

**The contribution of smallholder agriculture production to food security in rural Zimbabwe:  
A case study of Masvingo Province.**

**By**

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## **Abstract**

Agricultural development is back on the development agenda. Even though the smallholder farmers are in the majority and at the forefront in terms of food production and agriculture being the backbone of the economy of Zimbabwe, there is no clearly defined policy on smallholder agriculture in Zimbabwe. The food insecurity has remained a continuous challenge for the rural poor in Zimbabwe. This study investigated the contribution of smallholder agriculture to food security with particular reference to the Masvingo province. The study employed qualitative method of research entailing extensive review of literature as a method of data collection. The study utilized the modernisation theory and sustainable livelihoods framework to illustrate smallholder agriculture and food security nexus. The study revealed that smallholder agriculture is the best option for addressing food security since agriculture is considered the main livelihood strategy for small scale farmers in Zimbabwe. There is general scholarly consensus that the main cause of food insecurity in Zimbabwe is a decrease in smallholder agriculture productivity. The study revealed that poor infrastructure , limited access to credit, limited access to inputs, poor investment in human development, limited access to markets and harsh climatic conditions weaken the capacity of small scale farmers to improve food security. Key recommendations are that supportive institutions need to be put in place to strengthen the smallholder farmer's capacity to improve food security in Zimbabwe.

**Key Terms:** smallholder agriculture, small scale farmers, agriculture development, food security, livelihoods, rural

## DECLARATION

I, **Godfrey Toringepi**, Student Number **200808207**, do solemnly declare that this thesis is a result of my own original work and includes nothing that is a result of collaboration. The work has not been previously submitted in part or in whole for an award at any other university or institution of learning. Information derived from other works has been duly acknowledged in the text, and a list of references is also given. I am fully aware of the University of Fort Hare's policy on plagiarism and I have taken every precaution to comply with the regulations. I further declare that I am fully aware of the University of Fort Hare's policy on research ethics and I have taken every precaution to comply with the regulations.

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Signature

.....

Date

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## List of abbreviations and acronyms

AIAS	African Institute for Agrarian Studies
AIDS	Acquired Immuno -Deficiency Syndrome
ALS	Agriculture and Livestock Survey
CA	Communal Areas
DVS	Department of Veterinary Services
EU	European Union
FANTA	Food and Nutritional Technical Assistance Project
FAO	Food and Agriculture Organisation
FTLRP	Fast Track Land Reform Programme
GDP	Gross Domestic Product
GMB	Grain Marketing Board
GMOs	Genetically Modified Organisms
GoZ	Government of Zimbabwe
ha	hectare
HIV	Human Immuno Deficiency Virus
HLPE	High Level Panel of Experts on Food Security and Nutrition
Hyvs	High yielding Varieties
IFAD	International Fund for Agricultural Development
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
ILO	International Labour Organisation
IMF	International Monetary Fund
IRDPS	International Rural Development Projects
kg	kilogrammes
MAMID	Ministry of Agriculture, Mechanisation and Irrigation Development

mm	millimetres
NGOS	Non Government Organisations
OECD	Organisation for Economic Cooperation and Development
OR	Old Resettlement
RBZ	Reserve Bank of Zimbabwe
SADC	Southern African Development Community
SAPS	Structural Adjustment Programmes
SL	Sustainable Livelihoods
SSA	Sub Sahara Africa
SSCA	Small Scale Commercial Areas
t	tonnes
UN	United Nations
UNDP	United Nations Development Programme
UNDP	United Nations Development Programme
UNESCO	United Nations Education Scientific and Cultural Organisation
UNICEF	United Nations Children’s Fund
USA	United States of America
USD	United States Dollar
WFP	World Food Programme
ZDHS	Zimbabwe Development Health Survey
ZFU	Zimbabwe Farmers Union
ZIMSTATS	Zimbabwe National Statistics Agency (formerly known as the Central Statistics Office)
ZIMVAC	Zimbabwe Vulnerability Assessment Committee

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## **Dedication**

To my loving mother Sekai Toringepi and late father Golden Kaperezo

# Chapter 1

## Introduction

### 1.0 Introduction

Global agricultural conditions are changing rapidly and the future of small farms seems to be on shaky ground. The modernisation of the global retail food system has raised fears that smallholder farmers may be increasingly marginalized thus raising questions over the best option to address food security issues. It should be noted that the majority of the households who are food insecure in the world are in the rural areas where small scale agricultural production is the main form of livelihood strategy.

Smallholder farmers are defined in various ways depending on context, country and ecological zone (Hazell, 2007). For example, Dixon et al. (2005) suggest that smallholder farmers face limited resource endowments relative to other farmers in the sector, whilst Todaro (1989) describes smallholder farmers as owning small plots of land on which they grow subsistence crops relying almost exclusively on family labour. A more comprehensive definition identifies one key characteristic of smallholder farmers as that they have access to land as means of livelihoods whilst relying primarily on family labour for production (Ellis, 1988).

It should be noted that although smallholder farmers produce for family consumption they also to a lesser scale produce for the market thus showing the potential of small scale farmers to ensure food security both on a micro and macro level. Most agricultural economics has sometimes equated subsistence farming to smallholder farming where the main output is consumed directly, few purchased inputs and where a minor proportion of output is marketed (Barnett, 1997). In some cases smallholder agriculture generally refers to rural producers often referred to as small-scale, resource poor or peasant farmers predominantly in developing countries, who farm using mainly family labour and for whom the farm provides the principal source of income (Barnett , 1997).

However, as contended by HLPE (2013) definitions of agriculture by scale are relative to national contexts, and smallholders in developed countries may have farms and incomes many times larger than those in developing countries (Morton, 2007).

In this study smallholder farmers are defined on the basis of the size of the landholding. The term smallholder is confined to farms of less than 2 hectares of owned land. This definition also assumes that the farm family provides the primary source of labour and that farming constitutes main source of income for the family. The small scale farmers in Zimbabwe are widely known as communal or peasant farmers who constitute 70 % of all farmers in Zimbabwe and more recently A1 newly resettled farmers are also in the category of the small scale farmers. In Masvingo more than three quarters of the agriculture sector is categorised as smallholder agriculture.

Hazell et al (2007) point out that smallholder agriculture can play an important role in livelihoods creation amongst the rural poor. In order to ensure food security there is a need to extensively increase the productivity of smallholder agriculture. This can be achieved by encouraging farmers to pursue sustainable rise of production through the use of improved inputs. The African agricultural landscape is characterized by small plots of land, use of traditional tools, slow growth, low productivity, and often also by practices that aggravated environmental problems (Todaro et al, 2009). Ellis et al (2001) illustrate that since the 1950s to 2000s, many African countries have implemented macroeconomic, and institutional reforms aimed at ensuring agricultural growth and food security; however, despite these developments, the sector's growth has remained insufficient to deal successfully deal with problems of poverty, malnutrition, food insecurity, and contribute to sustained Gross Domestic Product (GDP) growth on the continent (World Bank, 2007).

Jayne et al (2006:12) assert that African agriculture is dominated by small scale farmers who occupy more than 70 % of the land and produce most of the crop and livestock products at

subsistence level. IFAD (2007) laments that despite the number of sound agricultural policies adopted by most countries, implementation has been lagging. According to the World Bank (2007:64) the developing countries' government spending on agriculture declined from 6.4 % in 1980 to 4.5 % in 2002. Moreover, total aid for African agriculture fell from \$169 billion in 1981 to \$1 billion in 2001. According to SADC (2009:24) the SADC region is experiencing high food insecurity levels. Using total cereal production to reflect the extent of food security, the region's total cereal production has stagnated since 1990. The actual levels of production in 1990 and 2006 were 22,062,000 and 23,607,000 metric tonnes, respectively. Over the same time period, the region's population increased from 152 million to 249 million, implying that per capita food consumption from domestic production declined substantially from 145kgs in 1990 to about 95kgs in 2006. This means a sixty three % growth in population and only a seven % growth in cereal production(SADC 2009:6).These statistics reflect the extent of food insecurity levels in the region and a need to find a sustainable way to address the problem rather than depending on importing food and relying on donors for food aid.

FAO (2010) notes that, food security refers to access by all people at all times to sufficient, safe and nutritious food for a healthy and active life. In the context of the study food security is defined as the ability of a household to procure, through income, production and/or transfers, adequate food supplies on a continuing basis, even when the household is faced with situations of unpredictable stress, shocks or crisis (Maxwell, 2001).

In Masvingo food insecurity is a long time problem which can be traced back from the early 1980s. In the early 1980s food insecurity was as a result of poor accessibility than that of agricultural production (Anseeuw et al (2012). Even though there was high agricultural production in highly favourable regions and commercial farms, food insecurity was a problem among poor subsistence farmers as distribution of food was made difficult by poor infrastructural developments

in the rural areas. However from the early 2000 food insecurity became very rampant both on the national and household level. The problem is now caused by both poor agricultural production and accessibility in terms of distribution (ZIMVAC, 2012).

It should be noted that currently Masvingo province is dominantly characterised by smallholding agriculture prior to the land reform. Anseeuw et al (2012:23) asserted that land reform resulted in the agrarian structure constituting up to 98 % small scale farms of the total agriculture land. The small scale farmers, potential to ensure food security has not been given necessary support by the government. There has been less support and investment given to small scale farmers despite owning land that could successfully address the food insecurity problems. It should be noted that there is no clearly defined policy which supports small scale farmers in the province and in Zimbabwe in general. Smallholder farmers in Zimbabwe are victims of various problems. Robertson (2011) points out that Zimbabwe's economy has struggled for the past decade, and the agriculture sector is heavily affected. Most of the challenges emanated from the withdrawal of international support as a result of the controversial Fast Track Land Reform Programme (FTLRP), hyperinflation, capital constraints and government controls on markets. Zimbabwe's real GDP declined by more than 71% between 2000 and 2008 (Robertson, 2011:19), with overall agricultural production declining by 30% over the same period (Sukume et al, 2009:30). The government's land reform programme and the subsequent collapse of the agricultural sector, which was once the main source of employment and was the country's main source of export revenues and foreign exchange, are seen as the prime causes of the prolonged economic crisis (Richardson, 2004). Makumbe (2009) laments the issue that once known as the breadbasket of the Southern African Development Community (SADC) region, Zimbabwe is now characterised by chronic food insecurity and is entirely dependent on international aid, particularly food aid. It should be pointed out that after 2000 in the Masvingo province there have been several emergency-related programmes, from food relief to input support schemes, funded by the

government and international donors, to improve food security on short term basis but without a developmental policy which ensures sustainability in the long run. The agricultural productivity in the Masvingo province is very low and it is more prone to drought the region due to the low levels of rainfall in the region.

The agricultural sector in the province is characterised by an entirely new structure .It is mainly characterised by small scale and newly resettled farmers practising agriculture merely on a subsistence basis. In contrast a decade ago, the sector was composed of well established large scale commercial enterprises on private land. This raises new questions and new strategies in tackling the food security problem in the province. According to Scoones et al (2010:6), nationally the agrarian structure is currently characterised by smallholders farms made up of communal households (82.1%), old resettlement households (5.4%) and A1 households (10.5% ,medium scale farms (made up of old small scale commercial farms 0.6%) and A2 farms (1.1%) and large scale farms, conservancies and estates 0.4%). In other words, today 98% of all farms can be classified as smallholdings (Anseeuw et al, 2012:23).These statistics reflect the necessity and the urgency of addressing the food security issues, putting the small scale farmers at the fore front. This historical background motivated the study to investigate the role, challenges and opportunities of smallholder agriculture in ensuring food security in Zimbabwe using the case study of Masvingo province.

Masvingo is located 292 km south of the capital city Harare.The weather in Masvingo is hot and dry throughout the year except during the summer when the rain come. Masvingo is situated in a drought prone area with an average rainfall of 600mm/a. The smallholder agriculture sectors make up the majority of supplies of agricultural produce. However, despite the role that the smallholder agriculture sectors play in food security in the province there is less support from the government hence making it difficult for the sector to cope with external shocks like drought.

