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**OPPORTUNITIES AND CHALLENGES FACED IN PROMOTING
SMALLHOLDER FARMING AS AN ELEMENT IN RURAL ECONOMIC
DEVELOPMENT: THE CASE OF BUFFALO CITY MUNICIPALITY IN THE
EASTERN CAPE, SOUTH AFRICA**

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DEDICATION:

I dedicate this thesis in memory of my late father: Mr. Sipho Earnest Makhathini.

!!!!May His soul rest in peace!!!!

DECLARATION:

I, Siyabonga Makhathini, hereby declare that the work contained in this thesis is my own and that other scholars' works referred to here have been duly acknowledged. I also declare that this thesis is original and has not been submitted elsewhere for a degree.

Siyabonga Makhathini

Date

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To the FATHER, the SON and the HOLLY SPIRIT be all the glory and honour; for granting me the wisdom, strength, courage and diligence to complete this study. What is impossible to man is possible to God.

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ABSTRACT:

This study looked at the opportunities and challenges faced in promoting smallholder farming as an element in rural economic development. The main objective is to highlight the key factors affecting smallholder production; and how those factors affect smallholder farmers in rural areas of Buffalo City Municipality, and hence identify the ones likely to predict success for future use in intervention programs. The content and scope of this study is limited to the socio-economic constraints (economic activities, household assets e.g. natural assets, physical assets, financial assets etc.) faced by rural households and therefore prescribe the necessary interventions to enhance rural livelihoods.

Data was collected through review of secondary sources, direct observation through field visits and interviews with households. Questionnaires were used as the main tool of inquiry to gather data from households in selected villages within Buffalo City Municipality. The collected survey data was coded and analyzed using Statistical Package for Social Sciences (SPSS) Version 19.0. The study used Descriptive, Gini Coefficient and Binary Logistics model to analyze the collected survey data. For the descriptive model, the main pointers that were employed for this study were frequencies and mean values. The Gini Coefficient model was used to measure the contribution of different sources of income to overall inequality. The binary logistic regression model was used to uncover the correlates of the household income for different rural groups (farmers and non-farmers).

The results reveal that farm income has a strong association to overall household income per capita. Unearned income sources also have a substantial contribution to household income. Remittances and child grants were significant to non-farming household income per capita.

Given the diminishing farm size of smallholder-led agriculture; these results suggest that a diversified household income portfolio is vital in addressing poverty in rural areas. Based on the results this study concluded that agricultural activities cannot solely enhance food security.

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LIST OF ACRONYMS

ADM	Amathole District Municipality
BCM	Buffalo City Municipality
CS	Community Survey
DoA	Department of Agriculture
FAO	Food and Agriculture Organisation
GC	Gini Coefficient
GDP	Gross Domestic Product
HH	Household
HRSC	Human Science Research Council
IDP	Integrated Development Plan
KWT	King Williams Town
NAPC	National Agriculture Policy Centre
ODI	Overseas Development Institute
PFET	Public Further Education Training
SLA	Sustainable Livelihood Approach
SPSS	Statistical Package for Social Sciences
USDA	United States Department of Agriculture

CHAPTER 1: INTRODUCTION

1.1 Background of the study

South Africa is one of the most affluent countries in Africa; it is referred to as an upper middle income country (African Development Bank, 2006). Despite its relative wealth, the experience of most South Africans, more especially in rural areas, is of outright poverty or of long-term vulnerability to poverty. Most rural households are unable to attain the minimum standard of living measured in terms of basic consumption needs or income required to satisfy them (Pimentel & Pimentel, 2007). According to the Statistics South Africa's Community Survey (2007), about 50% of the South African population is rural, and 72% of that group is poor. Poverty is distributed unevenly among the nine South African provinces. For the Eastern Cape, it is 71%, Free State 63%, North West 62%, Limpopo 59%, Mpumalanga 57%, the Western Cape 28% and Gauteng with the lowest statistics of 17% (Statistics South Africa's Community Survey, 2007). This means that the Eastern Cape Province has the highest percentage of people in poverty, probably because the province is dominated by rural areas with very limited economic opportunities.

Global studies also highlight that the distribution and incidence of poverty is predominantly a rural problem and that it is increasing in South Asia and Sub-Saharan African countries. Nonetheless, there is a long history in rural development in relation to the roles of various sectors and the choice of strategic sectors for rural economic development. There have also been numerous country case studies and debates aimed at bringing light to rural economic development. Dollar and Kraay (2002) highlight that there is a growing consensus that

agricultural growth is essential to the achievement of the Millennium Development Goal of eradicating extreme poverty and hunger in rural areas.

The South African agriculture mostly consists of two categories of farmers, the smallholder farmers in the former homeland areas and the large scale commercial (mainly white) farmers. For the purpose of this study, emphasis is on smallholder farmers. According to Hazell (2001), smallholder farmers are identified as resource poor farmers; generally, they have been widely linked to the size of the landholding (or the number of livestock) owned or managed. Smallholder is often equated with a backward, non-productive, non commercial, subsistence agriculture that is found in rural areas (Delgado, 1999). Socio-economic factors limiting or constraining smallholder farmers to become viable and productive farmers include dependence on indigenous knowledge, lack of access to capital, inappropriate irrigation schemes, poor roads structure, low technology adoption, loan repayments, and lack of non-farm incomes. In general, these challenges make smallholder farmers susceptible and prone to agricultural risk (Delgado, 1999).

Moreover, rural areas across most of the developing world face a formidable employment challenge (Ashley & Maxwell 2001). According to Hazell (2001), even with migration to cities, rural populations continue to grow, sometimes very rapidly, as in Sub-Saharan Africa and South Asia. Each year's addition to the rural labor force needs to find work in agriculture or the rural nonfarm economy, or to migrate to the urban economy.

According to Jodha (2001), lack of non-agricultural employment in rural areas compels rural households to engage their labor in agriculture and petty services. This makes the agricultural sector the undisputed leader to rural livelihoods, because it provides employment and contributes significantly to poverty alleviation (Jodha, 2001). Agriculture is the main employer in rural areas; however, it is not prudent to speculate that its wage labor provides an

important source of income for the poor, because its weakness is the high percentage of rural population with low income. In contrast, non-farm employment is essential to rural households because it guarantees additional income and can be used to satisfy consumption requirements when farm income is not sufficient to safeguard food security (Hazell *et al.*, 2007).

There is a growing consent that agricultural development is important to eradicate extreme poverty and hunger in developing countries (Dollar & Kraay, 2002). However, Dollar and Kraay (2002) estimate that half of the world's 852 million chronically or acutely malnourished population live in smallholder farming households, two-tenths are landless, one-tenth are pastoralists, fisher folk and forest users. The rest live in rapidly spreading urban slum areas. Projections by the World Bank (2003), to the year 2015 show that the people living in absolute poverty in Sub-Saharan Africa will increase by 25% from 315 million in 1999 to 404 million in 2015. The socio-economic contributing factors to poverty include risk and vulnerability, low capabilities, inequality, exclusion and adverse incorporation, and limited livelihoods and opportunities. Specific risks and vulnerabilities include harvest failure, market failure and volatility, conflict, and health shocks which particularly affect the population of Southern South Africa (Geoff, Kate & Bhavna, 2009). The Millennium Development Goals Report (2011) disclosed that; the number of people in the region with access to safe drinking water increased from 252 million to 492 million between 1990 and 2008, according to the MDG Report, growing from 49 to 60 per cent of the population. Regarding education, the report says that with an 18 percentage point gain between 1999 and 2009, sub-Saharan Africa improved the most of any region in primary school enrolment.

According to Peacock *et al.* (2004), smallholder agriculture growth can eliminate rural poverty. It can be achieved through a balanced set of measures and priority should be placed on components to develop farmer's capacity to respond to new opportunities, and, thereby provide the foundations for a pathway out of poverty. Peacock *et al.* (2004) further explains, that rural investment should be directed at empowering and enabling the rural poor through access to land and water resources, effective and efficient frontline support services, and improved accessibility to rural infrastructure. It is evident that efforts to address poverty and hunger have not been effective, particularly in rural areas. Market orientation is vital if the growth necessary to improve the livelihoods of the rural poor is to be achieved. However, trade liberalization and the increasing concentration and vertical integration of markets further limits the opportunity for smallholder farmers to break through the market, even if they target local markets (Lundy *et al.*, 2004).

Several studies show that there is a wide-range of challenges to growth in smallholder agriculture, among them are the following:

- Low-value goods: The majority of farming households have been accustomed to producing basic staples for their own subsistence, with little surplus for sale to provide them with the cash to buy clothes, food items that they cannot produce themselves, and to access essential health and educational services (Anríquez *et al.*, 2003).
- Poor organization: Smallholder farmers in many countries are not affiliated to farmer's associations/unions and are not registered as formal business entities. The lack of such organization within the agricultural sector in many developing countries,

particularly in Africa, is often blamed on the failure of government to support farmer cooperatives (Foster and Rosenzweig, 2004).

- Declining infrastructure: Smallholder farmers are finding it increasingly difficult to compete in national and regional markets due to their poor access to infrastructure such as roads, storage facilities, power and transportation. As poverty is increasing in many parts of Africa, these facilities are deteriorating; therefore, many communities are less able to engage in more distant markets than before (Foster and Rosenzweig, 2004).
- Shocks: Some of the most severe constraints of growing markets in many developing countries are based on natural and civil shocks. These severe impediments are caused by drought, floods, war, political and religious disputes, the devastating effects of a host of diseases such as HIV/AIDS and malaria, and by natural attacks from such pests as locusts and grain borers (Foster and Rosenzweig, 2004).
- Undermining existing markets: While many governments have reduced their role in the food market, relief agencies have significantly increased their supply of free or highly subsidized imported food into developing countries. In many cases, this has meant that local marketing structures and systems are being bypassed and eroded by the agents that aim to assist developing countries (Foster and Rosenzweig, 2004).
- New trends: In the wholesale and retail sectors, in addition to all of these major hurdles to growth in the smallholder sector, there are also significant changes in how

goods are traded and the regulations that restrict access to these rapidly growing markets (Lundy *et al.*, 2004).

- Lack of information: Most farmers receive no information about changes in the value of their products; whereas traders have reasonably rapid access to such trade based information. This challenge in access to basic market information has been cited as a major impediment to empowering farmers to negotiate for better prices; and, thus, to build market confidence and trade links (Lundy *et al.*, 2004).
- Decline in commodity prices: Even the so called cash crops have experienced price declines in real terms over the past two decades. Trade liberalization and globalization, coupled with the improved production efficiency of medium to large-scale producers and oversupply of major commodities, some of which are important smallholder crops; have led to increasingly harsh and competitive marketing reality (Lundy *et al.*, 2004).
- Oversupplied markets: The success of many international development programs at the production level has led to oversupply of many global commodity markets. The collapse of markets in developing countries further impairs farmers who relied on these markets for their income (Lundy *et al.*, 2004).

Foster and Rosenzweig (2004) on the other hand pronounced that despite the worrying nature of these challenges, there is a significant amount of evidence that there are many examples of smallholder farmers confronting these challenges through a systematic approach to address the basic problem in engaging the market place. The strategies used by those smallholder

farmers utilize the following approaches: firstly, they increase competitiveness through achieving economies of scale and value addition by collective action and improved production, post production handling and processing, and marketing. Secondly, they diversify their production, by incorporating high value crops or livestock activities that have an identified demand.

According to Dollar and Kraay (2002), the transition of smallholder farmers, especially those located in more marginal areas distant from markets, requires orientation and mentoring from development organizations, access to a range of public and private services (inputs, transport, information, finance etc.) and a set of government policies that provide an enabling environment that supports business in remote locations.

Gardner (2005) postulate that, it is possible to alleviate or eliminate poverty while keeping the number of small holder farmers constant. Gardner (2005) suggests the importance of thinking in a broad perspective about maximizing the contribution of rural public policies to poverty alleviation.

Dollar and Kraay (2002), state that where growth in rural household income has been achieved, the following five factors have been present:

- Macroeconomic and political stability.
- Property rights and incentives.
- Productivity enhancing new technology.
- Access to competitive input and product markets.
- Real income growth in the non-agricultural economy.

The main question in achieving non-agricultural rural led growth is how to facilitate the transition from a rural economy based on small farms to a rural economy that is diversified in income sources, competitive in international markets, and dynamic (Gardner, 2005). According to Gardner (2005), this leads to a basic issue of geography and economics, the location of economic activities theory and evidence necessary to understand better within country regional development patterns and regional disparities. But, beyond purely economic and geographic causes, non-agricultural growth might not be observed for a variety of real world reasons related to household characteristics and to public and private assets. Mobility of labor and persons generally, education, infrastructure, and cultural barriers to mobility are important factors determining the ability of growth in some regions to reduce poverty. However, these impediments may be overcome by the provision of public goods, although investments in schooling, health, roads, and other infrastructure are more costly in low density and remote areas (Gardner, 2005).

Lopez (2004) estimates a decline in the importance of small farms in agricultural production and their contribution to the larger economy. Not only will the share of total output that originates on small farms decline, but the relative importance of the income generated on small farms will decline as well, both in terms of small farm family incomes and rural incomes more broadly. On the other hand, Reardon *et al.* (2001), suggests that wages, self-employment outside agriculture, and other earnings from commercial activities, manufacturing, and other services are becoming significant sources of income for rural households; this implies that rural non-farm income tends to be positively correlated with national development.

In line with Gardner (2005) and Lopez (2004), suggests that the point is not to maintain millions of small farmers, but to eliminate poverty. The best of all possible worlds perhaps is

one where a dynamic overall economy is spurred by agricultural growth, and in turn, spurs the growth of agriculture and the structure of farming, and at the same time offers better non-farm income opportunities to families of formerly small holder farmers. However, it is challenging when a dynamic economy, both domestic and global, drive changes in the structure of agricultural production but does not provide opportunities to the poor, who then remain as small farmers because of failure to obtain non-farm employment opportunities (Lopez, 2004).

1.2 Problem Statement

According to the African Development Bank (2006), approximately 75% of people living below the international poverty line of US\$ 2 per day live and work in rural areas (about 268 million in Sub-Saharan Africa; 223 million in East Asia and the Pacific, and 394 million in South Asia alone). Even in countries experiencing rapid economic development, such as China, there are 175 million rural dwellers below the international poverty line. According to Hazell *et al.* (2007), this might be due to under-investment in the agricultural sector that has undermined the small farm sector and rural food production capacity, leaving rural households vulnerable to food insecurity. On the other hand, Pretty and Hine (2001) mention that rural farm-based livelihoods are generally characterized by low input and low output agriculture due to limited access to productive assets such as land, labor, fertilizers, irrigation, infrastructure and financial services.

Several studies strongly suggest that agriculture is an important integral part of the rural economy and society. Diao *et al.* (2005) postulate that, to maintain rural communities farming is an important economic activity creating local employment; delivering multiple economic, social, environmental and territorial benefits. According to Spencer (1994), an agriculture-led growth strategy can generate patterns of development that are employment intensive which is

favorable to the poor and can be evenly distributed between rural and urban areas. In terms of indirect effects, any significant cut back in farming activity would in turn generate losses in rural income and jobs linked with agricultural activities. Opportunities for processing and adding value to agricultural production in rural areas also exist (Madeley *et al.*, 2007). However, the opportunities for processing and adding value are often limited, due to asset constraints, trade barriers and poor market access.

In the light of all the above factors, this study will scrutinize the impact and contribution of smallholder farming in reducing poverty and sustaining rural livelihoods of the Eastern Cape Province in South Africa, specifically Buffalo City Local Municipality. It is anticipated that the study results will be of direct benefit to the councils in the study area and provide appropriate policy recommendations to policy makers.

1.3 Objectives

The main objective of the study was to investigate the role played by smallholder farming in combating food insecurity and assess the scope of its contribution to rural livelihoods. The specific objectives are:

1. To decompose rural household income sources and asset portfolios in rural areas of Buffalo City Municipality (BCM).
2. To determine the contribution of each source to income distribution.
3. To uncover the correlates of total household income for different rural groups.
4. To find out the role played by smallholder farming to food security.

1.4 Research Questions

1. What is the distribution of household income source and asset portfolios in rural areas of Buffalo City Municipality (BCM)?

2. What is the contribution of each income source to income distribution?
3. What are the determinants of household income for different rural groups?
4. What is the contribution of smallholder farming to food security?

1.5 Hypothesis

This study will test the null hypothesis that:

1. Smallholder farming is one of the major household income sources for communities from Buffalo City Municipality.
2. On-farm income sources reduce income inequality while off-farm sources increases inequality.
3. Household income (livelihood) may be conditioned by socio-economic factors like, farm income, household size and child grants.
4. Smallholder farming contributes to rural household food security.

1.6 Justification of the study

Rural households in the developing world face alarming employment and awful challenges that lead to poverty. This is probably because the rural populations continue to quickly increase, especially in Sub-Saharan Africa and South Asia (Hazell *et al.*, 2007). Each year's addition to the rural labor force needs employment in agriculture or the rural non-farm economy, or to migrate to the urban economy. According to Matshe and Young (2004), most of the rural labor force derives a large part of their incomes from agriculture or from non-agricultural self-employment because they do not match the skills required in the non-agricultural labor markets. Thus, agriculture plays a significant role in sustaining the livelihoods of rural households in developing countries. Therefore, this study seeks to investigate the extent to which agriculture or smallholder farming contributes to food security

and rural economic development in South Africa, precisely in Buffalo City Local Municipality, in the Eastern Cape Province.

1.7 Delineation Statement

The case study is limited to a narrow band of rural areas of the Buffalo City Municipality in the Eastern Cape Province due to limited resource availability. The study only focused on the impact of smallholder farming to rural livelihoods in the study area.

1.8 Definition of Terms

Rural Livelihood: describes the capacities, capital (human, social, productive, natural etc.), and activities needed by rural households to meet their basic needs in an effort to sustain their lives. This definition was inspired by several studies and was borrowed from Chambers and Conway (1991). This study considers smallholder farming as the livelihood strategy under consideration.

Farming household: is a household which cultivates land or raises livestock.

Non Farming Household: is a household which does not cultivate land or raise livestock.

Poor Household: In the study, a poor household is defined in terms of a single scale, the poverty line measured in terms of incomes (farm income, non farm income, wages, grants etc.). In the study, any household earning below R839.11 per capita over one month was categorized as poor, this figure was adjusted for inflation. Before the adjustment the poverty line was R 431 per capita using 2006 prices (Statistics South Africa Community Survey (SSACS), 2007).

1.9 Outline

The study is organized as follows: Chapter two reviews past local and international research on the characteristics of smallholder farmers and factors that constrain their survival and growth in rural areas. It further explores the importance of smallholder farming in rural areas as a pathway out of poverty and as a driving force behind rural economic development. Chapter three then describes the location, physical setting, socio-economic setting and agricultural production of the study area. Chapter four highlights the methodological approaches and data gathering techniques that were employed in this study. Chapter five presents the demographic characteristics of the sampled households and highlights various factors affecting rural livelihoods in the in the study area. Chapter six provides the empirical results and discussion of the research findings. Last but not least, chapter seven presents the conclusions and recommendations drawn from the results on how rural livelihoods can be enhanced through smallholder farming.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

For the purpose of this study, this chapter describes rural areas and smallholder farmers in the context of developing countries, and reviews the possible causes of the afflicting poverty in rural areas. This chapter also narrates the importance of agriculture in rural areas as a solution to poverty for rural households and as driving force behind rural economic development.

2.1 Agriculture as engine for rural growth

Rural areas are heterogeneous; the term rural generally refers to an area where human settlement and infrastructure occupy only small patches of the landscape. Most rural areas are dominated by fields and pastures, woods and forest, water, mountain and desert, where most people spend most of their working time on farms, where land is abundant and cheap and where transaction costs are high (Ashley, Caroline & Maxwell, 2001). Agriculture is believed to be the engine of rural growth, especially in early development, when agriculture prospers, farmers and farm laborers benefit, and so do those with employment upstream and downstream from farming. However, these benefits are not automatic and not guaranteed in the future. Furthermore, the long-term decline in agricultural commodity prices weakens both the sector and the case (Lundy *et al.*, 2004).

Smallholder farmers are identified as resource poor, generally they have been widely linked to the size of the landholding (or the number of livestock) owned or managed (Delgado, 1999). They are often equated with a conservative, non-productive, non-commercial,

subsistence agriculture that is found in former homeland areas. According to Delgado (1999), socio-economic factors limiting or constraining smallholder farmers to become viable and productive include dependence on indigenous knowledge, lack of access to capital, inappropriate irrigation schemes, poor roads infrastructure, technology adoption, loan repayments, and lack of non-farm incomes. In general, these challenges make smallholder farmers susceptible and prone to agricultural risk.

