Assessment of sources of livelihoods and opportunities to improve the contribution of farming within available food chains.

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DECLARATION

I, Nontembeko Mbusi, hereby declare that this dissertation is my own original work and that it has not been submitted, and will not be presented at any other University for a similar or any other degree award. To the best of my knowledge, the works of other scholars referred to here have been duly acknowledged.

Signature Nontembeko Mbusi

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Abstract

Official statistics suggest that as many as 40% to 60% of people in South Africa are living in poverty, and the 15% poorest are in a desperate struggle for survival. Since 1994, Government has been making an effort to help smallholder agriculture through numerous programmes, including those that address land ownership and provide credit and grants for farms and households, but very little change has taken place. Understanding the sources of livelihood and opportunities to improve the contribution of farming within available food chains is therefore an important practical need.

The study investigated sources of livelihood and mapped the livelihoods profile of the farming households in parts of the Eastern Cape. The study was conducted in the Alice and Peddie communities in the Amathole district municipality. A set of structured questionnaires were used to interview the sample of 80 farming households selected through a random process within two irrigation schemes and communities that were selected purposively in line with the focus of the larger project on which this study is based. The resulting data were analyzed by means of descriptive statistics and multiple linear regression.

The descriptive results indicated that members of most rural households were old, married, uneducated and unemployed. Farming was primary livelihood strategy employed in these areas. Rural households were also dependent on remittances, social grants and pension funds because the farming strategy could not meet all their household needs. The major crops that were grown for income and food security to sustain their livelihoods included maize, potatoes, onions and butternut. Factors that had significant influences on outcomes were extension services, grants, pension and remittances, land productivity, type of irrigation system, market accessibility, output price difference and value adding. The available opportunities were land productivity, irrigation facilities, government or NGO programmes and working as a group. For improved livelihood of rural communities in Alice and Peddie, government needs to strengthen agricultural activities and equip farmers with market information, improve their access to irrigation schemes, provide training on value adding and also improve access to extension services.

Keywords: livelihood strategies, outcomes, poverty, farming, employment

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ACRONYMS

NDA	National Department of Agriculture
MLL	Minimum Living Level
MFFP	Massive Food Production Programme
MAFISA	Micro Agricultural Financial Institution of South Africa
CASP	Comprehensive Agricultural Support Programme
HSRC	Human Science Research Council
GAD	Grootfontein Agricultural Development Institute
PMG	Parliamentary Monitoring Group
DAFF	Department of Agriculture, Forestry and Fisheries
CSG	Child Support Grant
ISDC	Integrated Sustainable rural Development
PIR	Poverty and Inequality report
CRDP	Comprehensive Rural Development
IDS	Institute for Developmental Studies
HLS	Household Livelihood Security
SLF	Sustainable Livelihood Framework
SLA	Sustainable Livelihood Approach
SL	Sustainable Framework
SADC	South African Development Community
IES	Income Expenditure Survey
AMPS	All Media PRODUCTS Survey
SURUDEC	Sustainable Rural Development in the Eastern Cape.
LED	Local Development
SPSS	Statistical Package for Social Scientists
DBSA	Development Bank of South Africa
OLS	Ordinary Least Squares
FSP	Farmer Support Programme
VIP	Variance Inflating Factors

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Poverty levels are still high despite several post-apartheid policies that have aimed at poverty reduction. Although South Africa has been liberated from apartheid for more than 15 years, poverty levels are still high. Dirwayi (2010), cited in Landman (2003) reported that political analysts and economists have reached the consensus that 40-60 percent of South Africans are living in poverty, and the poorest 15 percent are in a desperate struggle for survival. The South African minimum living level (MLL) also suggests that 46 percent of the people (about 20.5 million) are still living in poverty (Dirwayi, 2010). Poverty and uneven income distribution are still persistent in South Africa. Most rural-based South Africans depend on agriculture as one of their major sources of livelihood. The South African socio-economy consists of two distinct social classes, namely the minority skilled and wealthier white people and the majority poor and unskilled black people (Landman, 2003). In South Africa, the Eastern Cape was reported to have a high number of rural communities with high poverty levels (HSRC, 2004).

Data generated by Kariuki (2003) suggest that subsistence farming is still an important source of household food supplies with small quantities of marketable surplus being generated for cash income, which is often insufficient to cover basic necessities (Kariuki, 2003). They lack access to natural resources, including the land, in terms of quality and tenure, and are often short of family labour (owing to migration or HIV/AIDS) and suffer from scarcity of peak seasonal hired labour. Smallholder and subsistence farming are not sufficiently remunerative due to the severe challenges and constraints that farmers, especially the resource-poor ones, face. These constraints and challenges increase the risk and uncertainty under which these farmers operate and hinder the emergence of black entrepreneurs in the farming sector. Smallholder farmers are also constrained by the small sizes of the plots on which they grow crops, while a number of restrictions at the wider communal level deny them livestock grazing access. As a consequence of all these, a large proportion of the black population in the rural areas still relies on low paying seasonal jobs as farm workers, and has limited access

to non-farm employment which, along with their lack of assets and resources, exacerbates their vulnerability (Kariuki, 2003).

The Department of Agriculture (2005) suggests that the main features of the production system for smallholders are the reliance on simple, out dated technologies, low returns and high seasonal labour fluctuations. Rural farmers are unable to access financing from the banks to develop the land in order to alleviate poverty and improve social and economic security.

The smallholder farmers are constrained by the lack of practical skills in land use planning resulting in under-utilisation and low productivity of agricultural land in rural areas. Rural farmers have limited access to the market due to a lack of infrastructure, which results in limited economic growth. These constraints limit the acquisition of agricultural resources and the supply of market services becomes more limited. The lack of assets, information, and access to services hinders small holder farmers in potential lucrative markets. Producing for income call for resources such as land, water, off-farm and on-farm infrastructure, a labour force, capital and good management resources. Land is arguably considered the most important asset in farming and in primary agrarian societies especially in the rural areas of South Africa. However few own land of any useful size and this prohibits small holder farmers from producing to their highest potential (Kariuki, 2003 and National Department of Agriculture, 2005). For small holder farmers to be integrated along the value chain, they must comply with market requirements such as economies of scale, good quality and consistency (Baloyi, 2010). Kirsten (1994) and Baloyi (2010), emphasized the need for structural reform in the participation of black farmers in the commercial agriculture sector.

The South African government has responded to these desperate development gaps by initiating a number of projects over the years to improve the livelihoods of the poor. These initiatives have included the Land reform programme comprising tenure reform, land redistribution and restitution, a Massive Food Production Programme in the Eastern Cape, the Micro Agricultural Financial Institution of South Africa (MAFISA), and the Comprehensive Agricultural Support Programme (CASP). But these programmes have been constrained by limited resources as well as a shortage of implementation capacity. There has been a serious

problem with beneficiary selection under these programmes with the result that many of the seriously disadvantaged smallholders do not benefit.

According to the Department of Land Affairs (1997), racially-based land policies were a cause of insecurity, landlessness, poverty among black people, and also of inefficient land administration and land use. The South African government's response to these skewed apartheid land policies included land reform programmes to transform the rural-poor societies from poverty to acceptable levels of improved livelihoods. Through the South African constitution under Section 25 of the Bill of Rights, land reform policies were enacted to enable black farmers expand their farms and make land available to the landless for improved household incomes and their general livelihoods.

Furthermore, the land reform programmes were initiated to address the wrongs of the past and to facilitate equitable and sustainable land acquisition for black people for the enhancement of social and economic development in the rural economy. As already highlighted above, the enacted land reform policies were divided into three broad programmes, namely land redistribution, land restitution, and land tenure reform (Department of Land Affairs, 1997).

In spite of the operation of the land reform programmes, there are many unanswered questions around socio-economic factors targeting beneficiaries of these programmes, and the extent to which the projects have led to the improvement of livelihoods. Turning the acquired land into more productive and sustainable forms of land use that benefit the masses of the rural poor and landless still remains to be seen (Ntsebeza, 2007). The majority of beneficiaries remain voiceless because of a lack of resources (Kahn, 2007). The social redress made by the land reform programmes has failed the poor people of South Africa. People living in poverty have sunk deeper into poverty and the gap between the rich and poor is widening (HSRC, 2004). There is a general agreement by researchers and policy makers that land reform is not occurring fast enough; however, there is still no agreement on the reasons. There are those who argue that the policy is in place, and the only problem is that it is being poorly implemented mainly due to the lack of skills and capacity among the implementers. On the other hand, there are those who argue that the problem is related to a fundamental

structure and policy, which prohibit the objectives of the land reform programme (HSRC, 2004).

Since the beginning of post-apartheid period, South African land reform programmes have been facing severe difficulties. These programmes have failed to address the unsatisfactory performance of land reform projects and set objectives (equitable restitution, redistribution and tenure security) for redressing the historical imbalances in wealth, livelihood opportunity and economic growth among South Africans (Ntsebeza, 2007). Land reform beneficiaries and supporters have identified that there are weaknesses such as the slow pace of land redistribution, and the failure to impact significantly on land tenure systems in communal areas. Disappointing performances of land reform projects may be attributed partly to the weaknesses identified in the market based approach which slowed down the progress of land restitution, redistribution and tenure processes (Ntsebeza, 2007). In addition, the on-going eviction and abuse of farm dwellers remain a critical problem and have long delayed the implementation of the reform of communal tenure.

Tenure reforms remain worst implemented component of the land reform programme. Little progress has been made so far in communities where communal tenure systems prevail. According to Ntsebeza (2007), land reform projects have yielded less impact on productive land use and general household livelihoods. This has been influenced by many factors, but the most cited are inadequate and inappropriate planning, a general lack of capital and skills among intended beneficiaries, a lack of post settlement support from state agencies most notably local municipalities and provincial departments of agriculture, and poor dynamics within the beneficiary groups (HSRC, 2004). Communal property associations are failing to meet their statutory obligations and many have collapsed, leading to a collapse of productive activities on the owned land (Ntsebeza, 2007). Land reform programmes have failed to achieve their objectives and it is evident that these programmes failed to have a positive impact on the agriculture economy which is dominated by few large scales, capital intensive farms and millions of small and poorly resourced farmers. Given the major problems facing the land reform programme, it is not on track to meet the stated objectives. There are traditional forms of land tenure that create complications for households in harnessing their assets to generate wealth (Global Insight's, 2009).

The Massive Food Production Programme (MFPP) targeted all agricultural sectors (primary, secondary and tertiary) that contribute to the Eastern Cape economy. The MFPP targeted under-utilized land in the Eastern Cape with the purpose of changing that land to a high potential land by providing resources and farm implements as part of input subsidies' scheme. The promotion of conservation farming techniques was central to the MFPP concept (Eastern Cape Provincial Department of Agriculture, 2002). This programme stresses the concepts of community-driven development and a reliance on local initiative. Its key focus was to get a critical mass of rural households (200,000) self-sufficient in carbohydrates and proteins by the end of the programme (Manona, 2005). The government opted for this strategy because it was not only to ensure food security, but was also a one-step transformation of small-scale farms into agglomerated commercial farming units.

The selection criteria are demanding and specific. Nilson and Karlsson (2008) defined the MFPP as top-down planned, as smallholder farmers did not have input in the planning and operation of this programme. This lack of information and participation from smallholders is one of the factors which contributed to failure of the Massive Food Production Programme (Mashiri *et al.*, 2010). The MFPP acknowledged the complications of managing remote smallholder fields and delivering inputs to them on time and at a reasonable cost. Furthermore, the lack of the appropriate mechanisation often represented a barrier to upscaling crop production. The programme faced challenges in implementation. The farmers also complained that the programme was inflexible and that over the timeframe of the project, the price of inputs rose, exposing farmers to even more risk. Storage and market access were not addressed, which was an issue of concern (Makara, 2010).

The Micro Agricultural Financial Institution of South Africa (MAFISA) was another government funded programme that was launched as pilot project in three provinces, Kwa Zulu Natal, the Eastern Cape and Limpopo. The MAFISA project had a vision of promoting the agricultural sector in the rural and peri-urban areas through enabling rural households to embark on self-help initiatives so as to- improve their livelihood, reduce poverty and develop viable businesses as well as graduate into larger commercial businesses (NDA, 2005). The MAFISA beneficiaries included communal farmers and farmers in the transitional stage from subsistence farmers to so-called "beginner farmers", women and youth emerging farmers, small-scale farmers, small agri-business, farm workers, user-owned self-help group and community based organizations involved in agriculture (NDA, 2005). This programme was established to address a larger number of constraints faced by a category of small holder farmers as stated above. MAFISA was required to provide funding through participating institutions for on-lending to target markets, to address the financial services needs of entrepreneurs in the second economy and to strengthen the developmental agricultural micro-finance system for their benefit (NDA, 2005).

In its initial stages, MAFISA faced major challenges and the disbursement of loans had started late. This resulted in the suspension of this programme's operation by the Land Bank in addition to the interruption caused by the subsequent expiry of the pilot agreements. However, by 2008, the Land Bank was back in its operation (Parliamentary Monitoring Group, 2008). Other challenges that the department faced related to capacity, the delayed establishment of accreditation committees at the initial stage, prolonged process lead-times that affected end user entrepreneurs, and reliance on extension officers who claimed to be already overloaded. The non-co-operation by some Land Bank branches, the need to coordinate programmes, and problems with Land Bank disbursements in Limpopo that posed a threat to loan repayments were further hindrances.

There was a need to change the mind set of end users who saw their loans as grants, since they were unwilling to repay the loans, as well as address the configuration of interest rates and compounding of interest, and address end users' difficulties in accessing financial services (Parliamentary Monitoring Group, 2008).

Another pro-poor development programme was the Comprehensive Agricultural Support Programme (CASP) which was established to provide support services to farmers under the agrarian and land reform programme (Parliamentary Monitoring Group, 2008). The aim of this programme was to provide post settlement support to the targeted beneficiaries of land reform and the other beneficiaries who had acquired land through private means and were mainly engaged in value-adding domestic enterprises or involved in export businesses (Parliamentary Monitoring Group, 2008). This programme mainly focused on six pillars which were information and technology management, technical and advisory assistance, and regulatory services, marketing and business development, training and capacity building, on/off farm infrastructure and product inputs and financial support (South African Government Information, 2012).

The CASP experienced challenges in operating the scheme. These challenges included the lack of capacity and of economic or financial experience at provincial departments. Intervention measures were instituted and provinces have now assigned Agricultural Economists to assist applicants with their operational plans. The process of training Credit Committees in collaboration with AgriSETA is a continuing on (South African Government Information, 2012). The Department of Agriculture Forestry and Fisheries regards skills development as one of the critical areas for the success of ASGISA. About 800 emerging farmers received hands-on training in various fields of farm management at the Grootfontein Agricultural Development Institute (GADI). Commodity-directed mentorship programmes were presented to a total of 10 000 farmers, while 2 251 farm workers received adult basic education and training in line with the objectives of the draft transformation charter. All participants in the programme are beneficiaries of the Agrarian and Land Reform Programme (South African Government Information, 2012).

The Department of Agriculture, Forestry and Fisheries launched other projects to ameliorate the livelihoods of the poor, and close the gap between the rich and the poor. The DAFF minister has promised to establish 50 000 commercial oriented smallholder farmers focusing on the former homelands, with a budget allocation of R179 million. Sixty million rand of this allocation was mainly for the Ilima/Letsema project in Limpopo, the Northwest, KwaZulu Natal and the Eastern Cape Provinces (Bua News, 2011).

During the apartheid era, different South African ethnic groups had livelihoods that were almost all land based. The South African Land Act 1913 gave out land to both white and black people. The parts allocated to African (black) people were known as Native Areas and represented only seven percent of the total. From 1910 white farmers turned commercial, but after 1960 they became even more commercial due to the transformation of the farming techniques (animal draught replaced by tractors). But this particular development was not implemented in the native areas (Cokwana, 1988). According to Statistics South Africa (2009), approximately 70 percent of rural people are poor due to the inability of the rural economies to provide them with formal or informal employment opportunities.

However, since the beginning of the 21st century the importance of farming to rural livelihoods has decreased due to a cluster of factors (social, economic and political). The limited overall importance of farming in rural livelihoods in South Africa was adequately illustrated by Van Averbeke (2008), and Njobe and Orkin (2000). Using the 1996 census data and the 1997 rural survey data, they counted 1 449 000 homesteads in the former homelands that held arable land (about 50 percent had less than 1 ha) (Van Averbeke, 2008). As a result of this, those rural areas contribute very little to the economy of the country.

In spite of the various projects initiated over the years, there is no significant change in rural livelihoods. According to Jacobs (2009), the livelihoods strategies of the rural poor are off-farm and on-farm activities among others. Most of these livelihoods combine their off-farm and on-farm income to sustain their living. A large number of these poor households depend on agriculture. In South Africa, most of the poor households depend on farming activities (livestock and cropping). In these farms, land productivity is threatened by various factors such as the shortage of land, and land degradation (CSIRO, 2011). Rural households employ various food-coping strategies to alleviate food stress or poor food availability.

Low income, poor food production and food availability, and low purchasing power characterize rural households. Most of the rural households in South Africa access food from the market to supplement their own food production (Baiphethi and Jacobs, 2009). For survival, this means that rural people rely on cash income to purchase food. To make matters worse, most rural households are no longer engaged in farming activities. Dixton (2005) suggests that among strategies, smallholder farmers diversify their livelihood sources through other activities that generate off-farm income.

1.2 Problem Statement

According to Perret (2002), Ndleve (2012) and Obi (2011), even after a series of policy shifts designed to spur development in rural areas, poverty still persists in the former homelands of South Africa. The vast majority of smallholder farmers are still using outdated technology and they have constraints preventing them from becoming productive and profitable farmers. Smallholder farmers have limited access to resources such as water and land. This situation

has a negative impact on production and productivity, with the result that the majority of these smallholders are living in poverty. Rural households have access to small plots on which they are only able to carry out subsistence oriented homestead gardening. The homestead food gardening is inadequate to successfully address food security and household incomes. Limited accesses to irrigation, land degradation and poor soils as well as lack of financial capital and human capitals are major challenges impeding rural households in exercising their entrepreneurial skills (Eastern Cape Socio-Economic Consultative Council, 2011).

These constraints limit production. In addition to this, food production only takes place during the wet seasons because of limited access to water. Approximately 70 percent of people in South Africa are poor due to the inability of the rural economies to provide them with employment opportunities (National Department of Agriculture, 2002). The Eastern Cape Province is still facing a substantial backlog of rural households living below the poverty line due to partly to the lack of infrastructure. The Eastern Cape is dominated by rural areas where the majority of poor farmers with low household income, depend on pension/grants and farm income for their livelihoods.

South African studies have shown that the number of households engaging in subsistence agriculture as a main source of food and income is declining, while there is a rise in the number of households engaging in subsistence production as an extra source of food (Aliber, 2005; 2009). However, there is evidence of under-utilisation of agricultural resources such as irrigation schemes, especially those in the former homeland areas (Aliber, 2005; 2009). Irrigation schemes in the former homelands are operating at low levels due, in part, to the lack of clarity on land rights. They can be used to increase and diversify crop production activity, resulting in improved livelihood outcomes, either directly in the form of food or income for plot holders, or indirectly by providing full or partial livelihoods to people who provide goods and services in support of irrigated agriculture on these schemes.

According to Aliber (2005; 2009), there is an observable decrease in the number of households engaged in subsistence farming as the main source of income. Furthermore, the number of households diversifying out of farming is increasing. The decrease in the population engaged in primary production is associated with agricultural development, so this

would have been a positive development if it were accompanied by enhanced livelihoods. But there is evidence of deteriorating livelihoods and a rise in prices, which is positively driven by food shortages, among other factors. In many places, malnutrition has been observed. Protests over wages have become rife in recent years, suggesting that people are finding it difficult to make ends meet. Some recent protests, some of which are still on-going, have led to a loss of lives and property in the Western Cape Province. The recent census conducted in 2011 provides further proof that unemployment and poverty are growing.

Establishment of irrigation schemes in rural former homelands were thought to be a potential remedy for up-lifting poor farmers from poverty. However, these irrigation schemes have been reported to be under-utilized and have failed to achieve their objective of improving livelihoods among poor farmers. The under-utilization of irrigation schemes may be the result of very significant technical and institutional challenges as well as the goals and aspirations of the farmers involved which, in turn, may influence the economic performance of farming enterprise (Aliber, 2005; 2009). Given the semi-arid landscape of the Eastern Cape Province and the potential impact of climate change, nothing is more important than the increased emphasis on a higher efficiency of water use under irrigation. Research involving the beneficiaries within these irrigation schemes may yield more policy-relevant results that contribute to the identification and application of strategies to improve productivity and better livelihood opportunities leading to reduced poverty in the nation(Aliber 2005; 2009).

Under-utilization of irrigation schemes has resulted in low crop productivity by smallholder farmers jeopardizing their earnings in farming and hence their opting for other sources of livelihood. However abandonment of farming may result in food insecurity and increased unemployment (Baiphethi and Jacobs, 2009). Therefore, there is need to identify ways of involving famers in more productive agricultural technologies and devise means of successful transformation from small homestead gardens to relatively larger farm sizes for increased production.

1.3 Objectives

The broad objective of the study was to determine the sources of livelihood and opportunities to improve the contribution of farming within the available food chains. More specifically, the study aimed to:

- (i) determine the current state of the livelihoods.
- (ii) identify the livelihood strategies that were used.
- (iii) identify the outcomes of the livelihood strategies used.
- (iv) determine the factors influencing livelihood outcomes.

(v) determine the opportunities in the existing and prospective livelihood sources and strategies to improve the contribution of farming within the available food chains.

1.4 Justification of the Study

The available data show that the Eastern Cape is one of the Provinces with the highest poverty rates in South Africa. The Eastern Cape Province also exhibits serious income inequality (Klasen, 1997; UNDP, 2007). Majodina (2011) stated that the adult unemployment rate was 18.4percent in the Eastern Cape Province while the youth unemployment rate in the Eastern Cape Province was approximately 41.4 percent compared with the national figure of 35 percent (Majodina, 2011). Rising food prices have worsened the welfare situation of those who reside in rural and urban poor areas alike, but rural dwellers are further disadvantaged by the absence of alternative opportunities for earning extra income to enable them afford their basic needs at the higher prices.

Government has initiated a number of programmes to deal with this situation, including the payment of social grants which target mostly rural dwellers. Despite these programmes, rural livelihoods are still not improving (Department of Rural Development and Agrarian Reform, 2011). While Government is still committed to improving rural livelihoods and supporting rural dwellers to acquire the necessary skills to participate productively in the economic life of their communities, there is little information regarding the appropriate policies that can improve rural livelihoods (Aliber and Hart, 2009: Zuma 2011)

Therefore, it was necessary to undertake this study to contribute to the identification of reasons for persistent poverty and high rates of unemployment in the Eastern Cape Province. The study was also fundamental in identifying the factors that discourage rural household's participation in agriculture as the main source of income in the Province. The research further made an effort to identify how best these households could be encouraged to participate in agriculture. By so doing, the smallholder farmers could be incorporated into the mainstream agricultural economy, improving the standards of living and enabling them to contribute to the economy.

1.5 Outline of the study

This dissertation consists of five chapters. The first chapter introduces the study and sets the context by defining the problem statement, specifying the objectives and providing a clear justification for the study. The literature review is presented in chapter 2 with relevant subsections which include rural livelihood strategies, available technologies in rural areas, government efforts to alleviate poverty and sustainable livelihoods. Chapter 3 consists of the description of the study area and the methodological approach employed to achieve the set objectives. The chapter further gives more detail on data collection methods, fitted models and other analytical procedures. The presentation and discussion of the findings are done in chapter 4. Chapter 5 summarizes the study, and provides conclusions and policy recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This study aimed to assess the sources of livelihoods and opportunities to improve the contribution of farming within available food chains. Thus, this chapter reviews literature on current livelihood strategies employed in rural areas globally and in South Africa. The chapter narrows down the discussion on the South African government's efforts to reduce poverty through agriculture, the government's contribution and the outcomes of government initiatives. Further the chapter discusses the available technologies in rural areas and finally it discusses the sustainable livelihoods concept, the sustainable livelihoods approach and a sustainable livelihood framework. The specific focus of the study was on crop farming and the literature review examines the key issues in production and marketing of the principal crops which constitute the available food chains in the farming systems of the project area.

2.2. Rural livelihoods strategies

Livelihoods are defined as the various ways in which households obtain the necessities of life both in good and bad years. The necessities comprise food, water, shelter, clothing, health care and education (FAO, 2009). Two characteristics define the of livelihoods of rural dwellers: one group stays in sparsely populated areas in which people depend on farming and natural resources, with small towns dispersed in these areas and another group, made up of large settlements in former homelands, which is dependent on migratory labour and social grants and has traditional land tenure systems (FAO, 2009). The South African National Department of Agriculture (2002) identified 240,000 smallholder farmers who derive their livelihood from agriculture and have 1 million beneficiaries and provide occasional employment to another 50,000.

Skewed apartheid policies are thought to be some of the major contributors to the poor standards living and high poverty levels among rural households, especially those living in the former homelands of South Africa. During the apartheid era, the high levels of poverty among the indigenous black population forced rural dwellers, particularly able-bodied males,

to leave their rural homes for employment in the mines and factories to raise income to pay hut tax and tax on livestock. In addition, they had to meet the living expenses of the family, while the women had to take over and become the household producers and day by day livelihood providers (Panin, 2001). Non- farm income has become a unique practice among rural households (Barret *et al.*, 2001). An analysis of rural livelihoods in Africa, Asia and Latin America, revealed that a larger portion of income is derived from non-farm employment (Obi *et al.*, 2011).