## 1.1 Problem statement

It should be noted that despite smallholder farmers being the majority and agriculture being the backbone of the economy of Masvingo province, the government is neglecting the potential role that the small scale farmers can play in ensuring food security. The problem is that there is no clearly defined policy on smallholder agriculture in Zimbabwe. It is a problem because without a policy it means there is no support for small scale farmers in the form of infrastructural development, education, incentives and subsidies; hence without support it means smallholder agriculture can be ineffective in addressing food security.

The smallholder agriculture sector in Zimbabwe and particularly in Masvingo has for many years suffered neglect that has resulted in decreased agricultural productivity and worsening food insecurity. The food insecurity situation has long been a problem in the province since 1980 although by then the problem which was causing food insecurity was the issue of poor distribution of food to the rural households which were food insecure despite food availability at national level. However since 2000 the problem of food insecurity became rampant at both household and national level due to a decline in agricultural production countrywide as result of the economic crisis, land reform problem and recurrent droughts. As a strategy to address the increasing food insecurity in the country the government has resorted to food imports and food aid approach which is not developmental and sustainable in nature. The current approach is not an effective method to ensure accessibility of food to all households considering the poor infrastructure in the country. The problem is being perpetuated by lack of political will to invest in small scale agriculture; the situation has been made worse by the fast track land reform which has resulted in various international organisations withdrawing support and credit facilities rendered to the sector in general. The lack of tenure among small scale farmers leaves land valueless hence making it a dead asset as farmers cannot use land as collateral to benefit from commercial banks credit facilities. The most affected are the small scale farmers in the communal areas and new farmers in the resettlement areas. The magnitude of the problem is mostly felt in Masvingo province as it is a

relatively dry province which lies in agro ecological region four and five where crop production is more vulnerable to recurrent droughts. According to ZIMVAC (2012:60) there are high seasonal food insecurity rates in Masvingo province which are 22% compared to an average of 18% in other provinces. The perceived implications from the stated problem is that the lack of a relevant and well defined policy and institutional framework leads to an ill-defined overall development strategy hence food insecurity will remain a problem.

In order to address the above stated problems, the study will specifically deal with the following questions: What is the role of the smallholder farmers in ensuring food security? What are the challenges faced by small farmers in ensuring food security? What opportunities are there to increase smallholder agriculture production and how could it be achieved?

## **1.2 Objectives**

The study seeks to investigate the role of smallholder farmers in improving food security using the evidence from Masvingo area. The study also investigates the challenges and prospects faced by small scale farmers in ensuring food security in Masvingo area. This will be done through extensive literature reviews. The contribution of smallholder agriculture production to food security will be measured through analysing the main determinants of food security which are food availability, food accessibility and food utilisation. The capacity of small scale farmers to achieve food security will be measured using the above mentioned determinants. The strategies which can be put in place to improve the capacity of small scale farmers to achieve food security will also be discussed.

## **1.3 Significance of the study**

This study is based on the premise that agriculture constitutes a key element, within a broad range of strategies that can be adopted to reduce food insecurity and contribute to agricultural productivity. As evidenced by the literature, despite the fact that 75-80 % of the world's farmers are small scale farmers, there is little work which has been done in the studies to reflect the

effectiveness of small scale farmers in addressing rural problems like hunger, poverty and food insecurity. Small scale farmers have not been the primary focus of agricultural development (FAO, 2009). Major researches have been centred on developing progressive, wealthy, educated commercial farmers.

In the context of Zimbabwe major work on the issue of agricultural development has been mainly focused on the favourable agri-ecological regions 1 -3 which receive high rainfall and with much agricultural potential and much focus on large scale farmers in other provinces like Mashonaland and Midlands province whilst little focus has been on the low potential dry areas like Masvingo and Matabeleland .There have been various food security strategies which have been implemented in Zimbabwe but there is still a gap between the conceptualisation of food security and the potential role of small scale farmers, and the design of operated instruments with which to address the concerns of small scale farmers as far as food security is concerned. Therefore, the study identifies and summarises key academic and practitioner literature concerning the contribution of small scale farmers in increasing food security using the case of Masvingo province.

#### **1.4 Research Methodology**

The study employs a qualitative research methodology. Research methodology clarifies the manner and way in which data is to be clarified (Creswell, 2009). Methodology can be viewed as an interface between substantive theory, method and practice.

There are two main types of research methodology which are qualitative research and quantitative research. Quantitative research methodology emphasizes objective measurements and the statistical or numerical data analysis through questionnaires and surveys. Quantitative research is beneficial in that it provides precise, quantitative numerical data and data analysis is less time

consuming. The weakness of quantitative research methodology is that knowledge produced might be too abstract and general to directly apply to chosen case studies.

Qualitative research use various forms of interpretative techniques that describe, translate and conclude certain events occurring in a natural world hence it can be summarised as a form of descriptive research (Creswell,2009).Qualitative research provides in depth discussion of complex phenomenos. The limitations of the qualitative methodology are that it poses difficulties when making quantitative predictions and it is also difficult to test hypothesis and theories with large populations.

The study utilises the qualitative approach to draw various conclusions and assertions on the role of smallholder agriculture in ensuring food security. The study is based on the case of Masvingo province.

The study involves a desktop review of literature supported by secondary data analysis to provide an overview of research on the contribution, challenges and prospects of small scale farmers to food security. The literature review focuses on studies dated between 2000-2012 but also includes some seminal works prior to 2000 to support the current work on the study with some historical overviews.

The study uses a historical approach methodology. According to Russel (2000) the historical approach is a methodology which was developed in the USA during the 1950s. Strong et al (2002) envisage that historical approach is whereby knowledge relating to historical periods is extended back into earlier times. This approach is best suited for the study since it looks at the contribution of smallholder agriculture to food security, a concept which had been recognised in the early 1960s and had seemed to be forgotten in the rural development thinking until recently. The World Bank (2008) reinvigorated the significance of smallholder agriculture as a strategy to address poverty and food insecurity in the developing countries.

The historical approach explains how smallholder agriculture development evolved in response to the needs of the rural poor. The historical approach looks at the evolution of rural development thinking examining various approaches which have been used that resulted in the support or exclusion of the smallholder agriculture's contribution to address food security. The historical approach requires the examination of a particular concept, for example the one which is being discussed in the study, the role of smallholder agriculture to food security. Moreover, the approach takes cognizance of various aspects like human development, empowering strategies and different structures that have existed and that could still be existing that contribute to development or underdevelopment of the aspect under investigation in this context, namely, smallholder agricultural development. Therefore, the study employs an historical approach that traces the history of approaches that caused underdevelopment or development of the smallholder agricultural sector in Zimbabwe.

Since the study does not use experimental or case study designs that rely on survey data, it therefore relies on information based on recognised development approaches and theory. The information used is obtained from extensive literature review and using various sources like official and non official documents from the international reports, United Nations documents, annual reports, human development reports, government documents ,publications and statistical reports as well as non-governmental documents on smallholder agriculture and food security. The study draws some insights from the development theories like modernisation to illustrate various attempts that have been made to modernise agriculture and various approaches like green revolution and sustainable livelihoods frameworks to illustrate the role of smallholder agriculture to food security. Therefore the historical approach will assist in identifying conceptual frameworks to understand the relationship between smallholder agriculture and food security.

In this study, Masvingo province has been chosen, with the view that it will offer a good representation on the contribution, challenges and prospects faced by small scale farmers in ensuring food security in rural Zimbabwe considering that it presents a picture of diverse

agricultural conditions, from higher potential areas near Gutu to the Limpopo valley and to the dry low potential areas in the south lowveld. This study will use the historical approach in analysing the trends of the contribution of smallholder agriculture to food security in Zimbabwe. Perceptions, conclusions and findings from various secondary data will be analysed.

### **1.5 Delimitations**

The study focuses on the contribution, challenges and prospects of small farmers to food security. The study uses qualitative method using secondary data to reflect the extent of food insecurity in Zimbabwe and the necessity to put a major focus in small scale farmers. The researcher opted to limit the study in a rural setup simply because that is where smallholder farmers are located. The study is further delimited to Masvingo province as the region offers a representativeness of the problems faced by small scale farmers in Zimbabwe as food insecurity is highly recorded in this province and the number of small farmers are also high in this province.

### **1.6 Organisation of the study**

Chapter 1 presents an introduction to the study covering the background of the study and defining central concepts used in the study. The chapter highlights the problem statement, objectives and delimitations of the study. Chapter 2 gives a discussion of smallholder agriculture theoretical base and food security in the context of rural development thinking. The study uses the modernisation theory to show how the smallholder agriculture can be modernised and contribute significantly to food security. Chapter 3 reflects the detailed discussion on the contribution of smallholder agriculture to food security by providing food production trends in Zimbabwe over the past decades. Chapter 4 presents the socio-economic background of the study area and provides the capacity of smallholder farmers in Masvingo to provide food security and challenges within the area. Chapter 5 presents findings and recommendations on the smallholder agriculture and food security in Zimbabwe. Chapter 6 presents conclusions from the study and areas of future research.

## **Chapter 2**

### **Smallholder agriculture development theoretical base and food security.**

#### **2.0 Introduction**

This chapter of the study provides a brief discussion on the evolution of thinking around smallholder agriculture and how it has contributed to food security in developing countries. To achieve this, the chapter discusses the dominant theories that have guided smallholder agriculture development programmes to address food security in the developing countries. Particular interest has been given to the impact that these development theories had on the significance of small scale farmers. Thus, the chapter discusses the concept of smallholder agriculture and the sustainability of the approach. In the past, agricultural development has been centred in developing progressive, wealthy educated commercial farmers and much focus on agriculturally favoured regions. Currently, the rural development debate is mainly centred on the potential of agrarian based development versus diversification out of agriculture in eradicating poverty and ensuring food security. In order to understand smallholder agriculture's contribution to food security in current rural development debates, this chapter will provide a brief overview of rural development thought from the 1950s to the present. This approach has been discussed by Ellis and Biggs (2001). Ellis and Biggs (2001) highlighted two main paradigm shifts during a sixty year time frame of rural development which are the modernisation ideas of dual growth and the traditional peasant farmer which have given way to a focus on small farm agriculture as the engine of growth and development from the 1960s onwards. This chapter also reviews changes in agriculture development with the primary focus on smallholder agriculture and implications food security.

#### **2.1 The modernisation approach**

Modernisation means the appearance of modes of social life or organization which emerged in Europe from about the seventeenth century onwards and which subsequently became more or

less worldwide in their influence (Giddens, 1991). Modernisation theories explain the changing ways of agricultural methods in traditional and post modern societies.

Modernisation theory is used to explain the process of modernisation within societies. Modernisation refers to a model of a progressive transition from a pre-modern or 'traditional' to a 'modern' society (Power, 2003). In the context of agriculture development, the theory advocates for a shift from traditional methods of farming to modern methods of farming. The theory looks at the internal factors of a country while assuming that, with assistance, "traditional" countries can be brought to development in the same manner more developed countries have. Modernisation theory attempts to identify the social variables that contribute to social progress and development of societies, and seeks to explain the process of social evolution (Escobar, 1995). Modernisation theory not only stresses the process of change but also the responses to that change. It also looks at internal dynamics while referring to social and cultural structures and the adaptation of new technologies.

According to theories of modernisation, each society can develop from traditionalism to modernity, and that those that make this transition follow similar paths. More modern states are wealthier and more powerful, and their citizens freer, with a higher standard of living. According to the theory smallholder farmers need to replace traditional methods of farming like hand tillage, shift cultivation, dependence on natural rainfall with modern methods of farming like development of agriculture and use of highly mechanised machines.

The theory is also based on the principle that there is a link between economic and social development connection and that there can be continuous progress and improvement in human development (Power, 2003). Therefore smallholder agriculture, if given the chance to modernise, can contribute not only to food security but also to the economic and social development of the community and the country. Furthermore, the theory encourages technological processes to help

give people further control over their environments, arguing that technological progress would eventually facilitate social progress. This emphasis on the technological advancement is important in the context of the study as smallholder agriculture worldwide is associated with poor technology advancement.