However, there are many success stories about agriculture as an engine of growth and as a major force for poverty reduction in the early development process (Ashley *et al.*, 2001). According to Huvio, Kola and Lundstrom (2004), agricultural growth is the precursor to the acceleration of industrial growth; and, agriculture also offers attractive business opportunities, such as high value products for domestic markets and international markets. Parallel to these successes are numerous failures in getting rural agriculture moving, because important challenges persist for agriculture in these areas. Food security also remains a challenge in rural areas for most developing countries especially in Africa, due to low agricultural growth, rapid population growth, weak foreign exchange earnings, and high transaction costs in linking domestic and international markets (Huvio, Kola & Lundstrom, 2004).

Most African rural households are faced with outright poverty or continuing vulnerability to being poor. As a result most young people are migrating from rural areas to urban areas to acquire a better economic opportunities to improve their lives. According to Banski (2003), it is generally the most talented and entrepreneurial youth that leaves for the urban areas. The population remaining in the villages tends to become more dominated by the frustrated and those who have little capacity to match up the requirements of the current labor market. This migration from rural areas leaves rural communities with a dark cloud of an upward trend of

unemployment because of, firstly, the accumulation of unskilled labor, resulting from the migration of the experienced to urban areas. The second reason is the closure and failure to develop non-agricultural economic activities in rural areas to encourage new employment opportunities that will cut into the unemployment figures and take up some of the slack when it comes to the excessive number of hands on farms (Banski, 2003).

2.2 Characteristics of small-holder farmers in rural areas

2.2.1 Subsistence orientated

Unlike market oriented commercial farmers, most smallholder producers in rural areas follow broad production objectives that are driven more by their immediate subsistence needs rather than demands of a market (Delgado, 1999). Biological survival and established cultural traditions may define the essential values of a subsistence community in rural areas. According to Scoones (1992), subsistence agriculture follows low input and risks averse strategies, and the producers take rational decisions to maximize overall benefits from limiting resources, or in broader terms, to ensure high total system output.

In addition, the degree to which each farm is integrated into the food market system varies according to a host of factors apart from subsistence, perhaps the most important of which being geographical location. Some areas may have a higher degree of market integration because rainfall and soil conditions are conducive to cash cropping and the production of surplus; others may lack one or both of these advantages but are compensated by their relative nearness to urban markets and other facilities (Scoones, 1992).

2.2.2 Dependence on indigenous knowledge

Smallholder farmers in Africa are generally associated with indigenous knowledge oriented techniques of production, merely because they are mostly uneducated subsistence farmers. In most cases, they acquired their skills from their parents, by observing them when they were producing (Ozowa, 1995). According to Ortmann (2000), while information is an essential ingredient in agricultural productivity and development, most smallholder farmers seldom feel the impact of agricultural innovations either because they are illiterate or because it is poorly distributed. Because of their dependence on indigenous knowledge, it is safe to state that the information needs of smallholder farmers revolve around the resolution of problems such as pest hazards, weed control, moisture insufficiency, soil fertility, farm credit, labor shortage, soil erosion and so forth. The information needs may be grouped into five categories such as agricultural inputs, extension education, agricultural technology, agricultural credit and marketing (Ortmann, 2000).

As mentioned above, the general lack of awareness among smallholder farmers can be attributed to their high level of illiteracy. This contributes to the low level of adoption of agricultural production technology (Ortmann, 2000). According to Ozowa (1995), agricultural technology for smallholder farmers is intended to help minimize the labor farm chores and increase productivity. In order for smallholders to be more productive, they should acquire information on production technology that involves cultivating, fertilizing, pest control, weeding and harvesting. This type of information at the moment is being diffused by extension workers, other farmers and agricultural equipment dealers. Apart from agricultural technology information, smallholder farmers also need to acquire information about agricultural credits, because they are among the potential beneficiaries of this resource,

but because due to their low level of literacy, they are mostly unaware of existing loan facilities (Ozowa, 1995).

2.2.3 Family labour

According to Delgado (1999), households with larger family size are more likely to become successful as the household has more labor to work on the farm. However, this would only work if all family members are old enough to perform the farm work, otherwise if the household size consists of a majority of young children who cannot be used as family labor, it will not work. However, according to Matshe and Young, (2004); farmers with bigger families were less successful than those with smaller family sizes. This situation is explained by the fact that the increased use of the family income to feed, clothe and educate a larger number of children may leave limited funds for meeting farming expenditures because of the high household expenditures.

2.2.4 Land size

Bosworth (1998), suggests that access to arable land in the homelands is available to a relatively large proportion of households, perhaps as high as 50 per cent, but average holdings are extremely small, in the order of 0.5 to 1.5 ha per household. There is, however, considerable variation in plot sizes, with a substantial proportion of households cultivating less than 0.5 ha, and a small group cultivating plots greater than 5 ha (Deininger and Songqing, 2003). According to Hall *et al.* (2003), by February 2003, only the equivalent of 2.9 per cent of total agricultural land (excluding the former homelands), benefiting less than 200,000 households, has been transferred from white commercial farmers to black farmers. As a result rural households have access to agricultural land, however, this land is still largely confined to the former homelands. As in the rest of the country, only a small proportion of this land is suitable for arable farming.

2.2.5 Level of production

According to Datt and Martin (1998), the production of crops and livestock for smallholder farmers in Asia and in Sub-Saharan Africa is characterized by low yields. The average yield of basic crops is inadequate to meet the needs of producers, either for direct consumption or for family income. Hazell (2001) also highlights that, low yields are mainly due to factors such as low productivity, low yielding varieties, water problems/droughts, lack of tillage facilities, poor infrastructure, lack of inputs, access to credit and inadequate research and extension services. Livestock production is faced with similar constraints to crop production. The major problem is that natural resources are degraded through over-use in areas with high stocking densities, whereas vast lands with great potential for livestock cannot be utilized because they are infested with disease or lack the necessary infrastructure (Datt and Martin, 1998).

2.3 Constraints faced by smallholder farmers in rural areas

2.3.1 Lack of domestic farm support programs

In rural areas, smallholder farmers or resource poor producers face challenges in accessing extension services (farming advice), training, credit, grants and markets. This is merely because support for productive and sustainable land use to the poor remains inadequate (Francis, 1999). According to Delgado (1999), provincial departments of agriculture receive, on average, around 1 to 3% of the provincial budgets, which is not enough to deliver the required support. Budgetary and staff constraints continue to hamper provincial departments of agriculture in responding to the post transfer needs of land reform beneficiaries (Delgado, 1999).

2.3.2 Technology adoption and lack of technical expertise

Farm inputs are basic and essential to any farm enterprise (without them, it is impossible to produce output). Consequently, major efforts aimed at developing efficient and effective

technologies to improve farm productivity have focused on high quality inputs (Ortmann, 2000). These efforts have, however, achieved limited success in the case of smallholder farmers, who are often regarded as resistant to change (Ortmann, 2000). Smallholder farmers' failure to adopt improved technologies is partly attributed to the inadequacy of support systems such as extension services, credit, and input supplies (Francis, 1999).

According to Ozowa (1995), smallholder farmers are unable to access and utilize new agricultural innovation such as technologies. Problems related to access of new technology include the following:

- The collapse of formal transfer structures, which has resulted in ad hoc extension services and no feedback mechanism;
- poorly designed technology transfer campaigns which do not attract a critical mass of adopters;
- high cost of science and technology applications;
- low disposable incomes; and
- inadequate support institutions. (World Bank, 2003)

The adoption problem does not entirely lie in dysfunctional extension systems or in the poverty of the people in the region, but results from the lack of credit to access new technologies and lack of markets where farmers can sell the produce they get from using the new technologies (Worth, 2001). In areas (commercial farms) where new technologies have been diffused, production is high, whereas in other regions (remote rural areas) where new technology has not yet been adopted, production is low and the majority of farmers still rely on subsistence techniques (Ozowa, 1995).

2.3.3 Lack of capital to purchase agricultural inputs

It is widely recognized that lack of access to capital is a key constraint in smallholder farming systems in Southern Africa (Ellis, 2000). Smallholder farmers in this region generally finance their productive efforts in two ways, firstly, with the profits from the previous season's harvest paying for diesel, seeds and labor, and secondly, from other sources of income such as sales of livestock and waged work, which raise the necessary capital for the inputs needed for the farming year (Ellis, 2000). In good years, this presents no problem for most households. However, when assets become depleted, or are unable to be mobilized (e.g. lack of waged work opportunities, livestock and security for loans), households face extremely tough circumstances, and in many cases are unable to cultivate (Ellis, 2000).

It is clear that most rural households cannot afford to farm because they lack capital to sustain their production. They lack the capital necessary either to start cultivation or to continue farming after several poor seasons. Ellis (2000), states that farming for most rural households is simply not a viable livelihood option even though some of them have the potential and the zeal to become productive farmers. For these households, the key constraints are either lack of finance or the inability to transfer certain assets into productive use. According to Francis (1999), access to credit is viewed as an important strategy in which farmers can raise finance necessary for farming.

2.3.4 Access to market

Smallholder farmers often face constraints when they want to access markets or when they want to improve their competitiveness in the markets. Market access and competitiveness relate to the options farmers have to sell their products and purchase inputs (Moyo, 2002).

Smallholder farmers often have low market access as compared to their larger and more capitalized colleagues. Moyo (2002) also postulates that smallholder farmers are disadvantaged due to small size of operations, weak technical capacity, high vulnerability to natural and market risks, and lack of capital. These constraints could be worse when smallholders are in remote areas. In addition, smallholder farmers have difficulties in complying with the high quality standards required by international markets and domestic supermarkets. Barriers into markets can be related to physical limitations in reaching the market such as low quality of roads, to restrictions on international trade, or to minimum product characteristics required. These barriers mean that a certain market does exist, but that smallholder farmers are hindered in selling their products on that market.

With the rise in the relative number of urban consumers as well as in the number of supermarkets barriers to entry are increasing also in domestic markets, developing countries and transition economy markets. Smallholder farmers, because of their low resource endowment, tend to be highly vulnerable to production risks, as well as to marketing risks that may result from price fluctuation or opportunistic buying behaviour. In most developing countries smallholder farmers are exposed to high market risks, because of missing or weakly developed institutions (insurance) (Poulton *et. al.*, 2000).

2.3.5 Land tenure and fragmentation

According to Bosworth (1998), providing land owners or users with security against eviction enhances their competitiveness by encouraging land related investment. Enhancing tenure security should be based on individual land titling, although this process can result in land being seized by elites and bureaucrats, weaken or leave out communal and secondary rights. In many developing countries, land held under customary tenure does not enjoy legal protection, often because of legislation from colonial times. For example, in many African

countries most land is considered to be state land and those who had cultivated such land for generations do not receive secure tenure rights (Waeterloos and Rutherford, 2004). From the traditional production point, the customary tenure arrangement is sufficient for the need of the large majority of small producers. The tenure arrangement, however, manifests considerable limitations when family size increases, resulting in further fragmentation of the smallholdings.

2.4 Agriculture as a pathway out of poverty for rural households

According to Diao *et al.* (2005), before the late 1960s, agriculture was widely seen as a stagnant, low productivity, and residual sector that could be robbed of its labor and capital for use in industry. This view was overtaken by the dynamism of the Green Revolution in the late 1960s when agriculture came to be perceived as a growth sector that could generate more food and raw materials at lower prices. It can also provide growing amounts of capital and labor for industrial development, and reduce poverty by increasing labor productivity and employment in rural areas by generating more remunerative opportunities for rural urban migration, and by lowering food prices for all (Diao *et al.*, 2005).

An agriculture-led growth strategy can generate patterns of development that are employment intensive which is favourable for the poor and can be evenly distributed between rural and urban areas (Spencer, 1994). This contrasts sharply with most industrial led growth strategies. In most African countries, agriculture-led growth has not met the requirements for a successful agricultural revolution; consequently African agriculture seriously lags behind the rest of the world. Many African countries still face severe national food constraints because Africa still has much low densities of rural infrastructure and has weak institutions for rural development (Spencer, 1994). Even though much of Africa boasts of abundant natural

resources on a per capita basis, revitalizing the sector will not be easy (Fan, Zhang, & Rao, 2004).

According to Fan, *et al.* (2004), in order for African countries to launch an agricultural revolution on the scale required to accelerate economic growth and eradicate poverty, it needs an agricultural led growth that is technologically driven. This could include increased and sustained investments in agricultural research, institutional and human capital, rural infrastructure, and more effective service provision (modern inputs, credit, and marketing services). Moreover, Diao *et al.* (2005) highlight that the strategy for rural development in Africa should be based on agricultural diversification, high value commodities and value added processing (rather than food staples production, privatization and good governance).

2.4.1 Production of high-value commodities and value-added processing

With chronic global surpluses of major food staples and rapid expansion in international agricultural trade, many see the best opportunities for developing country farmers in high value commodities such as fruits, flowers, vegetables, and livestock. In many successfully transforming countries, domestic demand for such products is growing rapidly, providing ready market outlets for increased domestic production. In many low income countries, domestic demand is much weaker, and the best opportunities are seen in export markets. Many African countries, for example, are being encouraged to expand into high value and non-traditional export market. According to Diao *et al.* (2005) and Hazell (2004), even if market opportunities for non-traditional exports are growing quite fast, the greatest market potential for most African farmers still lies in domestic and regional markets for food staples (cereals, roots and tubers, and traditional livestock products) because of high costs of exchange associated with high value crop products. In order for smallholders to have a niche

in the high value commodity market, will require critical public investments to raise their productivity and to reduce production and marketing costs.

2.4.2 Rural income diversification and the rural poor

In many regions across the developing world, agriculture has become a relatively small production sector because most rural households have diverse and geographically dispersed portfolios of income sources (Ellis & Harris 2004). This raises a question on whether agriculture should any longer be viewed as the primary engine of rural growth. Some schools of thought emphasize migration and rural non-farm activities and believe diversification options for multi-occupation and multi-location households can become the relevant engine of growth for rural areas. According to the Kenya Central Bureau of Statistics (1977), smallholder farmers in Africa derive half or more of their incomes from non-farm sources. If most African farmers have not been able to find pathways out of poverty despite income diversification strategies over many decades, then it is not clear why farming should suddenly work much better currently.

However, according to Haggblade, *et al.* (1991), it is very important in thinking about how to grow rural livelihoods, because rural urban migration and rural income diversification in Africa are not indicators of economic growth and structural transformation and are not a sign that workers are typically being pulled out of agriculture into higher paying occupations. Rather, migration and income diversification are more typically distress experience, with workers seeking to add to already low and declining per capita incomes in the saturated non-agricultural labor markets (Haggblade *et al.*, 1991).

2.5 Commercial transformation of food production systems

Key and Runsten (1999) bring into light that food markets in developing countries are undergoing profound changes fuelled by economic development, increases in per capita incomes, changing technology, and urbanization. These changes threaten the existence of smallholder farmers, and may mean the gradual disappearance of smallholder farmers who are unable to meet the private standards of health and safety set by large retailers and wholesale buyers (Reardon & Berdegue, 2002). The pressure to meet large retailers and wholesale buyers' requirements by smallholder farmers arises from poor public good provision that hinders market exchange and a new set of transaction costs that emerge from dealing with the modern food system characterized by different rules, regulations, and players (Key & Runsten, 1999). Transactions costs are more significant; they serve as a barrier of entry for smallholders into competitive markets, because of the costs of exchange for staple and high value crop producers. Even commodities are becoming differentiated products because of the particular requirements to meet the quality, size, and delivery standards; these requirements prohibit market entry for many small farmers even further.

2.5.1 Commercialization of small farms and agricultural growth

According to Key and Runsten (1999), most developing countries have witnessed agriculture moving away from traditional self sufficiency to an activity where farm output is more responsive to market trends. It is indeed true that with increasing economic growth, small farm production systems could not remain static and would need to gear themselves to some degree of commercialization for their survival.

Small farmers' production systems are mostly characterized as subsistence; there are a handful of smallholders with semi commercial production systems, and even fewer with commercial production systems. Increased commercialization shifts farm households away

from traditional self sufficiency goals and toward profit and income oriented decision making because farm output is more responsive to market needs. The returns to intensive subsistence production systems that require high levels of family labor generally decline relative to production for the market with predominant use of purchased inputs.

Given the potential for high rewards in the modern food markets, the structure of food systems has radically altered, as a result of changes in the domestic demand for agricultural goods both quantitatively and qualitatively (Pingali & Khwaja, 2004). According to Rondot, Bienabe, and Collion (2004), traditional food systems are essentially production systems that are involved only in basic processing and minimal distribution. On the other hand, modern food systems are highly integrated with greater forward and backward linkages and significantly involve the private sector in determining standards and market regulations. The non-traditional food system exhibit an ever increasing degree of technological and process innovation. As such, these modern food systems are much more discriminatory in terms of who is able to enter (Rondot *et al.*, 2004). Thus, entering the food system on a competitive basis is problematic for small farmers because of physical investments needed to enter, but also because of the transaction costs associated with the new agricultural market (Boehlje, 1999).

2.5.2 Implications of commercialization for the small farmer

There is considerable literature that testifies to the productive efficiency of small farms (Eastwood, Lipton & Newell, 2004). On the basis of that, it is argued that if smallholders can overcome their constraints (capital, information etc.) they can be well placed to enter markets. According to Pingali (1997), the difficulty for small farmers is whether the existing production structures can be geared toward the market and at what cost, because semi or fully subsistence farming in any form is not a viable activity for safeguarding household food

security and welfare (Pingali, 1997). This often seems to imply that small farmers face an option in terms of their enterprise choice in order to have a niche in the modern market food systems. They either stay in staples, which are regarded as unprofitable, or they make the changes to shift to alternative high value production. However, a critical question remains as to whether their size can profitably support such activities for a long term (Pingali, 1997). Moreover, there are increased costs of high value production stemming from the investments needed to meet the requirements of the output market and there is a greater level of exchange with new players in input and output markets, which is inevitably more costly (Napier 2001). As a result, it is not surprising that the new food systems tend to often favor scale.

2.6 Transaction costs specific to smallholders

Williamson (1996) defines transaction costs as a trade-off between the costs of coordination within an organization and the costs of transacting and forming contracts in the market. Transaction costs are faced by all actors in the food system and they have risen due to the product standards set by modern food systems in terms of quality, size, and delivery (Napier, 2001). Because of economic growth and increases in household income, farming families are increasingly willing to pay for product attributes that include convenience, taste, variety and high quality (Napier, 2001). Under these changes within the economy and household welfare, private companies in the modern agri-food systems capture markets and their product differentiation by putting more stringent conditions on suppliers. This explains why smallholder farmers do not participate fully in commercialized agricultural markets because small farmers are locked into traditional modes of production far removed to meet the requirements demanded by modern food systems (Van der Vorst *et al.*, 2005).

According to Hayes (2000), the transaction costs that specifically emerge from dealing with small farms include the costs of establishing and monitoring long term contracts, costs linked

to uncertainty about the actual quality of the goods, handling and storage costs and transport costs. Because transaction costs vary over households and enterprises, commodities, and regions, there is no single innovation or intervention, public or private that can reduce them. However, there are a number of ways in which transaction costs can be overcome and small farmers can develop market entry such as contract farming, creating incentives and sending signals that encourage private sector participation in developing rural economies, and development of vertical and horizontal coordination to transaction costs (Napier, 2001).

2.6.1 Horizontal coordination

Modern food market systems demand high output and quality which leaves small farmers behind; however Swinnen (2005) shows that collaborative actions and coordinated activities between small farmers may provide a better solution for small farmers to low transaction costs that are at similar levels to larger farmers. Pingali and Khwaja (2004) postulate that even where small farmers have coordinated their activities, the underlying trend is that as the process of commercialization advances, challenges will arise due to the dynamics of the modern food market system.