Most of the rural areas have three sources of income; namely, on-farm income, off-farm income and transfers (Panin, 2001). Even though a wide range of activities are associated with these three sources of income, rural households' transitions into high return, non-farm activities are constrained. Not all rural households enjoy equal access to high return and non-farm activities. Livelihood activities depend on different forms of capital in contrast to the more traditional production-based approach and required access to credit and the required skills (Obi *et al.*, 2011).

According to Perret *et al.* (2005), African rural households have long struggled to participate in developed non-agricultural and non-rural labour market. Further, the African rural households' income is moderately derived from non-farm sources (Perret *et al.*, 2005). Households often practise more than one livelihood strategy: different non-agricultural activities concurrently or at different points throughout the year (Bryceson, 2000).The offfarm labour market is used by most rural households because it has more work incentives and labour allocation (Perret *et al.*, 2005). Most of the activities have high prospects in nature and faster responses to market demands and supply (Bryceson, 2000).

South African households employ several dynamic livelihood strategies. These livelihood strategies differ according to the daily, monthly and annual variations in terms of timing and numerous of factors such as rainfall, labour availability, input costs, access to public services, markets and credit, migration opportunities, remittance income and transport costs (SLSA Team, 2003). Other determinants of livelihood strategies are also categorised by age, gender, wealth and ethnicity, as people are able to draw on differing material and social assets, political connections, experience and expertise (SLSA Team, 2003). Livelihood strategies are shown in details in Figure 2.1.



Livelihoods strategies employed in South Africa.

Figure 2.1: Davis and Pearce (2000).

South African lifestyles are characterized by a high degree of mobility. Whether it is an opportunistic response to deprivation and risk, moving in search of a better livelihood, geographical movement is embedded within a range of cultural strategies (SLSA Team, 2003). The migration phenomenon is still ingrained in the pattern of everyday life (SLSA Team, 2003). Large-Scale labour migration to the cities and mines has become an important source of livelihood and the pillar of the local economy by providing remittances to support the livelihoods of those left behind. Today this is still the case, although there have been significant changes in the migrant labour experience. However, remittances to rural areas have declined in recent years. This is mainly due, in large part, to retrenchments in the mining and manufacturing and public sectors (SLSA Team 2003).

Mofokeng (2008) states that, the high unemployment rate in the rural areas of South Africa has resulted in so much dependence on natural resources as major production assets to create employment and generate income (Philip, 2002). Nevertheless, rural livelihoods still earn a living from migrant labour. Despite the migration for better paying jobs to urban and industrial areas, unemployment still dominates, especially in rural areas. Largely, adults in these households are engaged in more casual local and migrant employment (Mofokeng, 2008). The key issue regarding employment in this situation is the fact that wages and remittances derived from such employment activities do not contribute much to the income of these households. Given the time period which migrants spend away from home, their low wages are not enough to take care of themselves and their respective families. Therefore, cash flows and opportunities generated by these activities at this point have proved unreliable (Philip, 2002).

Due to the large number of adult-males migrating from rural areas, most rural households are headed by women or pensioners. The situation is worsening as more household members shifting their labour from agricultural to insufficient wage non-agricultural production activities, and the male household head's dominant role as the family cash-earner is vanishing fast. Rural women also earn incomes, but these largely based on their home-making skills which are usually less remunerative compared to those of the men. Sales of prepared snacks, beer, hair plaiting, petty retailing, prostitution, knitting, tailoring, soap making, and midwifery are some of the few among many services they provide to earn a living (Perret *et al.*, 2005).

Some of these strategies often occur in harsh physical and economic environments. These circumstances are changing rapidly, requiring the livelihood strategies to employ more shifts and mixes of activities (IDS Bulletin, 2003). One of the diverse ways to earn an income in South Africa is through social grants provided by the government. It has been reported that the South African government spent over R104-billion on social grants to assist the most vulnerable in the country in 2011/12, with the number of beneficiaries expected to grow by a million to over 16-million people (Bua news, 2011). Social grants make up more than half of the income of the poorest households, having doubled in real terms between 2000 and 2005 (Mkhabela, 2010). In some of the rural households, more than one member gets the same type of grant or members get different categories of grant because more than one household

member qualifies for these social grants. The social grant strategy enhances the livelihood conditions of its beneficiaries.

In 2007 Statistics South Africa (Stats Sa) reported that the number of people receiving grants has increased, with up to 42percent receiving at least one grant per recipient, whilst the average grant receiving family included at least 2 beneficiaries. Altman and Boyce (2008) noted that most South African households (36 percent) receive at least one type of social grant and 31 percent receive more than one type of social grant, with the Child Support Grant (CSG) being the most common. In 2007, 51 percent of households reportedly received at least one CSG. This shows that approximately 60 percent of grant beneficiaries among these households are classified as low-income earners. It also means that social grants have a positive impact on the developmental and human well-being indicators within households (Jacobs et al., 2010). Living in a household receiving social grant is correlated with a higher success rate in finding employment. Individuals in households receiving social grants have increased both their labour force participation and employment rates faster than those who live in households that do not receive social grants. Social grants also help in increasing the standards of living and reduce poverty (Jacobs et al., 2010). Although the social grant is a major source of income, it does not always sustain household livelihoods, especially in families with a large household size. It is also partly because the cost of living including food prices has risen sharply.

Farming is regarded as a minor activity and a poor income generating activity in most cases. Most entitlements are from inheritances and transfers. Households primarily depend on the cash income provided by others, including remittances and social/welfare grants, hence livelihoods are highly diversified (Perret*et al.*, 2005). Rural dwellers are partially dependent on agriculture and partly on cash income from selling the surplus produce or from engaging in wage labour. The available evidence suggests that neither of these generates sufficient income to sustain the livelihoods (Kariuki, 2003). Many households practise subsistence crop agriculture and livestock production, and some of them, sometimes, produce surplus, which is marketed within the community.

Farming used to appear as the main economic activity for many villagers. However, the number of people cultivating their fields has declined probably because of harsh climatic changes, among other recent challenges (Perret *et al.*, 2005 and Kariuki, 2003).Most rural households have small parcel of land, relying on seasonal jobs as farm workers, non-farm employment; and their poverty is attributed to the lack of access to production resources and assets. A large number of informal enterprises in the rural areas and townships of the Limpopo Province make a diverse range of products, both food and non-food, that are mainly used by the people of the areas (Kirsten, 1995).

Limpopo province of South Africa has approximately 4 million black individuals from about 2.5 million households practise farming. They mainly practise farming as source of food, a source of income or as a leisure activity or hobby. Approximately 92 per cent of rural households practise agriculture as a source of food or as a leisure-time activity, and about 10 per cent are employed in agriculture as their main source of food (Cousins, 2013). Only 8 per cent practise agriculture as a main or extra source of income. Of these percentages women make up to 61 percent of all households engaged in farming.

Black smallholders are mostly found in three provinces with large rural populations, the Eastern Cape, KwaZulu-Natal and Limpopo. In these Provinces, the percentage of black households engaged in agriculture is between 57 and 72 (Cousins, 2013). Summaries of available national data with regard to small-scale agriculture in South Africa show that in 2006 the average per capita income per annum was approximately R4,600 for households that depend on farming as their main source of food and farmers who undertook farming as their main source of income earned approximately R9,000. This may be because households that are richer are more likely to produce more and earn more from farming since they have more access to production resources than poor households. The summary of the study presented by Cousins (2013) also shows that agriculture contributes a relatively small share of total household income.

The analysis of 1993 survey data, identified the following eight 'livelihood strategies: marginalized households without access to wages, remittances or welfare transfers (for whom small-scale agriculture makes up to 81 per cent of income); welfare dependent households; remittance-dependent households; secondary wage-dependent households; primary wage-

dependent households; mixed-income households with secondary wages; mixed-income households with primary wages; and entrepreneurial or self-employed households (May, 2000 and Cousins, 2013). Cousins's (2013) study indicates that the majority of all households in South Africa are wage-dependent, while others are remittance-dependent, and 11percent are welfare dependent.

Shackleton *et al.*, (2000) and Cousins (2013) argue that these survey data failed to capture the full range of land-based livelihoods. Crop yields, the full economic value of multiple-function herds of livestock and the significant contribution of natural resource use are often not taken into consideration.

Cropping in one area of the former Transkei indicated that if properly measured, maize yield on intensively cultivated homestead plots is about 1.8 tonnes per hectare more compared to yields on large-scale farms (McAllister, 2000 and Cousins, 2013). Homestead gardens are more productive, less risky and more viable, given the resource constraints faced by rural households. The resource constraints among homestead food gardeners are not evenly distributed. A study conducted by McAllister (2000) in the former Transkei showed that wealthier households had the ability to hire farm labour both for crop production and rearing animals such as cattle (Cousins, 2013).

According to Andrew *et al.*, (2003), farming is not sufficient to sustain livelihoods of rural households. These households are always faced with low levels of production resulting in the need to buy basic foods and maize. Andrew *et al.*, (2003) identified that crop sales contribute less than 10 percent of rural household income. Further, Andrew *et al.*, (2003), also identified that farming contributes 15-28 percent of rural livelihoods (Gilimani, 2005). Most of the research conducted in South Africa argued that from year 2000 to date, rural households use farming as a coping strategy. Formal employment is limited and these households do not have cash, therefore farming is the best coping strategy for these rural populations (Fraser *et al.*, 2003 and Gilimani, 2005).

Most of the small-scale farming in South Africa is carried out for household food supply, and only a small proportion of the product is sold (van Averbeke and Khosa, 2011). These

researchers also suggest that class differentiation exists as reflected in the differential levels of production and sales, as well as holdings of assets such as livestock but it is limited in its extent. A study conducted by Van Averbeke and Khosa (2011) in Limpopo shows that farming is only one of the several sources of livelihood for rural households. This is clear from a recent household survey, which indicates the presence of social differentiation in its initial analysis. Given that only households with plots on the scheme were included, it is not surprising that farming contributes about 33 per cent of all household income sources, and it is regarded as the single most important source. The next most important sources of income are child support grants, jobs and old age pensions, with few remittances in cash or kind being reported as most important sources of livelihoods (Denison and Manona, 2007). Smallholder subsistence farmers can be described as those who have limited access to permanent jobs and are employed locally; their production systems are highly labourintensive; they grow common food crops including green maize, tomatoes, cabbage, sweet potatoes and leafy green vegetables, while the production of specialized types of fresh produce for niche markets is absent or very limited (Lahiff, 2000; Denison and Manona 2007; van Averbeke and Khosa, 2011).

Although a large number of agricultural development programmes have been established since the end of apartheid, income from farming is still on the decline, partially due to the price fluctuations in input markets and the increasing prices of inputs. Fluctuating and increasing input prices have resulted in higher levels of farm monetization, and hence, it is becoming increasingly more expensive for resource-poor farmers. This probably explains the recent trend of rural households diversifying to non-farm activities to maintain the livelihoods (Sanchez, 2005 and Obi *et al.*, 2011). Diversification may also be caused by a lack of access to land, labour, credit and insurance (Battet *et al.*, 2001 and Obi *et al.*, 2011). Thus, agriculture alone cannot provide sufficient livelihood opportunities for rural households.

According to Hendricks and Fraser (2003), most people in the Eastern Cape are poor and poverty seems to be concentrated in the former reserves of the Ciskei and Transkei. The condition is obviously not static as people frequently migrate to the cities in search of work and other opportunities. Simultaneously, as the mining industry has seemingly reached its absorption capacity and has been retrenching workers, more and more people are moving

back to the so-called safety net of the reserve areas, since kinship ties remain the ultimate source of security in traditional societies(Gilimani, 2005).

Perret *et al.* (2005) state that the Eastern Cape employs more or less the same livelihood strategies employed in the country. Firstly, most rural people practice agriculture as their main occupation (as farmers or farm workers) or get non-farm or off-farm job opportunities only seasonally, and often, part time. Secondly, individuals and households are earning a living from various sources including production (farming, local craftwork, small-scale industries), own labour, trading, transfers (grants and remittances); this last form of entitlement often forms the backbone of rural people's livelihood in the Eastern Cape, especially through old-age pensions (Perret *et al.*, 2005).

2.3 Government Efforts to alleviate Poverty through Agriculture

The UNDP (2007) points out that poverty is all about a lack of power. Poverty alleviation should therefore address situations in which people are empowered to appreciate their rights and their responsible use. Rather than thinking of the poor as needy persons waiting for hand-outs, their basic rights to common resources should be recognised and enforced. South Africa's democracy brought equal rights, but not everyone is accessing them. Historical inequalities remain largely unaddressed by current economic policy, including black empowerment strategies. Unemployment figures are higher among women, and femaleheaded households are more likely to suffer from poverty (UNDP, 2007).

Given the multi-dimensional nature of poverty, it is logical that South Africa has sought to address poverty from different dimensions. The South African governments' commitment to poverty reduction has been articulated in recent years through various national, provincial and local policy interventions (Ntebeza, 2007). As such, since 1994, the South African government has introduced a large number of interventions to address poverty in its various manifestations. The most prominent interventions have focused on poverty (lack of income), human capital poverty (lack of education and skills), service poverty (lack of access to services and amenities), and asset poverty (lack of ownership of land and housing). These government interventions vary from child support and disability grants, subsidised water and electricity, housing, land redistribution and restitution, and various inter-departmental programmes such as the Expanded Public Works Programme.

In 2005 the Public Service Commission (PSC) commenced a research process, where all government projects were compiled into a single database. This provided the statistical overview of most of the poverty reduction initiatives that make up the Poverty Reduction Programme. A definition was proposed for government to consider describing projects that focus on poverty reduction. The Public Service Commission established that there is little capacity in government to implement poverty reduction projects (Kariuki, 2003 and the National Department of Agriculture, 2005). These projects are targeted at very poor people who need continued support to make a success of the projects. An example is the land redistribution projects, which are seen as completed as soon as the land has is transferred to the beneficiaries. These projects are in some instances not properly handed over to provincial agriculture departments. Where they are, these departments lack the capacity to support the projects properly (Kariuki, 2003). The lack of capacity is reflected in poor entrepreneurial skills; the lack of basic financial skills; the lack of technical skills in the area of business of the project; and the lack of skills to conceptualise and execute poverty reduction programmes that address the multi-dimensional nature of development.

The expenditure by government on agricultural programmes to alleviate poverty has grown considerably since the mid-1990's (Aliber and Hall, 2012). Although public expenditure on agriculture has increased over the last decade, there are very few households receiving direct support from the government. One of the reasons for the limited direct support from the government to the farmers is attributed to the shortage of agricultural extension services, which is seen as the core problem. To resolve this, the National Department of Agriculture initiated the Extension Recovery Plan (NDA, 2008). The Minister of Agriculture stressed this problem of the shortage of staff, which leads to sporadic farm visits and training (Aliber and Hall, 2012). The other reason for the small holder farmers getting less benefit from these programmes were that government was not aware of their existence. In 2008, the government initiated a pilot programme to address this. The core objective of the project was to establish information on the number of existing smallholder farmers in South Africa (Hart, 2010).

Government has established a large number of programmes to alleviate poverty and create a social balance (Hart, 2010). This section underpins the land reform programme, which aimed at redressing the tenure security of black farmers although many researchers have criticised this programme. Many stakeholders understood it differently (Hart, 2010). Stakeholders such as local residents, planners, technician, managers and field staff involved in this programme worked independently and were not linked to one another. Subsequently, the influence of the stakeholders involved was misinterpreted by the beneficiaries and other people to meet their needs. According to Latour (1996), the land reform programme must be given the credit for the little success that has been achieved.

The Farmer Support Programme (FSP) also faced severe difficulties and failures. This programme was developed in mid-1980 by the Development Bank of South Africa (DBSA) (Aliber and Hall, 2012). The main objective of the programme was to assist underperforming smallholder farmers. The Development Bank of South Africa defined the smallholder farmer as someone who can access agricultural resources, either fulltime or part-time to practise farming. The broad objective of the DBSA was to encourage and promote smallholder farmers by offering grants and input subsidies. The DBSA objective was changed to offer farmers access to extension support services in 1987 (Aliber and Hall, 2012). Later an inclusive approach was adopted by the DBSA focusing on helping farmers by providing them with inputs, capital and mechanisms, trainings and extension, market access and research. Hayward and Botha (1995) identified a number of problems associated with the FSP such as the excessive purchase of inputs, the lack of training to extension staff and subsequent indebtedness. Due to such problems encountered by the programme, it became fiscally unsustainable (Aliber and Hall, 2012).

The DBSA analysed this programmes as excessively expensive. This was based on the amount of money (R25 000) that was allocated to each farmer over a period of 6 years. Relating this project to programmes such as CASP and MFPP, it was more expensive. Apparently, it doubled the average amounts spend on black farming households by the Provincial Department of Agriculture (Aliber and Hall, 2012). Hence it did not last for long, having become unaffordable on a national scale. Although the Farming Support Programme faced a number of problems, it played a huge role in rural farming.

In 1998, the government published the Poverty and Inequality Report (PIR), which highlighted concerns about whether the macroeconomic framework would be able to achieve the poverty eradication objective, or whether it was necessary to propose a number of ways to enhance well-being through agriculture, employment creation and land reform policies (The Presidency, 2008). The report demonstrated two strands of thinking that dominated the debate about restructuring and land reform in post-apartheid South Africa's rural economy. Since 2000, land restitution has been seen as conducive to poverty eradication and able to support agriculture effectively to create employment and improve rural livelihoods (Perret, *et al.*, 2005). Almost fifteen years have passed, yet the question remains unanswered by the South Africa government.

There is still much that the government needs to do. Certain groups in South African society are still trapped in poverty (The Presidency, 2008). These groups include women (particularly those who are single parents), children, the youth, the aged and families where one or more family member has a disability (The Presidency, 2008). The increasing trends of poverty also show that inequality between the rich and the poor is growing, and is associated with race, gender and location. Government therefore needs to ensure that future development of policy addresses the needs of these groups and individuals most at risk (The Presidency, 2008).

Supporting the establishment of income generating projects is one of the primary objectives for government's poverty reduction efforts, and participation also includes the corporate social investment and civil society initiatives (Towards an Anti-Poverty Strategy for South Africa, 2008). In contrast to public works and land redistribution, income generating projects are neither linked to a unified programme nor associated with a coherent structure, but rather are attempted by a wide variety of different government departments through diverse programmes in many sectors. As a group, income generating projects are exemplify the idea that government should assist people to become economically independent rather than reliant on welfare, or what is termed 'developmental welfare (Towards an Anti-Poverty Strategy for South Africa, 2008).

The government also established the Integrated Sustainable Rural Development Strategy in 2000. The government introduced this programme as a "concerted effort to improve opportunities and the well-being of the rural poor" (Government of South Africa, 2000). In
the Eastern Cape Province, the ISRDS covered the Ukhahlamba, Alfred Nzo, Chris Hani and OR Tambo District Municipalities, which were recognized as the most underdeveloped areas, with the highest levels of poverty (Manona, 2005). The programme was expected to produce positive results by 2010 (Government of South Africa, 2000). But these expectations were not realized in light of the practical realities on the ground. A number of studies carried out revealed that the ISRDS encountered several problems due to conflicting social and economic goals. Everatt (2002) revealed that co-ordination and communication problems were the major impediments to the successful implementation of the initiative.

In addition to some of these broader initiatives, there were a number of development planning initiatives underway in the Dwesa/Cwebe area. For example, consultants were then in the process of designing a development plan for the area (Amatole District Municipality, 2003), and conservation authorities had undertaken, in conjunction with the communities, to develop a new management plan for the nature reserves (Department of Economic Affairs, Environment and Tourism, 2003). Furthermore, poverty-alleviation funds were being channelled into the area in the form of labour intensive public works programmes, such as road building, clearance of exotic vegetation, and training of tourist guides (Department of Economic Affairs, Environment and Tourism, 2003).

During the betterment planning programme, much of this was replaced with fencing; strong policing from the chiefs (then used as government tools), the government and its rangers; culling of livestock; and a centralised form of management. De Wet and McAllister (1983) reported that the plan during the betterment planning programme was to rehabilitate areas declared for betterment and to make them economically viable. It was also intended to change conditions for the black population, which had further deteriorated and livelihoods, which had become progressively compromised. According to Van Averbeke (1999), most blacks are still landless in South Africa. Yet the betterment Planning alleged that plots were allocated to families that settled in any place. Many studies including Monde (2003) and Ngqangweni (2000) reported the fall-outs of these policies and regulations, demonstrating how most areas lost their agricultural potential, and explaining the establishment of small plot sizes that are now found in the rural homelands of the Eastern Cape.

2.4 Available Technologies in rural Areas

In considering how technology can be used to address poverty and how to improve rural livelihoods, there is a need to understand the concept of technology and its dimensions. Wallender (1979) defines technology as any tool or technique, product or process, physical equipment or method of doing or making, by which human capability is extended. Hence 'technology' includes process technologies, which lead to higher productivity or improved quality of a product; product technologies, which create new products; and transaction technologies, which facilitate co-ordination, information sharing and exchange among market participants (HSRC, 2012).

A product innovation is an end product for consumption while a process innovation is an input to a production process (Rogers, 2003). Product innovation technologies play a vital role in economic development (Carteling, Di Benedetto, Doree, Halman and Song, 2011). Technology research also plays a major role in agriculture especially in climate back up strategies and economic development (Rosenberg, 1992). Technology input can positively or negatively affect productivity growth by increasing the total output or trimming down the use of more less expensive inputs (Huffman and Evenson, 1993). The most common technology available in rural communities is irrigation schemes.

The importance of irrigation technology in agricultural production has been recognized for a long time and can be discussed within the broader framework of the role of improved technology in agricultural development. Theorists of the induced innovation model have prepared an excellent case for technical change in the process of agricultural development, looking at how production co-efficients changed due to changes in resource allotment (Hayami and Ruttan, 1971: Grabowski 1979 and Ruttan and Hayami, 1984). The major contribution of the model has been to explain the mechanism underlying the choices society makes among alternative technological paths to achieve agricultural development. In the process of developing the model, the thinking had been that technical change and institutional reform were exogenous to the system. However, the induced innovation model provided a strong argument foundation for treating technical change as endogenous to the system because internal pressures occurred from the constraints imposed on the system by changing resource endowments that are the major factors driving change (Ruttan and Hayami, 1984).

Much of this thinking has clued-up the development and use of irrigation technology to bring about massive improvements in agricultural development.

Small-scale irrigation farmers in South Africa can be categorised in terms of their water supply as follows: farmers on irrigation schemes, vegetable gardeners (served by communal water supply infrastructures) and independent farmers each with a "private" water supply. For many decades smallholder irrigation schemes have generated public interest, mainly because their establishment and revitalisation were made possible through the investment of public resources (Perret, 2001). The South African smallholder irrigation schemes are used by different co-operatives and individual farmers, irrigation of less than 5ha in size (Van Averbeke and Mohamed, 2006). Many technologies in rural areas were established before the launch of the Comprehensive Rural Development Programme (CRDP) by both government and non-government institutions. These irrigation schemes were established in the former homelands of South Africa (Van Averbeke and Mohamed, 2006). Some of these are now supported in terms of the CRDP, but others are not. Technologies used in agricultural production tend to predominate, in that, they are found at every site, while different types of agricultural technologies and practices are often found at different sites. Mining, on the other hand, is found at very few sites but the technologies used are similar across sites and are largely simple, hand-held tools (HSRC, 2012).

The availability of irrigation infrastructure that is efficient, effective and in a good state of repair is a crucial success factor in smallholder irrigation. Van Averbeke, Letsoalo and Mohamed (2006) presented evidence collected at Khumbe, which indicated that, when canals and concrete furrows are deteriorating as a result of being not maintained, plot holders stop irrigating their plots. Once the irrigation schemes are revitalized, the maintenance of the infrastructure needs to be on practice all the time. Regular monitoring of maintenance on smallholder schemes by a third party, with feedback being provided to both the state and the plot holders, could possibly assist in the adoption of improved maintenance routines by farmer communities. This, in turn, is expected to extend the life span of the infrastructure and reduce the need for special and deferred maintenance, processes that were found to be beyond the capacity of irrigation communities (Letsoalo & Van Averbeke, 2006 cited by Mohamed, 2006).

The dynamic operation of irrigation technology transfer and agricultural development policies is considered as an essential strategy to build human capacity in order to render and sustain rural livelihoods (León and Garay-Flühmann, 2005). For many decades smallholder irrigation schemes have drawn public attention, mainly because their establishment and revitalisation were made possible through the investment of public resources (Perret, 2001). Yet these irrigation schemes are still facing a number of problems hindering productivity.

According to the FAO (1997), the failure of public schemes has resulted in the limited lending experience of these organizations, the high transaction costs, and the lack of collateral by target farmers. There are also a number of problems facing smallholder irrigators such as high transaction costs. The efforts did not yield much because the focus was shifted to one side of finance abandoning the demand side. The government has tried to fix these problems of collateral and insurance faced by smallholder farmers through Micro Agricultural Finance Institute of South Africa (MAFISA).

According to the FAO (2009,) irrigation conveys a variety of potential changes in agricultural production. Previous research by Lipton & Litchfield (2003) affirmed that the impact of irrigation is on output levels. Irrigation enhances total farm output; hence increases farm income as input costs are kept constant.