Modernisation theory appreciates societies which are open to change and views reactionary forces as restricting development (Rahnema et al 1997). According to the theory maintaining tradition for tradition's sake is considered to be harmful to progress and development. Using the modernisation theory, it is important to analyse if the smallholder agriculture is open to change and accommodate modern ideas of agricultural development. The theory makes it possible to view if the traditional methods of farming are really a hindrance to increased agricultural production.

Modernisation theory is associated with improvements in living standards, physical infrastructure, education and economic opportunity to refute such criticisms (Datt et al,1996).Modernisation advocates that new technology is a major source of social change. Since modernisation deals with social change from agrarian societies to industrial ones, it is important to look at the technological viewpoint; however new technologies do not change societies by themselves. Technology makes it possible for a more innovated society and broad social change. This dramatic change through the centuries that has evolved socially, industrially, and economically, can be summed up by the term modernisation.

The modernisation theory constituted development thinking in the 1950s to the 1960s that is rooted in capitalism (Power, 2003). It is of paramount significance to elucidate the role and place of the smallholder agriculture in this period. According to the modernisation theory as envisaged by Ellis and Biggs (2001) the subsistence sector possessed negligible prospects for productivity or growth. The subsistence sector could only play a passive role in the process of economic development through supplying resources to the modern sector of the economy. The modern large farms were viewed as capable of enhancing the efficient use of resources and modern technologies, hence they were viewed as more productive than small farms.

The main development thinking focused by the modernisation approach was mainly on growth through industrialization which had its roots in the dual economic theory of development also referred to as the Lewis Model (Lewis, 1954), which analyses the long-run development of an economy with two specific sectors, a large agricultural one and an industrial or modern one, exploring the path through which a poor economy does convert itself into an industrial one. The dual economy models posited a relatively advanced sector and a relatively backward sector. These have alternatively been called capitalist and subsistence, formal and informal, modern and traditional, industry and agriculture, urban and rural, primary and secondary (Fields, 2007:27). The dual economic model defined smallholder agriculture as a primitive mode of agriculture with the primary goal of food production being subsistence. The sector was viewed as less ambitious.

The model illustrates the growth of a developing economy in terms of labour shift between two sectors, which are the subsistence sector and a capitalist modern sector. The agricultural sector is characterized with abundant endowments of labour and land. Lewis (1954) indicated that given the unlimited labour supply at the subsistence wage, the marginal product of labour will be very low (if not zero or negative), producing a horizontal curve of the marginal product at the level of subsistence wage for a considerable period.

Lewis (1954) further elaborates that on the other side, there exists an industrial sector, in which the exogenous wage is institutionally characterised at a level higher than the one in the rural sector; since at subsistence level there is a large excess supply and labour surplus hence capitalists in the industrial sector do not strive when deciding the amount of workers to employ. Further, it is assumed that only capitalists in the industrial sector do save, while agricultural and urban workers and agricultural landlords do not, as they consume their entire budget.

The model is also characterised by an output per head which is lower in the subsistence sector than in the capitalist sector, because it was not fructified by capital hence Lewis (1954) termed it unproductive. The model assumed that as more capital becomes available more workers can be drawn into the modern industrial sector from the traditional subsistence sector, and their output per head rises as they move from the one sector to the other. Therefore, in the Lewis model, the process of development is said to depend on the transfer of surplus labour from the subsistence sector characterized by zero marginal labour productivity to the capitalist sector (Lewis, 1954). The model views that there is abundant labour in the smallholder sector which lies idle and unutilised in most periods of the year hence rendering the sector unproductive in ensuring food security and poverty alleviation.

The Lewis theory had limitations which can be summarised as follows: the dualistic role of agricultural landowners and the voluntary nature of unemployment. The Lewis theory assumed that urban growth and industrialisation were fundamental principles for economic growth. It should be pointed out that the assumption that urban growth drives economic growth leads to the neglect of the agriculture by government yet the majority of the people in the developing countries survive on agriculture. Furthermore, the approach resulted in capital being invested in labour saving mechanizations instead of agricultural inputs or employing more workers in agriculture, thus leading to rural-urban migration, resulting in another problem within the city “urban poverty”(Lewis 1954:150).

The Lewis model considered the subsistence agriculture sector as a labour pool and not a vehicle of development. With this worldview, little attention was given to agricultural development and particularly smallholder agriculture, and the primary focus of rural intervention was on community development that was largely on social welfare interventions (Barnett, 1995).

### **2.1.1 Modernisation of agriculture**

The modernisation theory contributed to the modernisation of agriculture. The concept of modernisation incorporates the full spectrum of the transition and extreme transformation that a traditional society has to undergo in order to become modern (Barnett, 1995). The agriculture modernisation process entails encouraging farmers to try new crops, new production methods and new marketing skills (Ellis et al, 2001). In general, agriculture modernisation led to the introduction of hybrids, the green house technology, genetically modified (GMO) food, use of artificial fertilizers, insecticides, tractors and the application of other scientific knowledge to replace traditional agricultural practices (Ellis et al 2001:441).

The view above is supported by Smith (2007) who pointed out that modernisation is about exchanging of older agriculture practices with something more recent. Agriculture societies can therefore be regarded as modern when they display specific characteristics. The extent to which these characteristics are exhibited gives an indication of the degree of modernity that has been reached. The characteristics are cited succinctly by Coetzee et al. (2007: 31) as; readiness to accommodate the process of transformation resulting from changes, continuous broadening of life experiences and receptiveness to new knowledge, continuous planning, predictability of action and the ability to exercise effective control, high premium on technical skills and understanding of the principles of production, changing attitudes to kinship, family roles, family size and the role of religion and changing consumer behaviour.

According to Lewis (1965) the main challenge to smallholder agriculture in developing countries lies on the primitive poorly developed agricultural systems which are characterised by lack of scientific knowledge, poor equipment, inefficient marketing, insecure tenure, uneconomically small-scale operations exacerbated by an increasing population growth. In addressing these problems Lewis (1965) advocated for an agrarian revolution with much focus on large scale

agricultural production which promotes the use of machinery and other high sophisticated technology. In his opinion, he considers large-scale agriculture to utilise fewer people per acre than on a smallholding sector. Hence where the countryside is overpopulated and where there are not enough new lands an agricultural revolution should go hand in hand with providing new employment opportunities outside agriculture. Thus, an agricultural revolution and an industrial revolution should always go together, such that the former release labour which the latter draws off the land. Lewis (1965) further explains that this is why governments of developing countries have to put into their agricultural programmes projects for industrialisation.

The historical analysis of the model shows that the governments of developing countries end up neglecting the potential role in ensuring food security and addressing general rural problems with more focus placed on urbanisation and industrialisation as the best strategies for economic development.

### **2.1.2 Green revolution**

The most accredited role of modernisation as far as smallholder agriculture and food security are concerned came with the green revolution. The decade of the green revolution was characterized by high expectations of the promise of technology. The Green Revolution was the technological response to a world-wide food shortage which became threatening in the period after World War II (Moore et al ,1996). Technology transfer focused on large scale, input intensive agriculture based on packages of higher yielding hybrid seeds, fertilisers, pesticides, mechanisation and post harvest technologies which came to be known as the Green Revolution. There are different views on the success and sustainability of the green revolution as well as concerns about its impact on smallholder agriculture which was being replaced by of large scale commercial agriculture.

The green revolution approach was associated with large-scale state investment in infrastructure, research, and support for the adoption of new technology. An important underlying proposition

included the existence of economies of scale in agriculture, for instance that large farms could make more efficient use of resources and modern technologies than small farms (Ellis et al , 2001). This view led many governments and donors to finance special programmes for agriculture in high-potential areas.

The green revolution showed evidence that agricultural productivity would increase rapidly due to the use of hybrid seeds, high technology and research. A good example is the Asian green revolution which began in the 1960s with improved access to fertilizer through state supported subsidies, rural credit and improved infrastructure and contributed to strong productivity growth in rice and wheat. According to Ellis et al 2001 as a result of green revolution production of rice and wheat in Asian countries increased by 75% between 1965 and 1980. In Indonesia, rice yield in 1960 was 1.3 tonnes per hectare. By 1994 it had risen to 4.3 tonnes per hectare. In India, production more than doubled between 1960 and 1993 (Moore et al, 1996:52).

The introduction of High Yield Varieties (HYVs) spread rapidly. By the mid-1980s, approximately 50% of the wheat of Asian countries cultivated was HYVs (Moore et al, 1996:56). In 1983, China cultivated 95% of its rice area and Latin America sowed 82% of its wheat area to high yielding varieties (Moore et al, 1996). In utter contrast to the Asian experience, African states were less successful from the outcome of the green revolution. Although there were positive results in some of the African countries implementing the green revolution generally the results were not sustained due to a number of reasons such as widespread corruption, insecurity, lack of infrastructure and general lack of will on the part of governments (Ellis et al 2001:400).

Ellis et al (2001) summarise that the major problems of the modernisation projects were that development was very much localized and the major focus was on large farms, highly favourable regions, irrigated areas and superior cereals dependent on costly inputs. Development in the

modernisation period was based on the direct transfer of capital and technology from high-income countries to the third world countries by applying a diffusion model. Modernisation theory has been criticized, mainly because it conflated modernisation with Westernization. In this model, the modernisation of a society required the destruction of the indigenous culture and its replacement by a more Westernized one. By one definition modern simply refers to the present, and any society still in existence is therefore modern. Proponents of modernisation typically view only Western society as being truly modern arguing that others are primitive or unevolved by comparison. This view sees unmodernised societies as inferior even if they have the same standard of living as western societies. Opponents of this view argue that modernity is independent of culture and can be adapted to any society.

It has also been criticised empirically, as modernisation theorists ignore external sources of change in societies. The binary between traditional and modern is unhelpful, as the two are linked, and often interdependent; whilst 'modernisation' does not come as a whole. The modernisation approach is important to illustrate the historical trends of agricultural production. However, the theory will not be used in the analysis of the findings since it does not fully accommodate the role of traditional methods as developmental which is difficult to ignore as far as smallholder agriculture is concerned due to the limited financial capital in the sector, hence a need to accommodate other sustainable methods of enhancing agriculture production .Therefore the sustainable livelihoods approach which will be discussed in the last section of the chapter will be used to fill that gap.

## **2.2 Smallholder agriculture and modernisation**

Smallholder agriculture when provided with support and technological advancement is usually considered synonymous with commercialisation. The most frequently stated objective of current agricultural development programs is increased farm income (Harwood et al 1979). Other indicators of development progress are amounts of cash inputs used and farmer participation in credit programmes. The underlying assumption is that greater cash flow across the farm

boundaries (increased commercialization) is a true indicator of increased farm productivity and improved farm family well-being.

Harwood et al (1979) posit that slowness or outright inability to commercialize large segments of the world's farmers and the questionable effects of such commercialisation on family well-being in other cases lead development thinkers to a more general concept of development for small farms. Smallholder agriculture modernisation signifies a progression into more efficient and more productive use of limited farm resources to ensure food security. It nearly always implies an increase in labour productivity and an increase in quality or quantity of the food output of a farm unit.