2.7 Moving beyond the farm

Rural areas across most of the developing world face a formidable employment challenge (World Development Report, 2008). Even with migration to cities, rural populations continue to grow, sometimes rapidly, as in Sub-Saharan Africa and South Asia (Hazell, 2001). Each year's addition to the rural labor force needs to find work in agriculture or the rural non-farm economy, or to migrate to the urban economy. The rural labor market offers employment in the agricultural and non-agricultural sectors to skilled and unskilled labor, in self-employment and wage labor. Agriculture employs many wage workers, 20% of the sector's labor force (World Development Report, 2008). The dynamic high value crop and livestock

sector is labor intensive with high prospects for employment growth. Yet, labor conditions in agriculture are not always conducive to large welfare improvements because of the nature of the production process and because of a lack of appropriate regulation. Rural non-farm work is increasing rapidly and includes numerous low-productivity commercial activities in thin local markets. But, dynamic non-agricultural subsectors, linked to agriculture or the urban economy, offer opportunities for skilled workers. Wages in agriculture are considerably lower on average than in the other sectors. This difference is largely a result of the skill composition of workers. With labor as the main asset of the poor, landless and near-landless households have to sell their labor in farm and non-farm activities or leave rural areas (World Development Report, 2008).

2.7.1 The variation in rural households' income strategies

Rural households engage in farming, labor, and migration, but one of these activities usually dominates as a source of income (Matshe & Young, 2004). Five livelihood strategies can be distinguished in rural areas. Some farm households derive most of their income from actively engaging in agricultural markets (market oriented smallholders). Others primarily depend on farming for their livelihoods, but use the majority of their produce for home consumption. Still, others derive the larger part of their incomes from wage work in agriculture or the rural non-farm economy, or from non-agricultural self employment (labor-oriented households). Some households might choose to leave the rural sector entirely, or depend on transfers from members who have migrated (migration oriented households). Finally, diversified households combine income from farming, off-farm labor, and migration (Escobal, 2001).

According to Matshe and Young (2004), contrary to the ideal image of smallholders as pure farmers, landed rural households rely on many activities and income sources. Besides farming, they participate in agricultural labor markets, in self employment or wage

employment in the rural non-farm economy; and they might receive transfers from household members who have migrated (Matshe & Young, 2004).

2.7.2 Agricultural wage employment

In rural Africa, for example, recent in-depth studies suggest that participation in the agricultural labor market is far greater, with agricultural wage employment particularly important for poor and relatively landless households (World Development Report, 2008). The nature of agriculture affects the demand for agricultural labor because of seasonality, agricultural production risks. Agricultural production is also subject to droughts, floods, pests, and price fluctuations. These shocks (even if insured), affect labor demand and supply in ways that exacerbate each other. When the demand for labor declines and the supply of labor by small farmers increases to compensate for the shortfall in on farm profit. Consequently, wages fall very sharply in agricultural employment as compared to other sectors, because of the shortfall in farm incomes and the excessive number of hands on farms (Escobal, 2001).

2.7.3 Rising rural non-farm employment

Agriculture remains the backbone of most rural economies, but rural employment is diversifying out of agriculture because non-farm employment tends to be more important. Rural non-farm enterprises are transforming the employment structure in rural areas (Matshe & Young, 2004). The rural economy offers benefits to investors in some areas because of the low cost of labor and land, and the reduced congestion. The significant constraints on investment in rural areas include poor access to credit and its high cost, inadequate supplies of electricity, poor quality roads and infrastructure.

2.7.4 Wages and earnings in the rural labor market

According to Matshe and Young (2004), wages are considerably higher in rural nonfarm employment than in agricultural wage employment. There is evidence that across the world, agricultural wages have been declining and temporary workers have lost about a third of their income over the last 30 years (World Development Report, 2008). Rural non-farm enterprises that create employment opportunities usually exhibit higher labor productivity. According to the World Development Report (2008), workers in these larger enterprises are also more educated. More than half of them have finished secondary school, and almost none are without completed primary school education. Migration to urban areas in search of higher income is common and a potential pathway out of poverty. It induces an upward pressure on wages in areas with high rates of out-migration. This wage increase can have a positive effect on the labor force participation of non-migrants because of the need to replace migrant workers. On the other hand, remittances can create an incentive to reduce the labor supply of non migrants by increasing their reservation wage. Migration is most pervasive in the transforming and urbanized economies, where growing urban areas offer more employment opportunities (Matshe & Young 2004).

2.8 Definitions of food security

A significant amount of research has been done focusing on exploring and understanding household food security, food insecurity and hunger (FAO, 1996). The World Bank (1986), defined food security as access by all people at all times to enough food for an active and healthy life. According to Food and Agriculture Organization (FAO) (1996), food security exists when all people, at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life style. On the other hand; food insecurity is defined as the lack of access to enough food to

sustain life (World Bank, 1986). According to FAO (1996), food insecurity is limited or uncertain availability of nutritionally adequate and safe foods, limited or uncertain ability to acquire acceptable food in socially acceptable ways.

From literature food security may be defined both at individual and household levels, as well as at national and regional level. All these levels are inter-related; all these levels are therefore to be considered as important. According to HRSC (2003) the national food security is internationally defined as the condition whereby the nation is able to manufacture, import, retain and sustain food needed to support its population with minimum per capita nutritional standards.

According to Anderson (1990), community food security is a situation whereby residents in a community can obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice. Radimer *et al.*, (1990) states that, there are several indicators that used to examine a community food security status. These indicators includes the location of the community (urban or rural, closer or further away from the basic services used to procure food and to access health services); the culture/social norms, health knowledge, attitudes, beliefs, practices and resources of the community; and the income and education level of the community.

Radimer *et al.*, (1990), a household is considered food secure when its members do not live in hunger or fear of starvation. According to FAO (1996), household food security is determined by a number of indicators such as the household location (urban or rural community), household density (measured by the number of people living in the same household), and the income status of the household (the source of income, health status of the household occupants, food production or employment status of the breadwinner).

2.8.1 The Incidence of Food Insecurity in South Africa

The Millennium Development Goal is to eradicate hunger, malnutrition and food insecurity by 2015 (USDA, 2006). In accordance with the Millennium Development Goals the South African Constitution state that “every citizen has the right to have access to sufficient food and water and that the state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realization of this right to sufficient food”. The National Department of Agriculture is also committed to eliminate food insecurity; adopting as its guiding vision the attainment of universal physical, social and economical access to sufficient, safe and nutritious food for all South Africans to meet their dietary requirements (Department of Agriculture, 2002).

According to Lund (2008), South Africa presents a distinctive and significant case for research on food security. Before 1994 the majority of black South Africans were denied political rights and excluded from taking part in the economic mainstream, resulting in economic deprivation and poverty. Charlton and Rose (2002) estimates that approximately 1.5 million South African children suffer from malnutrition, 14 million people are vulnerable to food insecurity and that 43% of households suffer from food poverty. Malnutrition continues as one of the principal contributors to child morbidity and mortality in South Africa, with an estimated 1.5 million children suffering from this disorder (Department of Social Development, 2002)

Fifty seven percent of South Africans still live below the poverty index line (HSRC, 2003). Labadarios *et al.*,(2008) asserts that, the majority of households below the poverty index line were less educated and remained disadvantaged with respect to their living conditions and

overall wellbeing. Based on the survey conducted by Statistics South Africa in 2008 it can be deduced that the South Africa economy is plagued by poverty and unemployment. The recent steep food and fuel prices, high energy tariffs and increasing interest rates also added a severe pressure on ordinary South Africans already struggling to meet their basic household needs.

However, on the other hand, there is significant amount of evidence that the majorities of South Africans living in urban areas enjoys a better socio-economic status and are also more likely to have secure food banks in their households than those in rural communities (Puoane *et al.*, 2002). Irrespective of the fact that socio-economic disparities in South Africa may play a role in the prevalence of food security, the interaction effects between social class and other factors, such as the individual's culture and attitudes, may also play a role in the development of food insecurity (Labadarios *et al.*, 2008)

2.9 Insights from the literature review

Global studies bring to light that the distribution and incidence of poverty is largely a rural problem and that it is increasing around the world, especially in Asia and Sub-African countries. The literature also revealed alarming views: Other studies postulate that half of the world's 852 million chronically or acutely malnourished population live in smallholder farming households, while other studies projects that by the year 2015 people living in absolute poverty in Sub-Saharan Africa will increase by 25% from 315 million in 1999 to 404 million. Moreover, some studies estimate a decline in the importance of small farms in agricultural production and their contribution to the larger economy.

In contrast, several studies emphasized on the importance of agricultural development in eradicating extreme poverty and hunger in developing countries, especially in rural areas. These studies have shown that smallholder agriculture growth can eliminate rural poverty and this can be achieved through a balanced set of measures and priority should be put on

components to develop farmers' capacity to respond to new opportunities and thereby provide the foundations for a pathway out of poverty.

CHAPTER 3: DESCRIPTION OF THE STUDY AREA

3.1 Introduction

This chapter describes the selection of the study site where the research was conducted. It focuses on location, physical setting, socio-economic setting and agricultural production of the district and province under study.

3.2 Geographical location of the study area

Buffalo City is a municipality situated on the east coast of the Eastern Cape Province, South Africa, at the coordinates of 27.16 E, 33.19 S. It was established in 2000 after South Africa's re-organization of municipal boundaries, and it was named after the Buffalo River, at whose mouth lies the only river port in South Africa (Buffalo City Municipality Integrated Development Plan, 2009-2010).

This local municipality includes the following urban areas; East London, Bhisho and King William's Town, as well as the large townships of Mdantsane and Zwelitsha; and, it is part of the Amatole District Municipality (See Figure 3.1 below). This municipality also contains a wide band of rural areas on either side of the urban corridor and it covers an area of approximately 2 515km², with 68 km of coastline (Buffalo City Municipality Report, 2008).

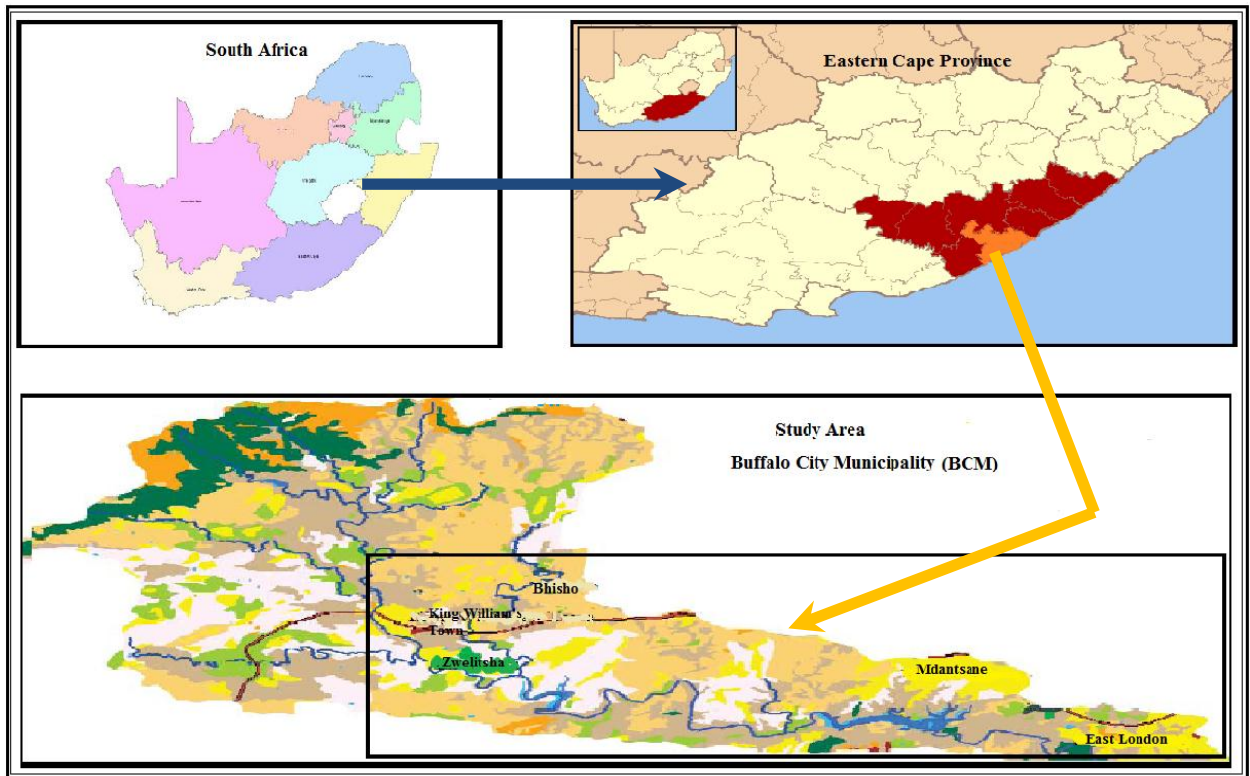


Figure 3. 1 : Location of the study Municipality

Source: Buffalo City Municipality Integrated Development plan, (2009-2010)

This local municipality includes East London, Bhisho and King William's Town, as well as

3.3 Population and population density

According to the community survey (CS) conducted by Statistics South Africa (2007), the population of Buffalo City Municipality (BCM) was estimated to be 724 312, of which females and males were estimated to be 370 191 and 354 115 respectively. The BCM population constituted 208 389 households resulting to an average of 4 persons per household (Stats SA, 2007). It is divided into 45 wards (Buffalo City Municipality Integrated Development Plan, 2009-2010).

As shown in Table 3.1 below, BCM has the highest population within the Amatole district (Buffalo City Municipality Integrated Development Plan, 2009-2010). This can be linked to the fact that BCM is one of the key economic hubs of the Eastern Cape Province and is the most important economy in the eastern part of the province. According to Buffalo City

Municipality (2010), BCM has the important functions, which are; Bhishe is the provincial administrative centre and contains the seat of the provincial government of the Eastern Cape Province, whilst East London is the dominant economic centre and King William's Town function as the eastern part of the province service centre.

Table 3. 1 : The Amatole district estimated population

The Amatole district estimated population and households in Census 2007		
Municipalities	Persons	Households
Buffalo City Local Municipality	724 312	208 389
Mbhashe Local Municipality	262 008	59 705
Mnquma Local Municipality	297 663	75 410
Great Kei Local Municipality	33 382	11 957
Ngqushwa Local Municipality	83 086	25 564
Nkonkobe Local Municipality	130 100	34 890
Nxuba Local Municipality	24 824	6 277

Source: SSACS (2008)

3.4 Climate

The BCM climate is warm and temperate. Temperatures are moderate in the coastal zone (8-39°C) with a warm mean annual value of 21°C. Inland temperatures vary between -2 and 42°C with a mean annual value of 18°C. The mainly summer rainfall in the Buffalo River catchment ranges from 400 to more than 1000mm per year with an annual mean value of about 850mm. Evaporation rates are 160-170mm per month in December and January, reducing to 70mm during June and July (Buffalo City Municipality Report, 2008).

3.5 Land cover and land-use

There are four biomes in the BCM which include grasslands, forest, savannah and thicket. The indigenous forest covers 7% of the total catchment area, while pine and blue gum plantations account for a further 4% (Buffalo City Municipality Report, 2008). According to Buffalo City IDP (2002), many indigenous species are used for *muti* (medicine) and traditional rites, for example, *umthathi* (sneezewood) and *umnquma* (forest olive). On the other hand, forest trees are used for firewood and structural timber. Almost 17% of the total catchment area is considered to be degraded thicket and grassland (Buffalo City IDP, 2002). Agriculture is widespread in the BCM, although subsistence farming predominates. Local areas of intensive irrigation provide fresh produce and other crops, and dry land cultivation is engaged mostly by subsistence farmers (Buffalo City Municipality Integrated Development Plan, 2009-2010).

3.6 Composition of rural and urban areas

BCM is the key urban centre of the eastern part of the Eastern Cape. It consists of a corridor of urban areas, stretching from the port city of East London to the east, through to Mdantsane where there is a wide range of economic activities (Buffalo City Municipality Report, 2008). East London is the primary node, whilst the King Williams Town (KWT) area is the secondary node. BCM also contains a wide band of rural areas on either side of the urban corridor where there is little economic activities. Approximately 10600 informal settlements of varying sizes exist in rural areas within the BCM jurisdiction (Buffalo City IDP, 2002).

BCM's land area is approximately 2515km², with 68km of coastline (Buffalo City Municipality Report, 2008). BCM is broadly characterized by three main identifiable land use patterns. The first is the dominant urban axis of East London, Mdantsane and KWT, which dominates the industrial and service sector centres and attracts people from throughout

the greater Amatole region in search of work and better access to urban services and facilities. The second is the area comprising the fringe peri-urban and rural settlement areas, which, whilst remaining under the influence of the urban axis, is distinct in character and land use patterns. These include the Newlands Settlements which previously fell within the former Ciskei Bantustans, and the Ncera Settlements located west of East London. Thirdly, the commercial farming areas form a distinctive type of area. These areas are dominant in the north-eastern and south-western (coastal) sectors of the municipality and are characterized by extensive land uses, with certain areas making use of intensive farming (irrigation-based) (Thorton & Feinstein, 2004).

3.7 Agriculture

According to Buffalo City Municipality Integrated Development Plan(2009-2010), agriculture within the BCM has the potential to become a significant contributor to urban as well as rural households' livelihoods. Ashley *et al.* (2001) suggested that agriculture is the engine of rural development especially in early development, because when agriculture prospers, farmers and farm laborers benefit, and so do those with careers upstream and downstream from farming. In the BCM region, the sector's potential contribution to the economy is probably ten times the existing situation (Buffalo City Municipality, 2010). Agricultural development in BCM is impeded by infrastructure backlogs, a weak local consumer market and high transportation costs to the major national markets.

According to the Buffalo City IDP (2002), opportunities for agricultural development within BCM include:

- a) Dairy
- b) Tunnel farming

- c) Essential oils
- d) Fat lamb production
- e) Strawberry production
- f) Timber production
- g) Hemp and paprika production
- h) Macademia nuts, and
- i) Agro-processing.

A significant amount of literature revealed that large-scale commercial enterprises can generally command the resources necessary to utilize land resources efficiently, and are better positioned to respond to changes in the markets (Banski, 2003; Delgado, 1999; Huvio *et al.*, 2004). But on the other hand, small-scale farmers in BCM face a variety of constraints (Buffalo City Municipality Integrated Development Plan, 2009-2010), such as:

- a) Shortage of draught animals and/or mechanical draught power;
- b) Shortage of arable land;
- c) Shortage of grazing land;
- d) Overstocking and land degradation;
- e) Decline in carrying capacities;
- f) Shortage of labor;
- g) Lack of capital for both agricultural inputs and services;
- h) Lack of access to financing, which might counter the lack of own capital;
- i) Insufficient access to markets for products and input suppliers;

- j) Lack of transport to markets;
- k) Problems of reliability in supply and quality of produce; and
- l) Poor roads.

Several studies suggest that socio-economic factors limiting or constraining smallholder farmers to become viable and productive farmers include lack of access to capital, inappropriate irrigation schemes, poor roads structure, technology adoption, loan repayments, and lack of non-farm incomes (Delgado, 1999; Ashley *et al.*, 2001). This implies that challenges faced by small scale famers in rural areas within BCM are not unique; however, these challenges are pertinent to BCM and serve as a barrier to agricultural development in BCM. Nonetheless, BCM constitutes a significant market for agricultural produce. King Williams Town and East London provide a potential market for many basic food crops that could be produced locally even by small-scale farmers and the principles of sustainability suggest that from many points of view, reliance on locally produced goods is the most appropriate. However, BCM cannot claim to be particularly sustainable because most of its food comes from the Free State or Western Cape Provinces. This sustainability can only be achieved with directed investments in institutional support and communication infrastructure that supports local farmers in obtaining inputs, advice and information, and in accessing markets and finance (Buffalo City Municipality Integrated Development Plan, 2009-2010).

3.8 Main economic activities

BCM is one of the key economic hubs of the Eastern Cape Province and is the strongest economy in the eastern part of the province. In 2004, it was estimated that BCM contributed 23% to the total GDP of the province and provided 19% of the province's formal employment opportunities (Buffalo City Municipality Integrated Development Plan, 2009-2010). Over time, the BCM economy has shifted from primary and secondary sectors to a growth of the tertiary sectors. The top three sub sectors of BCM's economy are finance and business services, manufacturing and government services and these are highlighted in Table 3.2 which details the percentage split between and within the sectors, with the primary sector contributing 0.9%, the secondary sector 23.5% and the tertiary contributing 75.6% to BCM's economy in 2004. Table 3.2 reflects the performance of the primary, secondary and tertiary sub sectors of the BCM.

