2002). Household Livelihood Security in Rural KwaZulu-Natal, South Africa. Wageningen, *Ph.D Dissertation*, Wageningen Universiteit.

Mushunje, M.T. (2001). Women's Land Rights in Zimbabwe, BASIS Management Entity, Madison. www.rmportal.net/library/content/nric/1042.pdf/at_download/file. Accessed 27/11/2007.

Mutangadura, G. (2004). Women and Land Tenure Rights in Southern Africa: A Human Rights-based Approach, *Land in Africa : Land in Africa: Market Asset, or Secure Livelihood?* Conference paper, Church House, Westminister, London. November 8-9 2004.

Neuman, W. L. (2000). Social Research Methods: Qualitative and Quantitative Approaches. 3rd Edition. London: Allyn & Bacon.

Newland, K. (1980). Women, Men, and Division of Labor, WorldWatch Paper 37.

Newman, I. and McNeil, K. (1998). Conducting Survey Research in the Social Sciences. Lanham, New York: University Press of America.

Nthai, M. M. (2007). An Evaluation of Irrigation Water Supply Infrastructure to Improve Conveyance Efficiency and Water Availability at Dzindi Irrigation Scheme, Limpopo Province. *Masters thesis*, University of Venda.

Olusi, J. (1997). Enhancing Female Participation in African Agricultural Transformation: The Nigerian Experience, *ISSUE*: *Journal of Opinion*, 25 (2) pp12-15.

Patton, M. (1990). Qualitative evaluation and research methods. New Delhi: Sage.

Perret, S. (2002). Water Policies and Smallholding Irrigation Schemes in South Africa: A History and New Institutional Challenges, *Working Paper 2002–19,* Department of Agricultural Economics, University of Pretoria.

Rwelamira, J. K., Phosa, M. M., Makhura, M. T. and Kirsten, J. F. (2000). Poverty and Inequality Profile of Households in the Northern Province of South Africa. *Agrekon* 39 (4) pp 529-537.

Schreiner, B. and Van Koppen B. (2001). From Basket to Basin: Poverty, Gender, and Integrated Water Management in South Africa. *Paper presented at workshop on Integrated Water Management in Water-stressed River Basins in Developing Countries*, 16–21 October, Loskop Dam, Mpumalanga.

Schroeder, R.A. (1996). "Gone to Their Second Husbands": Marital Metaphors and Conjugal Contracts in the Gambia's Female Garden Sector, *Canadian Journal of African Studies*, 30 (1) pp69-87.

Shezongo-Macmillan, J. (2005). Women's Property Rights in Zambia. *Paper presented to the Strategic Litigation Workshop,* 14–18 August, Johannesburg, South Africa.

Sigenu, K. (2006). The Role of Rural Women in Mitigating Water Scarcity. *Masters Dissertation,* University of Free State.

Staudt, K. A. (1988). Women and Participation in Rural Development: A Framework for Project Design and Policy-Oriented Research. Rural Development Committee, Center for International Studies, Cornell University, Ithaca, New York.

Stats SA (Statistics South Africa). 2007. Labour Force Survey, March 2007. http://www.statssa.gov.za/publications/P0210/P0210March2007.pdf. Accessed 28/10/2009.

Taylor, S. J. and Bogdan, R. (1984). *Introduction to Qualitative Research Methods: The research for meanings*. New York: John Wiley and Sons.

UNDP. (1980). Rural Women's Participation in Development. *Evaluation Study No. 3*. New York: UNDP.

Van Averbeke, W. and Mahomed, S. S. (2006). Smallholder Irrigation Schemes in South Africa: Past, Present and Future. *Paper presented at SANCID Symposium*, 14–17 November, Aventura Resort, Swadini.

Van Koppen, B. (1999). Targeting Irrigation Support to poor Women and Men, Water resources Development, Vol.15, Nos. 1/2 pp121-140 (International Water Management Institute.

Van Koppen, B. (2002). A Gender Performance Indicator for Irrigation: Concepts, Tools and Applications. *Research Report 59*. Colombo, Sri Lanka: International Water Management Institute.

Van Koppen, B., Namara, R. and Safilios-Rothschild, C. (2005). Reducing Poverty through Investments in Agricultural Water Management. *Working Paper 101*, International Water Management Institute.

Vaughan, A. (1997). Irrigation Development - Current Realities, New Policies, and Future Possibilities for Positive Impacts on Rural Poverty. Institute for Social and Economic Research.

Water Wheel. (2007). Smallholder Irrigation, Water Research Commission. http://www.wrc.org.za/Knowledge%20Hub%20Documents/Water%20Wheel/Articles/2007/06/WaterWheel_2007_06_Smallh%20irrig%20p%2016-19.pdf Accessed 19/03/2008.

Wenhold, F., Faber, M., Van Averbeke, W., Oelofse, A., Van Jaarsveld, P., Van Rensburg, W., Van Heerden, I. and R. Slabbert. (2007). Linking Smallholder Agriculture and Water to Household Food Security and Nutrition. University of Pretoria. Water Research Commission (WRC) Report.

Williams, J. L. H. (1994). The Role of Women in Agricultural Development and Its Implications for Extension: Experiences at the Keiskammahoek Irrigation Scheme, Ciskei. *South African Journal of Agricultural Extension* 23(1994) 78–80.

Zwarteveen, M. (1996). A Plot of One's Own: Gender Relations and Irrigated Land Allocation Policies in Burkina Faso. *Research Report No. 10,* International Irrigation Management Institute, Colombo, Sri Lanka.

Zwarteveen, M. and Neupane, N. (1996). Free-Riders or Victims: Women's Participation in Irrigation Management in Nepal's Chhattis Mauja Irrigation Scheme. *Research Report No. 7,* International Irrigation Management Institute, Colombo, Sri Lanka.