As illustrated above the smallholder agriculture potential to contribute to food security has been developed from the rural development thinking in the 1950s which emphasised agricultural development as a strategy to address rural problems like poverty. Various efforts were made on providing support and stimulating development in the agriculture sector. The increasing support to smallholder agriculture was placed under the auspices of the international agricultural development service (Harwood et al, 1979). The model traces the development of smallholder agriculture from the primitive mode up to the highly developed modern farms. This agricultural development model owes its origin to the modernisation theory as previously discussed which advocates for the modernisation of the agricultural sector to address poverty in the rural areas. As noted before the modernisation theory is critiqued for failing to address adequately the gap between the poor small scale farmers which resulted in the agricultural development favouring the rich commercial farmers at the expense of the smallholder agriculture sector. Ellis and Biggs (2001) summarise that the major problems of the modernisation approach were that development was very much localised and the focus was on large farms, irrigated areas and crops dependent on costly inputs. Hence the smallholder agriculture concept was developed to address the neglect of the smallholder agriculture sector in agricultural development which was supported by various

authors like Lipton (2005), Newell (2004) and Hazell (2007) who centred their discussions on agricultural development putting small scale farmers at the fore front. The model was applied successfully during the green revolution in Asian countries in the 1960s with FAO playing a leading role which was characterised by high mechanisation, use of hybrid seeds and various incentives in the agriculture sector. Notable success stories were noted in this green revolution and prompted the development thinkers to apply the same approach to all developing countries but the approach did not result in an overall improvement in the economic and social well-being of rural people in Africa. The green revolution in Africa was hampered by many factors, like poor support from the government. Misra et al (1981) noted that since the majority of rural people in developing countries are landless or small farmers with a limited access to inputs and credit facilities, the green revolution could not initiate major changes in the quality of life of rural poor. The agricultural development model is of value in addressing the issue of food security but it cannot be used in isolation of various strategies like the non-farm activities hence rendering this approach various loopholes in tackling the issue of food insecurity. Therefore, smallholder agriculture in this study is also going to be viewed as a rural livelihood strategy amongst other strategies thus introducing another approach that is going to be the mainstay of the study which is the sustainable livelihoods approach.

### **2.3 The Participatory development approach**

The participatory development approaches led by Chambers (1983) and others, was important in applying participatory ideas to smallholder agriculture in a manner that would allow the poor to be informed participants in development, with external agents acting mainly as facilitators and sources of funding Further support for this development approach came from the progressively strong critique of development, that is, from the post development perspective such as Escobar (1995) as well as Rahnema and Bawtree (1997). The top down approaches were criticised for their disempowering aspect and hence were rendered ineffective. The development thinkers argued that macro-economic development is not the answer to development but small scale

centred farming. In addition, Ashley and Maxwell (2001) stated that the rural development debates needed not to emphasize just on participation but governance, with particular emphasis on democratic decentralisation.

Since the participatory approach to development, growth was regarded as essential, the private sector was the main engine for development, and government was regarded as the provider of strategic policy and investment support for infrastructure, service delivery and marketing (Ellis and Biggs, 2001). With the participatory development approach, there was little enthusiasm for large-scale and integrated rural development programmes that characterised the 1970s; instead small-scale credit programmes became the popular agricultural intervention for smallholder agriculture following the Grameen Bank model. Grameen Bank is a poor focussed grassroots institution involved in disbursing small loans for self-employment purposes to landless women in Bangladesh (Bostein, 1995).

The introduction of participatory development in Sub Saharan Africa came with the era of structural adjustment as a dominant paradigm which was associated with large scale liberalization, reduction in the role of the state, market determined prices, the removal of quantitative restrictions, and promotion of private sector, privatization and decentralization policies. Therefore in summary it can be argued that the participatory development approach paved the way for the acceptance of the role that the smallholder agriculture can play in addressing problems like poverty, malnutrition and food insecurity. However, the main problem which came with the approach was the removal of the subsidies and support by the government to the smallholder agriculture sector which negatively impacted on the productivity of the sector. Hence most developing countries experienced increased levels of food insecurity as a result of structural and adjustment policies which came with the participatory development approach.

## 2.4 Sustainable Livelihoods Approach

The livelihood concept is based on the premise that a rural household has access to (or has an endowment of) a minimum amount of resource base which can be summarised as human, natural, physical, social and financial capital, which can be used to come up with a set of livelihood strategies, for example crop farming, livestock production, off-farm activities, among other strategies (Chambers and Conway, 1992).

The emergence of sustainable livelihoods framework (Carney, 1999, Chambers and Conway, 1992) drew on much of the development theory and approaches summarized above and is explicitly transdisciplinary. Its focus on an asset vulnerability framework draws on the famine and food security literature (Ellis and Biggs, 2001). Many earlier development approaches downplayed differentiation between households in rural areas and assumed that rural households had single-purpose economies (in other words, that they only had one way of making a living). As a result, development planners tended to focus on narrow, sectoral, production-orientated strategies that often bypassed those most at risk and failed to recognise that poor households have multiple livelihood strategies (Ward et al, 2002). The approach cuts across the boundaries of more conventional approaches to looking at rural development which focuses on defined activities: agriculture, wage employment, farm labour, small-scale enterprise (Scoones, 2009). The Sustainable Livelihoods (SL) approach recognises the different livelihood sources of the poor, highlights shocks and stresses which impact on these and the enabling factors which enhance them.

The aim of the approach is to ensure that livelihoods strategies are sustainable. In this case smallholder agriculture is sustainable if it can cope with and recuperate from shocks such as internal conflicts, outbreak of crop or livestock diseases and sudden death of a family member and managing to recover from stresses such as recurrent adverse weather and seasonality and economic meltdown and political instability, while not undermining the natural resource base

(Chambers and Conway, 1992). The ability of smallholder agriculture to cope with various shocks is fundamental to ensuring food security.

The main strengths of the approach lie in that it can be applied to any type of development activity thus allowing the nexus of the studies' focus on smallholder agriculture. In this study smallholder agriculture was viewed as one of the livelihood strategies in a rural setting and the cornerstone of food security.

The strength of the framework in the context of this thesis is that it places a strong focus on natural resources as productive assets in supporting rural livelihoods (Carswell and Jones, 2004:185). The approach starts with what people have (assets/capitals) and what they do (livelihood activities), so moving attention away from what they lack; in practical terms, it enables strengths to be strengthened. It shifts the focus away from “, problems, constraints and needs” to perceived “strengths, opportunities, coping strategies and local initiative” (Carswell et al, 2004: 185). The approach highlights trade-offs that people make between the different assets, livelihood activities and outcomes. It embodies a people-centred, responsive and multi-level approach to development (Carswell et al, 2004:185). Of significance in this framework are the institutional processes (embedded in a matrix of formal and informal institutions and organisations) which mediate the ability to carry out specific strategies and achieve (or not achieve) particular outcomes. The framework highlights the complex social and economic realities faced by smallholder farmers. In addition, the sustainable livelihoods approach is linked to food security, which is another central focus of this thesis. Indeed, the approach is critical in this regard, in that it shows that food security is not just an issue of productivity or even the sustainability of production, or entitlements but depends on how people, especially poor people, gain access to production and exchange capabilities and to food (Swift and Hamilton, 2001:84). The approach does not view smallholder agriculture as passive and asset-less and facing severe insufficiencies which can only be addressed by outside intervention as mainly advocated by the modernisation theory. Smallholder

agriculture is viewed to have critical assets in relation to local technologies and farming techniques.

However, the approach has some challenges as its focus on non income aspects of livelihoods (reduced vulnerability, access to assets) is difficult to measure. However, despite these limitations the approach still remains relevant to the study and is going to be the main framework of the study in assessing the contribution of smallholder agriculture to food security amongst other livelihood strategies.

## **2.5 Food Security**

FAO (2010) notes that food security refers to access by all people at all times to sufficient, safe and nutritious food for a healthy and active life. According to the definition there are three components to food security: availability (sufficient quantities of appropriated food are available from domestic production), accessibility (adequate income or other resources to access appropriate food through home production, buying barter, gifts, borrowing or food aid) and utilisation (food is approximately used through food processing and storage practices adequate knowledge and application of nutrition and healthcare services), (FAO, 2010).

The 1970's concept of food security highlighted the importance of producing sufficient food to meet the needs of the global population. Countries hence aimed at self-sufficiency for producing enough food domestically or ensuring they had the financial resources to purchase imports to cover the domestic shortfalls. In such instances, the solution to food insecurity lay in pursuing food production self-sufficiency by raising crop yields through bio-technology (Green Revolution and genetically modified crops) (Devereux, 2007).

The perception that food security depends on physical supply and availability of food, as described above, can be linked to the work of Thomas Malthus. In his Essay on the Principle of Population

(1798), he argued that human populations could not increase indefinitely in a world of limited natural resources and that famine would eventually intervene to regulate population growth and balance the demand for food with food supplies (Devereux, 2007). His theory emphasises failures of food supply as the cause of food insecurity and in the worst instances famine, and it underpins contemporary resource scarcity debates. The theories developed on this basis became known as the food availability decline (FAD) theories. They focused on demographic process, (for example Malthusian predictions that famine will occur when population exceeds an area's carrying capacity) (Devereux, 2007). Other factors which FAD theories identified as causes of disrupted food supply included environmental processes like desertification as well as climatic shocks like droughts and floods.

The major weakness of these theories in explaining food insecurity is that they only explain disrupted availability to food, for example crop failure, but pay very little attention to failures of access to food (Devereux, 2007:9). This means that the social and political dimensions of food security are not analysed, so as to explain why some people were more vulnerable than others to food insecurity. These dimensions became important because widespread hunger continued to exist even if there was sufficient food supply at the national and global levels. This resulted in a paradigm shift in the 1980s credited to the work of Amartya Sen (1981). His study focused on developing a new theory on the causation of starvation in general and more specifically famines. It moved away from the traditional approach of analysing famine which focused solely on food supply. Sen (1981) developed the entitlement approach which instead concentrated on ownership and exchange, using case studies of the Great Bengal famine in 1943, the Ethiopian famines of 1973 and 1974, the Bangladesh famine in 1974 and the famines in the Sahel countries of Africa in the 1970s.

The new concept highlighted that food security went beyond the single component of production shocks as it now needed to entail secure access to adequate food at all times. This shifted the analysis from food production systems to the relationship between people and food (Devereux, 2007). For Sen (1981), starvation is characteristic of some people not having enough to eat. It is characteristic of there not being enough food to eat. The new question asked with regard to food security was whether people had enough to eat as opposed to whether there was enough food to feed everybody (Devereux, 2007). It therefore became more usual to define food security as being a problem of access, with food production at best a route to entitlement, either directly for food producers or indirectly by driving market prices down for consumers (Maxwell, 2001).

In this context, food security is defined as the ability of a household to procure, through income, production and/or transfers, adequate food supplies on a continuing basis, even when the household is faced with situations of unpredictable stress, shocks or crisis (Maxwell, 2001). Such situations could include crop failure resulting from drought, market fluctuations such as sudden price rises, the decline or loss of employment and loss of productive capacity because of sudden illness. The challenge with this shift from food first to livelihoods relates to the unit of analysis; in particular, whether it should be the household's or the individual's access to food that becomes the critical dilemma. Recent research (Hart, 1986; Evans, 1991; Kabeer, 1991,1995) has favoured analysis of an individual's access to food in the household, as this is linked to the control they have over resources in the household and their access to household income (Maxwell, 2001:17). Because of this, most definitions of food security begin with the individual element , though recognising the complex inter-linkages between the individual, the household, the community, the nation and the international economy (Maxwell, 2001:17).

Maxwell (2001) highlights that whilst the subjective dimension of food security has become important, questions have been raised as to how to measure the subjective perceptions about the

quality of food, whether there are trade-offs for instance; can some aspects of what food quality is be overlooked or replaced? and who decides on these perceptions of food quality? Nevertheless, Maxwell (1988) goes on to define food security as follows: A country and people are food secure when their food system operates in such a way as to remove the fear that there will not be enough to eat.

In particular, food security will be achieved when the poor and vulnerable, particularly women and children and those living in marginal areas, have secure access to the food they need. Contemporary definitions of food security place emphasis on individual entitlement, but they also recognise the complex inter-linkages between different spatial levels, from individuals and communities to the international level. Food security therefore is the capacity of households, communities and the state to mobilise sufficient food through production, acquisition and distribution, and on a sustainable basis (Chambers, 1995; Frankenberger, 1996). As a result, it depends on the land resources available to the household or community and their ability to mobilise resources for the production and/or distribution of food to achieve an active and healthy lifestyle. Food availability is a crucial but not adequate condition to ensure food security for a household. Reliable access to food is also linked closely to concepts of sustainability and vulnerability. Sustainability in this context refers to households being able to maintain a consistent level of access to food without this causing challenges or problems to future levels of access, whilst vulnerability refers to a situation where households are faced with a scenario which threatens their access to food (for example, natural disasters).