Table 3. 2 : Performance of the Primary, Secondary & Tertiary Sub-sectors in BCM

Sub-sector	GDP 1995	GDP 2004 (current)	% of sector	% sector & sub- sector of BCM economy	Annual Average Growth 1995 – 2004		
					Buffalo City	Nine Cities	Nat
PRIMARY SECTOR				0.9			
Agriculture	134 666 605	175 295 584	90.5		-0.29%	1.90%	2.70%
Mining	11 614 810	18 363 832	9.5		0.21%	-0.20%	-0.40%
SECONDARY SECTOR				23.5			
Manufacturing	2 967 189 721	4 629 664 798	87.0		1.15%	2.30%	2.20%
Electricity & water	271 697 888	289 581 582	5.4		-1.70%	0.70%	1.00%
Construction	266 288 210	404 100 804	7.6		3.50%	3.40%	2.80%
TERTIARY SECTOR				75.6			
Trade	2 309 249 976	3 719 453 659	21.7		3.33%	4.70%	4.20%
Transport & communication	1 061 285 939	1 741 393 325	10.2		3.27%	6.70%	6.40%
Finance & business services	2 858 972 995	5 311 790 095	31.0		3.88%	5.60%	4.90%
Community, social & other personal services	1 285 019 162	2 296 951 318	13.4		3.49%	3.50%	3.40%
General government services	2 746 204 830	4 070 443 573	23.7		0.99%	-0.10%	0.20%

Source: Buffalo City Municipality, (2010).

The relative growth of the tertiary sector versus the primary and secondary sectors over the period 1995 to 2004 is graphically illustrated in Figure 3.2 below. This figure confirms the steadily growth of the tertiary sector in BCM relative to the stable and stagnant growth of the secondary and primary sector, respectively. According to Table 3.2, the primary sector (mainly agriculture) in BCM contributes less than 1% to BCM's economy. This may indicate that the rural areas in BCM have high unemployment rate and may be food insecure.

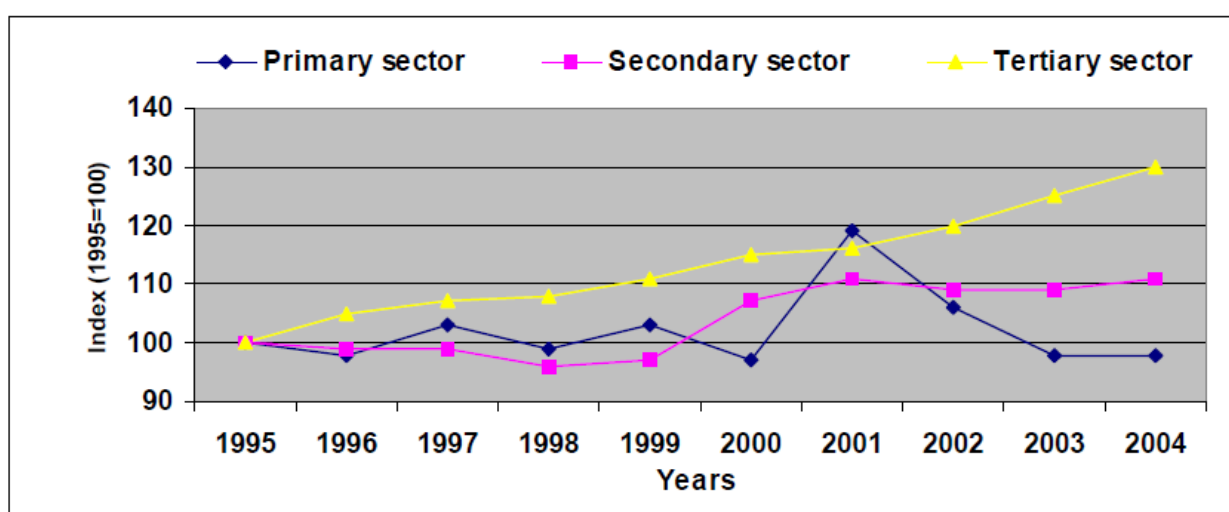


Figure 3. 2 : Growth of the Economy of Buffalo City, 1995 -2004
Source: Buffalo City Municipality, (2010)

The low contribution of the primary sector to the BCM's economy can be linked to the challenges faced by small scale farmers in rural areas such as shortage of arable land and labor, lack of capital for both agricultural inputs and services, insufficient access to markets for products and input suppliers, problems of reliability in supply and quality of produce.

3.9 Infrastructure

3.9.1 Road network

The road network is one of the key components of the transportation system. A large percentage of BCM's road infrastructure is old, rapidly deteriorating and in some cases past its functional life. Major rehabilitation is required to surface roads in the rural areas, where road infrastructure has had little maintenance; in addition, a large proportion of the roads in these areas is gravel and will over time, require surfacing (Buffalo City IDP, 2002).

3.8.2 Water services

Buffalo City has been designated as a Water Services Authority and has in place a Water Services Development Plan (Buffalo City Municipality, 2010). The BCM Water Resource System supplies water to the urban and rural areas. Water is sourced from the Bridle Drift (main source), Rooikrantz, Nahoon, Laing and Sandile dams and the Peddie Scheme.

The water resource system is complex and is made up primarily of surface water resources, with the limited groundwater resources suitable for only a few localised schemes. According to Buffalo City IDP (2002), rural areas have access to communal water supply to a radius of about 100 families and in a number of areas there are no sanitation facilities at all. This makes life difficult for rural households, especially smallholder farmers who use water at regular basis for irrigation.

3.9.3 Electricity

Both Eskom and Buffalo City supply electricity within the Buffalo City Municipal area. BCM supplies the former King Williams Town and East London areas, whilst Eskom supplies the remaining rural areas (Buffalo City IDP, 2002). The electricity network in

Buffalo City is currently in an unfavourable condition. This is as a result of budget constraints, which force the Electricity Department to cut down on the maintenance, upgrading and replacement of equipment. Consequently, there are frequent power outages and a poor quality of supply to electricity consumers. There are non-technical challenges which are currently a problem within the BCM such as illegal connections, theft of electricity and meter tampering; however, the installation of meters in strategic points will help identify areas with such problems (Buffalo City Municipality,2010).

3.9.4 Education

In King Williams Town, there are three technical colleges and two universities, Walter Sisulu University (WSU) satellite campus in Berlin and University of Fort Hare (The Bisho satellite Campus of the Fort Hare University in Alice). In East London, there are three universities: University of Fort Hare (The East London Campus of the Fort Hare University in Alice), WSU (The East London Campus) and University of South Africa (UNISA) satellite campus with main campus in Pretoria (Buffalo City IDP, 2002). Within the BCM, there are also other private colleges such as Strategic Community College, Lovedale PFET College, Academy of Learning, Damelin, Oxford College and Stanford Business College. There are no agricultural colleges within the BCM, which may speed up the process of rural development by recruiting and bringing the youth on board in agricultural activities and engage in community projects.

3.10 Tourism

Tourism is a fast growing industry in many parts of the world (Buffalo City IDP, 2002). South Africa has great potential for development of the tourism sector and, within this context, the Eastern Cape is seen as having a similar potential. King Williams Town and its surrounding region, however, have a very limited tourism sector to date; nevertheless, there is

certainly scope for expansion (Buffalo City Municipality Integrated Development Plan, 2009-2010). Visitors to the BCM comprise 95% domestic and 5% international, with the international component mainly being business and backpackers (SSACS, 2001). The existing tourism and potential for development include a wide variety of activities, structures and natural resources. The landscape of the BCM region varies from unexploited beaches via beautiful undulating hills and deep river valleys to mountains. The cultural heritage includes above all strong black cultures like the Xhosa culture as well as the colonial cultures with English and German influences (Buffalo City Municipality, 2010).

3.11 Natural environment

The BCM has an environment that is primarily pristine and wilderness in nature (e.g. coastal forests, estuaries) and as such is of great tourism potential (Buffalo City IDP, 2002). The undulating topography has contributed to the problem of remote areas being difficult and costly to develop, manage and maintain. Uncoordinated development and inappropriate land use planning has resulted in environmental degradation in the Buffalo City area. Of particular concern are issues such as deforestation, expansion of informal settlements, erosion, pollution of watercourses, increase in alien invasive vegetation, illegal dumping and inappropriate use of developed parks (Thorton, & Feinstein, 2004).

The clearing of natural vegetation has been associated with the proliferation of informal settlements, particularly over the last decade, as people have been drawn to urban areas in the hope of finding employment (Buffalo City Municipality Integrated Development Plan, 2009-2010). Deforestation and the encroachment into natural areas are occurring throughout Buffalo City Municipality (Buffalo City IDP, 2002). The collection of firewood and the removal of trees for use in dwelling construction have resulted in the rapid reduction in the size of natural vegetation areas. Illegal encroachment of settlements into municipal public

open space is also taking place in formal areas. Associated with the uncontrolled clearing of natural areas is the increase in erosion. Erosion is particularly prevalent within the peri-urban and rural areas of Buffalo City Municipality (Buffalo City IDP, 2002).

Watercourses in Buffalo City are massively polluted, particularly the Buffalo River. This is linked to the uncontrolled release of industrial effluents, pesticides, herbicides and a lack of access to sewerage facilities in rural and informal settlements (Buffalo City IDP, 2002). Another major problem is the lack of availability of land to establish or develop new rural and urban agricultural facilities (Buffalo City Municipality Integrated Development Plan, 2009-2010).

3.12 Conclusion

The study area is one of the leading economic hubs of the Eastern Cape Province and is the strongest economy in the eastern part of the province. The recent top three sub sectors of the BCM's economy are finance and business services, manufacturing and government services (See Table 3.2). Some opportunities exist for agricultural development; but the study area's agricultural potential contribution to the Gross Geographic Product (GGP) is postulated to be ten times the existing situation. The reason behind this assumption is that; agricultural development in this area is impeded by a number of factors which includes infrastructure backlogs, weak local consumer market and high transportation costs to the major national markets. Nonetheless, the study area constitutes a significant market for agricultural products; it provides a market for many basic food crops that could be produced locally even by small-scale farmers. There is a general lack of community gardens within BCM, and in particular within informal settlements. The development of community gardens could potentially reduce poverty, assist in alleviating malnutrition and AIDS related illnesses and create employment opportunities. Reliance on locally produced goods is the most appropriate;

however, the study area cannot claim to be economic sustainable because most of its food comes from the Free State or Western Cape Provinces.

CHAPTER4: METHODOLOGY

4.1 Introduction

This chapter highlights the methodological approaches and data gathering techniques that were used in this study. It also describes the sources and the type of data used in assessing the impact of small scale farming to rural livelihoods as a second economic development strategy.

4.2 Sustainable Livelihood Approach (SLA)

According to DFID (2001), the sustainable livelihood approach (SLA) was developed by the UK's Department for International Development. It is a holistic, asset-based framework for understanding poverty and the work of poverty reduction. The SLA was developed to help understand and analyze the livelihoods of the poor (DFID, 2001). It provides a way of thinking about the livelihoods of (poor) people, placing the components of household livelihood in a framework to understand their interaction and their relative importance within a particular setting (See Figure 4.1). It is also useful in assessing the effectiveness of existing efforts to reduce poverty.

The SLA has been used in several studies, on a wide range of published and unpublished sources by researchers concerned with poverty reduction, sustainability, and livelihood strategies (e.g. Carney *et al.*, 1998; Scoones, 1998). The National Agricultural Policy Centre (NAPC) and Ministry of Agriculture and Agrarian Reform in Syria, used SLA to explain and examine how different non-farm livelihood strategies impact a rural livelihoods in selected areas of Syria (Davis, 2003). The Overseas Development Institute (ODI) also used the SLA to

provide a checklist of constraints on livelihood success and identify the links between them, in a study to investigate rural livelihood diversity in developing countries.

This study also applied the SLA to explain and examine the impact of small scale farming to rural livelihoods, specifically the rural areas in Buffalo City Municipality. The main components of the sustainable livelihood framework are shown in Figure 4.1 and are summarized below.

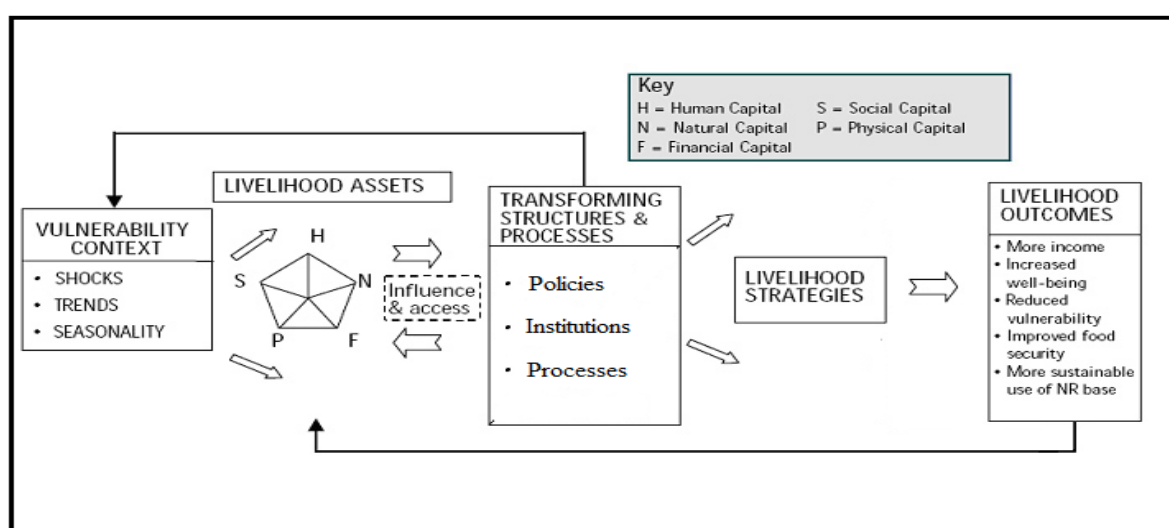


Figure 4. 1 : Sustainable Livelihoods Framework
Source: DFID, 2001

Vulnerability context: People's livelihoods are fundamentally affected by critical trends and changes (technology, population, environmental change etc.), shocks (floods, droughts, violence or civil unrest etc.) and seasonality that are the result of the external environment (DFID, 2001).

Livelihood assets: The SLA seeks to gain an accurate and realistic understanding of people's strengths (assets or capital endowments) and how they attempt to convert these into positive livelihood outcomes. The asset pentagon (human capital, natural capital, financial capital,

physical capital and social capital) lies at the core of the livelihoods framework, ‘within’ the vulnerability context (DFID, 2001).

Transforming structures and processes: The institutions, organizations, policies or legislation that govern people’s behaviour, lives, and opportunities are key parts of the livelihoods framework.

Livelihood strategies: The livelihood strategies area a combination of activities and choices that people make or undertake in order to achieve their livelihood goals (including productive activities, investment strategies, reproductive choices, etc.).

Livelihoods Outcome: Livelihood outcomes are important because they help us to understand the output of the current configuration of factors within the livelihoods framework (a first step to understanding the nature of causality), what motivates people to behave as they do, what their priorities are (as a basis for planning support activities), how they are likely to respond to new opportunities, and which performance indicators should be used to assess support activity (Scoones, 1998).

4.3 The poverty line and income per capita measurement

Households differ in size and make-up; and, straightforward comparison of household consumption is therefore not a sensible measure of wellbeing (SSACS, 2007). Therefore, it is standard practice to use some form of normalization. The simplest normalization is to divide household consumption by the number of people living in the household and then to compare households on the basis of per capita consumption. According to the Human Science Research Council (2004), more complex adjustments involve calculations of consumption per adult equivalent, where children are given a weight that reflects the proportion of household expenditure that is attributable to them. SSACS (2007) states that, the poverty line advocates

that expenses attributable to children and adults in poor households are of similar magnitude. This suggests that the additional complexity of adult equivalence calculations may be unnecessary.

When calculating national poverty lines as a statistical measure, the most common approach is to estimate the cost of a minimum basket of goods that would satisfy the necessary daily energy requirement per person over a period of a month (Human Science Research Council, 2004). Using the 2007 Income and Expenditure Survey data, Statistics South Africa has estimated that when consuming the kinds of foodstuff commonly available to low income South Africans, it costs R511 per person every month (in 2006 prices) to satisfy a daily energy requirement of 2261 kilocalories (Statistics South Africa, 2007).

In this study, R511 was updated using an average inflation rate of 15.7% over a period of 4 years (between 2007-2010). However, it is important to note that the study employed an absolute poverty line measure which assumes a fixed basket of goods, and, does not take into account the shift in the average standard of living in society. The updated poverty line for inflation used in the study for the year 2010 was R831. In other words, R831 was the amount necessary to purchase enough food to meet the basic daily food energy requirements for the average person over one month in 2010.

To measure household income per capita using the updated poverty line, all household members were converted into adult equivalents following an approach used by Statistics South Africa (2007).

$$Y/CAPITA = \frac{\text{Total HH Y}}{\text{HH Size}} \quad (1)$$

Where:

Y/CAPITA = Income per capita;

Total HH Y = Total household income; and

HH size = Household size

Households whose income per capita was R831/month or more were regarded as food secure or not poor; and those below R831 were regarded as food insecure households or poor. Hair *et al.*, (2002) asserts that, poverty level is a key measure in assessing livelihoods and based on income or consumption levels different procedures can be used to develop an absolute poverty line measure. According to SSACS (2007), an adequate level of nutrition can be expressed as a minimum food requirement, leading to a specific poverty measure defined by reference to household food consumption. But individual preferences and household needs vary, so there is no satisfactory way of aggregating measures of food security/poverty with complementary measures of other needs; such as shelter, energy or clothing. A poverty line is therefore typically constructed as a measure of income adequacy, expressed in money terms. It comprises an aggregate cost of a minimum basket of goods, and therefore indicates a required level of household expenditure, but not the actual composition of individual household consumption (Hair *et al.*, 2002).

In this study, income per capita was used to measure the poverty line and also used as a proxy for food security to measure poverty levels in the study area; where households with household income above the poverty line were considered to be food secure. On the other

hand households with household income below the poverty line were considered to be food insecure.

4.4 Research design

This section describes the research design used in gathering and analyzing data and aims to explain how the study was conducted using research tools. According to Gujarati (1992), the research design refers to the researcher's general plan for obtaining answers to the research questions and testing the research hypotheses. It also describes the data collection methods and the tools that were used for collecting data. This section goes on to present the collected data collected on the variables used in the study; and explains the analytical and empirical frameworks. The section also outlines the data processing tools and model and a justification why the model has been chosen.

4.4.1 Unit of analysis and sampling frame

The main focus of the study is to gain an understanding of the role played by small scale farming in combating food insecurity in rural areas and assess the scope of its contribution to rural economic development in terms of generating employment and income for rural households.

The selected households as the unit of analysis were divided into two groups: the first group were farming households (households who are cultivating land or raising livestock) and the second were non-farming households (households who are not cultivating land or raising livestock). The logic behind selecting two different groups (farmers and non-farmers) in this study was to compare the impact of smallholder farming on rural livelihoods as opposed to non-agricultural activities' impact on rural livelihoods.

4.4.2 Sampling procedure

According to Bless and Smith (2000), data acquired from the total population is more reliable and advantageous, when weighed against sample data. The data acquired from the total population is advantageous merely because it reflects all the characteristics of the unit of the study. However, due to limiting factors (time and financial resources); only 120 respondents were interviewed for this study.

Stratified random sampling method was used to group respondents into two strata, farming households and non-farming households. The respondents were divided into relatively homogeneous subgroups (farmers and non-farmers) before simple random sampling was used to pick respondents for interviewing, presuming that the target population was homogeneous and the individuals interviewed were similar to the overall defined target population with regard to the characteristics being studied (Hair, *et al.*, 2002).

4.4.3 Sample size

The studied population was contracted to a narrow band of rural areas of the Buffalo City Municipality due to inadequate resource accessibility. Questionnaires were administered in three different villages in the BCM (Mdingi village, Tyutyu village and Tyusha village) as shown in Table 4.1. These villages are located within the wide band of rural areas alongside the urban corridor of King Williams' Town. A total of 120 questionnaires were administered to farmers and non-farmers. Over-all, a number of 60 questionnaires were administered to each group.

Table 4. 1 : Distribution of respondents by district

Village	Approximate No. of HH	Interviewed Farming HH	Interviewed Non-Farmers HH	Total	Percentage %
Mdingi	100	20	20	40	40
Tyutyu	100	20	20	40	40
Tyusha	130	20	20	40	30.8
Total	330	60	60	120	

Source: Survey (2011)

The number of household approximation in Mdingi and Tutyu village was the same (both had 100 households). Tyusha village had more 30 households as compared to the other villages. According to Audit Sampling (2001), when performing testing of populations of fewer than 200 items (between 100 and 199), generally the minimum items to examined is 20 items. In reference to the Audit Sampling (2001) and based on limited resources, a homogeneous number of participants or respondents in terms of household activity per village were chosen. Table 4.1 shows that 40 respondents were selected from each participating village for interviewing (20 farmers and 20 non-farmers per village), both farmers and non-farmers had 60 respondents as the units of the sample.