Smallholder irrigation was established in the 19th century in Egypt and it was given support by the fast increasing missionary activity which coincided with the preliminary stages of the individual diversion scheme phase (Backeberg and Groenewald, 1995). Smallholder irrigation developments were also private and the technology used (river diversion) was similar. Irrigation schemes covered a small portion and much of what was developed seized to function by the end of the 19th century. Averbeke and Mohamed (2006) describe this era as the "peasant and mission diversion scheme era" to reflect its association with the inception of Christian evangelizing missions during that period when organized agricultural enterprise was introduced.

The second phase of smallholder irrigation was established in 1930 after the failure of the first initiatives. This phase operated from 1930 until about 1960, which coincided with the era of the establishment of public storage schemes as part of the national irrigation system

(Backeberg and Groenewald, 1995; and Bruwer and Van Heerden, 1995). Many of the smallholder schemes established during this era were constructed after the Second World War and were primarily aimed at providing African families residing in the "Bantu Areas" (i.e. the areas subsequently re-designated "independent homelands") with a means of livelihood (Van Averbeke and Mohamed, 2010) citing the report of the Tomlinson Commission 1955).

The Land Act of 1913 and the 'Land and Trust Act' of 1936 restricted land ownership by black people in South Africa to these territories (Bantu areas). The Tomlinson Commission (1955) identified smallholdings on irrigation schemes in the north of South Africa that were supervised by Europeans as the most successful smallholder farm enterprises in the "Bantu Areas". Studies undertaken between 1952 and 1953 by the Tomlinson Commission illustrated that profits from black farming were extremely low when related to white farming profits. The Tomlinson Commission (1995) therefore recommended the need for investment in smallholder irrigation development to improve rural production and enhance livelihoods for black families in the "Bantu Areas". In 1952, there were 122 smallholder irrigation schemes covering a total area of 11 406 ha with a total of 7 538 plot holders in these areas (The Tomlinson Commission, 1955). Table 3.1 presenting a summary of the historical situation, provides some indication of the evolution of the smallholder irrigation schemes in the country.

Era	No of schemes	Area (ha)	Mean area per scheme (ha)	Main technology used
Smallholder canal scheme (1930-1969)	74	18226	246	Gravity-fed surface irrigation
Independent homeland (1970-1990)	62	12994	210	Different forms of overhead irrigation
IMT and revitalisation (1990-present)	64	2383	37	Pump and sprinklers or micro-irrigation
Year of establishment uncertain	117	15897	136	Mostly overhead irrigation
Total	317	49505	156	

Table 2.1. Classification of existing sinalinoider infigation scheme develop	existing smallholder irrigation scheme develo	pmen
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Source: Denison, 2006

All smallholder irrigation projects developed during this phase extracted water from a river through a concrete canal diversion. Some of the schemes used storage dams, which were also built in the same period and were also extracting water through a concrete canal conveyance system. These irrigation schemes had the plot sizes ranging from 1.28 to 1.71 ha approximately 1.5 to 2 morgen (1 morgen is equivalent to 0.86ha) (Bembridge 1997; Van Averbeke*et al*, 2006). In this phase the land held by the farmers was removed from a traditional tribal social structure by transferring ownership to the state. Thus farmers on these schemes held their plots by means of Permission to Occupy. This form of land tenure system was given out by the state with the necessary powers to prescribe land use and to withhold and replace farmers whose practices did not agree with the operational rules (Van Averbeke, 2006).

Averbeke, Denison & Mnkeni (2011) identified that in 2010, smallholder irrigation schemes covered 47 667 ha, compared to the 1 675 822 ha of registered irrigation land in 2008, of which 1 399 221 ha was irrigated annually. The total population of 34 158 plot-holders on smallholder irrigation schemes in 2010 was also relatively small compared to the 1.3 million Black homesteads that had access to land for cultivation. The history of smallholder irrigation schemes in South Africa was characterised by policies and economic development of the country. Thus the smallholder irrigation schemes were established in phases (Van Averbeke *et al.*, 2011).

2.5 A Review of Available Food Value Chains

Food value chains consist of two concepts: value and chain. The term chain means the food supply chain from producing the product through the processes involved in the life cycle to the end point. According to Muchara (2011), food value chains refer to the chain that links the different stages and activities involved, from food production to consumption. For agricultural products, value addition can also take place through the differentiation of a product based on food safety and food functionality. The agricultural food value chain is meant to increase competition in the market through producers, processors, marketers, food service companies, retailers and supporting groups such as shippers, research groups and suppliers.

The New American Foodshed (2013), defines a food value chain as the core function of production, manufacturing, and marketing links from the farmer to the consumer. The food value chain incorporates activities and processes involved from the field to the consumer. These include seed suppliers, equipment dealers, food processor, distributors and government regulators. In the food value chain, the producer is the one to maintain the quality of the product. All stakeholders play an important role in food value chains (New American Foodshed, 2013).

According to Porter (1985) as cited by Muchara (2011), the food value chain is classified into two groups, primary and support activities. Primary activities comprise the creating of a product, marketing, delivering the product to buyers, as well as after-sales assistance/service. Support activities underpin the primary activities and each other by exchanging inputs. On the other hand, Porter (1985) defined support activities as classified into four categories, namely, procurement, technology development, human resource management and firm infrastructure. Support services are important to ensure that primary activities operate efficiently.

Agricultural production is changing globally from household level to larger firms that are more bound with the food value chain and is driven by consumer demand. According to Delgado and Siamwalla (1997), there is a need for smallholder farmers to get more involved in production that has high value addition such as crops. This involves processing, market participation and sales of high value crops. Adding value to agricultural products increases the chances of smallholder farmers getting enhanced access to secure markets and to participate in the formal market.

According to Baloyi (2010), food value chains have two principal factors, which are transport logistics and cold chains, and these are necessities which enable smallholder farmers to participate in agribusiness food value chains. This can be used as credit, to consolidate production, minimize transaction cost, and add value to agricultural products and access to high-value markets. Smallholder farmers who practice food value chains tend to find themselves in a steep learning curve (Baloyi, 2010). Because larger firms have high demands such as a reduction in cost, high quality standards and increased delivery speed. Hence it is

advised that smallholder farmers consolidate their surpluses and sell them collectively in order to participate successfully in the market (Hendriks and Lyne, 2003).

Today, there is high product diversity and producers are expected to meet the current standards of food value chains. Yet the smallholder agriculture is known for producing unprocessed products at cheaper prices (Muchara, 2011). Scholars and development specialists have different opinions on how to make the food value chain in agriculture more efficient. There are current initiatives established to improve the food value chain in agriculture. But there is still a gap as smallholder farmers need to be equipped with up-to-date market information in order to meet the market standards (quality, packaging, etc) and increase the profit margins (Muchara, 2011).Humphrey and Schmitz (2002), state that smallholder farmers do not compete with commercial farmers because it is not efficient to produce more and meet consumers' demand.

According to Lusine (2007), there are four performance measures used in the food value analysis. These are efficiency, flexibility responsiveness and food quality. With regard to the study topic, efficiency was used to measure the rewards from the livelihood strategies used. Therefore, gross margins were used to measure the performance of food value chains and the extent to which different livelihood strategies contribute towards its level. The gross margin assesses the effect of the food value chain in ensuring that the livelihood strategies practiced meet food security. Agricultural growth alleviates poverty through high profit margins, low prices for consumers and high levels of employment (Gooms *et al.*, 2011).

Smallholder agriculture is involved in fewer value activities with low rewards. Agricultural production includes all types of resources (physical, human, financial, social and natural) and other economic resources (Gooms et al., 2011). This also includes the livelihood strategies of the households involved in food production. In developing countries, both off-farm and on-farm households are involved in the food value chain. Smallholder farmers either lack these assets or have insufficient access to the required amounts, hence it is harder to influence the production decision making and participation in food value chains. Most of the smallholder farmers derive their income from agricultural activities. Therefore food value chains do not occur directly; instead, they occur indirectly through lower cost and more nutritious and safer food for consumers (Gooms et al., 2011).

A food value chain analysis can promote investment in natural resources and such investments create the opportunity for farmers to take part in food value chains. According to Muchara (2011), resources such as water also play a vital role in food value chains. Most researchers focus on fertilizers, seeds, herbicides and machinery usage, with limited stress on natural resources (Land and water). The usage of water at household level depends on the availability of water and not the cost of both crop and livestock. Usage of water varies according to the crop water requirement and growth stages of the particular crop. Crop water productivity requires strategies including the good practice of soil and water management, appropriate selection of crops and cultivars (Muchara, 2011).

In crop production, smallholder farmers use water through irrigation and rain-feed and in livestock production water is used through extensive and intensive farming. Global warming has caused harsh climatic conditions that resulted in droughts leading to the increased use of irrigation to enhance food security (Muchara, 2011). A combination of livestock production and irrigation can increase food value chains by providing organic matter. Irrigation is recommended as an effective mechanism to increase yields in smallholder agriculture. Rainfed agriculture is mostly practiced by poor rural households (Muchara, 2011). Rain-fed agriculture is characterized with low output and farmers barely participate in profitable food value chains. Baiphethi (2004) compared the rain-fed and irrigated crops at small scale level. The study revealed that most households in the Free State Province (Thaba Nchu) stopped crop farming because of the high risks incurred and the uncertainty of inadequate moisture, and generally low returns, often at a great cost to their limited resources (Baiphethi, 2004)

2.6 Sustainable Livelihoods

This section deals with sustainable livelihoods. The section starts by explaining the sustainable livelihood concept, and then explains the sustainable livelihood approach and the sustainable livelihood framework. This section also deals with comparison of sustainable frameworks and an analysis of the sustainable livelihood framework.

2.6.1 Sustainable Livelihoods Concept

The sustainable livelihoods idea was created by the Brundtland Commission on Environment and Development, and the 1992 United Nations Conference on Environment and Development expanded the concept, advocating for the achievement of sustainable livelihoods as a broad goal for poverty eradication (Krantz, 2001). In 1992 Robert Chambers and Gordon Conway introduced a combined definition of the sustainable rural livelihood, which is most used at the household level. "A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required as a means of living: a livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and asset (Scoones, 1998).

Many authors disagreed with this definition, because the asset portfolio was complex as it included both tangible assets and resources, and intangible assets such as claims and access. Some authors argued that the definition had to include the ability to avoid, or more usually to withstand and recover from, such stresses and shocks (Krantz, 2001). More recently, the Institute for Development Studies (IDS) and the British Department for International Development (DFID) have implemented this SL concept and approach. Scoones (1998) of IDS suggested a modified definition of Sustainable Livelihoods (SL) as, "A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks maintain or enhance its capabilities and assets, while not undermining the natural resource base (Krantz, 2001).

2.6.2 Sustainable Livelihoods Approach

Majale (2002)describes the sustainable livelihoods approach as a multi-disciplinary approach that tries to capture, and provide understanding of the fundamental causes and dimensions of poverty without collapsing the focus onto just a few factors (e.g. economic issues, food security, etc.). The term livelihood comprises the capabilities, assets and activities required as a means of living. A livelihood is only sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable

livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the long and short term (Majale, 2002).

The sustainable livelihoods approach has three insights into poverty which underpin it. The first is the realization that economic growth is very essential for poverty eradication. This all depends on the abilities of the poor to take advantage of expanding economic opportunities (Krantz, 2001 and Majale, 2002). The second insight is that poor households are not only described as low income earners but also described as households faced with other dimensions such as bad health, illiteracy, lack of social services, etc., as well as a state of vulnerability and feelings of powerlessness in general. And finally, it is now recognized that poor household are aware of their situation, therefore they must be involved in the policy formation and implementation of the projects projected for them as they want the best out of them (Krantz, 2001).

It also attends to the main factors that affect poor people's livelihoods and the typical relationships between these factors. It can be used in planning new development activities and in measuring the input that existing activities have made to sustain these livelihoods (DFID, 1999). Households are the main focus rather than the resources that government is giving them. SLA is used to discover opportunities available to poor people.

2.6.3 Sustainable Livelihoods Framework

The Sustainable Livelihoods Framework is a more complex system. It is a tool for planning and assessing development interventions (UNDP, 1997). It focuses on how people tactically use the resources available to them to create livelihoods, and how development interventions affect the available resources and the way people relate to them.

The framework identifies two basic types of intervention that communities can manage to implement effective poverty reduction strategies (CASE, 2003). 'Practical interventions' facilitate the efforts of low-income households to enable them build up their livelihood assets and they comprise of counselling programs, education, employment training, economic literacy and savings programs, and support for small business development. 'Strategic interventions' mainly focuses on the vulnerability context. This works toward the goal of

social and economic change at the systemic level. Among the methods used are community building and organizing, alliance building, policy work and advocacy (Krantz, 2001).

The livelihood framework specifies outcomes in terms of income, but also in terms of `wellbeing and reduced vulnerability', Livelihoods are derived from assets namely, human, natural, financial, social and physical. According to Scoones (1998) as cited byDirwayi (2010) this framework is an important analytical tool for illustrating the link between the livelihoods systems and strategies with institutions and policies. Its focuses on the various factors and processes which enable or disable poor people make an economical, ecological, and social and sustainable livelihood.

The framework is non-sectorial, recognises that there are various factors that influences the understanding of livelihoods, and acknowledges that households often practise various livelihood strategies (Farrington *et al.*, 2004). It also allows for an understanding of livelihood alteration as livelihood portfolios shift in response, due to the capacity of households to generate new strategies in response to needs and opportunities, and how these are influenced by the altering vulnerability context and transforming structures and processes (Farrington *et al.*, 2004). The SLF is therefore a useful tool for understanding the livelihood assets available to households, the strategies adopted to utilise these assets, and how these are influenced by external factors.

2.6.4 Comparison of Sustainable Livelihood Frameworks

This section deals with the comparison of sustainable frameworks such as Department for International Development, CARE and United Nations Development Programme. The frameworks are compared based on context, livelihood strategies and outcomes. The frameworks are also further explained in this section.



Figure 2. 2: The DFID Sustainable Livelihood Framework

Source: DFID (1999)



Figure 2.3: Sustainable Livelihoods Framework Source: Krantz (2001)



Figure 2.4: The CARE Sustainable Livelihood Framework.

Source: Scoones (1998)

2.6.4.1 The United Nations Development Programme Framework

For the UNDP the SL approach is a core programming framework which developed a set of incorporated support activities that improve the sustainability of livelihoods among poor and vulnerable groups by empowering the resilience of their coping and adaptive strategies (DFID, 1999). Although this is an open-ended process, the introduction of improved technologies and social and economics investments are also considered (DFID, 1999). In addition, policies and governance issues that affect livelihoods are addressed. The various support activities are organized as specific SL programmes, usually implemented at a district level and have an outcome at the community and household level (CASE, 2003).

2.6.4.2 CARE Framework

CARE's organizational consent as an international NGO focuses its programmes on helping the poorest and most vulnerable, either through regular development programmes or through employment creation (Krantz, 2001). CARE Household Livelihood Security (HLS) as a framework has been utilised for programme analysis, design, monitoring, and evaluation since 1994. The concept of HLS developed from the classic definition of livelihoods developed by Chambers and Conway (1992), which embodies three fundamental aspects: the possession of human capabilities (such as education, skills, health, psychological orientation); access to tangible and intangible assets; and the existence of economic activities. The interaction between these three attributes defines what livelihood strategy a household will pursue. CARE particularly emphasizes the strengthening of the capability of poor people to enable them take initiatives to secure their own livelihoods. It therefore stresses empowerment as a fundamental dimension of its approach. The CARE Livelihood approach brings an understanding that production and income activities are only ways to create a living (Krantz, 2001).

2.6.4.3 DFID Framework

In 1997 the DFID confirmed 'eradicating poverty' as its primary aim. One of the three specific objectives that were set to achieve this aim was an obligation to be involved in

'policy formation and implementation and actions that promote sustainable livelihoods' (Carney *et al.*, 1999).

DFID's definition follows the one developed by the IDS and which in turn is a modified version of the original definition elaborated by Chambers and Conway DFID's SL approach aims to increase the agency's effectiveness in poverty reduction in two main ways: the first is by mainstreaming a set of core principles which determine that poverty-focused development activity should be people-centred, responsive and participatory, multi-level, conducted in partnership, sustainable, and dynamic. The second is by applying a holistic perspective in the programming of support activities, to ensure that these correspond to issues or areas of direct relevance to improving poor people's livelihoods. A central element of DFID's approach is the SL Framework, an analytical structure to facilitate a broad and systematic understanding of the various factors that constrain or enhance livelihood opportunities, and to show how they relate to each other (Conway, 1998).

All of these approaches have five factors in common. First is a focus on the household and the assets it controls. Second is the diversification of livelihood strategies that are pursued by households. Third is the attention to the dynamics of a household's wellbeing, particularly how households balance short and long term strategies as a means to buffer themselves against vulnerability. Fourth is a multi-sectorial approach to development problems. Last is the attention to the institutions that plays an integral role in determining the resources available to households and the livelihood strategies that they can pursue (Conway *et al.*, 2002) Cited by McDermott (2006).

The CARE Livelihood model brings to realization that production and income activities are only a means to improving livelihoods and not an end in themselves (Krantz, 2001). This Sustainable Livelihood framework is centred on a household's livelihood strategy. The asset box, as depicted in the figure, includes the capabilities of household members, the assets and resources to which they have access, as well as their access to information or to influential others, and their ability to claim from relatives, the state, or other actors. The sustainable livelihoods framework became well liked with its slight challenges and was adopted by the several major organisations including the United Nations Development Programme (UNDP), CARE, Oxfam, the Institute for Development Studies (IDS), and the DFID (McDermott, 2006).

The difference between these frameworks is the agencies that utilise the approach. UNDP and CARE use it to facilitate the planning of concrete projects and programmes. The DFID's utilization of this approach is based more on the framework analysis than on procedures and programming, and also focuses on assets and on-going projects (Krantz, 2001). The second difference between these three frameworks is the level of implantation. CARE primarily focuses on household food security at community level. UNDP and DFID work at community level, but also emphasize that the tackling of enabling policy environments, macro-economic reforms, and legislation are equally necessary and efficient for poverty reduction. The DFID's analysis of people's livelihoods usually takes place at a household (or community) level. The aim is not just to identify constraints or opportunities that could be remedied at that level, but also to understand how policies and other institutional factors affect the livelihoods (Krantz, 2001).

2.6.5 Sustainable livelihoods framework analysis

This section comprises the vulnerability context, livelihood assets, policies, institutions and processes, livelihood strategies and outcomes. These factors are analyzed based on how they affect the rural households.

2.6.5.1 The vulnerability context

The vulnerability context consist of three aspects; namely, shocks, trends and seasonality. According Payne and Lipton 1994 cited by Scoones (1998) the ability of the livelihoods to cope with and recover from stresses and shocks are central to the definition of sustainable livelihoods. Those who are not able to cope (temporary adjustments) or adapt (longer term shifts in livelihood strategies) are certainly vulnerable and have few opportunities and chances to attain sustainable livelihoods. Assessing resilience and the ability to adapt positively or cope successfully requires an analysis of a range of factors, including an evaluation of historical experiences of responses to various kinds of shocks and stresses.

Different types of shock or stress, in turn, may result in different responses, including avoidance, repartitioning, and resistance or tolerance mechanisms (DFID, 1999).

The vulnerability context can demolish the capital and the opportunities available to the people, and the impact could be far reaching (DFID, 1999). The vulnerability context has different effects on different people (de Sagte *et al.*, 2002 and Ramashala, 2007). The DFID (1999) argued that poor people are unable to control these factors in the short and medium terms. It is important to identify indirect ways in which these factors can be neutralised (DFID, 1999). This can be achieved through understanding how people forecast, address, and recover from shocks and stress (de Sagte *et al.*, 2002). The DFID (1999) pointed out that the vulnerability context does not always affect people's livelihoods in the negative way. Nonetheless, it should be noted that the majority of the poor cannot cope with shocks and stresses, and are not well equipped to capitalise on positive trends (DFID, 1999). Devereux *et al.*, (2006) argued that vulnerability is the product of threats and the ability to manage them. When it comes to shock the vulnerable group will almost always require external help to prevent or deal with the effects of shocks (Ramashala, 2007).

The DFID 1999 describe shocks as most unpredictable and unforeseen circumstances. Shocks include natural disasters, civil unrest etc. As an example of a natural disaster, Speight (2001) as cited by Ramashala (2007) pointed out the effect on livelihoods of the shock when certain locust species erupt into plagues and destroy crops. This means shocks could destroy capital and require even more capital to rebuild livelihoods. Similarly, the cost of controlling the locust eruption could be enormous (Speight, 2001).

CASE (2003) and DFID (1999) describe seasonality in relation to the poor as labour, price fluctuation, food availability etc. The DFID (1999) argued that seasonality is closely related to rural economics and acutely rural people than to urban people. Furthermore, Campbell and Beardmore (2001) cited by Ramashala (2007) argue that seasonal changes in ecosystems could present opportunities for seasonal employment. This means some seasonality could be anticipated by the people and consequently presents opportunities.

Data generated for the United Nation's Millennium Development Goals (MDG) Report 2008 (United Nations, 2008) portrays that 26 percent of the world's population was deeply trapped

in poverty in 2005. The World Bank (2012) hinted that the situation had improved when it was measured with purchasing parity terms, with the fraction of people with less than \$1.25. Yet these developments outshine the vulnerabilities occurring in sub-Saharan Africa. The rapid developments have occurred in East Asia but this has not affected South Asia, while in Southern African countries the situation is becoming worse (World Bank, 2012). Hunger is continuously increasing with as much as one in seven people starving (World Hunger Education Service, 2012). Therefore the sub-Saharan continent is characterized as a continent crisis that is seriously affected by vulnerabilities (Nweke *et al.*, 2002).

The Southern African Development Community (SADC) indicates that it is still occurring regularly even though cereal production has increased in few a countries (SADC, 2011). In 2001/2002 rural conditions were getting worse in many countries of the SADC region and the whole region was getting devastated with a humanitarian and food shortage crisis (United Nations Development Programme, 2003). Some affected countries have been recovering from this situation, but not all. This is because there may be other factors hindering the recovery. The SADC (2011) says that the number of people demanding more food and nonfood assistance is increasing, with the estimated number reaching 4.04 million persons.

South Africa is still a riddle in many aspects. In spite of a well-performing micro economy, the country is still facing the unpleasant reputation of being the most unequal society in the world. The post-apartheid government in South Africa initiated policies to redress inequalities of income, wealth and livelihoods created by the apartheid government. Policies were anticipated to improve access to productive resources and technical support that would have positive impact in agricultural productivity for black farmers, who comprise a large number of smallholders in the country. But recent studies have shown that these policy objectives have not been met especially in the black population (Klasen 1997, May *et al.*, 1998; Klasen and Woolard, 2005; UNDP 2003 and UNDP, 2007). The studies have pinpointed the worst situation of unemployment rates, the poverty rates, the Gini Coefficient, and Consumption Expenditure Growth. South Africa's employment rate has been deteriorating since 1993. Whereas government had the objective of lowering the unemployment rate to about 14percent, it was still lingering around 25-40percent in 2011 (The Economist, 2011). The Eastern Cape provincial data suggest that the Province has about 30-70percent (May *et al.*, 1998; Department of Labour, 2003).

The data available show the high poverty in the country is going hand in hand with the highest levels of income inequality in the world (HSRC, 1996; Klasen, 1997; Lam, 1999 andUNDP, 2007). According to the UNDP (2007), the estimated Gini co-efficient for South Africa in 2006 was 0.59. The Gini coefficient rose to 0.66 and 0.68 depending on whether it was computed on the basis of the All Media and Products Survey (AMPS) or the Income and Expenditures Survey (IES) of the Statistics South Africa (The Presidency, 2009). In 2012, this index worsened further to 0.69 (Westaway, 2012). Such a result is consistent with the fact that, among the Medium Human Development countries to which South Africa is placed by the UNDP, it is one of the few whose Human Development Indices actually deteriorated since the early 1990s, having fallen from 0.735 in 1990 to 0.653 in 2004 (UNDP, 2006). In 2011, this index fell to 0.619 (UNDP, 2011), again highlighting the worsening welfare performance.

The Department of Land Affairs/Department of Agriculture (2005) reports the Expenditure Survey of South Africa that indicates that consumption growth decreased to less than 1percent per capita per annum over 1994 and 2000. Recent figures reported in the Development Indicators show some improvement averaged at 3.7 percent since 2003 (The Presidency, 2010). In spite of these improvements that were identified, the level of poverty is still increasing in the country. According to the Development Indicators *2010*, while 70percent of the GDP is earned by the richest 20percent of the population, the poorest 10percent of the population is receiving only 0.6percent of the GDP (The Presidency, 2010). This picture agrees with the trend in the Poverty Headcount Index which suggests that up to 48percent of the population might still be living below the poverty line set at R524 to accommodate the increased uptake of social grants in the rural areas (The Presidency, 2010).

2.6.5.2 Livelihoods assets

According to Carney (1998), households come in different shapes and sizes and have access to a variety of resources or assets including human, physical, financial, social, natural capitals. Assets enable productivity to take place and in order to be able to try a variety of livelihood objectives; people bring together and accumulate a portfolio of assets (CASE 2003; DFID 1999and Scoones 1998). These assets could be used to develop the people's ability so that they can lead a fulfilling life (Ekins *et al*, 1992). In essence the assets are at the core of making a livelihood. Assets are transformed into livelihood outcomes and assets identify and determine livelihood options. Most often the livelihood outcomes depend on the manner in which the different class of assets are combined (FAO, 2008).