Jooma (2005) illustrates that food security is not just a matter of the immediate availability of food, but a failure of livelihoods to guarantee access to sufficient food at household level. In such instances, households either lack the assets to produce enough food or lack the financial resources which can be exchanged to buy food. When households are unable to acquire sufficient

food using their regular means of access to food for example, because of poor crop production or a loss of a source of income, Corbett (1998) argues that they will employ a sequence of coping strategies to meet their food needs. According to Ellis (1998) coping strategies are involuntary responses to disaster or unanticipated failure in major sources of survival. Ellis (1998) furthermore elaborates that such strategies are different from risk management, which is a more deliberate household strategy to avoid or anticipate failures by maintaining a range of livelihood activities. Coping includes the adoption of tactics for maintaining consumption levels, for instance drawing on savings, using up food stocks, gifts from relatives, community transfers, and sales of livestock and other asset sales (Ellis, 1998). There are sequential phases which characterise coping strategies. Initial strategies seek first to protect the future income generating capabilities of the household, even if current consumption is compromised. It is only as a last resort that assets critical for future survival are sold or abandoned to stave off starvation (Ellis, 1998). Rosset (2006) has however argued that the whole notion of food security has been stripped of its real meaning.

Whilst food security means that every child, woman and man must have the certainty of having enough to eat each day, the concept even in its evolution has said nothing about where the food comes from and how it is produced. Therefore, agricultural policy makers in the USA have often argued that it is better for poor countries to achieve food security by importing food rather than producing it themselves. The consequence of this policy has been that the massive imports of cheap and subsidized food has undercut farmers especially smallholders in the developing countries, driving them off their land. Alternative sources of income through employment either in rural or urban areas are often insufficient for such households to purchase food. Rosset (2006) argues that to achieve genuine food security people in rural areas need to have access to productive land and receive prices for their crops that allow them sufficient livelihoods.

In Zimbabwe, food insecurity is a long term problem which can be traced from the early 1980s. In the early 1980s food insecurity was as a result of poor accessibility than that of agricultural production (Anseeuw et al (2012). Even though there were high agricultural productions in highly favourable regions and commercial farms food insecurity was a problem among the poor subsistence farmers as distribution of food was made difficult by poor infrastructural developments in the rural areas. However from the early 2000 the food insecurity became extremely rampant both on the national and household level. The problem is now caused by both poor agricultural production and accessibility (ZIMVAC, 2012).

It should be noted that currently Zimbabwe is dominantly characterised by smallholding agriculture prior to the land reform which, as asserted by Anseeuw et al, (2012) resulted in the agrarian structure constituting up to 98 % small scale farms. The small scale farmers, potential to ensure food security has not been aided with the government support and there has been less support and investment given to small scale farmers despite owning land that could successfully address the food security issues. From the discussion, it is indeed clear that the challenges faced by rural households, especially increased poverty levels, food insecurity and landlessness, centre around their livelihoods, and any attempts to address these challenges must be looked at from a more holistic framework at the core of which must be the notion of rural livelihoods which have been discussed above.

## **2.6 The significance of focusing on smallholder agriculture**

Globally, there are questions over where to focus development efforts between high potential areas where development options are greater or poor areas where the potential is less but the incidence of poverty and food insecurity is greatest. The promotion of smallholding agriculture may be the best option in addressing food security as noted by the (World Bank, 2010) which asserted that smallholders' agricultural production may be efficient or more so than that of large scale

estates. On a more convincing note, smallholder agriculture may generate more employment per hectare than large estates and smallholders' income may be "2–10 times what they could obtain from wage employment only" (World Bank, 2010:26). Population increase, urbanization and income growth will drive the demand for food while high energy prices, stress on natural resources, and climate change may act to constrain supply. To feed the world's growing population projected to exceed 9 billion in 2050 (UN, 2009) it will be necessary to boost the production of food and to do so the smallholder agriculture sector should be supported and put on the forefront. It is projected that most of the population growth will occur in developing countries, where smallholder agriculture dominates and food insecurity is rampant. An important element in addressing food security in these countries and the world at large is higher promotion to be given on small farms to increase productivity (World Bank, 2007).

The pessimists for smallholder agriculture like Collier (2008) argue that to ensure success in agriculture in Africa, large commercial farms may be a better option than smallholder agriculture. Moreover, other scholars like Maxwell (2000) also support the view through further positing that the changing environment where there is competition from other wider markets will marginalise small scale farmers up to a point where it will no longer be sustainable to rely on small scale farming. These pessimists see the disappearance of small scale farms in the near future hence advocate for livelihoods under other non-farm activities like tourism. This is in utter contrast with the smallholder agriculture proponents like Hazell (2007), who argue that there is great efficiency in small scale farming. Therefore, it should be noted that challenges of small scale farmers have to be analysed making use of various ideas from the pessimists, however without completely ruling out the potential role of smallholder farmers in enhancing food security without giving them the necessary support. The contribution of small scale farmers in ensuring food security has to be appreciated and contemplated with necessary expertise, incentives and infrastructural development.

## **2.7 Conclusion**

This chapter has placed smallholder agriculture and food security firmly into a rural development context, through a detailed discussion of various development approaches since 1950s the theory of modernisation, and sustainable livelihoods approaches were discussed to shape the role of smallholder agriculture in contributing to food security in each phase of rural development. While all theories were seen to have aspects relevant to this study, the sustainable livelihoods framework was considered to be more appropriate as it appreciates the assets possessed by smallholder farmers, it focuses more on the capabilities rather the weaknesses of the small scale farmers, hence will be used in the analysis of the findings. The framework is also appropriate considering that the thesis is based on a subsistence oriented agriculture system. The modernisation theory was used to trace various strategies implemented to ensure full development of the smallholder agriculture sector. The study also provided the significance of agriculture and particularly smallholder agriculture in addressing rural problems and, in the context of this study, food security. Contributory literature reflected the relationship between smallholder agriculture and food security. In the next chapter the study is going to provide a full discussion of the contribution of smallholder agriculture to food security.

## **Smallholder agriculture and food security**

### **3.0 Introduction**

This chapter examines the contribution of smallholder agriculture to food security from a global perspective. It examines the contribution of smallholder agricultural production in relation to the dimensions of food security, which includes food availability, food access, utilization and the nutritional aspect. The chapter provides a general overview of the global smallholder agriculture sector and food security and the various conditions which are necessary to increase the capacity of small scale farmers in ensuring food security. Smallholder agricultural production plays a pivotal role in enhancing food security. In this chapter, it is recognized that smallholder farming potentially plays an important role in food security amongst the rural poor. Smallholder production can increase food supplies and thus cushion households from food price shocks consequently improving household food security (Baiphethi, and Jacobs, 2009:462). The chapter further expands on the previous chapter by discussing the significance of smallholder agriculture. Given the relationship between food security and livelihoods, the chapter also investigates how smallholders can effectively address food insecurity through diversification strategies and smallholder agriculture placed amidst a wide range of other livelihood strategies.

### **3.1 Global perspectives on food security and the role of smallholders**

The World Bank (2007) acknowledges the significance of agriculture in addressing poverty and food insecurity in developing countries. International Food Policy Research Institute (IFPRI) 2011, further reinforces the significance of agriculture and particularly smallholder agriculture by alluding that investing in agriculture and rural development, with a focus on smallholder farmers, is the best option for achieving global food security, alleviating poverty and improving living standards of the rural populace.

In sub Saharan Africa, most people in rural areas depend on the pursuit of farming activities (Bryceson, 2000). Though they depend on small scale crop production to ensure food availability in their households; they struggle to provide sufficiently for their food needs. The ETC Group (2009:16) argues that 70% of the world's food is produced by smallholders or landless farm labourers. Despite climate change, pests, diseases, water scarcity and myriad other challenges, smallholder farms produce a large proportion of the world's food.

According to Wiggins et al (2013:64) nearly half the world's population is estimated to be fed by smallholder farmers today. However, new supply chains for supermarkets, large-scale food buyers, and international trade increasingly rely on large-scale producers to meet more demanding quality and health standards and ensure regular, large volumes of homogeneous product. Buyers for specialty fresh and processed products increasingly specify the variety and growing practices; thus, they tend to rely on larger scale producers and strongly organized producer groups

A large share of international development assistance to agriculture has been for export development. Unlike the reiteration of the large-scale, trade-oriented groups, most development thinkers focus on "Food Security for the Poor" that is, how to ensure that individuals, households, and communities with low economic purchasing power (the 1 billion who are already at risk of hunger) will have year-round, adequate food supplies and quality (HLPE,2013:44). Given the disproportionate incidence of hunger in rural areas and among smallholder farmers, their concern is with feeding rural farming and pastoral communities and nearby small towns (FAO, 2012).

The advocates of smallholder agriculture show greater interest in diversified products to ensure food security and better nutrition; strengthening capacities of smallholder farmers to supply food; local distribution systems; production systems that do not depend as much on inputs that must be

imported from outside the area and special provision of such inputs. The advocates of smallholder agriculture view agricultural production and related processing and marketing as a central strategy for addressing food insecurity and poverty reduction in rural areas, and seeks to link these components strategically (HLPE, 2013:32).

According to the World Bank (2007) the increase in participation of smallholder farmers in dynamic domestic food markets requires paying special attention to deep-rooted inequalities in access to assets and public services. Producer organizations and contract farming are essential for these smallholders to take part in value chains and cater for supermarket demands. The World Bank (2007) notes that public-private partnerships, with an agribusiness sector active in organizing smallholders as competitive suppliers in these markets, are also important.

Experience shows that helping smallholder farmers can contribute to a country's economic growth and food security (FAO, 2008). For example, Vietnam has gone from being a food deficit country to a major food exporter, and it is now the second largest rice exporter in the world. It achieved this largely through development of its smallholder farming sector (FAO, 2008). In 2007 the poverty rate fell below 15 %, compared with 58 % in 1979 (IFAD, 2001:8). 73% of Vietnam's population lives in rural areas, and agriculture is the rural population main source of income (FAO, 2008:16). Higher food and energy prices are already putting millions of poor in developing countries deeper into poverty and raising the spectre of the world running low of food (Financial Times, 7 July, 2008).

Smallholder farmers play a major role in enhancing food and non-food production. For example, as noted by HLPE (2013:12), China alone has at least 250 million smallholder units; they constitute only 10% of the total amount of agricultural land that is globally available, and they produce 20% of all food in the world. This is an important indication of the productivity that might

be achieved in smallholder agriculture. Moreover, Wiggins et al (2013:34) also noted that Brazil present as another major agricultural powerhouse which has a dual agricultural structure. The total available land in Brazil is unequally divided. The smallholders units only comprise of 24.3% of the total area whilst the large corporations control 75.7% of all land. Nonetheless, smallholders produce 38% of the total value of production. These data show that the inverse relationship between farm size and land productivity is still omnipresent today.

### **3.2The contribution of smallholder agriculture to food security**

#### **3.2.1 Food Availability.**

Smallholder agriculture contributes significantly to food availability. It should be noted that food availability is influenced by several factors which include the smallholder agriculture potential to ensure increased production, the productivity, storage, transport and trade. Food availability is related with the supply of food. Wiggins et al (2013) illustrate that food availability should balance in terms of quantity and quality and with the capacity to provide variety. The capacity of the smallholder agriculture to ensure food availability has to be investigated worldwide, and especially in the developing world. Wiggins et al (2013) illustrate that the production of food has increased ahead of population growth for most of the last fifty years. Much of this increase in availability has come from small-scale family farms, particularly in Asia.

#### **3.2.1.2 Increased agricultural production**

Smallholder agriculture has the potential to lead to increased agricultural production. Wiggins et al (2013) narrate that smallholders are the largest investors in smallholder agriculture. Their system of production is both complex and dynamic. In order to design policies that effectively support their own investments (including investments by other actors such as the public and private sectors) it

is necessary to have a picture of some of the key contributions of smallholder agriculture to food security.