4.4.4 Interviewing procedure

Interviews were carried out by the researcher and trained enumerators who were recruited from the University of Fort Hare. The purpose of the study was explained to the enumerators and the data needs were clarified. Knowing what was required for the study; ideas were shared on how to approach the respondents in the various villages of BCM. The study objectives and questionnaires were also discussed and explained to the sampled farmers and non-farmers. All this was done, so that enumerators could institute a liaison with the participants and also encourage them to cooperate and provide honest and unbiased answers.

4.4.5 Criteria set for a respondent to be included in the sample

For the respondent to be included in the survey for this study, the following attributes were considered. The respondents should be:

- Resident of BCM's rural areas;
- In the case of farmers, actively involved in farming (cultivating land or raising livestock);
- In the case of non-farmers, not actively involved in farming; and
- Willingness to take part in the research.

4.4.6 Collected data and instruments

Both primary and secondary data were collected to acquire information on the impact of small scale farming on rural livelihoods. The household questionnaires were used to collect data, and designed in accordance with the SLA, by adopting the components of livelihood portfolios and pathways identified or recognised by the SLA. The data that was collected focused on the following topics:

- 1) Household general information aiming at identifying the household demographic characteristics, structure, gender distribution, occupations of household members etc.
- 2) Information on households' assets endowments, namely:
 - Natural assets which include three important items: land, water and forest.
 - Human assets which include education, knowledge and skills.

- Physical assets, which include public and private basic infrastructure (transportation including roads, secure buildings; water supply and sanitation,) as well as tools and technology (equipment for production, traditional technology).
 - Financial assets, including all financial resources people use to achieve their livelihood objectives.
 - Social assets, which refer to social relationships such as networks.
- 3) Household strategies (activities) and motivations indicating the households' participation in agricultural and different activities non-agricultural activities.
 - 4) Household income resources describing the main sources, and the distribution and share of household income sources into agricultural and non-agricultural categories.

The questionnaires were administered in person in order to eliminate the problem of misinterpretations or misunderstandings of words and questions and to avoid the problem of respondents omitting complicated questions. One of the best advantages of interviewer-administered questionnaires is that they can be administered to respondents who cannot read or write (Bless & Smith, 2000). The questionnaires encompassed both closed and open-ended questions, in order to extract as much information as possible from the respondents without taking too much of their time.

The data was collected in November 2010 according to the following steps:

- 1) Direct observation through field visits,
- 2) Interviews with key informants (Traditional leaders and councillors) &

- 3) Interviews with farmers and non farmers.

4.5 Methods of data analysis

The collected survey data was coded and analyzed using Statistical Package for Social Sciences (SPSS) Version 19.0. The study employed Descriptive, Binary Logistics and Gini Coefficient Decomposition model to analyze the collected survey data. For the descriptive model, the main indicators that were used for this study were frequencies and mean values, because they are useful in analyzing household characteristics and the relationship between variables. Binary Logistic model was used to assess the impact of small scale farming to rural livelihoods in this study. Income per capita was the dependent variable of the Binary Logistic model employed to measure the poverty line. Income per capita was also used as a proxy for food security to identify the links between rural household livelihood's socio economic dynamic forces (Age, gender, household size, access to land, choice of economic activity etc.) and food security. The Gini Coefficient model was used to measure the contribution of different sources of income to overall inequality.

4.5.1 Descriptive statistics

According to Bless and Smith (2000), descriptive statistics is the discipline of quantitatively describing the main features of collection of data. It is distinguished from inferential statistics (or inductive statistics), in that descriptive statistics aim to summarize a data set. Descriptive statistics was computed to describe the major farm and non-farm household characteristics within the study area for the following major parameters: household characteristics (age, sex, education, land ownership etc.) and broad farm running parameters (labor, technical skills, market accesses etc.). According to Trochim (2006), it is noted that other factors such as ownership of land, education of the household head and household size are important in the

determination of household welfare. Community characteristics such as access to electricity, markets and infrastructure in general play a very important role in the welfare of agricultural households

Table 4. 2 : Description of estimated variables

Variable	Description
Age of the HH head	Was measured by years of HH head.
Sex of the HH head	Was determined by whether the HH is headed by a male or female, in order to find out if sex has an influence in HH livelihoods.
Marital status of the HH head	Was determined by whether the HH head was single, married, separated, divorced or widowed, in order to discover if marital status has an influence in HH livelihoods.
Education of the HH head	Was measured by years per educational level: 1 – No formal education (0 year), 2 – primary school (2-6 years), 3– secondary school (8-12years), 4 –Tertiary (12 > years).
Farmer	Household which is cultivating land or raising livestock
Non Farmer	Household which does not cultivate land and does not raise livestock
Employment of HH head	Was determined by whether the HH head was formally employed, unemployed, self employed or full time farmer
HH size	Was measured by the number of HH members. The equivalence of scale used to give household units where: 1-Adults (male and female), 0.5-Children.

Members of the HH who are unemployed	Was measured by the number of the HH members above the age of age 21 years who are still depending on the HH head.
Land	Was measured in hectares, to determine the influence of access to land and its size to HH livelihoods.
Farm Income	Was determined by the sum of all receipts from farming activities such as, sales of crops, livestock, farm related goods and the value of home consumption
Wage Income	Was measured by the sum of all means of remuneration, earnings and allowances payable to an employee in respect of work done.
Self-Employment	An individual who works for himself or herself instead of working for an employer that pays a salary or wage.
Remittances	Was measured by the sum of personal transfers (cash or in kind) received by a resident household from other non-resident household.
Old Pension	Government grant paid to people who are 60 years and older.

Source: Survey (2011)

4.5.2 Gini Coefficient Decomposition

For the determination of the contribution of each source to income distribution, the study employed the Gini Coefficient (GC) model. This model has been used in several studies. Omilola (2009) used this model to investigate rural non-farm income and inequality in Nigeria; this study adopted this model. STATA was used to analyze the collected survey data. The GC model was very useful in measuring the contribution of different sources of income

to overall inequality. The overall income was broken down into four income sources, including agricultural income, wage income, self-employment and unearned income.

Geometrically, it is based on the Lorenz Curve concept (Figure: 4.1) and equals to Area A divided by Area A plus B as shown in the figure below. Therefore, GC is a number which can take a value between zero and one, and the higher its value, the more the inequality in relevant population (Adams & He, 1995)

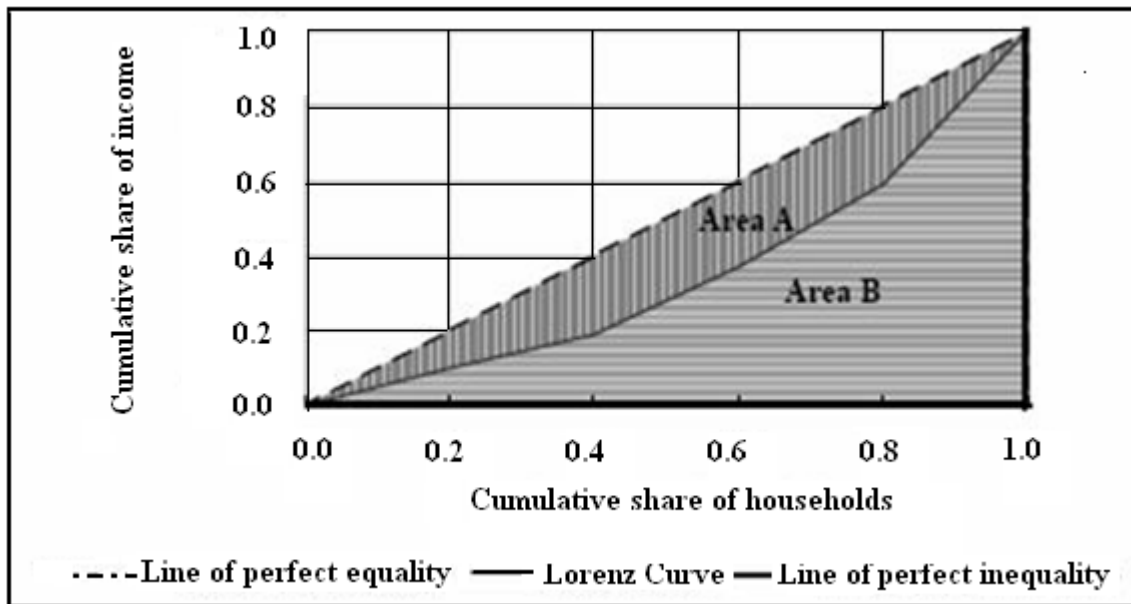


Figure 4. 2 : Lorenz Curve

Source: Adams & He, 1995

The GC can be computed algebraically. The approach is very useful in so far as it makes possible a decomposition of the GC aiming at studying the contribution to overall income inequality of different sources of income (Adams & He, 1995).

According to Pyatt *et al.*(1980),the GC of total income is equal to

$$G = \frac{2}{n\mu} \text{cov}(y, r) \quad (2)$$

Where n is the number of sample observations, μ is the mean of total income, y is the total income, and r is the descending ranking of the total income. Accordingly, the GC of the i^{th} source of income, G_i , can be calculated as follows: (Pyatt *et al.*, 1980).

$$G_i = \frac{2}{n\mu_i} \text{cov}(y_i, r_i) \quad (3)$$

Where: μ_i is the mean of the i^{th} source of income, y_i refers to the series of income from the i^{th} source, and r_i is the descending corresponding ranks. Since total income is the sum of source incomes ($y = \sum y_i$), the covariance between total income and its rank can be written as the sum of co-variances between each source of income and rank of total income. From equations (2) and (3), we can conclude with the following equation that computes the GC of total income based on the GC of each income source: (Pyatt *et al.*, 1980).

$$G = \sum \frac{\mu_i}{\mu} R_i G_i \quad (4)$$

Where: R_i is the correlation ratio that can be expressed as follows: (Pyatt *et al.*, 1980).

$$R_i = \frac{\text{cov}(y_i, r)}{\text{cov}(y_i, r_i)} \quad (5)$$

From equation (4),

$$w_i = \frac{\mu_i}{\mu} \quad (6)$$

Where: w_i is the weight of the i^{th} source in overall income (Pyatt *et al.*, 1980).

In addition,

$$g_i = R_i \frac{G_i}{G} \quad (7)$$

Where: g_i is the relative concentration coefficient of the i^{th} source in overall inequality. That can be computed as (Pyatt *et al.*, 1980).

$$g_i = p_i \frac{\sigma_i / \mu_i}{\sigma / \mu} \quad (8)$$

Where, p_i is the correlation coefficient between the i^{th} source and total income, and σ_i and σ are the standard deviation of the i^{th} source and total income, respectively.

Based on the above equations the contribution of each income source inequality to overall income inequality can be expressed as follows: (Pyatt *et al.*, 1980).

$$\frac{G}{G_i} = 1 = \sum w_i g_i \quad (9)$$

Where, $w_i g_i$ is the factor inequality weight of the i^{th} source in overall inequality. The i^{th} income source is inequality-increasing or inequality-decreasing according to whether g_i is greater than or less than unity. That is, any additional share of income from i^{th} source leads to an increase or decrease in overall income inequality.

The study used this model to answer the determinants of the contribution of each source to income distribution. The model incorporates a more detailed share of data, captures inequality starting from the base and moving across the entire distribution (Adams & He,

1995). It satisfies almost all of the criteria for measuring inequality, and has attractive properties that can inform policy analysis (Pyatt *et al.*, 1980). Other advantages of the Gini Coefficient include its clarity and its ability to offer an easily interpretable picture of inequality, largely because the Gini Coefficient can easily be derived from the Lorenz curve (Adams & He, 1995).

4.5.3 Binary Logistic Regression Model

As defined in chapter one, drawing from Chambers and Conway (1991), the term livelihoods was defined as combination of capabilities, assets (including both material and social resources) and activities required for a means of living. Within the SLA, there are five key livelihood elements that can be recognized. According to Chambers and Conway (1991), each element relates to a wider literature with established ways of assessing livelihood outcomes. According to Hair *et al.*, (2002), the poverty level is a key criterion in the assessment of livelihoods and various measures can be used to develop an absolute poverty line measure based on income or consumption levels. In the case of this study, to assess rural livelihoods income per capita was used to measure household poverty levels, as a result of their engagement into small scale farming and other rural non-agricultural income earning activities (See Chapter 4, Section 4.3).

The binary logistic regression model was used to uncover the correlates of the household income for different rural groups (farmers and non-farmers); in terms of the connections between per capita income and its deconstruction on the basis of different income sources, the ownership of social and wealth assets, and how this relation can vary depending on poverty status. This model has been widely applied in several studies across the world. For example Mukarumbwa (2009), conducted a study where he investigated potential of sorghum and finger millet to enhance household food security in Zimbabwe's semi-arid regions: The

binary logistic regression model can be used to predict a dependent variable on the basis of continuous and/or categorical independent variables. It is aimed at finding a linear relationship between the dependent variable and multiple independent variables (Gujarati, 1992).

Using stratified systematic sampling technique based on household income per capita status of respondents, two homogeneous mutually exclusive strata were created (**stratum “A”** - low income/food insecure – rural poor group: n = 91 and **stratum “B”** high income/food secure – rural non-poor group: n = 29) for independent analysis. The binary logistic regression model was therefore used to estimate socio-economic factors capable of influencing household income per capita. Thus far, household income per capita status of respondents was taken as the dependent variable. It is important to note that income per capita status was used as a proxy for food security status in the model. This implies that households with income above the poverty line were considered to be food secure; on the other hand households with income below the poverty line were considered to be food insecure (See Chapter 4, Section 4.3).

Microsoft Excel was used for data entry and cleaning. SPSS version 19.0 was used for the econometric analysis. The dependent variable was dichotomized with a value of 1 if the respondent was classified in the rural non-poor category (high income/food secure) and 0 if classified in the rural poor group (low income/food insecure). Effectively, eleven predictor socio-economic independent variables were regressed against the binary dependent variable of income per capita status of households.

According to Gujarati (1992), the binary logistic regression model is as follows:

$$g(x) = \ln \left(\frac{P(y=1|x)}{1-P(y=1|x)} \right) = \alpha + \beta_1 X_1 + \dots + \beta_n X_n \dots \dots \dots (10)$$

Where:

P = the predicted probability of high income,

$1 - P$ = the predicted probability of low income,

α = the constant of the equation,

β = the coefficient of predictor variables and

X = the predictor variables.

According to Hosmer and Lemeshow (2000), the logit $g(x)$ is linear in its parameters, may be continuous, and may range from $-\infty$ to $+\infty$, depending on the range of x . The independent variables in equation one represents the following variables in the model (See, Table 4.2):

X_1 = Gender

X_2 = Marital Status

X_3 = Age

X_4 = Education Level

X_5 = House Hold Size

X_6 = Farm Income

X_7 = Self Employment

X_8 = Wage Income

X_9 = Remittances

X_{10} = Old pensions

X_{11} = Child Grants

The variables included in the empirical Binary Logistic model are as shown in Table 4.3 below.

Table 4.3 : Description of the Variables Specified in the Ordinary Least of Squares Model

<i>Variable</i>	<i>Description</i>	<i>Type of measure</i>	<i>Expected Sign</i>
Dependent variable			
Y_i	Income per Capita (Food security)	Dummy (1=high income, 0 = low income)	
Explanatory variables			
X_1	Gender	0 = male; 1= female	+/-
X_2	Marital status	0 = married; 1 = not married	+/-
X_3	Age	Actual number of years	+/-
X_4	Education	Actual number of years of schooling	+
X_5	House hold size	Number of HH members	+
X_6	Farm income	Actual annual farm income	+
X_7	Self employment	Actual annual self-employment income	+
X_8	Wage income	Actual annual wage income	+

X_9	Remittances	Actual annual remittances	+
X_{10}	Old pensions	Actual annual old pension income	+
X_{11}	Child grants	Actual annual child grants income	

4.5.4 Justification of the econometric model

The use of the logistic regression model was chosen because of the nature of the dependent variables, which is dichotomous. Gujarati (1992), explained that the logistic regression model is the best fitting model to describe the relationship between an outcome (dependent or response) variable and a set of independent (predictor or explanatory) variables where the dependent variable is dichotomous.

According to Hosmer and Lemeshow (2000), there are many different methods that have been proposed for use in the analysis of dichotomous outcome variable. Regardless of that, Hosmer and Lemeshow (2000) pointed out two major reasons for using the logistic regression model in analyzing dichotomous dependent variable. The first is that mathematically it is an extremely flexible model and easy to use. Secondly, it lends itself to a clinically meaningful interpretation. The logit model was chosen because of its mathematical simplicity compared with other models and because it gives fewer classification errors (Gujarati, 1992).

Using data from relevant independent variables, logistic regression model was used to identify significant socio-economic factors capable of influencing household income per capita. Therefore, household income per capita status of respondents was taken as the dependent variable, which was used as a proxy for food security status in the model (See

Chapter 4, Section 4.4.4). This means that in this study food security was measured using income per capita. Whereby, households with income higher than the poverty line were regarded as food secure; on the other hand households with income lower than the poverty line were considered to be food insecure (See Chapter 4, Section 4.3).

4.6 Summary

This chapter outlined the methods that were used to collect and analyze data in this study. Data was collected from three villages of Buffalo City Municipality in the Eastern Cape Province from a sample of 120 respondents. Stratified and random sampling approaches were used to select respondents for interviews. A questionnaire was administered to the respondents through face-to-face interviews. For testing the relationship, the Ordinary Least of Squares and the Gini Coefficient model was used. The results of the study are presented in the subsequent chapters.

CHAPTER 5: CHARACTERISTICS OF THE STUDY POPULATION AND DISCUSSION

5.0 Introduction

This chapter presents the research results emanating from the field survey that was carried out in three rural areas of Buffalo City Municipality. The aim of this chapter is to highlight the various factors affecting rural livelihoods in the context of the Eastern Cape Province. This chapter begins with explaining the demographic characteristics of the sampled households. Finally, a comparison of income sources between rural households who are farmers and those who are non-farmers is undertaken.

5.1. Demographic characteristics of sampled households

Household head's aspects such as gender, age, marital status, educational levels etc. are very important because they are most likely to influence the decisions and activities of the household head (Randela, 2005; Makhura, 2001). As such, it is very important for this study to consider these household head aspects in analyzing the potential impact of small scale farming to rural livelihoods.

The study sample consisted of 120 households; of which 50% of these were non-farmers and the other 50% were famers (See Table 4.1). Household size represents the total number of family members. The average household size for rural households who were non-farmers was 4.9 and for farmers was 5.5. According to Nhundu (2010), citing Parikh *et al.*,(1995), a larger family size means that a diversity of labour competence is available in the form of children, youngsters, adults and elderly members. As a result, the combination of balanced household labour force can be an advantage to those households who strive to engage their labour to

farming and ultimately achieve food security. However, in the case of this study it is not clear whether family size had an impact in the choice of household economic portfolio, because of the slight difference between farmer and non-farmers family size.

5.1.1 Gender of household head

Gender of household head is significant as it influences the capacity of the household to source income and access assets such as land and capital that have a direct bearing on agricultural productivity (World Development Report, 2008).

An analysis on the gender of household head was carried out for the interviewed farmers and non-farmers the results are as shown in Table 5.1 below. Table 5.1 shows that out of 60 farmers that were interviewed 23 were male headed and 37 were female headed and from 60 non-farmers interviewed, 29 were male headed and 31 were female headed. Table 5.1 shows that on average both categories had females dominating as household heads.

Table 5. 1 : Gender distribution of respondents by household activity

<i>Household Head</i>	<i>Farmers</i>		<i>Non-farmers</i>	
	Number	Percentage(%)	Number	Percentage (%)
Male	23	39.3	29	48.3
Female	37	60.7	31	56.7
TOTAL	60	100	60	100

Source: Survey (2011)

According to Nhundu (2010), citing Mushunje (2005), households in rural areas are headed by females due to male migration to urban areas. This could be explained by the fact that males could be engaged in work elsewhere, other than farming. According to World

Development Report (2008), one of the reasons leading males to seek employment elsewhere other than farming, is the nature of agricultural upshots for example, seasonality and production risks.