The people have a different understanding of assets (DFID, 1999). While some people may view livestock as purely financial investment, others may view it as a social investment. This is because values are social and political constructs, which depend on beliefs, needs, desires and choices of the people (Bass *et al.*, 2001). According to the DFID (1999), assets could be destroyed or enhanced by trends, shocks and seasonality. The point is that, when adequately prepared, poor people could take advantage of the positive trends and build a resistance to negative trends, shocks and seasonality. This means being able to forecast the trends, shocks and seasonality and having the necessary skills and capital to take appropriate measures which are important to protect the assets.

A study conducted in Limpopo by Mohamed *et al.*, (2011) shows that the asset ownership level suggests that most households that joined the irrigation schemes or food plots are poor. The households are entitled only to own domestic goods (such as a stove) and some kind of electronic or communications device (such as a radio or television set), but these are rather few in number. Very few households own a vehicle. Almost all households own agricultural tools or machinery of some kind, most of which are hand tools such as hoes and forks or spades. Very few households own a tractor. A minority of households own cattle, and herd sizes are relatively small. Most households own less than six cattle, with only four households owning herds of more than ten animals. However, ownership off goats is very common (Mohamed *et al.*, 2011).

(i) Natural Capital

Natural capital consists of tangible and intangible goods which are stocks (soil, water, air, genetic resources, etc.) and environmental services (hydrological cycle, pollution sinks, etc.) from which resources and services useful for livelihoods are derived, although some of these natural assets affect livelihoods negatively (Krantz, 2001). The DFID (1999) argues that most

of the shocks are natural disasters (e.g. floods, storms, etc.) and these have a negative impact on people's livelihoods.

Nevertheless, natural assets are important because they constitute a large resource base for poor people and they provide resources that could be used to support livelihoods (CASE, 2003). Natural resources are an important asset for influencing policy and making users more aware of the monetary value of the resources they use (Ntshona, 2002). Livelihoods could be affected by changes in the natural resource base.

(ii) Financial assets

Capital is based on (cash, credit/debt, savings, and other economic assets, including basic infrastructure and production equipment and technologies) which are essential for the pursuit of any livelihood strategy (Krantz, 2001). The ease of access to cash or any means used to exchange goods and services is referred to as financial assets. The sources of financial assets include savings and regular inflows of money (CASE, 2003and DFID, 1999). Livestock could also be categorised as financial assets (de Sagte et al., 2002). The financial assets can be converted into other categories of assets, depending on the available structures and processes (Case, 2003 and DFID, 1999). Financial assets could therefore be a force for change in alleviating poverty due to its versatility (DFID, 1999). For example, financial assets could be used to achieve directly the livelihood outcome of food security by buying food (CASE, 2003and DFID, 1999). The DFID (1999)cited by Ramashala (2007) points out that it is of the utmost importance that people have adequate knowledge and appropriate structure and processes to utilise these assets (DFID, 1999). CASE (2003) and the DFID (1999) maintain that financial assets could be used as a political tool and help people participate in structures and processes that affect the livelihoods of the poor. Support for building solid financial assets can be done at the organisational level, institutional level and the legislative and regulatory reform level (CASE, 2003and DFID, 1999).

(iii) Social Capital

Social capital consists of networks, social claims, social relations, affiliations and associations which people use as a skill when they pursue different livelihood strategies

requiring co-ordinated actions (Krantz, 2001). Case (2004); Pretty (2002); DFID (1999) and Ramashala (2007) pin point important aspects of social capital. Firstly, the building of trust relations and the returning of favours in order to reduce the cost of performing activities could be a way of building social capital. This is because people are more likely to invest in collective activities if they know others will do the same. Secondly, social resources are not always positive. Thirdly, social capital is difficult to build and easy to break. Fourthly, those who do not fit into a group for one reason or another will be disadvantaged. And lastly, some networks may be limiting (Ramashala, 2007).

Social assets can be developed by networking and connecting with other people to be able to have the right of entry into institutions. De Sagte *et al.*, (2002) suggest that social resources could be improved through a culture of human rights and democracy and the quality of governance systems. This effectively means that there should be gender equality and rules applied with impartiality. It could also be developed through obtaining membership of formal groups with rules, norms, and sanctions (CASE, 2003and DFID, 1999). The DFID (1999) noted that organisations create their own habits, norms, procedures, traditions, cultures and memories. These characters could either enable or hinder the people in pursuing livelihoods goals. This is because logically these norms would not accommodate every individual in every community (De Sagte *et al.*, 2002).

Social assets play a vital role in rural development, especially farming communities in developing countries. Social assets are the economic development drivers in the world. Government policies concentrate on empowering rural communities which are supported and encourage the building up of social capital to fortify governance and management of common property resources including natural resources, physical and financial assets.

(iv) Physical Capital

Physical capital consists of two types, which are tools and technology (tools and equipment for production such seed, fertiliser, and pesticides and traditional technology) and infrastusture (transport - roads, vehicles, secure shelter & buildings, water supply & sanitation, energy and communications) (Krantz, 2001). The basic infrastructure and the tools and equipment used in producing goods are collectively called the physical assets (CASE,

2003and DFID, 1999). Physical assets enable people to carry out livelihood activities (Ramashala, 2007).

Thus, poor infrastructure is regarded as a pointer to poverty. For example poor human health could be caused by a lack of access to clean water and sanitation. The important factors of the physical assets are its accessibility, appropriateness and whether there are services to support its existence (CASE, 2003 and DFID, 1999). This is because more savings are required to maintain physical assets. The lack of access to technology that is appropriate to the people's needs, skills, infrastructure and institutional support systems degrades the poverty cycle. This would particularly be true where technological innovation is rapid and unaffordable (Ramashala, 2007).

Physical assets are the support needed to enhance sustainable livelihoods. Evaluation of physical assets availability is normally done to validate an intervention or initiative. Studies have revealed that rural projects in sub Saharan Africa have a positive correlation with feeder roads and agriculture productivity (Njenga, 2003). Inadequate public infrastructure could lead to great losses for the producers (Gavira, 1990). Investment in physical capital to support agricultural production is very essential, especially among poor rural farmers.

(v) Human Capital

Human capital comprises skills, knowledge, ability to labour and good health and the physical capability important for the successful hunt for different livelihood strategies (Krantz, 2007). Education and health seem to be the main factors of human assets (CASE, 2003 and DFID, 1999). This is mainly because the SL approach is people-centred and it is difficult to imagine people without skills and in poor health contributing meaningfully to the creation of sustainable livelihoods.

Okpara (1999) argues that indigenous knowledge systems have long been used to address poverty but not much has happened. These knowledge systems include the production, exchange, and consumption of goods and services which contribute to a sustainable livelihood. Where necessary these knowledge systems could be combined with scientific knowledge for a positive impact (Cromwell, 2001). The DFID (1999) argues that, although

human assets are a means to achieve livelihood outcomes, they could also be used as livelihood objectives. When people lack skills and have poor health status, skills improvement and improving health status may become livelihood outcomes (DFID, 1999).

Many studies have revealed that credit given to human capital increases productivity and the great efficiency in the use of agricultural resources. Educated, experienced and well-trained farmers have attested to be earlier adopters of new technologies and more efficiently productive than their corresponding farmers (CIMMYT, 2000; Padilla-Fernandez and Nuthall, 2001; Ogundari and Ojoo, 2005 & Tjornhom, 2006). This is because such farmers are literate, have the ability to keep records, organize and manage, and adopt new market oriented technologies more easily.

2.6.5.3 Policies, institutions and processes

Livelihoods are formed by policies, institutions and processes (PIPs) at all level s, from the household to the international (Ramashala, 2007). These do not only determine the access to the various types of capital (natural, physical, human, social and financial), but also to substitute one capital with one another. These PIPs determine available options for livelihood strategies, as well as access to decision-making bodies and external sources of influence. Organisations, in both the public and private sectors, decide and implement policies, legislation and regulations, and undertake activities, that affect livelihoods. Processes determine the way in which institutions, and individuals, operate and interact (Bennett, 1999).

These processes cannot function themselves and require transformation structures capacity. Logically, the building capacity within the structures would be very important to ensuring the effective functioning of processes. This also means structures are crucial in driving transformation processes (Ramashala, 2007). Some processes could be less empowering and oppressive. Bennett (1999) argued that in Pakistan women's roles are re-enforced and supported by laws and government directives. Among others, women are denied access to information, health, education, rewarding jobs, and political participation (Bennett, 1999).

Institutional processes allow the recognition of restrictions/barriers and opportunities (or 'gateways') to sustainable livelihoods (Ramashala, 2007). Since formal and informal institutions (ranging from tenure regimes to labour sharing systems to market networks or credit arrangements) intervene to access the livelihood resources and in turn affect the composition of the portfolios of livelihood strategies, an understanding of institutions and organisations is key to designing interventions which advance sustainable livelihood outcomes (DFID, 1999).

The transformation structures form a foundation for implementing programme activities and driving various processes (DFID, 1999). These transformation structures also provide a platform and a link where these can interact (Pasteur, 2001; Ramashala, 2007). Okpara (1999) also argues that the transformation structures can help pass the indigenous knowledge systems from one generation to the other. However, it is noted that structures without processes are not helpful as they cannot function (DFID, 1999). As such, transformation structures should be linked to a particular process.

2.6.5.4 Livelihood strategies

Livelihood strategies comprise agricultural intensification/extensification, livelihood diversification and migration. These strategies cover the array of options available to rural people (Scoones, 1998). Either one benefits from large livelihood rewards from agriculture (including livestock rearing, aquaculture, forestry etc.) through processes of intensification (more output per unit area through capital investment or increases in labour inputs) or extensification (more land under cultivation), or one diversifies to off-farm income earning activities, or one migrates and seeks a livelihood, either temporarily or permanently, elsewhere. More commonly, one pursues a combination of strategies together or in sequence (Scoones, 1998).

Identifying what livelihood resources (or combinations of 'capitals') are required for different livelihood strategy mixtures are a key action in the process of analysis (Scoones, 1998). For example, successful agricultural intensifications may combine, in some circumstances, access to natural capital (e.g. land, water etc.) with economic capital (e.g. technology, credit etc.),

while in other situations, social capital (e.g. social networks associated with drought or labour sharing arrangements) may be more significant. Understanding the dynamics and the historical context, how different livelihood resources are ordered and combined in the pursuit of differently livelihood strategies, is therefore crucial (Scoones, 1998).

Livelihood strategies refer to a collection and mix of activities and choices made in order to achieve livelihoods goals (CASE, 2003 and DFID, 1999). CASE (1999) further argues that choice, opportunities, and diversity are important for livelihood strategies to withstand shocks and stresses. Diversity can be regarded as a strategy to accumulate for those with a bigger assets base and as a survival strategy for those with a smaller assets base (Baker 1995; Bryceson 2000 and Ellis, 1998 quoted in Tacoli, 1999) as cited by Ramashala (2007). Campbell and Beardmore (2001) argue that diversity presents the opportunities for utilizing different types of technology, which could reduce conflict regarding the assets.

Communities need different activities, skills and assets to meet their livelihood needs. The more assets the people have the more chances to improve livelihood strategies become available (DFID, 1999). Different livelihood strategy combinations depend on the available livelihood assets (Scoones, 1998). As a result some strategies are geared towards maximising or pooling resources together in order to have better livelihood strategies.

A combination of activities that are pursued can be seen as a 'livelihood portfolio'. Such portfolios may be highly specialised with attention on one or a narrow range of activities; others may be quite diverse. Different livelihood pathways are evident over different time-scales. Over seasons and between years, variations in options emerge (Chambers *et al.*, 1981). Equally, within domestic cycles different combinations or strategies may be pursued sequentially, depending on the changes in dependency ratios, health conditions and other factors. Over longer periods and over several generations, for example, more substantial shifts in combinations may occur, as local and external conditions change. It is this dynamic element, evident in the composition and decomposition of livelihood strategies, which is important to examine, especially in the context of assessing the sustainability of different options. This makes an historical approach central to any analysis (Scoones, 1998).

2.6.5.5 Livelihoods Outcomes

Livelihood outcomes are the consequences of livelihood strategies (CASE, 2003 and DFID, 1999). The livelihood outcomes are classified as: more income, increased well-being, reduced vulnerability, improved food security, and sustainable use of the natural resource base. A combination of any of the above could be targeted as outcomes. Hence, Campbell and Beardmore (2001) argue that poor people combine attempts to increase income and production with plans for minimising risks. Achievements of livelihood outcomes needs are measured by indicators (Scoones, 1998). As a matter of principle, people should be involved in the process of developing such success indicators (CASE, 2003). It is further argued that, in order to establish the indicators of livelihood outcomes, it is important to understand sustainable the livelihood concept and its principles. Effectively, it means the stakeholders should develop a similar understanding of sustainable livelihood. Otherwise, it would not be clear how a compromise is reached when there are different opinions (Scoones, 1998).

Outcomes can be assessed by focusing on the intended and unintended results which in part could be attributed to the programme outputs (Vernooy, 2005; Babbie & Mouton, 2001). Coffmann (2002) argues that the focus is on the effects of the programme on the intended beneficiaries. Coffmann (2002) and Babbie and Mouton (2001) note that these effects could occur at the various levels which are: behavioural and attitudinal levels, the service delivery level, and the policy level. Rossi and Freeman (1993) cited in Shadish (1998) assert that outcome evaluation is unsuitable to new programmes and may not be reliable for long-established programmes. New programmes are unlikely to have produced outcomes and would more likely be working on the programmes may have been achieved by means other than the programme.

Livelihood outcomes can be determined by considering five indicators and each relating to wider literature (Chambers, 1997). These indicators are best for assessing livelihood outcomes. These indicators comprise the creation of working days, poverty reduction, wellbeing capabilities, livelihood adaptation, resilience and vulnerability natural resource base sustainability (CASE, 2003 and DFID, 1999). The creation of working days, poverty

reduction, wellbeing capabilities are linked to concerns over work and employment, poverty reduction, the wider issues of adequacy, security, wellbeing and capability. While livelihood adaptation, resilience and vulnerability and natural resource base sustainability enhance the livelihood dimension, looking, in turn, at the resilience of livelihoods and the natural resource base on which, in part, they depend (Chambers, 1997).

The creation of working days relates to the capability to combine particular livelihood activities to create meaningful strategies such as off-farm or subsistence employment (Chambers, 1997). The type and the number of livelihoods created will dependent on the labour available. Poverty is also a key to assess livelihood outcomes through using various measures based on income and consumption levels (CASE, 2003 and DFID, 1999). Poverty and inequality can be assessed using Gini co-efficient measures. While well-being and capabilities give a clear scope of the livelihood concept. The concept includes concerns of food intake or income.

Such ideas represent more than the human capital which allows people to do things. Chambers (1997) argues that such a well-being approach to poverty and livelihood analysis may allow people themselves to define the criteria which are important to them. This may result in a range of sustainable livelihood outcome criteria, including diverse factors such as self-esteem, security, happiness, stress, vulnerability, power, exclusion, as well as more conventionally measured material concerns (Chambers, 1989). Livelihood adaptation, vulnerability and resilience assess the ability of a livelihood to be able to cope with and recover from stresses and shocks that are central to the definition of sustainable livelihoods (CASE, 2003 and DFID, 1999). Such resilience in the face of stresses and shocks is basic to both livelihood adaptation and coping. Assessing resilience and the ability to adapt positively or cope successfully requires an analysis of a range of factors, including an evaluation of historical experiences of responses to various shocks and stresses. Natural resource base sustainability shows that most rural livelihoods are reliant on the natural resource base at least to some extent (Chambers, 1989).

These five indicators of sustainable livelihoods are quite different in scope, with a range from very exact measures, agreeable to measurable assessment, to very broad and diffuse indicators requiring more qualitative techniques of assessment. The concept of sustainable

livelihoods is a combination of many ideas and interests, the coming together of a number of different strands in the development debate. The important thing to recognise about the term is that it is always subject to negotiation. Different people will inevitably have different views about the priority indicators, and, where conflicts are highlighted choices then have to be made. By disaggregating the definition into a series of indicators, however, such choices become explicit, making it possible to negotiate between outcome possibilities as part of any policy development, planning or implementation process which has sustainable livelihood concerns at its centre

2.7 Summary of the Chapter

This chapter reviewed literature on livelihood typologies. The literature review revealed that rural households are migrating to cities to seek better opportunities. Other households are practising farming as their livelihood strategy; although the review showed that farming is not sufficient to sustain rural households. Hence, other respondents practise farming as source of income or as a source of food.

The majority of households are dependent on social grants provided by government. This chapter reviewed the literature on government efforts to alleviate poverty, which revealed that government has established a number of programmes to eradicated poverty but not much has happened, as people are still trapped in the poverty. Available technologies in rural areas were also reviewed in this chapter. The literature has highlighted that the importance of irrigation technology in agricultural production has long been recognized and can be discussed within the broader framework of the role of improved technology in agricultural development. The most common technology in rural areas is Irrigation technology. This chapter further reviewed the literature on sustainable livelihood, the sustainable livelihood concept and the sustainable approach. The chapter also reviewed the literature on frameworks, compared frameworks such as DFID, CARE and UNDP, and analysed the sustainable framework. A review of available food chains was also done in this this section. The review covered the literature on the effectiveness of food value chains and measuring the performance of food value chains in smallholder agriculture.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The overall objective of the study was to analyse the sources of livelihoods and opportunities to improve the contribution of farming within the available food chains. This chapter commences by describing the two study areas chosen for the research. This was done on the basis of demographics, historical background and agricultural potential. This chapter discusses all approaches used to conduct the study. The chapter also describes the analytical framework used in this study, namely: sampling, sample size, data, data collection procedures, model description and the specific analyses carried out to address the study objectives.

3.2 Site selection

The study area for this research was purposively selected in the Eastern Cape Province of South Africa. The Amathole district was selected for conducting the research and two local municipalities (Ngqushwa and Nkonkobe) were selected on the basis of types of farming, agricultural water use practices, and demographic structures. The study was mainly based in the Ndlambe community (most specifically the Tyefu irrigation Scheme) located in the Ngqushwa (Peddie) local municipality, and the Binfield (NGO-supported irrigation scheme projects) located in the Nkonkobe local municipality. Therefore, discussions regarding site selection will be limited to the Eastern Cape and refer to the areas that were previously designated as homelands, where the small-scale irrigation schemes were established as part of the Betterment Programme (Van Averbeke *et al.*, and Obi, 2012). This would create a starting point for analysis and to offer the basis for future effect valuation of any involvements that are made in those communities consequent to the present study.

Given the site selection requirement, an analysis of government documents and dissertations and theses developed at the University of Fort Hare was done. In the end, the government sources proved to be the most informative sources for the foregoing requirement. The documents and government sources primarily outline the government's priorities in investment and for operational support to the farming communities in any budget period. Further, the documents identified the major projects to be supported, to what extent, and the timing of such support. In this way, it was the most vital and quickest source of information for drawing up a sampling frame of this research and, hence, sites/areas to be focused on for drawing a sample for a more intensive investigation.

It was then decided to enlarge the search to documentation produced by the government officials and to schedule face to face meetings with irrigation scheme management and members of the group. These consultations showed that the local municipalities selected are home to several privately-owned and managed irrigation schemes, although these principally served emerging farmers, many of whom were already involved in medium to large scale production for export.

3.3 Description of the Study Area

The study was carried out in two villages drawn from two local municipalities under the Amatole District municipality of the Eastern Cape in South Africa. These two local municipalities are Ngqushwa and Nkonkobe local municipalities. This section presents the socio-economic information on each of the study areas.

3.3.1 Description of Ngqushwa (Peddie)

This section presents the socio-economic characteristics of Peddie which include historical background of the study, climate, demographic information, employment status, infrastructure and agricultural potential.

3.3.1.1 Historical Background

Peddie was established in 1829 on the territory between the Great Fish and Keiskamma rivers. The Peddie community was formerly known as Victoria, but the name was changed to Peddie in 1948. It was named after Lt-Col John Peddie, Officer Commanding the 72nd

Highlanders who were arrested by the British military during the frontier war of 1834-35 for protecting amaMfengu refugees evicted from Gcalekaland (South African History, 2000). Peddie is a small rural town dominated by the Xhosa-speaking Rharhabe population with the history of being primarily agricultural and under developed (SURUDEC, 2012). During 1950's and 1960's was brought under the government betterment programme.

3.3.1.2 Climate and Geographical Location

Peddie falls under the Ngqushwa Local Municipality, Amatole District Municipality located in the Eastern Cape Province of South Africa. The municipality is an amalgamation of two towns namely, Hamburg and Peddie. With its natural beauty and character (especially in the coastal areas), Ngqushwa is a wonderful tourist attraction that prides itself in its rich history and heritage. The municipality has a climate which varies with the elevation from cool humid sub-topical at the coast to hot and sub-arid inland. The climate is characterized by variable, moderate to low rainfall ranging between an annual average of 700mm at the coast and 400mm inland, with about 60 percent of the rainfall occurring in the summer and peaks in October and February (Ngqushwa Local Municipality, 2008). Ngqushwa is bounded in the East by the Great Fish River and on the South by the Indian Ocean. This community has low flat lands mainly set aside for crop production.

3.3.1.3 Demographic Information

Peddie has 118 villages under its jurisdiction and a population of 84 234 made up of 20 757 households. It has a large number of people aged less than 20 years (45 percent). These figures represent 4.6percent of the total population of Amatole District Municipality (estimated at 1 835 893) and 10 percent of the surface area of Amatole District Municipality, which is approximately 23 573 square kilometres. This area is distant from the urban centre (Ngqushwa Local Municipality, 2008).

3.3.1.4 Employment Status

Peddie is a small rural economy that depends on both the commercial and agricultural sectors and there are a few rural tourism and beach resort developments. This town is alleged to have high poverty rates (87 percent) and an unemployment rate of 79 percent (Ngqushwa Local Municipality, 2008). The majority of these people are highly dependent on social grants and many of them produce agricultural products. Therefore, there is no major development in the formal economy and there are no formal jobs currently available. About 91 percent of the population earns R1500/month or less whilst 41 percent of the population earns nothing and only 9 percent of the population earns more than R1500/month. This is wide spread poverty and economic stagnation (Ngqushwa Local Municipality, 2008).

3.3.1.5 Agricultural Potential

Peddie has farming potential mainly attributed to its endowment of resources such as: the Great Fish and Keiskamma Rivers, Coastal grazing land, Alluvial terraces that offer irrigation of Pineapples, Citrus, Vegetables, Tomatoes (tunnels), Dryland Crops: Chicory, Cotton, Sugar beet, Olives and vegetable crops. Peddie has these agricultural development programmes which mainly target cattle improvement, pineapple production, massive food production, sugar beet production, chicory production, and cotton production taking place in different communities surrounding this area.

The natural vegetation has been vastly transformed by grazing practices. Even though certain parts of the vegetation have been degraded and show evidence of severe veld mismanagement, especially with the presence of "alien plants", a greater portion of the region is in an environmentally superior state and the region is favourable for livestock production. In terms of soil fertility, previous agricultural practices have indicated that areas with soils suitable for agricultural purposes are confined to the following areas:

- The alluvial soils associated with the Keiskamma River terraces. These soils are considered suitable for subtropical fruit production, vegetable and / or pasture crop production.
- The irrigable soils located in the lower Tyefu area. The moderately high / moderate potential soils suitable for dry land crop production and situated in the coastal plain and plateau.

3.3.1.6 Irrigation Schemes

Ndlambe was chosen as one of the sites to conduct the study. Ndlambe community is a rural community located by the Fish River bank in Peddie. Ndlambe location is about 30km from Peddie town, 50 km to Grahamstown along the N2 (SURUDEC, 2012). This community falls within the 400-600mm rainfall per annum area. Ndlambe has the total of 318 households with the total population size of 1245. Ndlambe is also situated in Tyhefu No. 29. Since the beginning of the Post-apartheid era Ndlambe became independent of the state of Ceskei. Tyhefu irrigation was established in 1977 and this scheme encompasses four villages, which are Kalikeni, Ndwayana, Glenmore and Ndlambe. Each farmer had 0.25ha per plot and there are 256 plots in this irrigation scheme (SURUDEC, 2012).

3.3.2 Description of Alice

This section describes the Socio economic characteristics of the Alice community. Socio economic factors that are included are the historical background of the study, climate, demographic information, employment status, infrastructure and agricultural potential.

3.3.2.1 Historical back ground

The origin of Alice goes back to the first occupation by British soldiers of what came to be known as Fort Hare, apparently named after Colonel John Hare, in 1846. It is also not clear whether the Alice Eastern Cape Socio-Economic Consultative Council was named after Queen Victoria or Colonel Hare's wife (ECSECC, 2000). Alice is like the other Bantustan spatial economies that are described as extremely underdeveloped, with poverty and a lack of basic services in surrounding communities.

3.3.2.2 Climate and Geographical Location

Alice is a small town in the Eastern Cape and is located $32^{\circ} 47' 0''$ S, $26^{\circ} 50' 0''$ E. The climate of Alice area can be described as sub-humid, with a mean annual rainfall that ranges
between 500 and 800 mm. Although the mean annual rainfall is relatively high, the winter period is generally dry, with June and July as the driest months. The expected annual rainfall in those months is 7 percent compared to roughly 9 percent in the months of October through to March (Bennett 2003).