The increased food availability has been largely due to the 'green revolution' that began in the late 1960s across the developing world (Hazell, 2009: 10).

This gives a good indication on the potential of small scale farmers to ensure food security, as green revolution in Asia was characterized by increased application of higher-yielding varieties of maize, rice and wheat, with much greater use of manufactured fertiliser and crop protection chemicals, usually supported by irrigation. Much the same can be said for agricultural development in Africa where the majority of farms are smallholdings. Examples of successful agricultural development in Africa are almost entirely accounts of increased production from smallholdings.

Although production data are rarely reported in the developing world by farm size, most scholars argue that smallholders have made a large contribution to the increases seen in the green revolution. This view is strongly supported by Wiggins et al (2013) who argue that most of the additional production from the green revolution, at least in Asia, came from family farms of less than ten hectares, many considerably less. The technology based around improved seeds was neutral to scale: applicable on very small fields. Initial adoption of the new seeds may have been by the larger family farmers, but within a decade most smallholders in areas suited to the new varieties had adopted them.

The World Development Report 2008 (World Bank, 2007) notes that agricultural production is important (while also noting the inherent challenges) for food security as it is a source of income for the majority of the rural poor, especially due to the highly variable nature of domestic production, limited tradability of food staples and foreign exchange constraints in terms of the

ability to purchase imports. Therefore, increasing and stabilising domestic production is essential for food security. According to Wiggins et al (2013:60) four-fifths of the developing world's food is produced on about half a billion small farms. It should be pointed out that smallholder farmers utilize the most ecologically, climatically, vulnerable landscapes, hillsides and floodplains to earn their livelihoods hence capitalizing the land that could be rendered uneconomic by large scale farmers. Smallholder farmers are at the forefront of the world's efforts to deal with climate change, environmental degradation, poverty and food insecurity.

According to the Rockefeller Foundation (2006) the poor performance of smallholder agriculture is blamed on low or the non-use of high-yielding crop varieties that are widely used in other parts of the world, hence increasing yields depends mostly on increasing the area cultivated. Wiggins et al (2013) point out that if better seeds and technologies could reach the farmers, the inefficiency and food shortage risks could be significantly reduced. However, the challenges of bringing better seeds, fertilisers and technologies to smallholder farmers are much more complex. The complexity arises from the diversity of climate, soils and the range of suitable crops. Nonetheless, it is possible to deliver these improved inputs and assist farmers to use them more effectively (Rockefeller Foundation, 2006).

In strategic terms, smallholder farming is generally viewed as indispensable to development as a whole, and agricultural growth in poor rural areas can drive poverty reduction through three broad mechanisms: the direct impacts of increased agricultural productivity and incomes on the rural poor; benefits of cheaper food for both the urban and rural poor; and agriculture's contribution to economic growth and the generation of additional opportunities in the non-farm rural sector. Over time, these three factors lead to structural economic change, characterized by the increased importance of the non-farm economy, and the decreasing relative importance of the agricultural sector. In this scenario, small-farm agriculture is presented as a growth equity 'win-win' (Dorward

and Kydd, 2005). Agriculture as a source of food is the most direct way by which household agricultural production translates into consumption. Own production has more impacts on smallholder farmers since their food consumption and nutritional status is usually affected by what they grow (World Bank, 2007).

Smallholder agriculture often shows impressive productivity under favourable circumstances. Many high value crops, for example, rubber, and fruit and vegetables that require labour intensive farming, perform better in well developed smallholder agriculture than in other types of farming because of the favourable incentive structure in self-employed farming and the significant transaction and monitoring costs of hired labour (HLPE, 2011). China, according to the HLPE (2013:12), has close to 200 million smallholdings, and according to Paul (2008:6), it has at least 250 million small family farms (Paul , 2008). More significantly these small scale farmers cover only 10 % of the total amount of agricultural land that is globally available, but they produce 20 % of all food in the world. This is an important indication of the productivity that might be achieved in smallholder agriculture. Smallholder agriculture is strategically contributing to food security. In Brazil, 58 % of all milk is produced by household agriculture, for chicken and pork this is, respectively, 50 % and 59 %. For coffee, the contribution of smallholders is 38 %, for maize 46 %, for beans, the contribution of smallholders reaches 70 % and for cassava this is as high as 87 % (IBGE, 2009:16).

For example, as illustrated by Wiggins et al (2013:44), in Benin a traditional sector consisting of small scale family run units provides 80% of the production of palm oil. This craft industry has always been able to adapt to changes in the upstream sector (variations in the volumes of raw materials offered by planters) and downstream (diversification of demand), and cover most of the local market.

Smallholder agricultural development can be an excellent way to reduce poverty and tackle hunger in low income countries. It can increase food production, raise rural incomes, and push down food prices hence improving the access of poor and vulnerable people to food and thereby contribute considerably to improving their food security. Given that many of those who are food insecure work in agriculture, then its effects can be direct. The implication is to continue with efforts to develop agriculture and especially that of small-scale family farms to address poverty where it is localized (HLPE, 2013:14).

Numerous studies find a positive relationship between growth in agriculture and poverty reduction. In a cross country study on the links between agricultural yields and poverty, Irz et al (2001:16) found strong evidence that increases in crop yields led to a decrease in the number of poor by about 0.7 % (at the US\$1/day limit). It was also found out that for every 10 % increase in farm yields, there was a 7 % reduction in poverty in Africa and more than a 5 % reduction in Asia. However, growth in manufacturing and services did not show a comparable impact on poverty reduction (Irz et al 2001:24).

In another cross-country study, Christiansen et al (2010:44) found that a 1 % increase in agricultural per capita GDP reduced the poverty gap five times more than a 1 % increase in GDP per capita in other sectors, especially among the poorest people. Lipton (2005) notes that agriculture's potential to reduce poverty exceeds that of non-agricultural activities. It should be noted that whether the comparison is within or between countries, more than half the reduction in poverty achieved in 25 countries studied in detail by Cervante et al (2010) for the Organisation for Economic Co-operation and Development (OECD) could be attributed to growth in agricultural incomes (Lipton 2005:24).

### 3.2.3. Food Access

Smallholder agriculture plays a significant role in ensuring food security through ensuring food access. Food access is discussed under various measurements, which includes income and cash crop diversification. Smallholder agriculture's contribution to food security is clearly reflected in its capacity to ensure food access. Food access plays a pivotal role in addressing the demand for the food. Food access is influenced by economic factors, physical infrastructure and consumer preferences. Wiggins et al (2013) point out that food access is related in large part to incomes including implicit income from small farmer's own production, as well as other entitlements such as gifts, loans and transfers from government. Sen (1981) stressed the importance of entitlements in determining who suffers during famines, arguing that almost all famines in the twentieth century were the result of entitlement or access failures, rather than from food being unavailable.

Mwaniki (2005) identifies the root cause of food insecurity in developing countries today as the inability of people to gain access to food due to poverty. There is a general consensus that rural inhabitants access food mainly through three sources. These are the markets, small scale production and transfers from public programmes or other households.

For smallholder farmers to be food secure, food at their access must be adequate not only in quantity but also in quality. Food should be accessible to ensure an adequate and consistent supply of energy and nutrients through sources that are affordable and socio-culturally acceptable to the smallholder farmers. Eventually food security should turn to an active healthy life for every individual. Therefore, adequate health and care must be provided in addition to adequate food. In this scenario lies the problem facing poor small scale farmers today as they strive to balance the nutritious aspect of the food security. Wiggins et al (2013) contend that food insecurity has the potential to influence food intake and ultimately the health and nutritional status of rural small scale farmers. In developing countries over 85 % of the food consumed by poor households in the rural

setting is obtained from the farm (HLPE, 2013:12). Therefore, it should be asserted that the importance of foods purchased from markets in meeting food security depends on food income and market price.

Diversifying food and cash crops is also viewed as one of the best strategies by small scale farmers to balance food access. Smallholders who focus on production of cash crops for sale have the capacity to strengthen their food security and nutrition levels, since commercial production from smallholdings is also often associated with increased food production and higher incomes. However, Wiggins et al (2013) illustrate that a longstanding concern is that production by smallholders for the market, especially of non-staples, usually results in smallholder farmers replacing their food crops for their own consumption with cash crops for sale and thereby reduce their capacity to ensure food security. Farmers end up neglecting food crops in favour of cash crops which will not provide sufficient income to sustain the food security due to use of poor methods of farming and technology hence output usually will be low. However, this is in sharp contrast with Maxwell et al (1989) findings as it was reported that at national level, countries that produce more cash crops also tend to produce more food crops as well. The ability to grow cash crops can lead to positive results as far as food security is concerned. This view is supported by FAO (2006) discussion on food security as it notes that for households to be food secure, food must be available in sufficient quantities and of appropriate quality through either domestic production or purchase which may include food aid when necessary (FAO, 2006).

Smallholder agriculture has a reliability aspect when it comes to ensuring availability and access of food. Wiggins et al (2013) point out that not only should small scale farmers have access to food but it should be reliable. Further, that food availability should not vary significantly by season and year, but also people should feel secure of access to food, they should not fear that they will go hungry at some time or other.

An increase in income enables smallholders to diversify the diet and also to buy more non-foods, and this tends to imply a greater dietary quality. For example, the smallholders who produce cash crops can increase their food security and nutrition, since commercial production is often associated with increased food production and higher incomes, allowing individuals and households greater access to nutritious foods. Economic growth from agriculture can also improve access to health care and education, either at the household or national level (Hawkes et al., 2012; Wiggins and Keats, 2013). Income generation is considerably strengthened when small scale farms expand activities and integrate production and processing. This is often the case with products that are important in local food markets and cultures. Despite the smallholder's size, the production systems occupy a significant cultural, social and economic place in many developing countries.

### **3.2.4 Food Utilisation**

The smallholders' capacity to ensure food utilization is measured through assessing smallholder's capacity to diversify their diets. Food utilisation comprises those aspects that interfere between having food and this translating into adequate nutrition. Food utilisation includes the way that food is distributed, how it is prepared, and the health of those eating the food. Since each of these considerations can be quite complicated, this dimension is not always fully appreciated. Wiggins et al (2013) refer utilisation to people's ability to select, store, prepare, distribute and eat food. This ability should be in a way that ensures adequate nutritional absorption for all members of the household. The availability of safe water, sanitation, nutrition education and health care services also influence the ability to attain nutritional health (Hart 2009). This makes it imperative to pay attention to issues of food safety, quality and sufficiency.

Smallholder agriculture ensures food utilization. Smallholder agriculture can play a key role in improving dietary patterns, both for smallholders themselves and for urban populations, with an

enabling infrastructure, market and policies at broader levels. For example, the green revolution in India provides an outstanding example of a successful development pathway combining technical, organizational and institutional dimensions within an inclusive, policy-oriented scheme, which made it possible to keep up with quality market driven demand and income generation for poor and less poor farmers, including landless or marginal farmers (owning at least a cow). It is also a remarkable achievement in terms of improving nutrition in rural areas (HLPE, 2013:19).

### **3.2.5 Smallholder agriculture ensures stability**

Smallholder agriculture contributes to food security as far as stability is concerned through ensuring shield to price volatility, market related and other shocks (Wiggins et al 2013). Smallholder agriculture's asset in terms of the stability dimension of food security is clear from the fact that they produce for themselves. Smallholders keep a variable but widespread share of their production to feed the family and engage in reciprocal relations within the community. Smallholder farmers usually keep a share of their production to be safe and provide as a means of being protected from market volatility. HLPE (2013) alludes that this share of self provision is a key component of the smallholders' risk management strategies, towards a certain level of autonomy regarding access to food and managing scarcities and risks in the face of imperfect and volatile markets. The same examination can be made in developed countries where farming for subsistence is a strategy for low income or vulnerable households that have access to land and can find a way to escape from market expenditures, especially in times of crisis. This is especially true in those developed countries where the linkages between the population and rural farm land are still important, which often goes with the fact that there remain a significant number of smallholdings, for instance in Eastern or South Europe (Eurostat, 2012). In smallholder livelihood strategies, the farm plays an important role of economic refuge in case of crisis: household members having left the farm could eventually come back to the farm if they have lost employment in other sectors. This contributes to the stability dimension of food security, and also to the resilience of the economy as a whole (HLPE, 2013).