5.1.3 Age of household head

Age is a very important factor to individual's choices and decision make up because the way in which an individual thinks is closely related to the number of years an individual has lived (Maxwell *et al.*, 2001). This makes the age of the household head a very important aspect in determining household activities. Table 5.2 below summarizes both the age distribution of respondents who were farmers and those who were non-farmers. The overall average age of respondents was 59 and the median was 64. The dominant age range of the interviewed respondents was between 60-69 years for both farmers and non-farmers, which constituted 49 individuals and which is about 41% of the overall respondents for both categories (farmers and non-farmers). There was no household head below the age of 40 years. The youngest respondent was 40 years old. In line with the findings of this study Bansi's (2003) highlights that young people across Africa are moving out of rural areas to urban areas in search of better opportunities because most African rural areas have little economic activities. As a result there is high unemployment rate and households are vulnerable to being poor. This implies that young people living in rural areas are neither interested in farming nor non-farm rural activities.

Table 5. 2 : Age distribution of household heads

Characteristic	Mean	Median	Std. Deviation	Minimum	Maximum
Age	58.50	64.00	11.372	40	77
Age range	Farmers		Non-farmers		
	Number	Percentage (%)	Number	Percentage (%)	Total (%)
40-49	18	29.5	19	31.7	30.8
50-59	9	14.8	12	20	17.5
60-69	23	37.7	26	43.3	40.8
70-79	10	16.4	3	5	10.9
TOTAL	60	100	60	100	100

Source: Survey (2011)

Generally the youth that leaves to urban areas are those who have the capacity to match the requirements of the labor market, leaving behind in rural areas those that are less competent or have little capacity to match up the requirements of today's labor market. The migration of young people from rural areas leaves rural communities with a dark cloud of an upward trend of unemployment. Firstly, this is exacerbated by the accumulation of unskilled labor as the most skilled labor migrates to urban areas. Secondly, the closure and failure to develop non-agricultural economic activities in rural areas to encourage new employment opportunities that will cut into the unemployment figures and take up some of the slack when it comes to the excessive number of hands on farms (Banski, 2003).

5.1.4 Household size

According to Delgado (1999) households with larger family size are more likely to become successful as the household because they have more labour to work on the farm. This means that large family size is advantageous, because it means that a variety of labor capacity is available in the form of young, middle aged and elderly members. However, Paddy (2003) brings into light that large family size puts pressure on consumption than the labor it contributes to agricultural production. An analysis of household size was carried out for the interviewed farmers and non-farmers, and the results are as shown in Table 5.3 below.

Table 5. 3 : Household sizes

<i>Household head</i>	<i>Variable</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>Std. Deviation</i>
Farmers	Household size	3	9	5.53	1.321
Non-farmers	Household size	2	8	4.89	1.508

Source: Survey (2011)

The average household size for respondents who were farmers and non-farmers were 5.5 and 4.9 respectively. The minimum and maximum household sizes for farmers and non farmers were (3 and 9) and (2 and 8) respectively. There was a very small difference between the average household size of farmers and non-farmers; this means that household size may not be a factor to household head's decision make up on whether to engage its labor to farm or non-farm activities. Nonetheless, it can be inferred that most of the households had enough labor to produce because the average household size was about 5 people per household for both categories.

5.1.5 Educational level of household head

According to the World Development Bank (2008), education of the household head often influences the household economic activity choices. This is attributed to the fact that household heads with more years of schooling would be expected to seek non-farm employment because of the perceived non-farm sector economic rewards. Figure 5.1 summarizes the educational levels of household heads in the study area.

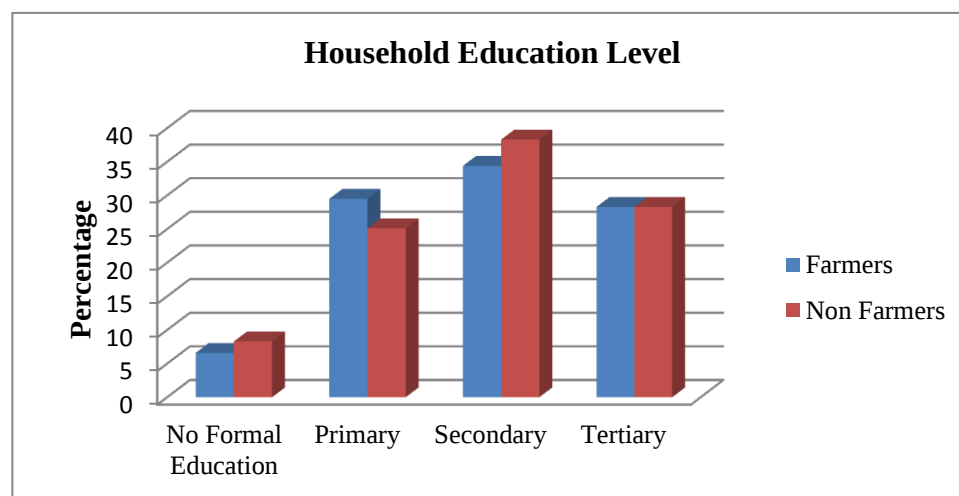


Figure 5. 1: Educational level of household head

Household heads who had no education were about 6.6% and 8.3% for farmers and non-farmers respectively. The percentage for farmers who had primary education was 27.5% and for non-farmers it was 25%. The bulk of the sampled respondents constituted household with secondary education which had an overall percentage of 36.6% for non-farmers and for farmers it was below 35%. Both farmers and non-farmers who had tertiary education were more than 25% in each group. However, these findings contrast an argument put forward by World Development Bank (2008) that households with more years of schooling would be expected to seek non-farm employment because of its economic rewards. The findings suggest that education was not a factor to household head choices of economic portfolio,

because there was an insignificant difference in education levels between the two groups (farmers and non-farmers).

5.1.6 Employment status of household head

In many regions across the developing world agriculture has become a relatively small production sector because most rural households have diverse and geographically dispersed portfolios of income sources (Ellis & Harris, 2004). This brings uncertainty in viewing agriculture as an undisputed lead for rural growth. Figure 5.2 below reveals that more than 40% farmers were pensioners and only 11% and 8% farmers received non-farm income in the form of self employment and employment respectively.

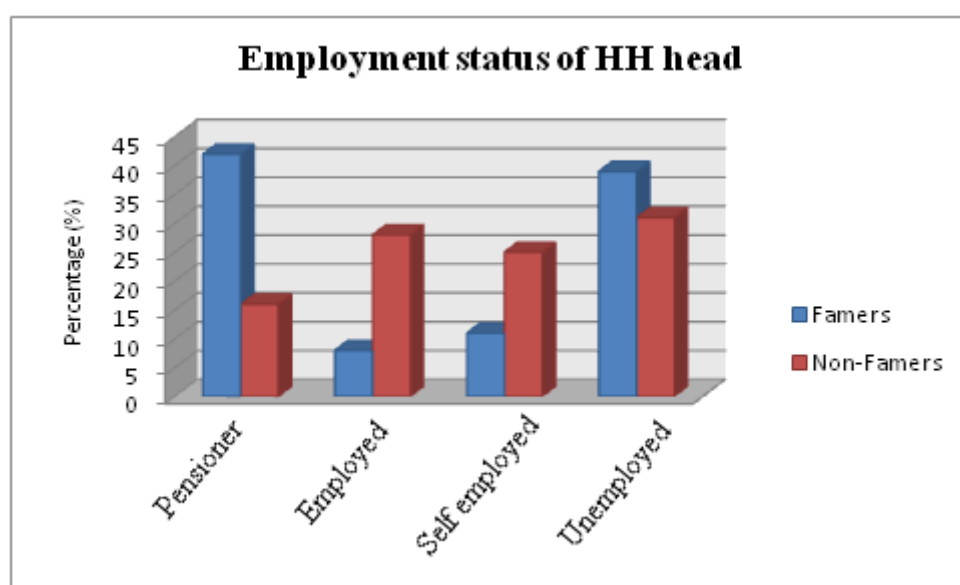


Figure 5. 2 : Employment status of household head

Close to 40% farmers were unemployed; however, it is not precise to conclude that those farmers were solely dependent on agriculture for their livelihoods because there are other transfers of income sources which include income derived from sources other than employment, such as remittances, aid and donations. In line with this study, the Kenya

Central Bureau of Statistics (1977) stated that most African smallholder farmers have not been able to find pathways out of poverty despite income diversification strategies. Income diversification sources cushion households from the risk of chronic or transitory food insecurity. This may imply that farm income cannot solely sustain rural livelihoods; it needs to be supplemented by non-farm income.

In contrast, non-farmers exhibited 28% (employed), 25% (self employed) and 16% (pensioners). Matshe and Young (2004) discovered that contrary to the ideal image of rural households as pure farmers, rural households rely on many activities and income sources. Besides farming, they participate in agricultural labor markets, in self employment or wage employment in the rural nonfarm economy, and they might receive transfers from household members who have migrated.

5.2 Poverty Status of Respondents

Considering the need to understand the contribution of small scale farming to rural livelihoods, a classification of surveyed households into poor and non-poor households was performed. As explained in Chapter 4, Section 4.3.

5.2.1 Poverty status of household

As explained in Chapter 4, Section 4.3 the updated poverty line for inflation used in the study for year 2010 was R831. In other words, R831 was the amount necessary to purchase enough food to meet the basic daily food energy requirements for the average person over one month in 2010.

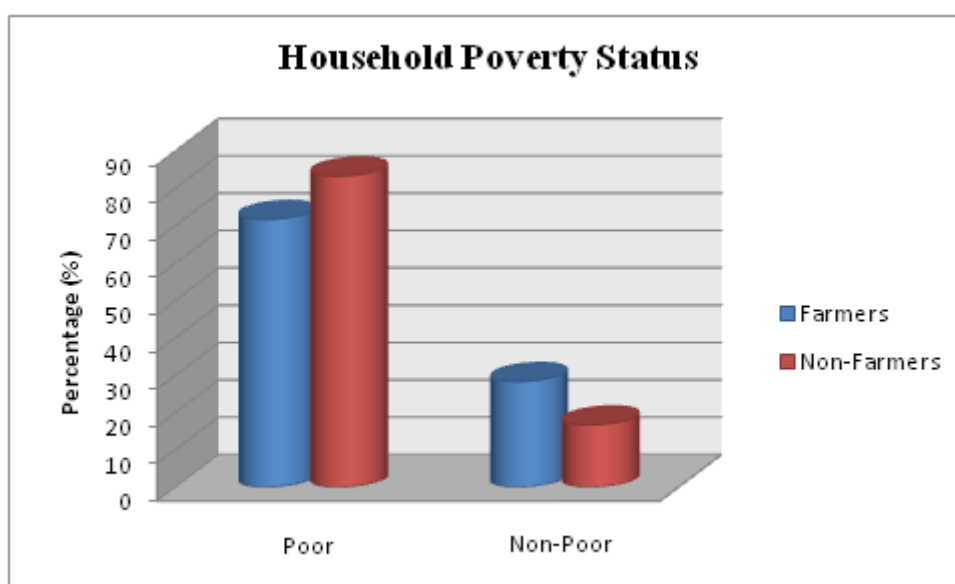


Figure 5. 3 : Distribution of respondents by poverty status

Figure 5.3 above summarizes the results of poverty status per household. About 71.7% farmers fell below the poverty line and 83.3% non-farmers fell below the poverty line. On the other hand only 28.3% households who were farmers and 16.7% households who were non-farmers were above the poverty line. It is very important to mention that some of the households who fell below the poverty line earned more income than some households who were above the poverty line. The reason for this is that household size played a pivotal role in determining income per capita. Table 5.4 below shows the relationship between household size and income per capita.

Table 5. 4: Association between Household size and Income per capita

Variable	Chi-Square	Probability
Household size and Income per capita	4.74	.029*

Significant at 5% significant level

The relationship between household size and income per capita was significant at 5% significant level because the probability that a change in household size will cause significant inverse change to income per capita was 0.029 which is smaller than 0.05. This is in agreement with the previous studies, like Matshe and Young, (2004) who explained that, an increase in family size reduces family income given the fact that more funds should be used to feed, clothe and educate a larger household number.

5.3 Household assets

In the sustainable livelihood approach, the resource set of a household includes five asset types: natural, human, physical, financial and social. To better understand the livelihood strategies and potential opportunities for rural households in rural areas of the Buffalo City Municipality, this study assessed the accessibility, quantity and distribution of these assets. In this section, surveyed household assets are presented per household category (poor and non-poor) for the two study groups (farmers and non-farmers).

5.3.1 Natural assets

Natural assets are naturally occurring assets that provide use benefits through the provision of raw materials and energy used in economic activity and that are subject primarily to quantitative depletion through human use. Natural assets cover three important items which include land, water and forest (DFID, 2001), and all three have been assessed in terms of quantity, accessibility and distribution among households.

Table 5.5 shows that households who were farmers had better access to land other than residential sites in terms of quantity.

Table 5. 5 : Natural assets: Farmers vs. Non-farmers

Natural Assets	Farmers		Non-farmers	
	Poor	Non-poor	Poor	Non-poor
No. of households	43	17	50	10
No. of land owners	14	23	7	14
Access to land other than residential site (% of surveyed households who manage land)				
Communal ownership	63	82	28	71
Rent tenure	46	11	---	---
Redistributed land	---	7	---	---
Access to irrigation water (% of surveyed households)				
Rivers and Dams	96.4	84.2	---	---
	2.1	32.5	---	---

These results suggests that non-poor farmers in the study area, except for rented land and access to dams and rivers, had more access to arable land, in terms of quantity, and benefit significantly higher access to irrigation water from public networks. In the case of non-farmers, the poor have more access to arable land, even though they did not use the land for farming. This implies that access to land did not influence household choice of economic portfolios in the study area.

5.3.2 Physical assets

Physical assets include public and private basic infrastructure (vehicles, secure shelter, water supply and energy), tools and technology (equipment for production, traditional technology) households possess to support their livelihoods (DFID, 2001). Table 5.6 below reports results

grouped into three topics: water and energy availability, transportation availability and agricultural equipment availability.

Table 5. 6 : Physical assets: Farmers vs. Non-farmers

Physical Assets	Farmers		Non-farmers	
	Poor	Non-poor	Poor	Non-poor
Water and energy accessibility (% of surveyed households) (*)				
Tap water	66.7	74.6	68.2	71.4
Electricity	100	100	100	100
Transportation (% of surveyed households)				
Private transport	---	8.3	3.2	15.3
Public transport	100	97.5	100	91.2
Agricultural production equipments (% of surveyed households) (*)				
Shovels	96.1	100	84.6	94.7
Plough	74.5	94.6	45.4	35.7
Wheel barrow	62.4	83.2	56.7	84.6
Own tractor	---	15.8	---	---
Tractor rental	94.2	84.2	---	---

Table 5.6 shows that all surveyed household had access to electricity in their households. More than 60% and 70% poor and non-poor farming households respectively had access to public water networks in their residential sites. One can note that both groups (farmers and non-farmers) tend to have access to production equipment such as shovels, ploughs and wheel barrows because these tools can also be used for other household activities other than

agriculture. Only about 16% non-poor farmers owned tractors; on the other hand about 84% and about 94% non-poor and poor farmers were renting tractors, respectively. Access to all the above mentioned physical assets is very crucial in supporting and sustaining livelihoods. The results infer that these assets were evenly distributed between households in both groups except for private transport and tractor ownership; this can be justified by the high cost associated with car and tractor ownership.

5.3.3 Financial assets

Financial capital includes all financial resources that people use to achieve their livelihood objectives (DFID, 2001). According to Davis (2003), financial capital is a resource that is complex to document without bias because households are generally very sensitive about their financial assets; hence in this study only two item groups were considered, namely: money and credit. Table 5.7 below shows that in both categories poor farmers and poor non-farmers received pension grants, with more than 70% poor farmers and about 70% non-farmers. This is in-line with the previous studies, Maistry, and Vasi, (2010), who explained that the extent of poverty and its manifestations in the rural areas of the Eastern Cape Province is very high, it is clear that social assistance is necessary for the survival of the majority in the province. In the case of access to credit, the results suggest that informal sources were moderately used by both farmers and non-farmers; however, formal sources of credit reflected very low levels in particular for the poor

Table 5. 7 : Financial assets: Farmers vs. Non-farmers

Financial Assets	Farmers		Non-farmers	
	Poor	Non-poor	Poor	Non-poor
Money Inflows (% of surveyed households)				
Permanent wage	--	8.3	11.7	15
Casual salary	3.3	1.7	8.3	5
Remittances	30	3.3	55	40
Pensions and Grants	71.6	7	68.3	23.3
Accessibility to credit (% of surveyed households)				
Formal	11.2	13.5	6.4	11.8
Informal	71.7	32.5	62.5	21.2
Reasons for not having access to credit (% of surveyed households)				
No collateral	65.9	5.6	63.3	9.6
Religious norm	5.4	---	4.2	---
No need	---	4.5	5.7	---

The low levels of access to formal credit sources can be linked to lack of leverage by rural households. This means that rural farmers also struggle to access capital from commercial banks and other institutions because they lack collateral.

5.3.4 Social capital assets

According to Lopez (2004), social capital consists of social relationships such as networks and connections, relations of trust and mutual support, formal and informal groups and mechanisms for participation in decision-making. Table 5.8 reveals that in general, Buffalo

City Municipality households do enjoy a fair level of social capital assets regardless of relationship type. Rural households, who are farming in particular, offer real opportunities to engage in mutually beneficial relationships such as renting and leasing out farmland, exchanging equipment and information and building friendship ties.

Table 5. 8 : Social capital assets: Farmers vs. Non-farmers

Social Assets	Farmers			Non-farmers		
	Poor	Non-poor	Total	Poor	Non-poor	Total
Social networks within households (% of surveyed households)						
Friendships	76	42		43	51	
Participation in community	73	11		10	7	
Exchange of information	31	59		14	30	
Exchange of equipment	65	56		--	34	

The data revealed that farmers had more social networks than households who were non-farmers, possibly due to the nature of farming or agriculture. Poor farmers who had friendship ties and participated in community services were more than 70%. This might be the result of the establishment of agricultural cooperatives and projects in rural areas. However, the data reflected low numbers in the case of exchanging information for the poor in particular in both categories. Exchange of equipment was moderately balanced for both poor and non-poor farmers, with more than 60% and 50% respectively.

5.4 Household income and sources

In this study, data on household participation in different activities were used to classify various sources of income. Five sources of income were selected and assigned to three major groups. The first group was agricultural income generating activities which included on-farm self-employment (crops and livestock production) and/or off-farm agricultural waged employment activities (e.g. harvesting, pruning); the second group of income was the non-agricultural income sources which included on-agricultural self-employment activities and non-agricultural waged employment activities (e.g. government employment); last but not least, the third major group of income was transfer income sources which included all individual's income derived from sources other than employment, such as remittances, pensions, grants, aid and donations.

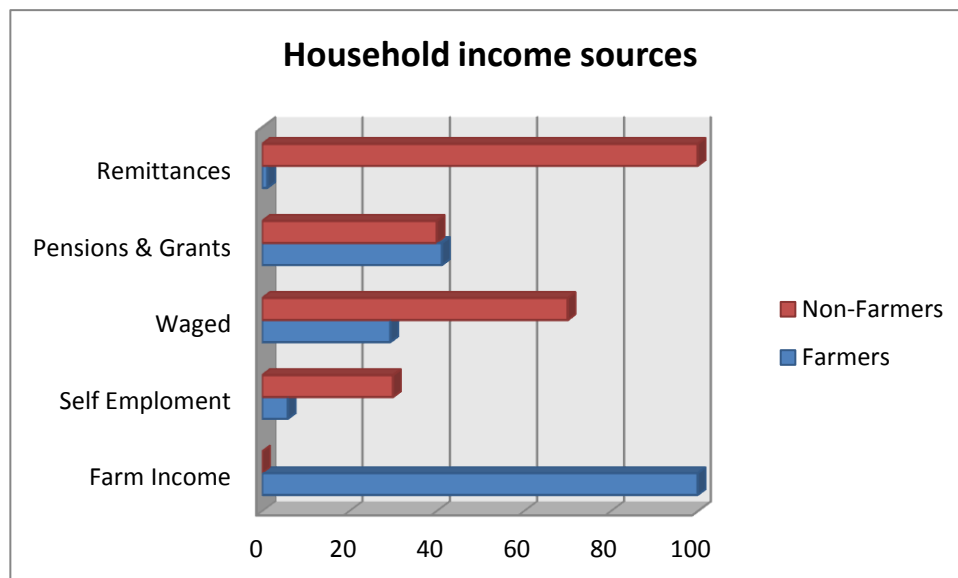


Figure 5.4: Income sources

The surveyed household economic portfolios in the study area were addressed in light of the findings related to the specific potential of household assets to generate welfare in the form of various occupations in agricultural and non-agricultural sectors. According to Lopez (2004),

limited access to the necessary natural and physical resources for agricultural production is a major constraint to household poverty alleviation in rural areas. Pretty and Hine (2001), identified that the amount and quality of other resources (human, financial and social) are likely, along with household preferences, to play a major role in shaping the diversification process into alternative household activities.