3.3.2.3 Demographic Information

Alice currently has a population of between 50000 and 55000.One third of the population is younger than 15years of age and 13percent is 60 years or older. The people residing in the rural areas are approximately 11337, while those staying in the urban area are estimated to be 43099. The population of Alice consists of 57 percent females and 43percent males. It is estimated that approximately 1 percent of the rural people attended matric while urban area has estimations of 21percent (ECSECC 2000).

3.3.2.4 Employment Status

Alice is different from other small rural towns of Eastern Cape because it is located near Fort Hare University which is partially playing a core role of socio-economic revival (ECSECC 2000). The major livelihood strategies in Alice are agriculture and heritage-based tourism, and these form the two main sectors which support Alice's economy (Department of National Treasury 2011). Out of the Alice population size, only 8 percent is employed (15 to 60 years), while 82 percent is uneconomically active (unemployed). Fifty eight percent of households earn less than R500 per month while 77 percent less than R1000 per month compared to 41 percent of households in the Eastern Cape that earn less than R500/month and 30 percent for South Africa as a whole. The statistics show that Alice is a very poor community and this raises questions around the issue of affordability of service levels (ECSSEC, 2000).

Alice has no substantial economic base. The economy of Alice is highly dependent on government connected expenditure. More than 50percent of the formal jobs in Alice are in either government or education (Lovedale College or UFH) linked jobs. In addition, the Alice population is also dependent on government social grants as their main source of income. Alice is also a service centre that provides surrounding farming and rural communities with

agricultural support services, retail shops, and community and government services (Department of National Treasury, 2011). Alice has no sustainable economic base.

3.3.1.5 Agricultural Potential

The socio-economic profile of the Nkonkobe district reflects the historical legacy of the apartheid system. The rural areas surrounding Alice have a high agricultural potential projected on the Tyhume River floodplain with alluvial soils suitable for agriculture. However, this area needs special attention as it loses nutrients through run-off (e.g. from fertilisers applied during the cultivation process). In terms of the veld type, Alice is dominated by Dohne Sourveld of the Eastern Cape Sourveld and it is not well suited for livestock production, because of its nutritional deficiency especially during the winter months and it does not generally tolerate high grazing pressures. . This area has been recognized as a potentially valuable resource for research into sustainable agriculture. Both UFH and Lovedale have expressed a strong interest in this portion of land (Department of National Treasury, 2010). The Fort Hare University's Department of Agriculture initiated the AgriPark centre in the mid-2000's to support agricultural development in the Nkonkobe Municipality. The core function of the University of Fort Hare's AgriPark is to capture as much of the economic activity within the local agricultural value chain as possible in Alice, which will increase the local agro-economic multiplier in support of LED (Department of National Treasury, 2010).



Table 3.1: Map of the study area

Source: Google map

3.4 Conceptual framework

This study employed the sustainable livelihood framework as the basis of achieving the set objectives. The conceptual framework presents a sustainable livelihood framework which explains the relationship between the vulnerability context, assets, livelihood strategies and livelihood outcomes. Figure 3.2 shows the relationship between these factors.



Table 3.2: Sustainable livelihood frameworkAdapted from IFAD 2007

In Figure 3.2, the sustainable livelihood framework can be described as: the vulnerability context causes the poor households to have limited assets which include (H) human, (S) social,(P) physical, (F) financial and (N) natural assets. The policies, institutions and processes influence the livelihood strategies such as farming. These livelihood strategies are the determinants of livelihood outcomes (more income, improved food security and others). Increased access to production assets, improved policies, institutions and increased level of participation of households in rural livelihood processes, result in more accumulation of household assets, increased food production, increased household incomes and reduced poverty levels. Further, the accumulated assets help rural households to mitigate the vulnerability context.

3.5 Analytical Framework

The analytical framework describes the tools and methods used in the study. This section summarises sampling and data collection, survey data, data analysis and model description and how and where these are used in the study.

3.5.1 Sampling and Data collection

A stratified random sampling procedure was used to collect the data. The first stage entailed selecting the study areas. The selection process started by visiting the Department of Agriculture, Forestry and Fisheries, where the information was released pertaining irrigation schemes and the government officials responsible. Then random site visits were made to four potential irrigation schemes, meeting with the government officials and irrigation committee members concerning these irrigation schemes. From these visits two sites were selected for the research; namely, Tyhefu (Ndlambe) irrigation scheme and Binfield food plots. This selection was done due to the operational status and crop diversity in these two areas.

A structured questionnaire was used to obtain further information about sources of livelihoods and opportunities to improve the contribution of farming within the available food chains in rural Alice and Peddie. The questionnaire used was close ended. Two communities were selected for the study. From both communities, the sampling frame was the irrigation scheme members and food plot holders. A multi-stage random sampling procedure was used in which the first stage involved selecting the local government areas. This was followed by the selection of the districts and finally the respondents. As such, sampling started from the site selection process, which involved random visits to irrigation projects in the Eastern Cape Province. A sample size of 80 was drawn from this frame.

The questionnaires were administered by the interviewers to avoid the difficulties of misinterpretations or misunderstandings of words or questions by respondents. Personal interviews were used because they have several advantages over the other methods. One advantage of this data collection method is that an interviewer is in a position to probe for more information from respondents. The respondents were sampled by using availability sampling, where the households were sampled based on their availability at the time the

interviews were carried out and the interviews were held in the households which were members of an irrigation scheme, or had food plots or home gardens.

3.5.2 Survey Data

Primary data were used for the study. The study utilized both categorical and continuous data. The questionnaire elicited household characteristics such as demographic information, livelihood activities, crop input acquisition, crop sales, land productivity, irrigation membership and others. Both technical and socio-economic data sets were collected from 80 smallholder farmers. Table 3.1 presents a summary of the data collected during the study.

Table 3. 3: Variables examined in the study

Dependant Variable	Unit	Type of variable	Hypothesis
Income	Amount Earned per household	Continuous	+/-
Crop produced	Actual numbers	Continuous	+/-
Independent			
Variables	Unit	Type of variable	Hypothesis
Gender	Female or male	Categorical	+/-
Marital status	Married, single, widowed or divorced	Categorical	+/-
Age h/hold head	Actual years	Continuous	+/-
Size h/hold	Actual number	Continuous	
			+
Educational level	Attendance of the formal school	Categorical	+
Household assets	Actual numbers	Continuous	+
Primary occupation	Farming, civil or off-farm business	Categorical	+
Household income	Actual amount	Continuous	+
Other sources of income	Actual amount	Continuous	+
Livelihood outcome	Satisfied or Not	Categorical	+/-
Livelihood outcomes	Sufficient or Not	Categorical	+
Land Acquisition	Purpose of land usage	Categorical	+
Land size	Actual size in hectares	Continuous	+
Market accessibility	Yes or No	Categorical	+
Farm implements	Yes or No	Categorical	+
Maize	Actual numbers	Continuous	+
Spinach	Actual numbers	Continuous	
			+
Butternut	Actual numbers	Continuous	+
Onion	Actual numbers	Continuous	+
Cabbage	Actual numbers	Continuous	+
Potatoes	Actual numbers	Continuous	+
Unit price	Actual numbers	Continuous	+
Market outlet	Local, shop, hawker or contractor	Categorical	+
Irrigation membership	Yes or No	Categorical	+
Governmental assistance	Received governmental assistance or		+
	not receive	Categorical	
Training	Training received or not	Categorical	+

Marital Status- Marital status is considered important for household decision making especially on how to manage and use resources, and to determine a family's goals and aspirations.

Gender- This variable is intended to establish the status of accessibility and control over resources, and how responsibilities are distributed within the household and communities based on variations in gender, male, and female. Depending on the type of crops grown, in most of rural Africa, more women offer agricultural labour than men and this is mainly attributed to skewed traditional (Cultural) rules and norms, and the migration of men from rural areas to urban areas to look for more paying employment. The migration of men to urban areas and the traditional (cultural) way of assigning household responsibilities subject women to farming activities in rural areas to a much greater extent and especially in subsistence agriculture, livestock rearing and food processing activities (FAO, 1995). Most times this variable is captured as a dummy (as male or female).

Age of the household head- Age is an important variable that determines the commitment of the household to agricultural practices. The older the farmers, the wealthier they might be, and hence, the more productive resources they have at their disposal (Mushunje, Belete and Fraser, 2003). Sometimes age is linked to experience and thus, older farmers are more likely to face fewer risks than young farmers. Age is expected to increase with increasing productivity and efficiency (increasing returns), and as the person grows older, the age increases with decreasing production and efficiency (diminishing returns). This variable is expressed as the factual number of years.

Size of the household- This is the number of people living together in one household. An increase in household size is thought to provide more farm labour which enhances farm production in rural areas. A large household size may cause the farming system to be more labour intensive by taking advantage of cheaper labour. The variable is measured by counting the number of people staying in a household at a given time.

Educational level- Most information in farming and training manuals is presented in English or Afrikaans in South Africa, Therefore, for the farmers to access this information they have to have knowledge of reading and writing. The knowledge of reading and writing is thought

to increase farmers' ability to keep records for good farm management practices and to adopt new technologies such as applying accurate measurements of agro-chemicals. Thus, the more educated farmers are expected to be more productive and efficient in agricultural production. Education is also important in decision making. The variable is expressed by the number of years household individuals spent in school.

Employment status- This variable measures whether household heads are employed or not employed. Employment has an effect on agricultural practices, because households do not devote sufficient time to agriculture due to their unavailability. This variable is divided into two categories, namely, the formal and the non-formal employment. Employment status enables one to capture the various sources of income, and whether these incomes have a positive impact on rural livelihoods.

Land usage- Land usage is an important variable because it has an impact on agricultural production. Some of the households let the land to lie fallow for quite a long time or let the land to become grazing camps for livestock. The variable is expressed by the size of land used for agricultural purposes.

Land acquisition- This explains how the land is acquired. In most rural areas of the Eastern Cape, households acquire land for agricultural purposes through traditional laws, inheritance, and freehold, communal tenure or by purchasing it on the land market.

Land size-Is the total size of the land owned by the household measured in hectares. Land size is thought to have an impact on agricultural production. The larger the land size, the higher the production level, though it also depends on the household decision on how to use it.

Farm implements- Farm implements are determined by this variable. Farm implements play an important role in agricultural production. It is always predicted that the more the farmers access farm implements, the higher they produce in a timely manner.

Household income- This is the total amount of money (in Rands) a household receives per month, whether it is from social grants, remittances or non-farm income. The FAO (1999)

reported that employment in off-farm and non-farm activities is essential for diversification of the sources of farm households' livelihoods.

Crop Produced- is a continuous variable that shows the amount of crop produced, consumed and sold by the household. The amount of crop produced is another determinant of the food security status of households. Rural households produce crops for different purposes either for marketing and consumption, marketing or consumption only. The variable is measured by a quantity of a given crop per hectare.

Market access- This variable focuses on whether the farmers have market access or not and whether the respondents participate or not in the market. Small-scale producers generally lack knowledge, information and resources to meet quality standards and formal markets' specifications

Governmental Assistance- This variable measures whether the households receive direct support from the government or not. Through development programmes, government assists rural households in many ways such as providing inputs, providing funds and providing extension services. Such assistance has a huge impact on crop production. Information accessibility enables farmers to make good decisions. Information gives the theoretical foundations for improved production and access to markets (Rwigema and Venter, 2004 and Dirwayi, 2010).

Livelihood strategies- In this study, this variable was used to identify the livelihood activities or sources. Whether the household is formally employed or is using other strategies to sustain the livelihoods such as remittances, social grants and pension funds. Carney (1998) classifies the livelihood strategies as natural resource based, non-natural resource based and migration, while Ellis (2000), in his framework, categorises livelihood strategies as natural resource based activities or non-natural resource based activities (including remittances and other transfers).

Livelihood outcomes- This variable measures income levels, and food security (in terms of quantity of farm output produced per annum). An understanding of livelihood outcomes is anticipated through a participatory enquiry. A range of outcomes improves the standard of living and reduces poverty in its broadest sense (DFID, 1999).

Training- Training helps the rural household to be better equipped with crop production techniques and provides more opportunities to enhance their livelihoods. When individuals exposed to training it affects their aspirations and decision making on which livelihood activities suits their goals. This variable identifies whether the rural households receive training or not. If they receive training, at what level did the training improve and or affect their livelihood outcomes.

3.5.3 Model Descriptions

The basic reasoning behind the study is that household welfare is a function of a number of variables, including a set of demographic variables, socio-economic characteristics of the household head, the employment status of the household head, as well as what the household head earns from main and supplementary occupations. For the assessment of sources of livelihoods and opportunities to improve the contribution of farming to sustainable rural development, a model was fitted by means of the Ordinary Least Squares (OLS) technique.

Economic theory predicts direct relationships between a vast array of socio-economic and household food production level (as source of income or food for the household) variables. It is therefore possible to fit a simple linear model of the form:

$$Y = f(x_1, x_2, \dots, x_n)$$
(1)
where:

Y is the dependent variable representing household food production levels (Quantity of a given crop harvested) while the x's are the explanatory variables fitted which include gender, household size (number of household members), age of the respondent, educational level of the household head (years in school), marketing strategy (point of sale), governmental assistance, crop sales and crop gross margins.

Following convention, the model can be specified as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \dots \beta_n X_n + \mu_i \dots (2)$$

where:

 β_0 = The intercept or constant term

 $\beta_1, \beta_2, \dots, \beta_n$ = Slope or regression coefficient

 X_1, X_2, \dots, X_n = Explanatory or independent variables

 $\mu_i =$ Error or disturbance term

The model was estimated to determine the role of crops production to rural livelihoods.

Given the rather large number of variables enumerated, the likelihood of correlation among independent or predictor variables is high. For this reason, the test of multicollinearity was

applied. Assuming two variables, X_1 and X_2 , collinearity is suggested if:

$$X_1 = \lambda X_2 \tag{3}$$

However, equation (2) demands that a more robust function be developed to cater for the several predictor variables in the model. This can be presented as:

$$\lambda_1 X_{1i} + \lambda_2 X_{2i} + \dots + \lambda_k X_{ki} = 0$$
 (4)

where λ_i are constants and X_i are the exploratory variables that might be linearly correlated.

The speed with which variances and covariances increase can be seen with the varianceinflating factors (VIF), which shows how the variance of an estimator is inflated by the presence of multicollinearity. A formal detection tolerance or the variance inflation factor (VIF) for multicollinearity as illustrated by Gujarati (2003) can be used as follows:

$$VIF = \frac{1}{tolerance}$$
(5)

where tolerance = $1 - R^2$

Tolerance of less than 0.21 or 0.10 and / or VIF of 5 or 10 and above indicates multicollinearity of variables. Where multi-collinearity was detected on the basis of the value of the VIF, the highly collinear variable, that is those with very high VIF, were deleted from the model.

Finally, a test was conducted to detect any possible serial correlation indicated by the size of the Durbin-Watson (DW) statistic by establishing that:

 $\mu_t = \rho \mu_{t-1} + \varepsilon_t \tag{6}$

Or that the error terms are not correlated.

In addition to the regression analysis, it was decided to conduct a correlation analysis to determine the extent of linear relationship between the independent variables included in the model above.

3.5.4 Data Analysis

The data collected for the research were both quantitative and qualitative. The study made use of graphs, tables and descriptive statistics to help in the presentation of the data. Descriptive statistics were used in the analyses of personal and household information (Demographic information) while graphs and tables were also used to present the analysed other relevant information. Averages/mean, percentages and frequencies were used to present the analysed the data. All the information from the questionnaires was coded on Ms Microsoft excel. All statistical analysis was done using the Statistical Package for Social Scientists (SPSS) version 11.0 (SPSS, 2001). Ordinary Least Squares was fitted to analyse some of the relevant information to answer the objective that was set to determine factors influencing livelihood outcomes. Table 3.2 presents a summary of the objectives and the analytical tools used in the study.

Table3.4: Summary of study objectives and analytical tools.

Objective	Analytical tool
To determine current state of the livelihoods	Descriptive analysis
To identify the employed livelihood strategies	Descriptive analysis
To determine the outcome of the employed	Descriptive analysis
livelihood strategies	Linear Regression
	Independent-Samples T-Test
To determine factors influencing livelihood	Ordinary Least Squares (OLS)
outcomes	
To determine opportunities in existing and	Descriptive analysis
prospective sources and strategies to improve	Cross tabulation by communities
contribution of farming	

3. 6 Summary of the Chapter

The research was conducted at Peddie town in (Tyhefu irrigation scheme or Ndlambe community and Binfield community in Alice. The study targeted members of the food plot or irrigation schemes in both communities. A total number of 80 respondents were interviewed using close ended questions. The data were captured on excel and transferred to SPSS version 11 for analysis. A descriptive analysis was used to map out the demographic characteristics of the households and other aspects such as livelihood strategies and livelihood assets. Ordinary least squares was fitted to determine the factors influencing the outcomes of the rural households.

CHAPTER FOUR

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter is a presentation of the research results in the context of the assessment of sources of livelihoods and opportunities for improving the contribution of farming in Peddie and Alice, in the Eastern Cape. The aim of this chapter is to highlight the various factors contributing to the livelihoods of the farmers. Household demographic characteristics, farm characteristics, crop production and input acquisition and marketing of crops are addressed in this chapter. Table 4.1 presents the descriptive analysis of the variables explained in this chapter.

Table 4.1: Descriptive Statistics

	N	Minimum	Maximu	Mean	Std.	Sk	kewness
			m		Deviation		
Variables	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Gender of Respondents	80	1.00	2.00	1.4500	.50063	.205	.269
Age of Respondents	80	24.00	87.00	60.8750	13.58552	237	.269
Marital status	80	1.00	4.00	2.1750	.85351	1.156	.269
Education Level	80	1.00	3.00	2.0375	.64521	034	.269
Employment Status	80	1.00	2.00	1.9250	.26505	-3.289	.269
Owned farm implements	80	.00	7.00	4.9500	2.16941	-1.063	.269
Condition of Implement	80	.00	3.00	1.3875	.87863	.870	.269
Primary occupation of the respondent	80	1.00	3.00	1.0625	.29095	5.127	.269
Amount earned from these activities	80	.00	5000.00	469.500 0	766.3672 3	3.507	.269
Other sources of income	80	1.00	5.00	2.4875	1.01873	.808	.269
Amount earned from these sources	80	.00	2700.00	1111.62 50	623.6772 2	179	.269
Sufficiency of the current livelihoods	80	1.00	2.00	1.6750	.47133	762	.269
Role played by Livelihood strategies in Respondent well being	80	1.00	4.00	2.2625	.70699	.017	.269
Livelihood goals the respondent wants to achieve	80	1.00	5.00	2.7750	1.44060	.224	.269
Farming Experience	80	1.00	4.00	2.0625	1.28619	.576	.269
Farming type	80	1.00	3.00	1.1500	.42397	2.954	.269
Farming System	80	1.00	3.00	1.9750	.27444	975	.269
Capital for farming	80	1.00	2.00	1.9875	.11180	-8.944	.269
Size of the land	80	1.00	4.00	1.1250	.51250	4.828	.269
Allocated land that is not being used	80	1.00	2.00	1.7750	.42022	-1.342	.269
Reasons for not using the land	80	.00	6.00	.6000	1.51449	2.461	.269
Source of water	80	1.00	6.00	2.2875	1.05775	1.962	.269

4.2 Demographic Characteristics of Study Households

In this section the demographic characteristics of the study are presented. These include gender, age, marital status, household size and educational levels. These aspects are important because the main household activities are coordinated by the household head and the head's decisions are most likely to be influenced by such demographic aspects (Makhura, 2001). Demographic characteristics are important determinants of livelihood activities and outcomes especially in livestock production in the Eastern Cape, as elsewhere in South Africa.

4.2.1 Gender distribution of household head

Farming is always associated with males only. There is a gender-linked distribution of economic roles in the rural economy of the Eastern Cape, where men are involved in farming while women undertake petty/ retail trading (FAO, 2003). As a result of this, there is a tendency for traditional farming to be more commonly seen as a man's occupation in the area". The results further show that this stereotype does not hold in Ndlambe whereas there is some indication that it is the case in Binfield. The results of the analysis of the gender distribution of the household heads are presented in Table 4.1 and Figure 4.1



Figure 4.1: Distribution of household by gender of the household head Source: Field survey 2012

As Figure 4.1 shows, while the situation in Binfield seems to confirm the stereotype of agriculture being male-dominated. That does not seem to be the case in Nndlambe where more women than men are involved in farming. According to the results, out of 41 respondents interviewed at Ndlambe, 25 percent were men while 26 percent were women. In the case of Binfield in Alice, of the 48 percent of the respondents interviewed, also 32 percent were male and 19 percent were female farmers. Taking the pooled sample, it would mean that out of the 80 households enumerated, 44 were headed by men while 36 were headed by women, thus confirming the FAO estimates. Macro-economic developments lead to retrenchments at the mines and loss of urban employments to unskilled labour. The overall sample indicates that there were 45 percent females and 55 percent males participating in farming. It is expected that male headed households will participate more in food production than female headed households. This expectation is based on the findings of Dlova *et al.*, (2004) that males are physically stronger and are therefore more capable of coping with heavy manual demands of farming (own food production) practices compared to women.

4.2.2 Marital status of household head

Marital status reflects level of responsibility and whether or not the respondents have other options. A study by Zenda (2002) revealed that married people are able to split household activities such as agricultural production, herding of livestock, harvesting of fruits, fetching firewood and water. The results of the marital status of community members interviewed are presented in Table 4.1 and Figure 4.2.



Figure 4.2: Distribution of household by marital status of the household head Source: Field survey 2012

Figure 4.2 shows that 14 percent of the interviewed household heads was single, 70 percent was married, 1 percent was divorced and 15 percent was widowed people. Binfield had one respondent who was a divorcee. In both communities Binfield and Ndlambe married people are more involved in farming practices than those who are single and widowed respondents. Divorced people are less involved in farming. Both single and widowed respondents ranged from 4 to 6 percent in both communities. Married people are likely to be involved in agriculture because the family is united and the labour is always available.

4.2.3 Education level of household

The number of years of formal education is one of the most important determinants of increased agricultural production. Education catalyses the process of information flow and leads the farmers to explore as widely as possible the different pathways of getting information about agriculture and technology. It is particularly crucial in the adoption and the use of modern technologies such as the use of hybrid seeds, cattle dipping and good management. For the purpose of this study, respondent were asked to indicate the number of years they spent in formal schooling. Results are shown in Table 4.1 and Figure 4.3 below.



Figure 4.3: Distribution of household by education level of the household head Source: Field survey 2012

Figure 4.3 shows that most of the rural households had primary education and or no formal education at all. Few respondents had a secondary education. This shows that most of the households engaged in farming were illiterate. The results further revealed that 19 percent of the respondents had no formal education, 59 percent only had primary education and 22 percent had secondary education. In both communities most of the respondents had primary education. Binfield respondents are more educated than Ndlambe. Bester *et al.*, (1999) noted that illiteracy is one of the factors that limit economic, social, physical, technical and educational development in less developed and developing countries. Educational considerations generally influence the adoption of new technologies by farmers. Illiteracy has a negative impact on the adoption of technologies and farming style.

4.2.4 Household size

Cherdchuchai & Otsuka (2006) found that the household size, the number of household members and working members, captures the quantity of human capital. Household size has important practical implications for labour availability which acts as the basis for a household to decide whether or not to participate in different activities. The majority of households in the rural areas of the former Ciskei in the Eastern Cape are small-scale or subsistence producers with limited participation in agricultural activities (Jari, 2009). The results of household size are presented in Table 4.1 and in Figure 4.4.



Figure 4.4: Distribution of household by household size

Source: Field survey 2012

The study revealed that household sizes in Binfield ranged from of 1 and 11per household while in Ndlambe the household size ranged from 2 to 9. It can be inferred that most of the households have enough labour for production because the average household size was 5 people per household, although this depended on the age distribution of the household members. In general, a larger family size also means that a variety of labour capacity is available in the form of young, middle aged and elderly members (Hayes *et al.*,1997). Increasing, family size tends to provide households with the required labour for agricultural production especially in cattle farming (Paddy, 2003). Extended family members and grandchildren made up the bulk of these household members. Small-scale farming heavily depends on the family for labour.

4.2.5 Age of the households

Age is an important determinant of the individual's personality make up, needs and preferences and decision making ability linked to experience and the stock of available skills and knowledge to address problems. Without a doubt, the way in which an individual thinks is closely related to the number of years a person has lived and what the individual has

experienced and been exposed to. The age of the household heads also determines the experience they have in a certain type of farming. The result of the analysis of the distribution of households by age of household head is shown in Table 4.1 and Figure 4.5



Figure 4.5: Distribution of household by age of the household head Source: Field survey 2012

Figure 4.5 shows that age ranged from less than 30 to more than 60 years. Only one respondent was less than 30 years old. In Binfield, older people are more involved in farming than in Ndlambe. Only 16 percent of respondents were less than 49. All other (75 percent) respondents were older than 50. Both Binfield and Ndlambe communities have older farmers. Old age has a negative influence on farming because most of the old people face health challenges and they eventually get less interested in farming due to declining earnings which may be linked to their relatively lower labour input than younger and more energetic farmers. Again, older people may be less eager to adopt improved technologies and embark on risky novel practices with potentially higher pay-off. However, age comes with better farming experience and therefore impacts positively on farm performance. According to Romuld and Sandham (1996), young people are more adaptable and willing than older people to try out innovations.