### **3.2.6 Smallholder's capacity influences prices**

It should be noted that increased food production can lead to falling real prices of food, especially for staples, as previously discussed. It is of paramount importance to note that due to the fact that the demand for staple foods is inflexible, small increases in supply ahead of demand can lead to substantial falls in prices. According to Wiggins et al (2013:12), worldwide, between 1960 and 2000, the prices of maize, rice and wheat in constant terms fell by 69%, 72% and 66% respectively on world markets. Most of the increase in the volume of cereals that made the fall of prices came from developing countries, rather than from the developed countries. Given the strong contribution of smallholder farming to increased production, it has contributed to falling food prices. Wiggins et al (2013) indicated that since the mid-2000s, prices have spiked and remain above their 2000 levels: but they are still well below prices in 1960. From the early 1960s, world food production per person has increased by one third. In the developing world, in Asia the quantity has doubled, in South America increased by more than 80%, and only for Africa has production increased more slowly than the world average although even in this case, production has increased slightly more than population growth (HLPE, 2013:23).

Furthermore it should be noted that smallholder farmers are the main food producers in developing countries, increased smallholder agricultural production means more food enters the marketplace, leading to lower food prices and better diets. The relationship between agricultural policy and food prices involves a range of supply and demand factors that affect the prices of various marketed food and non-food crops, which, in turn, affect the incomes of net sellers and the ability to ensure food security (including diet quality) of net buyers. This is particularly critical for rural and urban people in developing countries who spend a large percentage of their incomes on food expenditures (Johnson-Welch et al., 2007:23). Small farms also contribute to food security in rural areas where high transport and marketing costs can drive up food prices and at the national level, the higher land productivity of small farms enables poor countries to attain self sufficiency in

staples, such as in cereals, roots and tubers, and livestock (Diao et al., 2007). Rural households provide an important market for domestically produced manufactures and services (Hazell and Roell, 1983 cited in Diao, et al., 2007).

### **3.3 Role of smallholder farmers in food and nutrition security**

The links between agriculture and food security and nutrition have long been recognized and a number of conceptual frameworks were developed to show the pathways in which agriculture is affecting food and nutrition security (Haddad, 2000; Johnson et al., 2007; Watson et al 2011; Fan, 2011; Gillespie et al., 2012; Hawkes et al., 2012; Dorward, 2013). Most of these frameworks were built upon the widely known UNICEF's framework which identified three main determinants of good nutrition: availability and access to food; optimal quality of feeding and caring practices; and a healthy environment and adequate access to health care services. At the same time as the simplicity of the UNICEF's framework aids communication between multiple stakeholders and sectors, it is not necessarily optimal for highlighting specific pathways (Gillespie et al., 2012). As such the UNICEF framework has been adapted and applied to the needs and interests of different stakeholders and institutions. For example, Johnson-Welch et al (2007) modified the UNICEF framework to develop a framework called agriculture nutrition advantage framework which included agriculture, nutrition and food, with food as the common link between agriculture and nutrition (Gillespie et al., 2012).

The agriculture nutrition advantage framework postulates that agriculture helps ensure good nutrition, and good nutrition builds human capital, which is also an input for agricultural production, creating a circular pathway between agriculture and nutrition. One of the advantages of this framework is that it takes a new approach by integrating a gender approach and the issue of livelihood sustainability. Generally, in most of the existing frameworks describing the links between agriculture and nutrition, the production of food by smallholder farmers is presented as having the

potential to influence the nutrition of members of their households, either through direct consumption or indirectly by generating income which then allows them to buy food locally (Hawkes et al., 2012). This bidirectional impact of agriculture on nutrition is also described in Haddad (2000), World Bank (2007) and Wenhold et al (2007), where the impacts of agriculture on food and nutrition security are classified in two main categories: specific (or direct) impacts in food and not something else.

### **3.4 Smallholder agriculture as a livelihood strategy**

In the production of food the smallholder farmer is a central player in ensuring that food security is guaranteed through increased diversification of agricultural activities, for example crop production, livestock production, fishing (artisanal fishing and aquaculture fishing). Chapman et al. (2004) further elaborate that while farming still remains important for rural households, people are looking for diverse opportunities to increase and stabilise their incomes. Therefore rural livelihoods are based not solely on agriculture but on a diverse array of activities and enterprises. The extent of dependence on non-farm income sources varies across countries and regions.

Evidence from a sample of rural villages in Tanzania (Chapman and Tripp, 2004; Ellis and Mdoe, 2003) shows that on average half of the household income came from crops and livestock and the other half from non-farm wage employment, self-employment and remittances. Furthermore Chapman et al. (2004) illustrate that the poorest households are more reliant on agriculture, and this reliance on agriculture has the potential to decrease with increased diversification into nonfarm activities. In another study by Readorn et al. (2001:44) of 11 Latin American countries non-farm income accounted for 40% of rural household incomes.

Chapman et al (2004) points out that the extent to which the rural population are able to feed themselves depends on non-farm income as well as on agricultural production since non-farm income is used by many to purchase the staple grain. As supported by this evidence, therefore,

the issue of smallholder agriculture development needs to be understood in this context of diversified income sources.

According to Jayne et al. (1999; 14), 61% of maize growing farmers in Kenya were found to be net buyers of maize. Therefore, such farmers may be more interested in lower food prices than in investments to increase smallholder production. It is, however, generally believed that surpluses from off-farm income can provide farmers with the security that enables greater on-farm innovation. This depends to a large extent on whether the households diversified out of agriculture due to a lack of opportunities for on-farm innovation or whether they are exploiting a particularly high demand for their labour off-farm (Chapman and Tripp, 2004).

Furthermore, on farm investment is likely to occur when non-farm work is of short duration and the home farm has not been neglected. According to Bryceson (2000, 2002), based on a case study of seven countries (Nigeria, Ethiopia, Tanzania, Congo-Brazzaville, Malawi, Zimbabwe and South Africa), the countries were all undergoing “de-agrarianisation” and “de-peasantisation”. This was driven mostly by, restrictions on access to land (South Africa), urbanization (Congo-Brazzaville and Nigeria) and the removal of agricultural subsidies with the enforcement of structural adjustment policies in the other four countries. During this period, peasant agriculture, with its subsistence orientation and relatively low yields, was discouraged in favour of agro-industrial production. However, despite the above mentioned changes, African rural dwellers value the pursuit of farming activities (Bryceson, 2000).

The World Bank (2007) illustrates that agriculture is a main source of livelihood for about 86% of rural people in sub Saharan Africa. Due to economic hardships in most African countries, subsistence production in some urban areas is increasing (Maxwell, 1994). The prevalence of this practice in African urban areas ranges from about 33% to as much as 80% (Seti, 2003; 64)

however the relative contribution of the practice to household food consumption is not very well documented (Maxwell, 1994; Ruel et al., 1998; Seti, 2003), owing mainly to its neglect on the agricultural development and/or smallholder research agenda (Maxwell, 1994; Von Braun et al., 1993). As in rural subsistence production, most of what is produced is used for home consumption (subsistence) and only a small proportion is aimed at sale in urban markets. Urban agriculture has thus been recognised as an alternative food security strategy that can be used to cushion the urban poor against economic backlashes associated largely with structural adjustment policies (Smith et al., 1994; Von Braun et al., 1993).

Wiggins et al (2013:44) envisage that throughout the developing world, agriculture accounts for around 9 % of the GDP and more than half of total employment. In countries where more than 34 % of the population is undernourished, agriculture represents 30 % of GDP and nearly 70 % of the population relies on agriculture for their livelihood. This fact has in the past been used in support of the argument as to why developing countries should move away from agriculture and invest in technology. Because over 70 % of the poor live in rural areas, where also the largest proportion of the food insecure live, it is evident that it is almost impossible to significantly and sustainably reduce food insecurity without transforming the living conditions in these areas. The key lies in increasing the agricultural profitability of smallholder farmers and creating rural off-farm employment opportunities. The other objective of this study is also to illustrate the challenges to food security in rural Zimbabwe while providing alternative solutions to the problem that would not only allow for poverty alleviation but also better opportunities provided by the global side.

Smallholder agriculture contributes to food security as one of the livelihoods strategies of the rural population. It should be noted that since most people in the rural areas are dependent on agriculture other options are available as well to supplement its role in ensuring food security but agriculture, however, remains the centre focus amongst these livelihood strategies. Wiggins et al

(2013) note that smallholders are people who are actively engaged in improving their livelihood through the development of a resource base that allows, among other things, for agricultural production. This resource base according to Chambers and Conway (1992) comprises different assets or capitals (human, natural, social, physical and financial). In the context of stallholder farmers this resource base is considered to be small: it is short-sighted that other scholars view it as not in a capacity to be able to render an acceptable livelihood. Wiggins et al note that (2013) a smallholding is small because resources are scarce, especially land, and it is used to generate a level of income that helps fulfil basic needs. To achieve a sustainable livelihood consequently requires a high level of total factor productivity, requiring in turn a significant level of investment.

Wiggins et al (2013), note that smallholders are family farmers and this has important implications in ensuring food security. It should be noted that since small scale farmers are family members there is an existence of a close combination between productive assets and the patrimony of the family. This may induce de capitalization in the event of urgent, unpredictable and costly expenditure (for health or social obligations such as for funerals). It also allows some of the patrimony to be sold in order to increase productive assets. The high level of risks and the modest means available imply that unpredictable expenditures can trigger an impoverishment cycle. Also, when products are sold, there is pressure to first feed the family and repay loans or debts; thus the marketable surplus is reduced, cash incomes remain low and, consequently, investments through cash expenditures become difficult. Furthermore, smallholders often make investments by using their family labour. This means that the quality of life in terms of food security and access to basic domestic services is of primary importance. This is also accurate for education and training to improve famers' skills. Smallholders are largely part of the market economy even though their participation varies considerably.

HLPE (2013) notes that the rural poor depend on a number of livelihood strategies for their survival, but the majority will depend on small scale farming as their main means of earning a livelihood for almost their entire lives. Out of the world's 1.2 billion poorest people, 75% live in rural areas, and for the most part depend on agriculture, forestry and other related activities for survival (Diao, et al 2007:16). In Sub-Saharan Africa, the majority of people live in rural areas, where poverty is severe, and almost all these rural households depend directly or indirectly on agriculture (Diao, et al 2007). Diao et al (2007) further argue that agricultural-led growth played an important role in mitigating poverty and transforming the economies of many Asian and Latin American countries, but the same has not occurred in Africa. Diao et al (2007) contend that empirical analyses in case studies of various countries find that poor performance of agriculture will continue to result from the broader participation of smallholder farmers, and that the growth of staple foods generates more poverty reduction than other agricultural crops. Hazel et al. (2007) state that agriculture is likely to be central to both rural development and rural poverty alleviation.

The theoretical framework for assessing the role of small-scale farming in reducing food security in Zimbabwe embraces the following approaches: sustainable livelihoods approach (SLA) which is the dominant element; small farm development; and the household food security approach. All these approaches are oriented towards poverty reduction and maintenance of sustainable development

### **3.6 Conclusion**

The concept of smallholder agriculture and food security has been discussed in full. The significance of smallholder agriculture in ensuring food security has been discussed from a global perspective. The contribution of smallholder agriculture to food security has been discussed using the most agreed dimensions of food security which are production, availability, accessibility and stability. The next chapter is going to present the findings of the contribution of smallholder agriculture in the context of Zimbabwe, using the case study of Masvingo province.

## **Chapter 4: Socio-economic background of the study area.**

### **4.0 Introduction**

The Chapter presents the social and economic background information on Zimbabwe in general and Masvingo Province, in particular. The smallholder agriculture systems and the production capacity of the smallholder farmers that is essential for understanding the contextual results of the study are discussed. The study gives an overview of the study environment and a full discussion on the nature of smallholder farmers in Masvingo province to have better understanding on their capacity to contribute to food security. The nature of the assets, skills and the environment of the smallholder farmers are to be analysed in line with the study objectives.