5.4.2 Share of household income sources

This section presents overall annual household income derived from different economic activities and the contribution of each activity to overall household income. In Table 5.9 below, shows notice that the total annual overall income for farmers is higher than that of non-farmers. This can be credited to agricultural income received by farmers which is not available to non-farmers. In contrast to the results of the study, the literature raises a question on whether agriculture should any longer be viewed as the major source of income to rural households. Some schools of thought emphasize on rural non-farm activities and believe diversification options for multi-occupation and multi-location households can become the relevant engine of growth for rural areas. Parallel to the results of this study, Kenya Central Burea of Statistics (1977) suggested that, smallholders in Africa derived half or more of their incomes from non-farm sources. Table 5.9 also shows that farmers derived just above 30% of their overall income from agriculture. However, agricultural income weighed against other sources of income had the second largest share to farmers' overall income (see Table 5.9). This implies that smallholder farming had a substantial contribution to farmer's livelihoods.

In the case of wage income farmers had a small share (just above 5%), while wage income contributed 24% to non-farmers overall income. This can be explained by the fact that households which were farming were dominated by pensioners (See, Table 5.2). This implies that most farmers could not be absorbed in the non-farm sector as a result of age. This is in-

line with the a study conducted by Banski's (2003) who highlights that, young people living in rural areas across Africa are moving out of rural areas to urban areas in search of better opportunities.

Table 5. 9 : Total annual household income sources

Sources of income										
Ag. Income			WE income		SE income		UNE income		Total income	
Units	R	%	R	%	R	%	R	%	R	%
Farmers	33 376	32.1	5 500	5.3	23 486	22.7	41 715	39.9	104 077	100
Non-Farmers	---	---	21 736	23.8	18 494	20.2	51 210	56	91 440	100

Key: Ag: agricultural; SE: self-employment; WE: waged employment; UNE: unearned income (Remittances, child grants and old pension were integrated to Unearned income**); R: rand and Percentage.

In the case of unearned income, farmers received just below 40% from unearned income in their total income. On the other hand, unearned income had the largest share (above 50%) in non-farmers' total income. In both cases (farmers and non-farmers) unearned income had the greatest share to overall income as compared to other sources. In-line with the results Maistry and Vasi (2010), emphasizes on the importance of unearned income in balancing and supplementing rural household income.

5.5 Insights from the analysis

Taking into account the overall contributions of the five categories of income sources and their corresponding shares in household overall income, as reported in Table 5.9, it can be shown that income diversification is crucial in securing rural livelihoods. The results clearly reflect that rural households participate in more than one activity in an effort to sustain their livelihoods. The results also illustrate that farming households earn higher incomes than non-farming households (See, Table 5.9). These findings can be directly linked to the fact that

agricultural income contributed more than 30% to the total annual income for farmers which relatively boosted their incomes.

5.6 Conclusion

From the results, it can be implied that agricultural income plays a significant role in enhancing rural livelihoods of farmers, because the income for farmers was relatively greater as compared to non-farmers. However, the results from this study suggest that agriculture cannot sustain rural households solo. This implies that income diversification is very pivotal in sustaining rural livelihoods because all the income sources/activities (agricultural income, wage employment, self-employment, transfers/remittances, social grants etc.) had a significant contribution to household income for both groups.

CHAPTER 6: EMPIRICAL RESULTS AND DISCUSSION

6.0 Introduction

This chapter presents the empirical results and discussion of the research findings in an attempt to address set objectives and operational research questions of the study. The chapter commences by explaining the results of the Gini Coefficient Model. This was conducted to investigate the average level of income for both poor and non-poor households and how each income source contributes to the total household income. Furthermore, results of the logistic regression model are explained in trying to identify significant factors that affect rural household income per capita/food security. Significant variables are explained and this is followed by the conclusion of the chapter.

6.1 Household income decomposition analysis

In this study, a breakdown analysis of overall income was carried out to identify income sources that were particularly effective in yielding more income equality between on-farm and off-farm income. This section attempts to answer the hypothesis that, on-farm income sources reduce income inequality, while off-farm income sources increase inequality.

According to Adams *et al.* (1995), assessing the contribution of different sources of income to overall inequality is of prime importance in a context where a significant proportion of households are poor. Overall income was broken down into four income sources, which includes agricultural income, wage earning income (non-farm), self-employment income, and unearned income as shown in Table 6.1.

Table 6. 1 : Basic Statistics for Household Income Sources

Statistics Items	Overall Income	Sources of Income			
		Agricultural	Wage Earnings	Self-Employment	Unearned
Average income/year(Rand)	104,077	33,376	5,500	23,486	41,715
% of overall income	100%	32.1%	5.3%	22.7%	39.9%
Coef. Of variation	0.68	1.05	3.85	2.31	1.04
Skewness	1.65	1.50	4.70	3.50	1.63
Kurtosis	4.30	2.2	24.50	14.70	4.3

Taking into account the poor and non-poor household categories, income decomposition analysis was applied separately to the two groups (farmers and non-farmers). The Gini Coefficient measure of income inequality was used to investigate the income distribution among households.

According to Pyatt *et al.*, (1980), based on equation (9) the decomposition corresponding to the Gini Coefficient is expressed as (see Chapter 4, Section 4.5.2):

$$\Sigma = 1 w_i g_i$$

where: $w_i g$ represents the factor inequality weight of the i^{th} source on overall inequality; g_i is the relative concentration coefficient of the i^{th} source in overall inequality; and w_i is the share of the i^{th} source in overall income (Pyatt *et al.*,1980).

As such, an income source is inequality increasing or inequality decreasing depending on whether additional shares of income from that source lead to an increase or decrease in

overall income inequality. Otherwise stated, the i^{th} income source is inequality increasing or inequality decreasing according to whether g_i is greater than or less than unity meaning that the i^{th} income source is respectively more or less unequally distributed than the overall income (Omilola, 2009).

6.2.1 Analysis of overall income inequality

As explained in section 4.5.2, this model was borrowed from a study conducted by Omilola (2009) to investigate rural non-farm income and inequality in Nigeria. SPSS was used to analyze the collected survey data. The Gini Coefficient based analysis of overall income is reported in Table 6.2 (Farmers and Non-farmers). Referring to the relative concentration coefficients (g_i) and to the factor inequality weights ($w_i g_i$) enables one to assess, respectively, to what extent an income source increases or decreases overall income inequality, and how much a particular income source contributes to overall income inequality.

Results presented in Table 6.2, show that overall Gini Coefficients (GCs) are almost the same for both household categories. Table 6.2 shows that the GCs for households who were farming was 0.33 for the poor and 0.34 for the non-poor, on the other hand the GCs was 0.35 for the poor and 0.36 for the non-poor non-farmers. The GCs of individual sources differ more between the two household groups meaning that the income sources contributed differently to generate inequality among household overall incomes. Furthermore the GCs of individual sources are higher than the overall GCs, and this is especially notable for self-employment and unearned incomes, denoting a stronger inequality in the corresponding incomes.

Table 6. 2 : Gini co-efficient decomposition

Item	Label	HH Type	Sources of Income (y)									
			Farmers					Non-farmers				
			Total HH Income (Y)	Ag Income	Wage income	SE Income	UNE Income	Total HH Income (Y)	Ag Income	Wage income	SE Income	UNE Income
Average per capita annual household income	μ	Poor	4344.41					3844.5				
		Non-poor	6493.00					5663.25				
	μ_i	Poor		1173.75	---	919.83	2228.33		---	634	554.83	2655
		Non-poor		2411.37	687.5	1555.87	1837.87		---	1766	1479.5	2417.37
Source of income share	w_i	Poor	1	0.27	---	0.22	0.51	1	---	0.17	0.14	0.69
		Non-poor	1	0.37	0.11	0.24	0.28	1	---	0.31	0.26	0.43
Gini coefficient of total income	G	Poor	0.33					0.35				
		Non-poor	0.34					0.36				
Gini coefficient of source income	G_i	Poor		0.562	0.486	0.909	0.891		---	0.55	0.51	0.85
		Non-poor		0.483	0.562	0.791	0.960		---	0.39	0.81	0.61
Correlation ratio	R_i	Poor		0.215	0.765	0.537	0.489		---	0.45	0.80	0.00
		Non-poor		0.585	0.638	0.544	0.379		---	0.72	0.70	0.59
Relative concentration coefficient	g_i	Poor		0.368	1.133	1.488	1.328		---	0.70	1.16	0.00
		Non-poor		0.821	1.042	1.250	1.056		---	0.77	1.56	1.61
Factor inequality weight	$w_i * g_i$	Poor		0.082	0.075	0.121	0.057		---	0.78	0.22	0.00
		Non-poor		0.293	0.740	0.212	0.018		---	0.35	0.27	0.03

Key: HH: household; Ag: agricultural; SE: self-employment; WE: waged employment, UNE: unearned income Remittances, children grants and old pension were integrated to Unearned income**

Regarding the effects of individual income sources to overall income inequality, the following conclusions can be drawn:

Table 6.2 indicates that non-farm sources present the relative concentration coefficients (g_i) greater than unity; therefore, they increase overall income inequality of both poor and non-poor households. In detail, self-employment and unearned sources are the main inequality increasing income sources but their contribution is larger among the poor households than for the non-poor. Agricultural sources of income play a mild role in decreasing overall income inequality of the non-poor (Table 6.2).

In Table 6.2 waged employment presents the highest factor inequality weights ($w_i g_i$) denoting a greater contribution to the inequality of non-poor farmers categories overall incomes mainly due to its highest share of overall income (w_i). In Table 6.2, it appears that the waged employment sources of poor households present the highest factor inequality weights ($w_i g_i$), underlining it as the largest contributor to income inequality within this category (0.78). It is worth noting that for non-poor households the contribution of each source to income equality is about the same (except for the transfers and wage employment) denoting that there is no unique income source that dominates income inequality.

Based on previous considerations, the main inequality-increasing income source was self-employment and unearned income for both household categories (farmers and non-farmers). Wage employment also contributed greatly to the income inequality distribution on overall income. These results support the second hypothesis of this study that, on-farm income sources reduce income inequality, while off-farm income sources increase inequality.

6.3 Analysis of household income source

The binary logistic regression model was employed in this study to breakdown the relationship of the household income for different rural groups (farmers and non-farmers); between per capita income and its deconstruction on the basis of different income sources, the ownership of social and wealth assets, and how this relation can vary depending on poverty status. This section seeks to answer the hypothesis that, household income may be conditioned by socio-economic factors like; farm income, household size, child grants etc.

According to Gujarati (1992), the binary logistic regression model can be used to predict a dependent variable on the basis of continuous and/or categorical independent variables. It is aimed at finding a linear relationship between the dependent variable and multiple independent variables. The logistic regression model is mathematically simple as compared to other models and it gives fewer classification errors (Gujarati, 1992). This model was chosen in this study because of two major reasons. The first is that mathematically it is an extremely flexible model and easy to use. Secondly, it lends itself to a clinically meaningful interpretation.

As explained in Chapter 4, Section 4.5.3 the dependent variable was dichotomized with a value of 1 if the respondent was classified in the rural rich category (high income) and 0 if classified in the rural poor group (low income). Eleven predictor socio-economic independent variables were regressed against the binary dependent variable of income per capita status of households.

In the case of the study with regards to the model fit, a pseudo R^2 of 0.84 and 0.65 was obtained respectively for farmers and non farmers; suggesting that more of the variation were explained

by the models with an overall prediction percentage of 96.2 and 80.6 as shown in Table 6.3 and Table 6.4, respectively.

Table 6. 3 : Determinants of per capita income (Farmers)

Variable		B	S.E	Wald	Sig.
1. Gender	β_1	1.928	1.661	1.348	0.246
2. Marital Status	β_2	1.887	0.789	5.722	0.017*
3. Age	β_3	4.213	1.484	8.064	0.005**
4. Education Level	β_4	9.751	2.894	11.356	0.001**
5. House Hold Size	β_5	1.029	0.817	1.586	0.208
6. Farm Income	β_6	6.211	2.353	6.970	0.008**
7. Self Employment Income	β_7	-1.029	1.386	.551	0.458
8. Wage Income	β_8	11.599	3.450	11.306	0.001**
9. Remittances	β_9	-.305	1.584	.037	0.847
10. Old Pensions	β_{10}	.190	1.586	.014	0.904
11. Child Grant	β_{11}	-11.828	4.041	8.568	0.003**
Constant	β_0	-35.890	11.130	10.397	0.001
a) Chi-Square (df=11)		103.762			
b) (-2) Log Likelihood		34.742			
c) Accuracy of prediction; Overall (%)		96.2			
d) Nagelkerke (R^2)		0.84			

Notes: ** and * indicates significance at 0.01 and 0.05 probability levels respectively

From the eleven predictor variables fitted in the binary logistic regression model for farmers, six variables had a significant (marital status, age, education, farm income, wage income and child grant) impact on influencing household income, while five variables (old pensions, remittances, self employment, household size and gender) were not significant (See, Table 6.3).

In the case of non-farmers ten predictor variables were fitted in the binary logistic regression model, five variables also had a significant (house size, wage income, remittances, education and child grant) impact on influencing household income, while five variables (gender, age, marital status, pensions, self employment) were not significant (See, Table 6.4).

Table 6. 4 : Determinants of per capita income (Non-Farmers)

Variable		B	S.E	Wald	Sig.
12. Gender	β_1	0.182	0.207	0.880	0.383
13. Marital Status	β_2	-6.134	0.062	-2.162	0.135
14. Age	β_3	.042	0.136	.306	0.761
15. Education Level	β_4	.258	0.113	-2.289	0.026*
16. House Hold Size	β_5	-3.167	0.065	-2.581	0.012*
17. Self Employment Income	β_7	1.014	0.123	0.114	0.910
18. Wage Income	β_8	1.566	0.155	3.657	0.001**
19. Remittances	β_9	2.462	0.114	4.058	0.000***
20. Old Pensions	β_{10}	.014	0.123	0.114	0.910
21. Child Grant	β_{11}	5.757	0.169	4.477	0.000***
Constant	β_0	-11.649	5.663	10.537	0.051
e) Chi-Square (df=11)		73.771			
f) (-2) Log Likelihood		26.547			
g) Accuracy of prediction; Overall (%)		80.6			
h) Nagelkerke (R²)		0.65			

Notes: ** and * indicates significance at 0.01 and 0.05 probability levels respectively

6.3 Results of the regression model

6.3.1 Marital status

The positive significant coefficient of marital status indicates its positive influence on household income per capita for farming households. The marital status was significant at 1% significant level (p-value was 0.017, see Table 6.3). This implies that there is adequate proof to support the notion that household marital status increases household income per capita. Per every unit of married household head a 1.887 increase in the log odds of income per capita is expected holding other independent variables constant. This implies that the amount of income per capita available to a household and household' poverty status improves proportional to marital status of household head.

The study conducted by Mercer and Zhang (2005), on income inequality among races is in favour of the results of this study. Mercer and Zhang (2005), suggest that marriage makes families better off partly by allowing individuals with families to specialize, which yields greater productivity, hence income. Mercer and Zhang (2005), further highlights that in addition to specialization, the sharing of economic and social resources in marriage yields economies of scale and provides a risk-sharing protection against unexpected events. Because of the economies of scales arising from married couples sharing the costs of maintaining a household, the results of the study suggest that married households are more likely to have high incomes and become food secure.

6.3.2 Age

Household head age for farming households was found to have a positive coefficient and significant at 5% significance level, with the p-value of 0.005 (See, Table 6.3). In the case of non-farmers age was not significant; this may be due to the fact that young people living in rural areas are not interested into farming. This is in line with the findings of the study, most of the farmers in the survey were between the age of 60 to 69 years old (See, Table 5.2). Banski (2003) highlighted that because of the closure and failure of non-agricultural economic activities in rural areas, young people across Africa are leaving rural areas in search of greener pastures. The literature strongly suggests that the rural development focus should be on both agricultural and non-agricultural economic activities to retain young people in rural areas and encourage new employment opportunities that will cut into the unemployment figures.

6.3.3 Years of education

Years of education was also found to have a significant and a positive relationship with household income per capita at 5% significance level for farmers and at 10% significance level for non farmers, with the p-values of 0.001 and 0.026 respectively for farmers and non farmers. This implies that investing in education has a positive effect over household income per capita. In-line with the study, Worth (2001) found that, the best farmers were the educated and most of them had some vocational training. Worth's (2001) findings suggest that, the higher the level of education, the more successful the farmer will be. This means that, a sound educational background can reinforce natural talent as it can provide a theoretical foundation for informed decisions. Therefore, education is likely to improve managerial ability in terms of better formulation and execution of farm plans; and acquiring better information to improve marketing

ability (Worth, 2001). The literature also inferred that by large it is the most talented and entrepreneurial people that can match the requirement of the labor market in the non-agricultural sector. This implies that education is also very pivotal for non-farmers because to acquire education in order to match the labor requirements in the non-agricultural activities.

6.3.4 Farm Income

The positive significant coefficient of farm income indicates its positive influence on the farmer's household income per capita. The significance value of 0.008 (Table 6.3) implies that there is enough evidence to support that access to farm income positively influences the poverty status and the livelihoods of smallholder farmers. In line with this study Dollar and Kraay (2002) states that agricultural development is important to eradicate poverty and hunger in the developing world. Peacock *et al* (2004) infers that, smallholder agriculture growth can eliminate rural poverty; Jodha (2001) also supports that agriculture provides employment and contributes significantly to poverty alleviation. However the weakness of agriculture is the high percentages of people engage in smallholder farming who are in poverty (See Figure 5.3). This means that it may not be sensible to speculate that farming can sustain rural livelihoods in isolation.

6.3.5 Wage income

Wage income was found to have a positive coefficient and to be significant at 1% significance level for both farmers and non-farmers, with the p-value of 0.001 (See, Table 6.3 and Table 6.4). According to World Development report (2008), participation in the agricultural labor market is important particularly for the poor and relatively landless households. Nonetheless, Escobal (2001) states that, the demand for labor is declining whereas the supply of labor by smallholder

farmers is increasing to compensate for the shortfall in on-farm profit. The reason for agricultural wage employment to decline may be due to seasonality and agricultural production risk (droughts, floods, pests etc.); this may be explanation why wage income is important for smallholder farmers in enhancing their livelihoods.

In line with the results Matshe and Young (2004) highlights that, rural non-farm enterprises are transforming the employment structure in rural areas. The literature also reveals that it is no secret that wages are considerably higher in rural nonfarm employment than in agricultural wage employment. This may be the main motivation driving non-farmers and farmers to seek employment in the non-agricultural sector in search of higher incomes and a pathway out of poverty.

6.3.6 Unearned Income

The results suggest that there was a positive and significant relationship between remittances and income per capita for non-farmers at 1% (p-value was 0.000) significance level (Table 6.4). Children grants were also found to have a significant and positive relationship with household income per capita for both farmers and non-farmers at 1% significant level (See, Table 6.3 and 6.4). From the literature, it is clear that the strong relationship and the positive association between income per capita and unearned income was a result of a lack of non-farm employment. This implies that non-farm households relied on unearned income to sustain their livelihoods. Table 5.11 shows how income sources were distributed between farming and non-farming households, in the case of farmers close to 40% of their total income came from unearned income sources. On the other hand; more than 50% of non-farmer's total income was derived from unearned income sources. Escobal (2001) found out that even though the best farmers

derived ten times their income from farming, they were still dependent on other outside income. This means that unearned income sources had a substantial contribution to the livelihoods of both farming and non-farming households.

6.3.7 Household size

With reference to Table 6.4, household size for non farmers had a negative significant coefficient, while household size for farmers was not significant. The non farmer's household size p-value significance level was at 5%. The negative association between non farmer's household size and income per capita mean that increasing household size by one unit will make income per capita decrease. In other words, an increase in non farmer's household size would mean more people to feed. This implies that the probability of food security decreases with an increase in family size. An increase in household size reduces the chances of a household being food secure. In the case of farmers, the World Development Report (2008) highlights that; farmers with bigger families were less successful than those with smaller family sizes. This situation is explained by the fact that the increased use of the family income to feed, clothe and educate a larger number of children may leave limited funds for meeting farming expenditures because of the high household expenditures.