4.3 Current status and livelihoods strategies employed of the households

A livelihood encompasses the capabilities, assets and activities needed to generate income. Rural communities in southern Africa make a living in diverse ways mostly in harsh physical and economic environments. Such circumstances rapidly change and require shifts in livelihood strategies and mixing of activities (SLSA, 2003). Hence, these rural communities have income diversification and migration. In reality people combine different livelihood activities in a broad and complex portfolio and different livelihood strategies affect livelihoods pathways (Scoones 2009). Most of the residents of the rural communities' enumerated used three key livelihood strategies namely; off farm, civil and farming strategies as their main sources of income and livelihoods. The majority of the households from both communities were old as has been observed earlier and were therefore highly dependent on remittances, social grants and pension funds.

4.3.1 Livelihood strategies employed

Rural households have a wide variety of income ranges and sources. These incomes can be earned from formal employment or from other means of living. Most of the rural households derive their income from agricultural sources and the value of the household consumption of produced items. Employed livelihood strategies contribute a number of factors to the income. One of these factors can be less participation of members of the family in farming because of their commitments to other activities. Another factor can be education; the more individuals attain education, the less they participate in farming. Educated individuals shift from farming to civil employment. Table 4.1 and Figure 4.6 present the occupation of the rural households interviewed by communities.



Figure4.6: Distribution of primary occupation by communities Source: Field survey 2012

Figure 4.6 shows that both communities had the same number of respondents who are not formally employed but practising farming as their main livelihood strategy and source of income. In Ndlambe and Binfiled 44 percent of farmers practised farming. The results further revealed that 4 percent of the respondents had formal employment from these communities, 1 percent at Binfield and 2 percent at Ndlambe. There were no respondents involved in off-farm business at Binfield while only 1 percent of Ndlambe respondents reported off-farm business activity as a livelihood strategy. Figure 4.6 also shows that 95 percent of households engaged in agriculture as their livelihood strategy. The majority of the interviewed farmers reported that they did farming because there was no alternative. There was no formal employment available and farming was their primary source of income. Table 4.4 presents more information on primary occupation and incomes earned by households for each strategy employed.

4.3.2 Primary occupation by amounts earned

Table 4.4 illustrates that 49 respondents practising farming earned less than R500/month during the period covered by the survey. Twenty percent of the respondents who practised farming had an income range of R500-R999/month. Only 4 percent of the respondents had an income of more than R2000/month as indicated by the survey. The results showed that 4

percent of the respondents had formal employment. Of these, 1percent earned less than R500/month, 1percent had an income range of R500- R1000/month, while the remaining respondents had an income range of R1500-R2000/month. One percent of the respondents engaged in off-farm business also earned less than R500/month. Table 4.4 shows that most of the respondents earned less than R500/month from farming.

Strategies	Amount Earned					TotalPercentage
employed	<500	500-999	1000- 1499	1500- 2000	>2000	of respondents
Farming	49	16	6	2	3	95
Civil	1	1	0	1	0	4
Off-farm	1	0	0	0	0	1
business						
Total	51	17	6	3	3	100

 Table 4.2: Amounts earned by strategies employed

Source: Field survey 2012

Although farming is the most popular livelihood strategy employed, the results showed that farming incomes were generally too low to cover household basic needs. Rural households employing farming as a livelihood strategy stated that the income levels varied from month to month, being low in some months and reasonable in others. In the months when their incomes from farming were too low, these households reported greater reliance on other sources of income such as remittances.

4.3.3 Other Sources of income

The most likely reason for households to be engaged in diversified income earning strategies, such as remittances, is that the income derived from their primary employment is not sufficient to maintain their social networks with their relatives living in cities, receiving money from their sons and daughters employed in non-farm wage activities. The justification for relying on this source of livelihood is that the rural dwellers invested in the education or other training of the urban-based family member who is now obliged to reciprocate the prior support by providing financial support to the rural dweller who may now be incapacitated by





Figure4. 7: Distribution of other sources of income by communities Source: Field survey 2012

Figure 4.7 shows that most of the households from both communities were either dependent solely on social grants or on a combination of social grants and remittances as the other sources of income. Binfield had more households getting only social grants as the other source of income. Both communities had the same number of respondents who received pension funds as the other source of income. Ndlambe community had 5 percent and Binfield had 3 percent of respondents who did not have any other source of income. Ndlambe had more respondents receiving remittances than Binfield. Thirteen percent of respondents at Ndlambe and 1 percent of the respondents in Binfield received remittances. Binfield had more people receiving social grants than Ndlambe, as there were 28 percent of respondents at Binfield and 14 percentat Ndlambe. Figure 4.7 also shows that a few households were mainly dependent on their primary livelihood activities. Table 4.3 present details on the distribution of respondents by the form of supplementary income they received during the survey year.

Other Sources of	2	Amount Earned				
Income	<500	500- 999	1000- 1499	1500-	>2000	Total
				2000		Percentage
Remittances	4	5	1	1	0	14
Social Grant	4	3	24	0	1	40
Remittances and	l 1	1	7	18	2	36
Social grants						
Pension	1	1	0	0	0	3
None	6	0	0	0	0	7
Total	16	10	32	19	2	100

Table 4.3: Amounts earned for each source of income

Source: Field survey 2012

Table 4.3 shows that 6 respondents did not have any other source of income and 10 respondents earned less than R500/month. Most of these incomes were from remittances and social grants. The results further show that 10 percent of the respondents earned incomes the range of R500 – R900/month which were from remittances, while 40 percent earned incomes in the range of R100 – R1499/month. Only 4 percent earned an income of more than R2000 and this was from social grants. 24 percent of the respondents had an income of R1500 – R2000 and this was mostly from social grants combined with remittances. Table 4.3 also shows that most of these respondents earned more than R1000/month and these other sources of income were from social grants only or social grants combined with remittances. There were also respondents who did not have any other sources of income. The respondents indicated that, although they had other sources of income, they could not sustain their livelihoods. The rising cost of living also plays a role in this matter. Rural dwellers become more vulnerable as the cost of living increases.

4.4 Analysis of the farming system

This section is about how households use their land for agricultural purposes, in addition to farm experience and land size controlled by the family.

Land is the most important resource for agricultural production and is necessary for people in rural areas. This section also deals with farming type and nature of farming.

4.4.1 Farming experience

Farming experience plays a major role in the productivity of a farmer. Farming experience also plays a vital role in determining when to expect a lower yield and how to prevent such cases. Experience in farming helps the farmers know the seasons for planting, what to plant and when to harvest. Farming experience has a positive impact on farming (Muchara, 2011). Table 4.1 and Table 4.6 show more details of respondents farming experience.

	Community				
Farming	Nd	lambe	Binfield		
Experience	No of	Percentage	No of	Percentage	
	respondents		respondents		
< 5yrs.	33	80	11	28	
6 to 10 yrs.	4	10	2	5	
11 to 15 yrs.	2	5	9	23	
More than 15 yrs.	2	5	17	44	
Total	41	100	39	100	

Table 4.4: Farming experience by communities

Source: Field survey 2012

Table 4.4 shows that the Ndlambe community had more respondents with less than 5 years' experience than Binfield, with 80 percent at Ndlambe and 28 percent at Binfield. Binfield had 44 percent of respondents and Ndlambe had 5 percent of respondents with more than 15 years of experience. Therefore the Binfield community can be said to have more experienced in farming than that of Ndlambe.

4.4.2 Farming type

Farming type determines how profitable and dedicated the farmer is. Farmers engaged in intensive farming realize more profit than farmers undertaking semi-extensive or extensive farming. Figure 4.8 explains the types of farming that were employed by the Ndlambe and Binfield communities.



Figure 4.8: Farming type by communities Source: Field survey 2012

Figure 4.8 shows that 3 percent of Binfield respondents were engaged in intensive farming. The majority of the respondents were involved with extensive farming. Only a few respondents undertook semi-intensive farming in both communities. Ndlambe community had 49 percent of the respondents undertaking extensive farming and Binfield had 8 percent of the respondents involved in semi-intensive farming. Ndlambe had more farmers involved in extensive farming than Bienfield.

4.4.3 Farming Systems

The interviewed respondents reported that farming collectively increased their chances of getting market access, than farming individually. During the field survey, farmers also pinpointed that farming as a group created conflict although it helped for market purposes but they preferred farming individually. Table 4.5 displays the results of the farming systems of the interviewed communities, whether the farmers were farming individually/collectively or as project.

Farming System		Community na	me
	Ndlambe	Binfield	Total Percentage
Collectively	4	1	5
Individually	48	45	93
Projects	0	3	2
Total	51	49	100

Table 4. 5: Farming system by communities

Source: Field survey 2012

Table 4.5 shows that most of the households engaged in individual farming in both communities. According to the results of the survey, only 4percent of therespondents farmed collectively (1 respondent from Binfield and 3 from Ndlambe). 2percent of the households from Binfield were involved in the project. Table 4.5 also shows that farmers prefer to farm individually than in groups in both communities.

4.5 Outcomes of the employed livelihoods strategies

Livelihood outcomes are the consequences of livelihood strategies (CASE 2003 andDFID 1999). The livelihood outcomes considered in the study included income; increased wellbeing; reduced vulnerability; improved food security; and sustainable use of the natural resource. A combination of any of the above could be targeted as outcomes. These outcomes are measured by summing up all incomes generated from current livelihood strategies employed (social grants, farming and formal employment), accumulated amount of assets and quantities of food produced and consumed. Rural households were getting different livelihood outcomes from the livelihood activities employed.

4.5.1 Sufficiency of the livelihood strategies

The farmers were asked to indicate whether the livelihood strategies employed in the study were sufficient or not for their wellbeing, and the results are displayed in Table 4.6.

Sufficiency of the
current livelihoodsCommunityTotal PercentageSufficient141842

30

4139

68

100

 Table 4.6: Farmers perception on sufficient livelihood strategies by communities

38

52

Source: Field survey 2012

Not Sufficient

Total

Table 4.6 shows that 14 percent of households from Ndlambe and 19percent of the households from Binfield agreed that the activities they employed were sufficient for their livelihoods or as their livelihood strategies. Table 4.6 also shows that3 households from Ndlambe and 24 households from Binfield stated that the livelihoods they employed were not adequate. Table 4.7 further presents the results of interviewed respondents who had insufficient livelihood activities and activities they agreed to undertake to improve their livelihoods.

Table 4.7: Distribution of households by activities undertaken to improve livelihoods

Activities to Improve	Community		Total
Livelihood	Ndlambe	Binfield	-
Concentrate on one activity		2	2
Dedicating more time	2	3	5
Reduce operation cost	9	11	20
Shift focus to more			
profitable activity	19	8	27
Total	30	24	54

Table 4.7 shows that of 80 interviewed respondents, 68 percent had insufficient livelihood strategies and agreed to improve on their status to enhance their livelihood conditions. Ndlambe community had 24 percent of the households agreeing to shifting their focus to a more profitable activity. While14 percent of the households from Binfield agreed on reducing the cost operation of farming. Table 4.7 also shows that most of these households from both communities have inadequate livelihood strategies.

4.5.2 Role of livelihood strategies in respondent's wellbeing

The farmers reported several attributes of livelihood strategies which included increases income, meeting household food security, household basic needs and improving on savings. In Table 4.8 the role played by livelihood strategies chosen by the respondents in their wellbeing and whether the livelihood activities were sufficient or not is presented.

	Community name		
Impact of livelihood strategies in respondent well being	Ndlambe	Binfield	Total
Increases income	3	7	10
Covers food security	21	20	41
Cover Basic needs	16	11	27
Enough for savings	1	1	2
Total	41	39	80

Table 4.8: Role of livelihood strategies in respondents' well being

Source: Field survey 2012

Table 4.8 shows that current livelihood strategies employed by these communities were mostly covering access to food and basic needs. Only 4 percent of the respondents from Ndlambe and 9 percent of the respondents from Binfield had an income increase from these livelihood activities. 1percent of respondents from each community agreed that these livelihood activities were enough for their savings. Most of the respondent's livelihood strategies covered food security and other basic needs such as clothes.

4.5.3 Role of goals and aspirations in choice of livelihood strategies

Every individual has a goal/aspiration in life. Goals and aspirations are determinants of what the individual achieves. Not all goals are fulfilled. These goals require tasks and activities to help achieve them. Table 4.9 presents the livelihood goals the respondents aspired to achieve from the livelihood strategies they used.

Livelihood goals respondents want to achieve	Comm	nunity	
Livennood gouis respondents want to demove	Ndlambe	Binfield	Total
More income	10	14	24
Increase well being	2	2	4
Improve food security	15	20	35
Decrease vulnerability to poverty	14	3	17
Total	41	39	80

Table 4.9: Role of goals and aspirations in choice of livelihood strategies

Source: Field survey 2012

Table 4.9 shows that Ndlambe and Binfield communities had goals they wished to achieve and most of the interviewed households had the goal of earning a higher income. Only 3percent households per community had the goal of increasing their wellbeing. A total of 25percentof the households from Binfield and 18 percent of the households from Ndlambe had the goal of improving food security, whereas Ndlambe had 17 percent of respondents who had a dream of decreasing their vulnerability to poverty. Binfield also had 17 percent of the respondents who wished to increase their income.

4.5.4 Gross margin analysis

An estimation of crop gross margins makes it possible to compare the virtual profitability of alternative cropping options that have similar land, machinery and equipment requirements. This indicates the costs of production of alternative enterprises, which helps to make farm management decisions. This can also be used in analysing the performance of individual enterprises in order to make improvements (DAFF 2006). A large household size negatively affects the level of marketable surplus due to the consumption demand. These households

only sell the surplus produce. When a household comprises of youth or very young members, it becomes a challenge for that particular household because the youth do not want to engage in farming and the young ones cannot help with farming operations (Muchara, 2011). Tables 4.12 to Table 4.17 show the gross margins of crops grown by Ndlambe and Binfield community.

Respondents interviewed in both communities indicated that the mainly purchased seeds/seedlings and few purchased negligible amounts of other inputs such as fertiliser and pesticides. Therefore the major input cost considered in this study was money spent on seeds. Although the interviewed respondents indicated that there was a need to use hired labour, they could hardly afford to pay for this hired labour due to high poverty. The households exchanged labour in times of need, but in cases where these households hired labour for domestic purposes such as cutting the lawn, house chores or preparing the garden, an amount of R30 to R50 per person per day was paid. In the analysis, an average amount of R40/person/day was imputed to reflect the average labour cost. Table 4.12, to Table 4.17 display the gross margins of crops grown by Ndlambe and Binfield community.

Item	Unit	Quantity/	Unit price	Total
		ha	(Rand)	(Rand)
Income (Gross value of the production)		I.		1
Sales of Maize in 50kg	50KG/BAG	3.7	111	410.7
Maize consumed	Kg	2.2	111	154.2
Revenues (Gross incomes)				564.9
Variable Inputs Costs				
Seeds	Kg	1	27	27
Hired Labour (Land preparation/ploughing)	Day	4	40	160.0
Total Variable Costs (TVC)				187.00
Gross Margin				377.9

 Table 4.10: Enterprise Budget for Maize per season

Table 4.11: Enterp	rise Budget for	Spinach per season
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Item	Unit	Quantity/ha	Unit price	Total Rand
			Rand	
Income (Gross value of the production)				
Sales of Spinach bunches	Heads	4.9	5	22.6
Spinach consumed	heads	3.77	5	18.85
Revenues (Gross incomes)		·		41.85
Variable Inputs Costs				
Seed: Spinach seedlings (30 seedlings)	bundles	1	10.05	10.05
Hired Labour	Day	2	40	80.00
Total Variable Costs (TVC)				90.05
Gross Margin				-48.20

Source: Field survey

Table 4.12: Enterprise Budget for Potato per season

Item	Unit	Quantity/ha	Unit price	Total Rand
			Rand	
Income (Gross value of the production)				
Sales of Potato in 10kh/bag	Bag	11.1	37.6	417.36
Potato consumed	Bag	8.03	37.6	301.93
Revenues (Gross incomes)				719.8
Variable Inputs Costs				
Seed: Cabbage seedlings in 10kg/bag	Bag	2	76.3	152.06
Hired Labour	Day	4	40	160.00
Total Variable Costs (TVC)				312.6
Gross Margin				407.2

Table 4.13: Enterprise	Budget for	Onion per	season
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Item	Unit	Quantity/ha	Unit price	Total Rand
			Rand	
Income (Gross value of the production)	·		·	
Sales of Onion in 10kg/bag	Bag	2.88	45	129.6
Onion consumed	Bag	1.5	45	67.5
Revenues (Gross incomes)				197.1
Variable Inputs Costs				
Seed: Onion seedlings in 10kg/bag	Bag	Kg	1	8.03
Hired Labour	Day	2	40	80.00
Total Variable Costs (TVC)				88.03
Gross Margin				109.07

Source: Field survey

Table 4.14: Enterprise Budget for Butternut

	Unit	Quantity/ha	Unit price	Total Rand
			Rand	
Income (Gross value of the production)				
Sales of Butternut in 10kg/bag	Bag	3.60	50	180
Butternut consumed	Bag	2.23	50	111.5
Revenues (Gross incomes)		·		291.5
Variable Inputs Costs				
Seed: Onion seedlings in 10kg/bag	Bag	Kg	1	2.54
Hired Labour	Day	2	40	80.00
Total Variable Costs (TVC)				82.54
Gross Margin				208.96
Table 4.15:	Enterprise	Budget for	Cabbage per	season
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Item	Unit	Quantity/ha	Unit price	Total Rand
			Rand	
Income (Gross value of the production)				
Sales of Cabbage in heads	Heads	15.3	5.5	84.15
Cabbage consumed	heads	10.9	5.5	55.95
Revenues (Gross incomes)				144.1
Variable Inputs Costs				
Seed: Cabbage seedlings (30 seedlings)	Kg	1	8.3	8.03
Hired Labour	Day	2	40	80.00
Total Variable Costs (TVC)				88.03
Gross Margin				56.02

Source: Field survey

Table 4.16: Summary of Gross Margins by Crops

Crops grown	Number of	Minimum	Maximum	Mean	Std.
	respondents				Deviation
Gross Margin	80	-85.00	3555.00	377.8673	736.70235
for Maize					
Gross Margin	80	-90.00	610.00	-48.6875	95.38975
of Spinach					
Gross Margin	80	-312.60	7207.40	406.9700	1412.68648
of Potato					
Gross Margin	80	-88.30	5761.70	109.1375	723.67513
of Onion					
Gross Margin	80	-82.50	2417.50	209.3750	554.40947
of Butternut					
Gross Margin	80	-100.00	4820.00	56.2750	642.05885
of Cabbage					

Source: Field survey 2012 GM=gross margin, and STD means standard

Table 4.16 presents the gross margins of the crops that were most commonly produced by both Ndlambe and Binfield communities. Results show that the minimum average gross margin of maize was –R-85.00, while the maximum average was R3555.00 and the average mean was R377.89. Spinach had a minimum average gross margin of -R 90.00, the maximum average of R610 and the mean average of -48.69. Potatoes had a minimum gross margin of – R88.30, the maximum of R7207 and the mean of R406.97. Onion had a minimum gross margin of -R88.30, the average maximum of R5761.70 with the mean of R109.14. Butternut had the minimum gross margin of –R82.50, with the maximum of R2417.50 and with the mean of R400.00 with the maximum of R4820.00 and with the mean of R56.28. Maize and potato had a high gross margin while spinach and cabbage had lowest gross margins.

4.5.4.1 Maize Production, consumption and sales in Ndlambe and Binfield communities

Maize is one of the crops most commonly grown by smallholder farmers on small-scale irrigation schemes in the Eastern Cape Province (Van Averbeke et al., 2011). Maize is mostly grown in summer by smallholder farmers and its production mainly depends on rain-water (Fanadzo *et al.*, 2009). Although produced in small quantities, the crop serves as food for home consumption and the surplus is sold. Thus, maize production is crucial in ensuring household food security and incomes. The contributions of maize to rural resource poor households in Ndlambe and Binfield communities are presented in Table 4.17.

 Table 4.17: Analysis of Maize Production, Consumption, and Sales in Ndlambe and
 Binfield communities

Category	Number of respondents	Minimum	Maximum	Mean	Std. Deviation
Quantity harvested	80	1.0	70.00	6.3125	9.90153
(50kg bag/ha)					
Quantity sold	80	2.00	60.00	3.7000	8.45899
(50kg bag/ha)					
Quantity Consumed	80	1.00	15.00	2.2125	3.02602
(50kg bag/ha)					

Source: Field survey 2012 Std. Deviation = standard deviation.

According to results presented in Table 4.17, the approximated minimum average quantity of maize harvested was 1 bag of 50Kg/ha with an average maximum quantity of 70 bags of 50Kg/ha. Farmers in Ndlambe and Binfield produce a mean average of about 6.3 bags of 50Kg/ha. Further, results indicated that farmers sold on average a minimum of about 2 bags and a maximum of 60 bags with an average mean of 3.7 bags/ha (approximately 0.185 ton/ha). The minimum average quantity of maize consumed was approximately 1bag/ha, with the maximum average of 15bags/ha and an average mean of 2.2bags/ha. According to Fanadzo *et al.*, (2009), irrigated maize yields in South Africa range from 7 to 12 ton/ha, and thus, 0.185 ton/ha is extremely below the anticipated standard yields. These results also indicate that a slightly larger proportion of the maize produced by farmers in Ndlambe and Binfield is sold and little is consumed at home. The results further suggest that if more resources are directed towards maize production among smallholder, more income could be generated and hence, livelihoods could be improved.

4.5.4.2 Potatoes Production, Consumption and Sales in Ndlambe and Binfield communities.

Among the most important vegetables grown in South Africa are potatoes which are recognized as a staple food worldwide (DAFF, 2011). Potatoes are grown as vegetables in South Africa mainly in the winter season (Allemann and Young, 2008; Cousin, 2013). The crop is mainly consumed fresh by subsistence smallholder farmer households and the surplus is sold. Potatoes are high yielding and have a potential of generating substantial incomes under good management practices (DAFF, 2011). Thus, the crop can potentially improve household food security and incomes thereby improving livelihoods and alleviating poverty. The importance of potatoes to household livelihoods in terms food security and as source of income is reflected in Table 4.18.

	Number of	Minimum	Maximum	Mean	Std. Deviation
Category	respondents				
Quantity harvested	80	1.00	200.00	18.6875	36.87632
(10Kg pocket/ha)					
Quantity sold	80	5.00	180.00	11.1000	29.23003
(10Kg pocket/ha)					
Quantity consumed	80	1.00	100.00	8.0375	16.93954
(10Kg pocket/ha)					

Table 4.18: Analysis of Potato Production, Consumption and Sales

Source: Field survey 2012; Std. Deviation

For ease estimations in the absence of a weighing scale, farmers provided a proxy of the quantity of potatoes produced based on a 10Kg pocket/ha Results presented in Table 4.18 show that the minimum average quantity of potato harvested by farmers were about 1 pocket/ha while maximum average was approximately 200 pockets/ha and the mean average was 18.6 pockets/ha. The minimum average quantity of potatoes sold was about 5 pockets/ha with a maximum average of 180 pockets/ha and an average mean of 11.1 pockets/ha. For quantity consumed, the minimum average was approximately 1 pocket/ha with a maximum average of about 100 pockets/ha and an average mean of 8.3 pockets/ha. According to Allemann and Young (2008), the average potato yields are 28 tons/ha, and thus smallholder farmers' yields in the study area was extremely low (approximately 0.18 tons/ha). This indicates that there is potential to increase farmers' out if their access to resources such as land, water and agro-inputs and implements are improved. Improving yields is thought to increase their household food security and incomes, hence improving their livelihood and alleviating poverty.

4.5.4.3 Butternut Production, Consumption and Sales

Butternut is fairly widely grown as a vegetable by smallholder farmers and serves as a source of food for households and is an income earner where surplus is produced (Allemann and Young, 2008). Since it is a vegetable crop, it is also grown mainly in winter by smallholder

farmers on the available small plots (Allemann and Young, 2008; Cousins, 2013). The Table 4.19 presents the importance of Butternut among the rural household in the study area.

 Table 4.19: Analysis of Butternut Production, Consumption and Sales in Ndlambe and
 Binfield

Category	Number of respondents	Minimum	Maximum	Mean	Std. Deviation
Quantity harvested	80	1.00	50.00	5.8375	11.08819
(10kg pocket/ha)					
Quantity sold	80	2.00	40.00	3.6000	8.50108
(10Kg pocket/ha)					

Source: Field survey 2012.Std Deviation

Butternuts are packaged in 10Kg pockets for sale and this was used as a measure of quantities harvested, consumed and sold per hectare. Results in Table 4.19 revealed that the minimum average quantity of Butternut harvested by smallholder farmers in the study area was 1 pocket/ha, the maximum average was approximately 50 pockets/ha with a mean average quantity of about 5.8 pockets/ha. The minimum quantity of Butternut sold was approximately 2 pockets/ha while the maximum average was about 40 pockets/ha with a mean average of about 3.6 pockets/ha. Results further revealed that the minimum average butternut quantity consumed was 1pocket/ha while the maximum average was 30 with an average mean of about 2.2 pockets/ha.