6.4 Insight from the analysis

The extent an income source increases or decreases overall income inequality and how much a particular income source contributes to overall income inequality was reported in Tables 6.2. The results showed that the GCs of total income sources were almost the same in both categories. However, GCs of individual sources differ more between the two household groups meaning that

the income sources contributed differently to generate inequality among household overall incomes. The results show that the main inequality increasing income source was self employment and unearned income for both household categories (farmers and non-farmers). The reason for unearned and self-employment income to be the main inequality increasing income, could be the discrepancies or lack of consistency in these income portfolios. However, Davis (2003) suggested that, self-employment is the answer to the economic survival of many rural workers, households and the communities in which they reside. This means that the rural public policy should provide platform and stimulate the rural economic environment to allow rural households to engage more on self-employment activities.

Based on the analysis of the study, food security of households is dependent on various factors which include household size, farm size, years of education, household income (farm income, wage, self employment, grants etc.). Table 6.3 shows that an increase in the following variables: age, years of education, farm income and wage income increases household income per capita. On the other hand, Table 6.4 shows that an increase in the following variables: years of education, wage income, self employment income, remittances and child grants. As explained in section 6.3.7 a decrease in household size increases non farmer's household income per capita. These results confirm what the literature highlighted that rural households have diverse income portfolios.

6.5 Conclusion

Based on the empirical results of the Binary Logistic regression (Table 6.3 and Table 6.4), it can be concluded that years of education, household size, land size, farm income, wage income and unearned income play a major role in addressing rural household livelihoods.

The analysis shows that wage income plays a significant role in enhancing household livelihoods; 15.5% household received wage income. Also from both Binary Logistic regression models wage income had a substantial share in total household income. This means that an additional unit of wage income had a positive effect over the total household income per capita. Farm income was also found to have a substantial share in overall household income (Table 6.3). Farming households received farm income, and from these households only 14.2% was above the poverty line. Table 6.3 shows that, farm income had a strong association to overall household income per capita (significant at 5% significance level). Unearned income sources also had a substantial contribution to household income; however, Table 6.4 shows that remittances and child grants were significant to non farming household income per capita. Drawing from the analysis one can conclude that diversified household income portfolios is a pivotal strategy to address poverty in rural areas. This implies that agricultural activities cannot enhance food security in isolation; other non-farm activities must be incorporated in rural areas in order to enhance rural household livelihoods.

CHAPTER 7: SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

7.1 Summary and conclusions

This chapter provides the conclusions and recommendations drawn from the results on how rural livelihoods can be enhanced through smallholder farming. The chapter outlines the aims of the study that were stated in the introductory chapter (Chapter 1), so that conclusions and recommendations can be drawn.

7.2 Aims of the study

The purpose of this study was to investigate the impact of smallholder farming in reducing poverty and sustaining rural livelihoods within Buffalo City Local Municipality. The main objective of the study was to gain an understanding of the role played by smallholder farming in combating poverty in rural areas and assess the capacity of its contribution to rural household income. Other factors were also put into account in trying to explain which factors are significant in addressing rural livelihoods.

7.3 Socio-economic description of farm households

The general average household size for non-farmers was 4.9 and for farmers it was 5.5. The results showed that the average family was relatively high for poor households as compared to the non-poor households. Large households have more people to feed as compared to small households thus, reducing their income per capita.

Most of the households in this study were female headed (both farmers and non-farmers), only 39% of households were headed by male farmers and just above 40% household were headed by female non-farmers (in both categories). This aspect is significant because it reveals the essence of gender balance in terms of household head distribution and household head activity selection based on gender.

As far as household head age is concerned, the overall average age of respondents was 59 and the median was 64. More than 40% of the study sample was between the age range of 60-69 years. There was no household head between the age range of 30-40 years or younger. This can be explained by what was discovered by Banski (2003) that, young people living in rural areas across Africa migrate from rural areas to urban areas, because in the former, there is little economic activities; as a result, there is high unemployment in rural areas. Matshe and Young (2004) found that, older farmers are less capable of carrying out physical activities while younger ones are capable; and Peacock, *et al.*, (2004) concluded that younger farmers are more ready to adopt modern technology. This can be explained by the fact that younger people are more adaptive and more willing than older people to try new methods; age is expected to be an influencing factor. This may mean that, in order to revamp smallholder farming or even the rural economy at large, the rural public policy should focus on retaining young and talented people in rural areas and attract them into farming activities; .

Most of the households from this study were literate (received primary and secondary education); only 7.5% of the study sample did not attend school. Twenty percent of the study sample received tertiary education. This is very important for rural economic growth because several studies suggest that; the higher the level of education, the more successful the farmer will

be (Worth, 2001). This implies that, education can provide a theoretical foundation for farmers to make informed decisions.

In the case of household assets (natural assets, physical assets, financial assets etc.), there was a skewed distribution. Table 5.7 shows that only 28% poor non-farmers and above 70% poor farmers had access to communal land other than their residential sites. Table 5.8 indicates that all surveyed households had access to electricity in their homes, while more than 60% and 70% poor and non-poor household had access to public water networks in or close to their residential sites, respectively.

Transportation means are crucial for both farmers and non-farmer's livelihood support in rural areas, but access depends on its availability and household's individual financial capabilities. To this respect, the poor and the non-poor tend to use public transport for their transportation, while only 2.3% farmers and 6.6% non-farmers used private transport. In the case of money inflow sources, poor households in both categories (farmers and non-farmers) were concentrated more on pensions and grants with more than 70% poor farmers and more than 65% non-farmers. In the case of access to credit, data showed that informal sources were moderately used by both farmers and non-farmers; however formal sources of credit reflected very low levels in particular for the poor. This can be explained by the fact that most households had no collateral in order to gain access to formal sources of credit.

The analysis revealed that farmers had more social networks than households who were non-farmers possibly due to the nature of farming or agriculture. Poor farmers who had friendship ties and participated in the community services were more than 70%; this might be the result of the establishment of agricultural cooperative and projects in rural areas. However, the data

reflected low numbers in the case of exchanging information for the poor in particular in both categories. On the other hand, exchange of equipment was moderately balanced for both poor and non-poor farmers, with more than 60% and 50% respectively.

7.4 Conclusion

Looking at the asset portfolios in rural areas of Buffalo City Municipality, generally households enjoy a fair level of social capital assets. Farming households in particular, engage in mutually beneficial relationships such as renting and leasing, and exchanging equipment. However, farmers had more social networks than non-farmers. This could be credited to the establishment of agricultural cooperatives and projects in rural areas.

A decomposition of the rural household income sources and the contribution of each source to household income distribution in the study area was done. The breakdown analysis of overall income was also done to identify income sources effectiveness in yielding income equality between on-farm and off-farm income. Assessing the contribution of different sources of income to overall inequality is important particularly in poor households. Results show that overall Gini Coefficients (GCs) are almost the same for both household categories who were farming (0.33 for the poor and 0.34 for the non-poor). For non-farmers, the GCs was 0.35 for the poor and 0.36 for the non-poor. The difference in GCs of individual sources between the two household groups means that income sources contribute differently generating inequality among household overall incomes. Households with higher GCs of individual sources than the overall GCs, can be attributed to self-employment and unearned incomes; denoting a stronger inequality in the corresponding incomes.

Non-farm sources present the relative concentration coefficients (g_i) greater than unity; hence they increase overall income inequality of both poor and non-poor households. Self-employment and unearned sources are the main inequality increasing income sources. Agricultural sources of income play a mild role in decreasing overall income inequality of the non-poor. Results indicated that waged employment presents the highest factor inequality weights ($w_i g_i$) denoting a greater contribution to the inequality of non-poor farmers categories overall incomes mainly because of its highest share of overall income (w_i).

To uncover the correlates of the total household income for different rural groups, the binary logistic regression model was employed. A breakdown of the relationship of household income for different rural groups (farmers and non-farmers); between per capita income and its deconstruction on the basis of different income sources, the ownership of social and wealth assets, and how this relation can vary depending on poverty status was done. Results show that farm income has a strong association to overall household income per capita. Unearned income sources also have a substantial contribution to household income. Remittances and child grants were significant to non-farming household income per capita. These results suggest that a diversified household income portfolio is vital in addressing poverty in rural areas. Therefore agricultural activities cannot solely enhance food security.

On the analysis of income per capita which was used as a proxy for food security, results show that income per capita of food security is dependent on various factors that include household size, farm size, years of education, household income (farm income, wage, self employment, grants etc.). An increase in variables like age, years of education, farm income, wage income, remittances and child grants positively relates to household income per capita. A decrease in

household size increases household income per capita. The probability of food security decreases with an increase in family size because a large household size reduces the chances of a household being food secure.

7.5 Policy implications

Decomposition of rural household income sources and asset portfolios in rural areas of Buffalo City Municipality (BCM), the contribution of each source to income distribution, the role played by smallholder farming to food security and income portfolio have been analyzed. From the analysis households hold diverse income portfolios, which are influenced by age, marital status, education, farm income house hold size, ownership of farm assets such as machinery (tractor and production equipment), distance to markets, access to credits, and wage income among other factors. The appropriate mix of policies may be highly context-specific, but some general principles are likely to hold:

Since agricultural income had the second largest share to farmers' overall income (see Table 5.9). This implies that smallholder farming has a substantial contribution to farmer's livelihoods in the study areas. Ellis & Harris, (2004) highlights that in many regions across the developing world agriculture has become a relatively small production sector because most rural households have diverse and geographically dispersed portfolios of income sources. In line with Ellis & Harris, (2004), the results show that the surveyed households had diverse income portfolios. The study revealed that more than 50% farmers were pensioners and only 4.9% and 8.2% farmers received non-farm income. Access to income can affect the probability of a farmer becoming successful. The probability of success in farming should be directly related to access to other sources of income. However, given the diminishing farm size of small hold-led agriculture; it is

important therefore to diversify livelihood strategies particularly for rural population. The inclusion of high valued agricultural products arguments diversification portfolio and therefore increased income.

Contract farming seems to be working in some regions as a surety for market and price. The limitation is that poor infrastructure will continue to be a disincentive to farmers diversifying in other activities due to high transaction costs. There is need to improve the institutional context of private decision-making, for example by; reducing risk, increasing mobility, minimising barriers to entry (such as licensing regulations), and ensuring fairness and transparency in the conduct of public agencies. It is also about facilitating the poor to improve their assets, and to make use of those assets to best effect. Enhancing the asset status of rural poor merits special attention; including their human capital, independent ownership rights over land and other resources and participation in social processes.

The results of the study indicated that education has a significant positive relationship with household income per capita. This implies that investing in education has a positive effect over household income per capita. Having a sound educational background can strengthen the natural talent as it can provide a theoretical foundation for informed decisions. Therefore, education is paramount in improving the managerial ability in terms of formulating and executing farm plans; and also acquiring information to improve marketing ability (Worth, 2001). The relevance of education, both formal academic education and workplace skills, for improving livelihood prospects is established by a great number of studies, and poverty is closely associated with low levels of education and lack of skills. There is no doubt that rural education is under stress in many countries. There is high demand on the educational systems due to rising populations and

also the cost of updating educational materials. This makes innovative approaches to educational delivery at village level a priority in the future. Generation, dissemination and utilization of information depend on interdisciplinary team approach, organized into an interacting and cohesive group involving researchers, extension workers and farmers. There is need for strong research-extension-farmer linkages.

According to the Buffalo City Municipality Report (2008), BCM's rural areas are characterized by abundant natural resources on a per capita basis, such that yields are so low but plenty of opportunities exist to raise them through technological change. In line with BCM Report (2008), the results of the study highlight that, 92.1% of households who were farmers had access to rivers and dams close to their farming areas; while more than 60% and 70% poor and non-poor households respectively had access to public water networks in their residential sites. However; the study suggest, stimulating agriculture led growth in the studied area will not be easy because BCM's rural areas still have low densities of infrastructure and there are hardly any institutions for rural development. These challenges are neither new nor undefeatable to the studied area or the rural areas across the developing world. Despite these challenges, there is plenty of evidence to show that success is possible. The World Development Report (2008) reveals that from the past performance of the agricultural sector in Africa, on a continent wide basis the sector has actually grown at a respectable 2.5% per annum since 1980, compared with 1.2% for industry and 2.5% for services. The real challenge is that agricultural performance has been insufficient in relation to high population growth, leading to a decline in per capita production (Paddy, 2003).

Infrastructural facilities have a significant potential impact on poverty reduction by contributing to the integration of national economies, improving the working of markets, speeding the flow of information, and increasing the mobility of people, resources and outputs. Infrastructural provision will require innovative approaches to provision and maintenance. Reliance on central government and finance from donors cannot be depended upon to keep existing infrastructure in good repair or to make heavy investment in new infrastructure. Decentralisation may, arguably help to bring the prioritisation and the financing of rural infrastructure closer to rural communities themselves. Privatisation of infrastructural suppliers like electricity and telephone companies may help to reach remote rural areas more than under government monopolies.

In terms of access to credit, the results of the study show that formal sources were very low for both farmers and non-farmers particularly the poor (See Table 5.7). The low levels of access to formal credit sources can be attributed to lack of collateral by rural households, meaning the rural farmers struggle to access capital from commercial banks and other institutions. Credit is a priority area of micro-policy in the rural sector of most developing countries. There is emphasis on small-scale group lending schemes, enabling individuals and households to widen their income earning options. Credit policy is not only about micro credit schemes, there is also a need to facilitate the spread of rural financial institutions that are self-sustaining on the basis of savings and loans organised according to conventional banking criteria. This requires more effort from central governments to put in place the appropriate regulatory and guarantee provisions that would encourage the formation of such institutions and ensure confidence in them in the long term.

These policy areas are not the only policy themes worth pursuing in relation to promoting sustainable rural livelihoods. Nevertheless, some combination of them is likely to feature in any current list of micro-policy priorities, and other policy themes are often found to overlap or involve extensions to one or other of these areas.

7.6 Areas for further study

This study only focused primarily on the influence of smallholder farming and slightly on the non-farm sector in enhancing rural livelihoods. As such, it has not taken into account the influence of other factors, such as cultural and political factors, and their influence in rural livelihoods. Therefore, this research suggests and proposes that the influence of other factors be studied. The area of study has been confined to one municipality in the Eastern Cape Province of the South Africa, the Buffalo City Municipality. It is also suggested that a research of this nature be carried out in other municipalities of the province.

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APPENDIX 1 –Questionnaire



UNIVERSITY OF FORT HARE

FACULTY OF SCIENCE AND AGRICULTURE

Department of Agricultural Economics and Extension

**THE IMPACT OF SMALLHOLDER FARMING TO RURAL LIVELIHOODS: THE
CASE OF BUFFALO CITY MUNICIPALITY, SOUTH AFRICA**

Recording sheet number :.....Name of participant :.....

Number of participant :.....Name of Community/Farm :.....

Date :...../...../..... Name of facilitator :.....

A.HOUSEHOLD CHARACTERISTICS:

1. What is the sex of household head?

[1]___Male [2]_____ Female

2. What is the age of the household head? _____ Years

3. What is the highest level of education of the household head? _____

[1]_____ Primary [2] _____ Secondary [3]_____Tertiary [4] _____ Other Specify

.....

4. Marital status of household head?

1]___Married [2] ___Single [3] ___ Divorced [4] ___Widowed

5. Is the household head formally employed?

Yes [1] No [2]

7.a)Fill in the table below: (HH structure)

Name of HH member	Relationship to HH head	Sex	Age	Level of Education	Occupation

7. b) How many of the above family members assist with farm labour? (Number)

7. c) How many of the above employed family members support the household?

..... (Number)

7. d) How much do they contribute to the overall household income?

R..... (Actual figure)

B. HOUSEHOLD ASSET ENDOWMENTS:

1.Natural Assets.

1.1 Do you have access to land other than your residential site.

Yes [1] No [2]

1.2 If yes, type of access to land.

[1]_____ Owned land [2] _____ Hired land [3]_____ Communal land

[4]_____ Other; please specify:

1.3 How big is your land (Ha)..... (Number of Ha)

1.4 Do you have access to drinking water in your residential area?

Yes [1] No [2]

1.5 Which type of drinking water do you have access to?

[1]_____ River [2] _____ Dam [3]_____ Public network (tap water)

[4] _____ Other Specify.

1.6 Which type of irrigation water do you have access to in close proximity to the cultivated area (If farming)?

[1]_____ River [2] _____ Dam [3]_____ Public network (tap water) [4] _____

Other Specify :.....

2. Physical Assets

2.1 Do you have access to electricity? Yes [1] No [2]

2.2 Which type of transportation do you have access to?

[1]_____ Public transport [2] _____ Private transport [3] _____ [4]_____ Other; please specify:

2.3 Fill in the table below:

Type of asset & implement	Numbers	Value of asset
Brick house		
Tractor		
Plough		
Cultivator		
Seed planter		
Shovels		
Hoe		
Harrow		
Wheel barrow		
Other specify 1. 2. 3		

2.4 Fill in the table below:

Livestock	Cattle	Goats	Sheep	Donkeys	Chickens	Pigs	Other (specify)
Numbers							

3. Financial Assets

3.1 Do you have access to credit? Yes [1] No [2]

3.2 If yes, what is the type of credit?

[1] _____ Formal [2] _____ Informal credits [3] _____ Other;

Please specify:.....

3.3. If no, what are the reasons? Please specify.

.....

4. Social Assets

4.1 Which type of social networks do you have?

[1] _____ Friendships [2] _____ Exchange of information [3] _____ Exchange of
 equipment [4] _____ Other, please specify:

4.2 Do you participate in community projects?

Yes [1] No [2]

4.3 If yes, please explain the nature of these projects:

C. AGRICULTURE AND CROP PRODUCTION

1. What is the status of the respondent? [1]_____ Farmer [2] _____ Non-Farmer

(If the respondent is a farmer fill in the following table).

Crop/Vegetable	Area	Summer	Winter
Maize			
Cabbage			
Onion			
Spinach			
Carrot			
Tomatoes			
Pumpkin			
Potatoes			
Other (specify) 1. 2. 3. 4.			

D. FARM OPERATIONS

1. What type of draught power do you use?

.....

2. How much do you pay for hired?

[1] labour/ (ha) R..... [2] Tractor/ (ha)R.....

[3] Draft power/ (ha) R.....

3. How much did you produce?kg/ha

4. a) For the farming season 2009/2010, did you produce enough grain to last until next harvest?

[1] yes [2] no

b) If the answer to question a) is „no“, are you able to purchase supplement grain?

[1] yes [2] no

c) Do you have one or more gardens near you household?

[1]Yes [2] No

5) What sort of farming methods are you using in your fields?

[1] Tractor [2] Ox-drawn plough [3] Hoe

6) Did you apply fertilizer to your crops?

[1] Yes [2] No

7) For which crops did you apply fertilizer?

.....

E. MARKETING

1) Do you have any problems with getting produce sold?

[1] Yes [2] No

2. a) How far is the nearest market(in km)

b) How far is the furthest market(in km)

3. a) During the past 12 months, what major crops did you sell?

.....

b) From which shops/organizations did you source inputs?

.....

F. INCOME

CROPS 1. Which crops did you realize most of income after sales.

Crops/Vegetation	Income

LIVESTOCK

2. How much did you realize from the sale of livestock for the year ending 2010

Livestock	Number	Income

G. OCCUPATION

3 a) What is the occupation of the household head.....

b) If employed what is your salary per month? R.....

4. How many of your family members are formally employed.....

5. How much income does your household derive from the following activities?

Source of Income	R/month	R/year
Wages		
Self employment		
Remittances		
Old pension grants		
Children grants		

H. SOCIO-ECONOMIC CHALLENGES

1. What are your greatest problems you face in trying to sustain your livelihood, starting with the most pressing problem?

a) Farmer

i. _____

ii. _____

iii. _____

b) Non-Farmer

i. _____

ii. _____

iii. _____

2. What is your main source of income?.....
.....

3. What types of skills do you have?

4. a) Do you get some formal training?

[1] ____ No [2] ____ Yes

b) How often do you get this training?

c) What type of training do you get?

i) _____

ii) _____

iii) _____

5. What would you say are the biggest constraints you face in improving your livelihood?

.....

.....

6. How do you deal with these constraints?

.....
.....

7. What can the government do to reduce these Constraints?

.....
.....

Thank You

Thank You

Thank You

Thank You