4.5.4.3 Onion Production, Consumption and Sales

Using SPSS software results estimating the amount of onion harvested, quantities sold and quantities consumed were generated. These descriptive statics results presented in Table 4.20 indicated that farmers produced minimum averages of 1 bundle of onions per hectare, a maximum average of about 130 bundles per hectare with the average mean of approximately 4 bundles/ha of onions. The results further revealed that farmers at a minimum average sold about 5 bundles/ha with a maximum of 120 bundles/ha sold and an average mean of about 3 bundles. At minimum the average, farmers consumed about 1 bundle/ha of onions with a maximum of about 30 bundles/ha and an average mean of about 1.5 bundles/ha. These results presented in Table 4.20 suggest that most onion produced is sold with little consumed at

home. Therefore, more effort to invest in onion production may improve household incomes and reduce the risks of food insecurity among the rural communities under study.

Category	Number of	Minimum	Maximum	Mean	Std. Deviation
	respondents				
Quantity harvested	80	1.00	130.00	4.1750	16.01880
(bundles/ha)					
Quantity sold	80	5.00	120.00	2.8875	14.04603
(bundles/ha)					
Quantity consumed	80	1.00	30.00	1.5000	4.20066
(bundles/ha)					

 Table 4.20: Analysis of Onion Production, Consumption and Sales in Ndlambe and

 Binfield communities

Source: Field survey 2012Std. Deviation = standard deviation; measurement units used

4.6 Factors influencing livelihood outcomes

One of the specific objectives of the study was to determine the factors that influence livelihood outcomes. The livelihood outcome in this study was defined as the gross output of the principal crops grown in the farming system of the area. Maize and potato were identified as the most popular in the farming system. Therefore, the multiple regression model was fitted in which the kilograms of maize and potato per hectare of farmers' plot were employed as dependent variables. The explanatory variables were education level, size of the household, income of the households, size of the land, land productivity, type of irrigation system, market accessibility, methods of selling the product (value adding, and selling product at different prices to farmers and the effectiveness of the extension officers.

In respect of the variable "method of selling the product" the purpose is to assess the extent to which the farmer adds value to the raw product through processing. The expectation is that processing would result in higher value and hence the price which translates to higher revenue earned by the farmer. All things being equal, this should act as a motivation for increased investment in the production of the products in the question.

Regarding whether the farmer has the flexibility to vary product prices for different client categories, the important economic issue here is that the ability of the farmer to control product prices, which is a departure from the perfect market structure typified by the control agriculture creates over prices, would mean that the farmer can raise the prices and earn better revenues.

Both selected communities were located in semi-urban areas. Due to the proximity of the Binfield Location to the University of Fort Hare (Alice) which is a high income community and is engaged in non-farming activities, these farmers sell their produce to this community, making farming profitable. Hence, they are motivated to grow more crops.

Inferential results showing significant and non-significant and positive and negative variables are presented in Table 4.20 and in Table 4.21.

4.6.1 Factors influencing maize production

In rural areas crop yields are constrained by factors such as low income generation, small size land utilisation, a lack of proper inputs and a lack of resources, all of which limit productivity and further increase the level of poverty. Table 4.21 show the regression results of the factors influencing maize production.

	Coefficients	Standard	t-values	P- values
Independent variables		deviation		
Education Level	995	1.616	616	.540
	.202	.479	.421	.675
Household size				
	-0.004	.002	-2.642	.010***
Amount earned from other sources of income				
	1.984	2.321	.855	.396
Size of the land				
	33.518	8.842	3.791	.000***
Land Productivity				
	-2.020	.806	-2.507	.015**
Type of irrigation system				
	2.624	.979	2.680	.009***
Market Accessibility				
	1.136	.983	1.156	.252
Sell product directly as it from the farm				
	-5.563	2.604	-2.137	.036**
Methods of selling the products				
Selling methods	-1.812	.987	-1.835	.071*
	-1.108	1.005	-1.102	.274
Support provided by these programmes				
	4.676	2.081	2.247	.028**
Effectiveness of extension Officers advice				
	-37.162	14.022	-2.650	.010***
(Constant)				

Table 4.21: Regression results of the factors affecting maize production

Source: Field survey 2012. Where ***, ** and * represents significance level at 1percent, 5percent and 10percent respectively.

The inferential results presented in Table 4.22 show that the amounts earned from other sources of income such as social grants, remittances and pension funds has negative(-) and significant impact on the amount of maize being produced and harvested at 1percent level of significance. This is because some of the respondents indicated that their livelihood strategies were not sufficient for survival. Hence they were encouraged to engage in farming and produce maize.

Land productivity (farmer's response on soil fertility) was measured by using farmers' perception of land productivity. The respondents used indigenous knowledge, as the soil was not tested. Land productivity is significant and has a positive impact on the quantity of maize harvested at the 1percent level. Land productivity encourages farmers to cultivate more, the more productive the land is, the more yields of maize they get. These farmers reported that their land was productive; hence, they did not use fertilizers. The productivity of the land motivated these farmers to produce more maize.

Most of the interviewed respondents used manual irrigation schemes. This type of irrigation system has a negative impact on the crop produced and is significant at the 5percent level. This may be due to the manner in which the manual irrigation system was used. Hence they had lower yields of maize. Some of the respondents reported having little information on irrigation schemes. Other respondents used manual irrigation. Having insufficient information on how to use certain types of irrigation may lead to under-irrigation or over-irrigation. The farmers applied the same procedure to irrigate different crops; for example, different crops got the same amount of water although these crops consume water differently.

Market accessibility is positive and significant at the 10percent level. Getting more market access, acts as an incentive to farmers to produce more maize. These farmers did not have a ready market. Their market outlet was individuals from the community and hawkers in town. These respondents also reported that maize was the crop that was most in demand around their communities because consumers buy maize for various reasons, either to feed chickens or for home consumption.

Selling maize at different prices to different groups has a negative and significant impact at the 5percent level. Selling maize at different prices affects maize production as their prices are low and fluctuate. These farmers do not have a standard price for maize, as each farmer sells at the price that is convenient to him/her. Although they sold the maize at a high price to the few individuals who were buying in bulk, the majority of them sold it to the community at a low price.

Selling a product directly from the farm has a negative and significant impact at the level of 10percent. The majority of the farmers did not add value to their product as the majority of them did not sell any. Not adding value to maize production and more product consumption has a negative impact on maize yields, and this led to earning less income.

The effectiveness of extension officers has a positive and significant impact at the level of 5 percent. Surprisingly, according to this survey the respondents had little contact with extension officers but they did not care. These farmers reported that extension officers were ineffective in their areas. The only help they got was from Social Development trainees. Respondents reported that Social Development trainees helped them with inputs and advice. Poverty, low levels of managerial and technical skills and inadequate training are identified as the major determinants of low crop yields in South Africa.

4.6.2 Factors influencing potato production

People living in poverty cannot produce or buy food that maintains them and they are more susceptible to diseases. Sick people are not able to produce enough food. These small holder farmers lacked access to credit to start off. Lack of markets and infrastructure were also crucial. Inferential results of potato production are presented in 4.23.

	Coefficients	Standard	t-values	Р-
Independent variables		deviation		values
Education Level	7.869	6.527	1.206	.232
	633	1.934	327	.745
Household size				
	-0.004	.007	609	.544
Amount earned from these sources				
	-3.853	9.376	411	.682
Size of the land				
	-2.090	35.721	059	.954
Land Productivity				
	10.460	3.255	3.213	.002***
Type of irrigation system				
	-6.797	3.955	-1.719	.090*
Market Accessibility				
	5.670	3.970	1.428	.158
Sell product directly as it from the farm				
	9.984	10.518	.949	.346
Methods of selling the products				
	12.694	3.988	3.183	.002***
Selling methods			0.5.4	
	3.877	4.062	.954	.343
Support provided by these programmes				
	-3.199	8.407	380	.705
Effectiveness of extension Officers advice				
(Constant)	-12.979	56.646	229	.819

Table 4.22: Regression analysis of the factors affecting potato production

Source: Field survey 2012. Where ***, ** and * represents significance level at 1percent, 5percent and 10percent respectively.

The majority of respondents used a manual irrigation system. Inferential results presented in table 4.22 shows that the manual irrigation system used on potatoes had a positive impact on the quantity of potatoes produced and was significant at 1percent. This was caused by the type of irrigation system (sprinklers and manual) they used; or that the irrigation procedure they used was more suitable for potato production than maize production

The market accessibility has a negative and significant impact at the level of 10percent. This may be because most of the farmers did not have a ready market for their produce. They also did not selling their produce at all, but produced them for home consumption due to the lack of market access. More production for consumption lowers the spirit of the producers; hence, it negatively affects the quantity harvested. The Binfield respondents faced a challenge of birds eating their crops. The majority of them produced tuber crops which make a high competition for the market.

Selling the product (Potatoes) directly as it is from the farm have a positive and significant impact at level 1 percent. Some of the farmers did not sell their produce but the majority (60 percent) of the farmers' added value through sorting, packaging, and grading before selling. Value adding to potatoes positively affects the quantity produced, increases income and motivates the farmer to produce more.

4.7 Livelihood assets

Livelihood assets available to the household describe the basic position in which households may be established. Everything that goes towards creating a livelihood can be thought of as a livelihood asset (Chambers 2003). Assets comprised five types: human, financial, social, natural and physical capital. None of these assets alone can make or maintain all the many varied livelihoods outcomes (DFID1999). In order for people to create livelihoods, there must be a combination of assets that they have access to and a control over. The amount and mixture of different assets that the household can have, and the sense of balance between them can affect the type of livelihood they are able to generate for themselves at any time and type of a livelihood strategy they practise.

4.7.1 Natural assets

Natural assets are important because they constitute a large resource base for poor people and they provide resources that could be used to support livelihoods (CASE, 2003). Natural resources are an important asset for influencing policy and making users more aware of the monetary value of the resources they use (Ntshona, 2002). Livelihoods could be affected by changes in the natural resource base.

4.7.2 Land

Land is one among the most basic and important means of production. It is a crucial productive resource particularly for rural communities and that is why the stake-holders in the area put land as one of the main criteria in setting the community based relative wealth ranking (Jari, 2009). The land that is available to smallholder farmers in South Africa is usually shared among various residential and farming purposes (Ngqangweni and Delgado 2003 and Jari, 2009).

Size of the land	Comn	Total	
	Ndlambe	Binfield	
Less than 1ha	40	34	74
1 – 5ha	1	3	4
More than 10ha	0	2	2
Total	41	39	80

 Table 4.23: Land size by communities

Source: Field survey 2012

Table 4.23 shows that all respondents that were interviewed at Ndlambe and Binfield communities used communal land. From the 80 respondents that were consulted, 2 of the Binfield community respondents had more than 10ha. A total of 74 respondents had a land size of less than 1ha. Only 4 respondents that had land size ranges from 1 - 2ha. Ndlambe respondents own less than 5ha of land. All respondents used communal land. The size of the land in agriculture influences household food security; the larger the land size the higher the production (Najafi 2003). This implies that these households produce small quantities of food crops as they have only backyard gardens instead of producing using both home gardens and fields. Smallholder farmers do not own the land (fields) they farm on, even though they have

rights to use it. The households face serious financial constraints and are not always able to acquire the necessary inputs to expand production, hence the limited land sizes. The land size limits the output. The figure below provides more information on land acquisition and land size. Table 4.24 present results on land allocation by communities.

	Comm		
Land allocation	Ndlambe	Binfield	Total
Allocated land that is not being used	10	8	18
Used all amount of allocated land	31	31	62
Total	41	39	80

Table 4.24: Land usage by communities

Source: Field survey 2012

Table 4.24 shows that 78 percent of the households from both communities were used all the land allocated them. Both communities had the same number of respondents who use all the land they are allocated. The Table 4.25 also shows that 23 percent of the respondents did not use all allocated land, 13 percent of the respondents were from Ndlambe and 10 percentof the respondents were from Binfield. Table 4.25 shows the results on reasons for not allocating the land.

Table 4.25: Reasons for not using the land

Reasons for not using the land	Community		Total
	Ndlambe	Binfield	_
Morphology	1		1
Too distant	2	2	4
Fencing		2	2
Lack of capital	7	3	10
Lack of skills		1	1
Total	10	8	18

Source: Field survey 2012

Table 4.25 shows that 22 percent 0f respondents did not use all the land allocated for various reasons. Eleven percent of the respondents did not use the land due to a lack of capital. Five percent of the respondents did not use the land because of the distance between their homes and the planting area. Other respondents did not use the land because of poor fencing, and soil morphology. 12 percent of the respondents did not use part the land because of a lack of capital.

4.7.3 Water

A source of water is where there is a point of water supply, be it a dam, river or a tap. Crops depend on water in many ways, well beyond the few litres needed daily for drinking. Limits on water intake can depress crop production quicker and more drastically than any other deficiency. (Boyles2002). Irrigation water supplies can be obtained from many sources such as running water, wells, dams and stock ponds through different means (Humphrey and Shaw2007). Water availability for both domestic and agricultural purposes is one of the key elements in determining the habitability of an area. While rain water is critical for crop and animal production, perennial rivers and dams are very important for sustainable domestic water supply in any community (Muchara2011). Results are presented in the Table 4.26.

Tuble matter ubuge by communities	Table 4.26:	Water	usage	by	communities
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Water usage	Comn	Total	
	Ndlambe	Binfield	
Collectively	35	9	44
Not collectively	6	30	36
Total	41	39	80

Source: Field survey 2012

Table 4.26 shows that most of the respondents used water collectively with other farmers. A total of 55 percent of the respondents were using water collectively. A total of 45 percent of the respondents from both communities did not collectively use water with other farmers. Ndlambe community had many respondents who used water collectively with other farmers. Eleven percent of the respondents at Binfiled used water collectively with other farmers. And

8 percent of the respondents at Ndlambe did not use water collectively with other farmers. Results of the water sources are presented in Table 4.27.

Water sources	Comn	nunity	Total
	Ndlambe	Binfield	-
River	8		8
Dam	26	34	60
Community taps	5	2	7
Individual house taps		3	3
harvested water	2		1
Total	41	39	80

 Table 4.27: Water sources by communities

Source: Field survey 2012

Table 4.27 shows that, of 80 respondents, 60 used water from a dam. Ndlambe community had 10 percent of the respondents using water from a river and 3 percent of the respondents using harvested water. A total of 9 percent of the respondents used water from community taps and 4 percent of the respondents used individual house taps. The Table also shows that majority of the respondents used water from the dam to irrigate their crops. The 75 percentof the respondents from Binfield collected water from the dam and 65percent of the respondents from Ndlambe also collected water from the dam.

4.7.4 Financial Capital

Credit plays an important role in earning future income which is important in supporting the production and income making activities of farmers. Cash, savings, remittances and access to credit determine a household's ability to purchase and maintain tools, draught animals, tractors and implements, and to hire farm-power services. Men, as the heads of the houses, generally make decisions on when and how to buy new implements needed for farming.

4.7.5 Capital for farming



Farming capital is presented in Figure 4.10 based on communities and sources of capital investment for farming

Farming capitals by communities Source: Field survey 2012

The Figure 4.10 shows that a total of 51 percent of the households in Ndlambe community get the capital to invest in farming from their personal savings. There was only one respondent who got the capital to invest in farming from government. The other 49 percent of the households got their farming capital from their personal savings. These households complained that, in order for them to do farming, they had to invest capital from their earnings. This retards production because of the escalating prices of inputs. If government would provide farming capital they could produce for the market.

4.7.6 Physical assets

Physical capital consists of two types: tools, technology (tools and equipment for production of seeds, fertiliser, and pesticides traditional technology) and infrastusture (transport - roads, vehicles, secure shelter & buildings, water supply & sanitation, energy and communications) (Krantz 2001). The important issues with physical assets are their accessibility, appropriateness and whether there are services to support their existence (CASE 2003and

DFID 1999). For example, the number of farming implements varies according to wealth and household size. Households own different physical assets that vary according to the type of the farming system and the region. In practice, poor households do not own enough essential implements for all household members and they have to borrow from the neighbours.

4.7.7 Market facility

In order for the market to be accessible there must be physical assets that are in a good condition, such as roads and vehicles. Market information also plays a vital role in the participation behaviour of markets. Availability of market information improves the confidence of households that are enthusiastic to market their produce. In other words, market information allows farmers to make informed decisions. Thus, farmers who are more informed are more likely to participate in marketing. The source of market information is also of the utmost importance because it determines the accuracy of the information (Jari, 2009). Results are presented in Table 4.28.

	Comn		
Marketing	Ndlambe	Binfield	Total
Selling	36	14	50
Not selling	5	25	30
Total	41	39	80

Table 4.28: Marketing of crops

Source: Field survey 2012

Table 4. 28 shows that of the 80 respondents interviewed, 38 percent of the households do not sell their produce. A total of 50 respondents do not sell their produce. In the Binfield community, 31 percent of the respondents did market their produce and 18 percent did. Whilein the Ndlambe community, 45 percent of the respondents marketed their produce, while 6% percent did not. Ndlambe community had more respondents marketing their produce than Binfield. The results of the respondents who had market accessibility are shown in Table 4.39.

Market accessibility	Community		Total
	Ndlambe	Binfield	
Moderately Easy	3	7	10
Difficult	22	6	28
Very difficult	10	2	12
Total	36	14	50

Table 4.29: Market availability by communities

Source: Field survey 2012

Table 4.29 shows that 50 respondents marketed their crops. Ten respondents access the market moderately easy while 28 respondents were facing difficulties to access the markets. Twelve respondents reported that it was very difficult to access the market. At Ndlambe community there were 36 respondents accessing the markets and Binfield had only 14 respondents with access to markets. Ndlambe community had more market access than Binfield.

4.7.8 Value adding

Product value adding is important because it increases the total revenue from the product. Product value chain is a connected series of a producer, resources and knowledge streams involved from the creation to the deliverance of the product to the end users (Kaplinsky and Morris 2000 and Muchara 2011). Smallholder farmers in most developing countries are described as having many barriers of entry, hence they are entering into short value chains, and in most cases, they supply raw and unprocessed products. However, a lack of agricultural commodity marketing in the community suggests that communal farmers require much support to increase their level of production before marketing can take place (Jari, 2011). Results are presented in Table 4.30.

Selling methods	Comm	Total	
	Ndlambe	Binfield	
Value Adding	27	13	40
Not Value Adding	8	2	10
Total	35	15	50

Table 4.30: Crop value adding

Source: Field survey, 2012

Table 4.31 shows that of 80 respondents, 40 added value to their produce and 10 did not. In Ndlambe respondents' added value to their produce and in the Binfield community 13 respondents did not add value to their produce. Ndlambe had more respondents adding value to their product than Binfield community. Results of the respondents with various types of value addition are presented in Table 4.31.

			Total
Types of value	Comm	nunity	
adding	Ndlambe	Binfield	
Sorting	13	3	16
Grading	2	5	7
Packaging	11	2	13
Processing	1	3	4
Total	27	13	40

Table 4.31: Value adding by communities

Source: Field survey 2012

Table 4.31 shows that 40 respondents used various methods to add value to their produce. 16 respondents added value by sorting and 13 respondents' added value by packaging. A total of 7 respondents added value by grading and only 7 respondents' added value by processing. Ndlambe community had more respondents adding value by packaging and sorting than Binfield.

4.7.9 Farm Equipment

Accessibility of farm implements such as tractors ploughs and hoes are expected to influence the total output and marketing. Hence, farmers who own planting implements stand a better chance of using all of the land available to them (Jari, 2009). In addition, ownership of planting implements positively affects the time of planting. The farmer who owns farm implements is more likely to plant on time. This may result in larger output levels. Of equal importance is the development of the technology that is used to cultivate the land by the emerging and smallholder farmers. Results of the farm implements owned are explained in Table 4.32.

OwnedFarm Implements	Commu	inity	Total
	Ndlambe	Binfield	-
No farm Implements	3	3	6
Irrigation pipe	4	2	6
Spade or Hoe	2	8	10
Wheelbarrow and Irrigation pipe	1	5	7
Wheelbarrow and Hoe	2	10	12
Spade or Hoe and Irrigation pipe	13	6	19
All	16	4	20
Total	41	39	80

Table 4.32: Owned Farm implement by communities

Source: Field survey 2012

Table 4.32 shows that 6 households did not have any farm implements. They used borrowed ones. A total of 20 respondents had hoes, irrigation pipes and wheel barrows. Nineteen respondents had hoes or spades and irrigation pipes. There were 12 respondents with wheelbarrows and hoes and 10 with hoes only. The majority of the respondents from Ndlambe had all the implements listed. The majority of Binfield respondents had only wheelbarrows and hoes.

Table 4.33 present the results on the condition of the farm implements used by the sampled communities.

Condition of the Farm Implements	Comm	Total	
	Ndlambe	Binfield	-
Good	33	19	52
Bad	4	3	7
Fair	1	14	15
Total	38	36	74

 Table 4.33: Condition of the farm implements

Source: Field survey 2012

Table 4.33 shows that, of the 80 respondents, 52 households had good farm implements. The Ndlambe respondents had more farm implements that were in good working condition than Binfield respondents. A total of 7 households had defective farming implements. The Ndlambe community had 4 respondents with defective implements and Binfield community had only 3 respondents with defective implements. Fifteen households had fair farming implements. Binfield respondents had more respondents with fair implements than Ndlambe.

4.7.10 Social Assets

Social capital consist of networks, social claims, social relations, affiliations, associations, which people use as a skill when pursuing different livelihood strategies requiring coordinated actions (Krantz2001). Membership of cooperatives build strong social networks that make it possible for the household to be kept posted on all the required information on farming such as farm equipment, cash and credit usage and other non-farm income generating activities. Social assets can be developed by networking and connecting with other people for a right of entry to institutions.

4.7.11 Irrigation scheme membership

Sharing of a common source of water supply by a group is common in South Africa, and is assumed to limit members' flexibility in terms of irrigating. In most areas of South Africa irrigation technology has been adopted to increase flexibility of usage and management abilities for farmers. According to DWAF (2008) it has been established that the successful sharing of water resources requires the group to be well trained and organized in order to control, operate and maintain their infrastructure and manage their finances. Independent irrigation farmers are those not participating in an irrigation scheme or in a gardening group and who have a "private" water supply, such as pumping directly from a river or from their own borehole (NDA 2006). The majority of the subsistence farmers and smallholder farmers regard farming as an additional income source to their multiple livelihood strategy (Muchara, 2011). The results of irrigation membership are shown in Table 4.34.

Irrigation membership	Community		Total
	Ndlambe	Binfield	
Members	38	28	66
Non-members	3	11	14
Total	41	39	80

Table 4.34: Irrigation membership

Source: Field survey 2012

Table 4.34 shows that 66 members from these communities were members of irrigation schemes, and only 14 respondents were not members. In Binfield 28 respondents were members of irrigation schemes and 11 respondents were not members. In Ndlambe 38 respondents were irrigation scheme members and only 3 respondents were not members. Binfield had more respondents who were not irrigation scheme members. The results are presented in Table 4.36.

Information about irrigate on schemes	Community		Total
	Ndlambe	Binfield	
Have enough information	32	20	52
Have not enough information	6	8	14
Total	38	28	66

Table 4.35: Information about irrigation schemes

Source: Field survey 2012

Table 4.35 shows that of 66 respondents who were members of irrigation schemes or food plots, 52 respondents had enough information about their irrigation schemes. In Ndlambe of 38 respondents registered as members of irrigation schemes. 32 respondents had enough information about their irrigation schemes and 6 respondents did not have any information at all. In Binfield 20 respondents had enough information about their food plots and only 8 respondents did not have information about their food plots.

4.7.12 Membership in Organizations

Membership of community organization is one of the important social assets. Social asset could also be developed through obtaining membership of formal groups with rules, norms, and sanctions (CASE 2003and DFID 1999). The DFID (1999) noted that organizations create their own habits, norms, procedures, traditions, cultures and memories. These characters could either enable or hinder the people in pursuing livelihood goals. This is because logically these norms would not accommodate every individual in every community. Results of irrigation scheme membership are presented Table 4.36.

Table 4.36	: Programme	e membersh	ip b	y communit	ies
	0			•	

Programme	Community		
membership	Ndlambe	Binfield	Total
Non- Members	21	14	35
Members	20	25	45
Total	41	39	80

Source: Field survey 2012

Table 4.36 shows that 45 respondents were members of various agricultural organisations.45 respondents were not members of agricultural organisations. Respondents in the Binfield community had Nompumelelo and Siyazondla agricultural programmes and Ndlambe respondents had only the Siyazondla agricultural programme. The results of Benefits in agricultural programmes by community are shown in Table 4.37.

Benefits from these	Community		
programmes	Ndlambe Binfield		Total
Capital Assistance		1	1
Inputs	18	10	28
Implements	1	1	2
Markets	1	13	14
Total	20	25	45

 Table 4.37: Benefits from agricultural programmes by community

Source: Field survey 2012

Table 4.37 shows that 24 respondents were getting inputs from the government support programmes. Eighteen respondents were helped to get market access through these programmes. Only 1 respondent got financial assistance from these government programmes. Binfield had more respondents receiving help from these programmes.

4.7.13 Human Capital

Human capital comprises skills, knowledge, ability to labour, good health and physical capability important for the successful hunt of different livelihood strategies (Krantz2007).Education and health seem to be the main aspects of human assets (CASE 2003 and DFID 1999). This is mainly because the SL approach is people-centred and it is difficult to imagine people without skills and in poor health contributing meaningfully to the creation of sustainable livelihoods.

4.7.14 Supporting infrastructure

Supporting infrastructure is one of the fundamental aspects for farmer productivity. Most of the Binfield respondents used private extension services provided by non-governmental organizations. They pointed out that they had less contact with government extension services. Extension workers are biased towards farmer cooperatives, because farmers belonging to cooperatives get more service than individual farmers (Jari, 2009).

Effectiveness of extension Officers	Community		
advice	Ndlambe	Binfield	Total
Limited	20	19	39
Ineffective	21	20	41
Total	41	39	80

 Table 4.38: Efficiency of extension services in both communities

Source: Field survey 2012

Table 4.38 shows that of the 80 respondents interviewed 39 reported that extension officer's advice and services were limited and that they only came occasionally. 41 respondents reported that the extension officers' advice w ineffective. The respondents reported that they were getting help from (Community building) social development not from agricultural development

4.7.15 Farmer training workshops

Farmer training workshops can be used to educate farmers on farming practices. They can be functional and practical techniques for educating the older farmers on the advanced methods of production. Colleges and universities are beginning to shift their focus to the needs of smallholders, but much greater support is needed to achieve this. In particular the need was noted to develop stronger linkages between research, extension and training, so that the training is informed by experience on the ground (Gebrehiwot and Fekadu, 2012). Table 4.39 present the results of availability of training in Ndlambe and Binfield community.

Effectiveness of training in income	Community		
status	Ndlambe	Binfield	Total
No training	34	33	67
Training	7	6	13
Total	41	39	80

 Table 4.39: Availability of training in both communities

Source: Field survey 2012

Table 4.39 shows that only 13 respondents received training. A total of 67 respondents did not receive any training at all. These communities had almost the same number of respondents who had or had not received training. The results of the benefits received from these trainings are presented in Table 4.40.

Table 4.40: Benefits from these training by communities

Benefits from these training	Community		
	Ndlambe	Binfield	Total
Income Increased	3	4	7
Income reduced	1		1
No change	3	2	5
Total	7	6	13

Source: Field survey 2012

Table 4.40 shows that 13 respondents were trained in crop production and other agricultural courses. Only 7 members saw anything positive coming out of the training because the training increased their income. A total of 6 respondents saw no benefit from the training, and they regarded them as a waste of time. Only 1 respondent reported a negative outcome from the training, which was that the training reduced income.

4.8 Summary of the Chapter

Chapter four is the analysis of the research findings. In this chapter it was established that most the people who were involved in farming were men. The majority of the household members had primary education. Most of the interviewed respondents were married. Farming was the primary occupation. Most of the respondents had other sources of income. The majority of these respondents earned less than R1000.00 per month from farming, and had other sources of income. All the respondents were entitled to different livelihood assets such as social, human, physical, financial and natural capital. Maize and Potato had the high average maximum gross margins while spinach and cabbage had the lowest average gross margins. Crop production, consumption and sale were also presented for all crops. The Ordinary least squares was fitted to analyze factors influencing the livelihood outcomes. Maize and potato were used as Dependent variables while independent variable such as household size, land size, value adding and others were used. The model results were also presented in this chapter.

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.1 Introduction

This chapter presents a summary of the dissertation. This chapter started by summarizing chapter two which focused on the literature review in respect of the current state of rural livelihoods and the sources employed, available technologies, government efforts to alleviate poverty and a sustainable framework analysis. Chapter three dealt with the methodologies used to collect the data and the procedures and the model disruption fitted in the study. This chapter also included the summary of the key findings and recommendations.

5.2 Summary

This section covers the various chapters of this study. Chapter two which was the literature review reviewed the literature on different aspect of rural livelihoods. Chapter three dealt with methodologies of the study, study sites, data collection and the model used in the study. Chapter four covered the summary of the research findings including demographics, farming systems, livelihood strategies and livelihood assets provided for the rural households. Chapter four dealt with the analysis of gross margins and the analysis of the multi regression model.

5.2.1 Literature Review

The main objective of the study was to determine the sources of livelihoods and opportunities to improve the contribution of farming within available food chains. Therefore the literature focused on different subtopics related to this objective. The first subtopic looked at rural livelihood strategies, where the literature revealed that there are three livelihood strategies employed by the rural households of South Africa. These livelihood strategies are: farming, off-farm and transfers.

South African lifestyles are characterized by a high degree of mobility. Whether it is an opportunistic response of deprivation and risk, moving in search of a better livelihood and

geographical movement are embedded within a range of cultural strategies. South Africa employs dynamic livelihood strategies, and these livelihood strategies vary and differ according to the daily, monthly and annual variations in the timing and quantity of factors such as rainfall, labour availability, input costs, access to public services, markets and credit, migration opportunities, remittance income and transport costs.

The literature also revealed that some of the rural household migrate to cities to look for better employment opportunities such formal employment in the industrial sector. The reason for this migration is that the industrial (non-farm) sector is developing and is attractive to rural livelihoods and wages are increasing. The majority of the households are also dependent on social grants provided by the government. Some use farming as a livelihood strategy and the literature argues that farming is not sufficient to sustain rural households; hence, these households employ other livelihood strategies such as remittances and formal employment.

Government has initiated a number of projects to alleviate poverty in the rural areas of South Africa, yet the poverty rate is steadily increasing. Conversely, the measures applied had less or no significance for rural smallholder farmers whose condition became worse instead. Many researchers have concluded that these measures were initiated to loosen up the domestic food market and put South Africa within the international system, yet they have worsened the small holder farming conditions instead of helping them.

The literature also revealed that rural households are reluctant to adapt to technology due to the lack of knowledge (illiteracy) and gender bias among others. Technology input can positively or negatively affect productivity growth by increasing the total output or trimming down the use of more or less expensive inputs. The most common technology available in rural communities is irrigation schemes. The importance of irrigation technology in agricultural production has been recognized for a long time and is being discussed within the broader framework of the role of improved technology in agricultural development. The dynamic operation of irrigation technology transfer and agricultural development policies is considered an essential strategy to build human capacity in order to render and sustain rural livelihoods. The availability of irrigation infrastructure that is efficient, effective and in a good state of repair is a crucial success factor in smallholder irrigation. There are a number of irrigation schemes established in rural communities of South Africa.

The literature discussed the livelihood sustainability and livelihood framework. A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks maintain or enhance its capabilities and assets, while not undermining the natural resource base". Comparison of sustainable frameworks was done in the literature and a sustainable livelihood framework analysis is elaborated on in this section.

The literature also revealed that food value chains have two principal factors, which are transport logistics and cold chains, and these are necessities that enable smallholder farmers to participate in agribusiness food value chains. This can be used as a credit, consolidate production, minimize transaction cost, add value to agricultural products and access to high-value markets. Smallholder farmers who practice food value chains tend to find themselves on a steep learning curve because larger firms have high demands such as reduction in cost, high quality standards and increased delivery speed. Hence, it is advised that smallholder farmers consolidate their surpluses and sell them collectively in order for them to participate successfully in the market.

5.2.2 Methodology

This section summarizes the techniques and processes that were followed during the data collection. The study was conducted at Amathole district municipality in rural towns named Alice and Peddie. The selected communities were Binfield and Ndlambe respectively. Primary data were collected using close-ended questions. A structured questionnaire was used to obtain further information about crop production in rural livelihoods through the interviews with 80 participants. The study made use of graphs, tables and descriptive statistics to analyse data. Descriptive statistics were used in the analyses of the demographic information and socio economic factors while graphs and tables were also used to analyse other relevant information. Ordinary Least Squares (OLS) was used to determine the contribution of livestock production to household income and food security.

5.2.3 Research findings

This section deals with the research findings of the study. The section commences with a summary of the demographics of the areas. This section also summarizes the findings based on the objectives of the study. The specific objectives of the study were to determine the current state of the livelihoods; to identify the livelihood strategies that are used, to identify the outcomes of the livelihood strategies used, to determine the factors influencing livelihood outcomes and to determine opportunities in existing and prospective livelihood sources and strategies to improve the contribution of farming.

5.2.3.1 Summary of Demographics

The results of the study conducted at Alice and Peddie showed that the gender of these livelihoods was 55 percent male and 45 percent female. Most of the interviewed farmers in both communities were married. These households were also uneducated or had only primary education. The household sizes ranged from 2 to 11 members, with an average of 7 members per household. The rural household age ranged between 50 and 60 years and many of them were more than 60 years of age. This indicates that only older dwellers were engaged in farming.

5.2.3.2 Summary of the current status and livelihoods strategies employed of the households

Most of these rural households were not employed. They were trying other means of living. The majority of the households used farming as a primary source of income and only a few respondents used civil and off farm business strategies. Respondents who employed farming had an income of less than R500/month. These households had other sources of income, mostly social grants and remittances and most farmers had an income range of R1000 to R1500/month. None of the livelihood strategies employed were sufficient for rural livelihoods, as farmers disclosed that these livelihood strategies only covered their basic needs. This shows that smallholder farming alone is not sufficient to sustain rural livelihoods.

5.2.3.3 Summary of the outcomes for the employed livelihood strategies

A total of 26 members reported that the livelihood strategies employed were sufficient for their livelihoods, whereas the majority of respondents were not satisfied with these livelihood strategies. Rural households that were not satisfied with current strategies applied were willing to improve these livelihood strategies by shifting to more profitable activities in farming, and to reduce the costs of production. These livelihood activities played a major role in covering the basic needs of the household.

The results show that crop farming plays an important role in rural livelihoods. All interviewed respondents were involved in crop farming, and produced more than one crop. Potato, maize and onion had higher gross margins than other crops produced (cabbage, spinach, and butternut). The Binfield community produced and sold more maize than Ndlambe. In potato production, Binfield had higher gross margins that Ndlambe. Ndlambe community produced more maize than Binfield, as the Binfield community complained of birds and eagles eating their maize produce and this discouraged them. As for other crops, the Binfield community produced more than Ndlambe. There was a huge difference between Ndlambe and Binfield gross margins in all crops except for maize.

5.2.3.4 Summary of the factors influencing livelihood outcome

A Multiple regression was fitted to determine factors influencing maize and potato production. Maize and potato were the most common crops and were used as dependent variables. Independent variables such as demographics were used to measure maize and potato production. The factors that were identified were:

- The amounts earned from other sources of income such as social grants, remittances and pension funds has the negative (-) and significant impact on the amount of maize being produced and harvested at 1percent level.
- Land productivity has a positive impact on quantity of maize harvested at 1percent level.

- Type of irrigation system has a negative impact and is significant at 5percent level, this may be due to the manner they were using when irrigating those sprinkler irrigation, and hence they have negative yields of maize harvested.
- Market accessibility has a positive and significant impact at 10percent level.
- Type of irrigation system used on potatoes has a positive and significant impact at 1percent. This is because of type of irrigation (sprinklers and manual) they use; it is more suitable for potatoes production.

5.2.3.5 Summary findings of the opportunities existing and prospective sources and strategies to improve contribution of farming

The study identified that these rural households had access to natural assets such as water and land. Land tenure was communal and most of the farmers used all the allocated land. Government does not support these households with farming capital. Any capital was from their personal investments. Households were also entitled to natural assets, market accessibility, value adding and farm implements. The majority of the rural households interviewed added value to their production by sorting and packaging. But these farmers were not aware that they were adding value to their produce. Many claimed that they practised value adding for fun not as an opportunity to increase the income from the produce. A total of 52 respondents had more than one farm implement in good condition and this had a positive impact on farming, because rural households do not rely on others for the implements. They usually go to the farm at a time that suits them. Social assets available to these households were Irrigation membership, a food plot and membership in a government or NGO programme, all these memberships had a positive effect on farming. The interviewed households benefited from inputs and implements from these programmes. The only human capital the households had was the training available to them; although many of them did not participate.

5.3 Conclusions

Interviewed respondents were farming for different reasons. Most of these rural households used farming as a primary occupation. However, it was not sufficient to maintain their livelihoods. It was revealed in the study that households had alternative sources of income such as remittances and grants, and the major sources of income were either social grants or combination of social grants and remittances. Households earned around R1000 to R1500 per month. The majority of respondents earned R500 – R1000 per month from farm employment.

It has been highlighted in the study that rural households were facing challenges relating to market accessibility. Some of the respondents were adding value to their produce although they were not aware of this. Respondents from these communities they were better off without help from the extension officers, as the extension officers were reported to be ineffective. Respondents were getting help from Social development through community building. From both communities farmers were affiliated to food plot and irrigation schemes. Respondent were also practising extensive farming. All respondents were using communal land. These respondents were accessing water to irrigate their plots from dams and rivers.

The study revealed that these households were entitled to various assets. Their natural assets were land and water. Their financial capital was capital for farming, although this was usually from their personal savings. Their physical assets were market accessibility, market prices, adding value to the produce and farm implements. Their social assets were being affiliated to the agricultural organisations, irrigation schemes and food plots, although some of the respondents did not have sufficient information about their irrigation schemes and food plots. Their human assets were the trainings offered to the respondents as well as their education.

5.4 Recommendations

The study has highlighted various factors affecting livelihood sources. Therefore there is a need for these households to be consistently supplied with market information. Households were making little profit because they were selling their produce locally at low prices convenient to individuals. It is also important to equip the farmers with available market

information and rules of these markets. Ways to disseminate information to farmers must be carefully considered and diverse, in a way that the information is conveyed to all smallholder farmers of South Africa.

The study revealed that rural households did not recognise the importance of of value addition as an opportunity to increase their income; hence, it did not make a difference whether they practised it or not. This calls for government policy makers to disseminate information on the importance of the value chain adding. Farmers must also be trained in this aspect. Value adding is a crucial aspect of farming because it can increase profitability. Value adding practices that do not require a lot of capital such as drying out of vegetables, sorting and cutting must be considered. It has been highlighted that smallholder farmers need to be equipped to increase their produce using the same allocated land. This can be done by providing training and workshops on how to increase productivity using the same amount of allocated land.

Extension officers must also play a role using the recent extension approach of participatory rural appraisal, through discussions with farmers and empowering the farmers for marketing problems and solutions. Small-scale farmers should make sure that they contact Extension workers. If they do so, they stand a better chance of being assisted by the government, in terms of funding their infrastructure and production inputs. Most of these rural dwellers use agriculture to maintain their livelihoods. Therefore, government also needs to strengthen agricultural activities in these communities to sustain the rural livelihoods and meet the current standards of living. The government also needs to provide more access to irrigation schemes and provide credit to rural l farmers.
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UNIVERSITY OF FORT HARE

FACULTY OF SCIENCE AND AGRICULTURE

DEPARTMENT OF AGRIGULTURAL ECONOMICS

ASSESSMENT OF SOURCES OF LIVELIHOODS AND OPPORTUNITIES FOR IMPROVING THE CONTRIBUTION OF FARMING WITHIN THE AVAILABLE FOOD CHAINS.

QUESTIONAIRE FOR THE PROJECT

Date
Name of the interviewer
nterviewee's Name
Village
Municipality

Section A. Households Demographic Data

1. Household characteristics.

1.1 Name	1.2 Gender	1.3 Age	1.4 Marital	1.5 Education level	1.6 Employment	1.7 Period you
	1.Male	(Actual	status	1. No formal	status	have stayed in
	2.Female	number)	1. Single	Education	1. yes	this village
			2. Married	2. Primary	2. No	
			3. Divorced	Secondary		
				4. Tertiary		
				Others (others)		

2. Do you have other family members who moved to other cities, towns or villages? 1. Yes 2. No.....

3. If yes, fill the table below

3.1 Name	3.2 Gender1. Male2. Female	3.3 Age (<i>Actual number</i>)	3.4 Education level	3.5Employment status	3.4 Relationship with you.

Section B. Livelihood Assets

4. Which one of the following assets does each household have?

4.1 Type of asset	4.2 Number of	4.3 Period of	4.4 Condition	4.5 Livelihood activities
	assets	use		contributed to each asset
Household assets				
Brick house				
Mud house				
Furniture				
Car				
Farm Implements				
Plough				
Tractor				
Planting Machine				
Irrigation Pipes				
Wheelbarrow				
Spade or hoes				
Other (specify)				

5. How often do you use your farm equipment in a year?

Monthly	Quarterly	Semester	Yearly
1	2	3	4

Section C. Livelihood Strategies and Outcome

6. What is your current primary occupation?

Farming	Civil servant	Off farm business	Other
1	2	3	4

7. What is your current secondary occupation?

Farming	Civil servant	Off farm business	Other
1	2	3	4

8. What was your previous occupation if you changed?

Farming	Civil servant	Off farm business	Other
1	2	3	4

9. How much do you earn from these activities? R.....

10. Apart from livelihood activities what are the other sources of income?

Remittances	Social Grants	Pension funds	Other (specify)	None
1	2	3	4	5

11. How much is your income from these sources? (write exact amount)

Remittances	Social grants	Other (specify)	None
1. R	2. R	3. R	4. R

12. Are these strategies sufficient for your livelihood?

1. Yes 2. No

13. If no what can you do to improve your livelihood strategies

Concentrate on one activity	Dedicating more time	Reduce cost operation	Shift focus to more profitable
			activity
1	2	3	4

14. What role does each livelihood strategy play in your wellbeing?

Increases Income	Covers food security	Cover Basic needs	Enough for savings	Other(specify)
1	2	3	4	5

15. What livelihood goals do you aspire to achieve?

More income	Increase well being	Improved food security	More sustainable use of Natural resources	Decrease vulnerability
1	1	3	4	5

16. Is it possible to achieve these goals?

1. Yes 2. No

Section D. Farming System

17. How many years have you been involved in farming?

Less than 5 years	6 to 10 years	11 to 15 years	More than 15 years

18. What type of farming system are you using?

Extensive	Semi-intensive	Intensive
1	2	3

19. How do you farm?

Collectively	Individually	Government project	Other
1	2	3	4

20. Where do you get the capital to invest in your business?

From government	Personal savings	Loans	Other
1	2	3	4

Section E. Land utilisation

21. How did you acquire land for agricultural purposes?

Rental	Freehold	Inheritance	Leasing	Buying	Communal	Others (Specify)
1	2	3	4	5	6	7

22. What is the size of the land? (Ha)

Less than 2Ha	2 to 5.9Ha	6 to 9.9Ha	More than 10Ha
1	2	3	4

23. Do you have allocated land that you are not using? If no go to Q. 23

24. If yes why?

Lack of money	Too distant	Poor topography	Fencing	Inputs	Know-how	Other(specify)
1	2	3	4	5	6	7

25. What rules or laws are there concerning land acquisition?

Yes	No
1	2

Yes

1

No

2

26. If yes what are the rules?

Traditional rules	Government rules	Others (specify)	No rules
1	2	3	4

Yes

1

27. Are you willing to expand your land?

1	2
No	

No

Yes

1

No 2

0

Yes

28. Is your land productive?

29. If not why?

Land degradation	Soil fertility	Poor land use	Other (specify)
		management	
1	2	3	4

2

30. Do you have land (ha) that you not using

31. If yes why?

Lack of capital	Lack of skills	Fallow	Soil morphology	Not interested
1	2	3	4	5

Section F. Water and Irrigation usage

32. Do you use water collectively with other farmers?

Yes	No
1	2

33. What is the source of water for your crop production?

River	Dam	Boreholes	Communal taps	Individual	Harvested
				household tanks	water
1	2	3	4	5	6

34. What are your coping strategies in times of scarcity of water?

River	Dams	Boreholes	Communal taps	Individual household tanks	Harvested water
1	2	3	4	5	6

35. Are you a member of any irrigation schemes?

36. If not why?

Lack of funds	Selection criteria	Social conflicts	Other (specify)
1	2	3	4

Yes

1

No 2

37. Do you have enough information about the irrigation schemes?

Yes	No
1	2

Yes

1

No 2

38. What type of irrigation schemes are you using?

Sprinkler	Drip	Surface	Manual	Other (Specify)
1	2	3	4	5

39 Are these schemes helping you out to reduce poverty or enhance your livelihood?

40. If no why?

Underutilized	Water is not	Poor cooperation	Because of low productivity and	High cost of repairing
	sufficient	amongst farmers	profitability	and rehabilitation
1	2	3	4	5

41. Do you think these irrigation schemes will have positive effect to your livelihood?

Increase standard of	Reduce poverty	Increase food	More income	Other (specify)
fiving in general		security		
1	2	3	4	5

Section G. Profitability

42. Please fill in the production and marketing information in the table below.

41.1 Crop name and	41.2 Area Planted (ha, square Metres, acres)	41.3 Quantity harvested (Specify unit; tons, kg, bags)	41.4 Unit price	41.5 Quantity sold (Specify unit Price/Unit	41.6 Quantity 1.Consumed, 2.Bartered or 3.Donated – specify which	 41.7 Market outlet 1. Local 2. Shop, 3. Neighbours, 4. Hawkers, 5. Contractor, 6. Other – Specify 	 41.8 Season Planted 1-Summer 2-Autumn 3-winter 4-spring 	41.9 Times Planted a year
1-Maize								
2-Spinach								
3-Carrots								
4-Cabbage								
5-Tomatoes								
6-Potatoes								

43. What other sources of income and how much a. Remittances

b. off farming

c .on farm

44. Do you have a ready market for your produce?

Yes	No	N/a	
1	2	3	
		× r	

 Yes
 No

 1
 2

45. Are the prices you selling your product constant throughout the season?

46. How difficult do you find to sell your produce

Easy	Moderate easy	Difficult	Very difficult
1	2	3	4

47. How sustainable is your enterprise?

Unsustainable	Sustainable with support	Sustainable without support
1	2	3

48. Do you have knowledge on how to increase your productivity?

49. Are you selling with different price to different groups?

Middlemen	Supermarkets	Institutions	Individuals
1	2	3	4

50. Do you sell the product as it is directly from the farm?

51. If yes, in what way?

Sorting	Grading	Packaging	Processing
1	2	3	4

Yes	No
1	2

No

2

Yes

1

Section H. Input Acquisition

52. Please indicate the input procurement information of the following.

Crop name	Input type	Quantity purchased	used	Unit price	Source Supplier (Specify) 1.Local shop 2.Store in town 3.Co- operative 4.Individu al (friend, neighbour) 5.Donation	Harvesting and marketing costs 1.Labour 2.Transport 3.Other	Crop Name	Input type	Quantity Purchased	used	Unit price	Source Supplier (Specify) 1.Local shop 2.Store in town 3.Co- operative 4.Individual (friend, neighbour) 5.Donation	Harvesting and marketing costs 1.Labour 2.Transport 3.Othe
	1.Fertilizer							1.Fertilizer					
	2.Seeds							2.Seeds					
	3.Herbicide s							3.Herbicides					
	4.Pesticides							4.Pesticides					
	5.Tillage							5.Tillage					
	6.Labour						•	6.Labour					
	7.Other							7.Other					

Crop name	Input type	Quantity purchased	used	Unit price	Source Supplier (Specify) 1.Local shop 2.Store in town 3.Co- operative 4.Individual (friend, neighbour) 5.Donation	Harvesting and marketing costs 1.Labour 2.Transport 3.Other	Crop Name	Input type	Quantity Purchased	used	Unit price	Source Supplier (Specify) 1.Local shop 2.Store in town 3.Co- operative 4.Individual (friend, neighbour) 5.Donation	Harvesting and marketing costs 1.Labour 2.Transport 3.Othe
	1.Fertilizer							1.Fertilizer					
	2.Seeds							2.Seeds					
	3.Herbicides							3.Herbicides					
	4.Pesticides							4.Pesticides					
	5.Tillage							5.Tillage					
	6.Labour							6.Labour					
	7.Other							7.Other					

Crop name	Input type	Quantity purchased	used	Unit price	Source Supplier (Specify) 1.Local shop 2.Store in town 3.Co- operative 4.Individual (friend, neighbour) 5 Donation	Harvesting and marketing costs 1.Labour 2.Transport 3.Other	48 Crop Name	Input type	Quantity Purchased	used	Unit price	Source Supplier (Specify) 1.Local shop 2.Store in town 3.Co- operative 4.Individual (friend, neighbour) 5 Donation	Harvesting and marketing costs 1.Labour 2.Transport 3.Othe
	1.Fertilizer							1.Fertilizer			<u> </u>		
	2.Seeds							2.Seeds					
	3.Herbicides							3.Herbicides					
	4.Pesticides							4.Pesticides					
	5.Tillage							5.Tillage					
	6.Labour							6.Labour					
	7.Other							7.Other					

Section I. Government Assistance

53. Are you a member in one of these programmes?

Siyazondla	Siyakhula	Massive food production programme	Other (specify)
1	2	3	4

54. If yes what have you benefited from these programmes?

Capital assistance	Inputs	Implements	Other (specify)
1	2	3	4

55. Do you get any help from agricultural support services?

Yes	No
1	2

56. If yes who provides these support services?

Government	Local association	NGO's	Other (specify)
1	2	3	4

57. How effective or adequate are the extension officers advice?

Very effective	Effective	Limited	Ineffective
1	2	3	4

58. How often do you use the extension officer's advice?

Regularly	Quite often	Sometimes	Not at all
1	2	3	4

Section J. Business Skills and Level of Entrepreneurship

59. Have you ever been trained in small business skills development?

						No	
60. What type of training did you receive?						2	
Drying Vegetables	Crop Production as Business	Weaving	Carpentry		Othe	r (Specify)
1	2	3	4		5		

61. How has the training affected your income status?

Income Increased	Income reduced	No change	Other (specify)
1	2	3	5