### **4.1 Zimbabwe**

#### **4.1.1 The environment**

The Environment of Zimbabwe lies south of the Equator within the Tropic of Capricorn. It covers a total area of four hundred thousand square kilometres. The altitude varies from a maximum of two thousand five hundred and ninety-four metres in the Eastern Highlands to one hundred and fifty-two metres above sea level in the South Eastern corner of the country. The central plateau lies at an average height of between one thousand two hundred metres and one thousand five hundred metres and is characterised by fertile soils. Most of the large towns and industrial centres are situated along this plateau which generally separates the drier southern and western parts of the country from the wetter northern and eastern parts. The annual rainfall varies from areas with less than four hundred millimetres in Matebeleland to between areas with over one thousand four hundred millimetres in the Eastern Highlands (ZIMSTATS, 2012).

Masvingo Province lies mostly in the drier parts of Zimbabwe. The average winter temperatures are between fifteen degrees Celsius and twenty degrees Celsius and summer average temperatures are between twenty five degrees Celsius and thirty degrees Celsius. In October, the hottest month of the year, temperatures often exceed thirty-two degrees Celsius in some regions

of the country, especially the south-eastern lowlands and most of the Zambezi valley (ZIMSTATS, 2012)

#### **4.1.2 Agro climatic conditions**

Zimbabwe is a landlocked country, bordered by South Africa, Mozambique, Zambia, Namibia, and Botswana. The country is divided into five agro-ecological zones on the basis of annual rainfall variability (Agritex, 2002). See annexe 1 and 2 for the agro ecological map of Zimbabwe. Natural regions I and II are the most productive. These regions are mid-altitude, 800–1,600 meters above sea level and receive substantial and well distributed rainfall. Regions III, IV, and V on the other hand are the semi-arid zones, characterized by low, unreliable rainfall (ZIMSTATS, 2012). Zimbabwe lies entirely within the tropics but much of the Highveld and Eastern Highlands have a subtropical to temperate climate due to the modifying effect of altitude. Three seasons are recognized in Zimbabwe, notably; (1) a hot wet season from mid-November to March (summer); (2) a cold, dry season from April to July (winter); and (3) a hot, dry season from August to mid-November (spring). Air temperatures are closely related to altitude, with mean annual temperature ranging from about 25°C in parts of the Zambezi Valley to less than 15°C in the Eastern Highlands. Maximum temperatures are lowest in June or July and highest in October. During winter, mean daily temperatures range between 11°C and 20°C. Mean maximum daily temperatures can exceed 32°C during the spring (ZIMSTATS, 2012).

#### **4.1.3 Demographic and Social Aspects**

According to ZIMSTATS (2012) the current population of Zimbabwe is 12 978 808. The proportion of the population living in the rural areas is approximately 70 % according to ZIMSTATS (2012). The majority of the population is, however, resident in communal areas and largely dependent on individual small-scale farming. According to this census, over 50 % of the total population are under the age of fifteen years, 38 % under the age of nine years and only 3 %

above sixty years of age. Zimbabwe has eight administrative provinces comprising fifty-five districts which are mainly responsible for Local Government administration and communal lands development programmes (ZIMSTATS, 2012).

#### **4.1.4 Health**

ZIMSTATS (2012) estimates that there are three hundred and twenty-four clinics giving an average of forty per province and seventy-one hospitals are in operation. In terms of the availability of health workers (CSO, 2002) it notes that there are six health workers per district and the approximate ratio of medical doctors per head is one to eleven thousand and of the registered medical doctors in the country, 82 % are based in urban areas (CSO, 2002).

#### **4.1.5 Agriculture**

More than 70 % of Zimbabwe population depends on agricultural production for survival, either as producers or farm labourers. According to Central Statistics Office (CSO) 2002, 54.78 % of the population is employed in the agriculture sector. It should be noted that 76.53 % of the Masvingo population is employed in agriculture (CSO, 2002). Out of this total 71.08 % are employed as communal farmers. The province has the highest percentage of the population in the agriculture sector compared to all other provinces in the country. Globally Zimbabwe is estimated to have about 1 524 396 smallholder farmers broken down as follows; 1 403 651 communal famers, 107 625 old resettlement farmers and 23 120 small scale commercial farmers (Agritex ,2010).The hectare distribution of these subsectors according to agro-ecological potential is highly differentiated. The provinces in the Southern Regions of Zimbabwe, including Masvingo, are the most vulnerable provinces in terms of basic food production and self sufficiency due to poor rainfall and recurrent drought periods (ZIMSTATS, 2012)

#### **4.1.6 Industry and Mining**

According to CSO (2002), Zimbabwe has a fairly broad based industrial structure, based mostly on the processing of agricultural raw materials and on import substitution. Following a sharp boom

at independence resulting largely from the utilisation of excess capacity there has been a decline in output in the sector. Much of this decline has been attributed to the global recession and problems resulting from consecutive years of drought and the unpopular fast track land reform programme which scared off investors in the country. More than fifty minerals are mined commercially in Zimbabwe, among them, the world's finest deposits of chrome, diamond, asbestos and lithium (ZIMSTATS, 2012). In general the industrial and mining sectors and overall rural development projects were greatly slowed down by the recession, economic meltdown and drought. Drought prone areas like Masvingo Province have therefore lagged behind in their rural development efforts and suffered serious losses in incomes and assets (especially cattle) useful for crop production and food security.

## **4.2 Masvingo province**

### **4.2.1 Geographical location**

Masvingo Province is in the south-eastern part of Zimbabwe (see annexee 3 for the map of Masvingo province). The province borders Mozambique on its eastern border and the provinces of Matabeleland South to the south, Midlands to the north and west and Manicaland to the north east. It is one of the biggest of the administrative provinces of the country. The capital of the province is the town of Masvingo which was founded in 1890 making it the oldest town in Zimbabwe. Chiredzi and Triangle are the other major towns in the province. The Karanga people constitute the majority of people in the province who are the most populous tribe in Zimbabwe, and are a sub-group of the Shona speaking tribes that also include the Zezuru, Manyika and Ndau (ZIMSTATS, 2012).

### **4.2.2 Population distribution**

The province has a total population of 1 486 604 which is 11.5% of the national population, 795 254 are females and 691 350 are males (ZIMSTATS, 2012:1). The province is 56 566 square

kilometres (ZIMSTATS, 2012:15).The rural population of Masvingo is 1 186 187(ZIMSTATS, 2012:14).The population growth rate in Masvingo is 1.2 % and the population density is 26 people per square kilometre. ZIMSTATS (2012) points out that the population density varies among the districts from twelve people per square kilometre in Chiredzi to fifty-one per square kilometre in Bikita, while Gutu district has the largest number of people. Masvingo Province is one of the few provinces with a number of pockets of land under very high population pressure and yet it also has some of the most drought-prone districts.(ZIMSTATS,2012:15) As shown in Table 1 below smallholders constitute the majority of farmers in Masvingo province.

**Table: 1 Distribution of population by sex and sector in Masvingo province**

<b>Sector</b>	<b>Males</b>	<b>Females</b>	<b>Total</b>
Communal lands	416 455	502435	918 890
Small scale commercial farms	14 132	14417	28 549
Large scale commercial farms	43 028	43 735	77 763
Resettlement areas	79 612	81 373	160 985
Urban council areas	43 388	49 951	95 339
Administration centres	395	486	891
Growth points	7 069	8 562	15 631
Other urban areas	10 203	9 223	19 426
State land	1 727	1 247	2974
<b>Total</b>	<b>618 009</b>	<b>702 429</b>	<b>1 320 438</b>

( Source: CSO 2002:62)

According to ZIMSTATS (2012:95) 54.78 % of the population is employed in agriculture. It should also be noted that nationally 72.77 % of persons with disability are employed in the agriculture sector. The census (2002) further shows that a total of 54894 males and 56 963 females with disabilities respectively were employed in the agricultural sector. According to ZIMSTATS

(2012:16) of the 28.92 % employed persons in Masvingo ,71.08 % are communal farmers which shows the predominance of small scale farmers in Masvingo province. Given that agriculture is a key industry in the economy of Zimbabwe, a large number of the country's population depend directly or indirectly on land for their means of livelihood. For example, the agricultural industry provides employment for 70% of the Zimbabwean population (Moyo et al 2009:16). APRODEV (2002) findings illustrates that 71% of the total female population in Zimbabwe gain employment as communal area farmers, 20% are employed outside the subsistence sector, while 9% are classified as unemployed. The 20% of women employed outside the subsistence sector are involved in a wide variety of different occupations, such as casual labourers on commercial farms and in some instances as permanent labourers(ZIMSTATS:64). A small minority are involved in farming under resettlement schemes (Chigora, 2008).

#### **4.3 Presentation of the socio economic characteristics of the study area.**

In order to clearly illustrate and present the findings on the socio economic aspects of the study area the researcher opted to utilise the sustainable livelihoods framework. Therefore the five assets of the rural systems are used to document the nature of the smallholder farmers in Masvingo province. The smallholder farmers' incomes and assets are useful for determining production and food security. Access to livelihood assets, strong institutional support and a favourable external environment play a crucial role in smallholder agriculture's ability to produce and significantly contribute towards reducing food insecurity. It should be noted that these assets of rural systems are the major cornerstone in identifying the effectiveness and challenges of smallholder agriculture in addressing the food security and the available opportunities which are the objectives of the study.

### 4.3.1 Natural capital

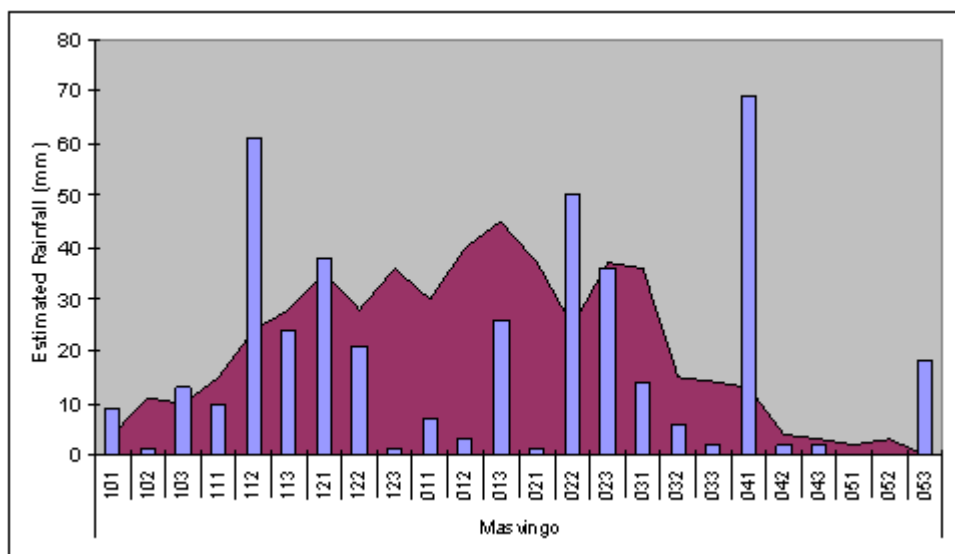
According to Pretty (2008) natural capital is the land air, water, living organisms and all other rich natural resources. In respect of the smallholders farmers in Zimbabwe the natural capital include land, rainfall and the natural vegetation. In Zimbabwe, the traditional land tenure system prevails for smallholders. In general, the land is often held by a group, community lineage or clan, family, or individuals and an individual in the community may give out a piece of land to another person for use, with the local leader's knowledge. Once acquired, land may be passed on from generation to generation within the family. According to Agriculture and Livestock Survey (ALS) 2013:16, in Masvingo farm size ranges from 1 to 13 hectares, with the majority of farmers having 2 to 5 hectares (ha). These findings are also supported by FAO (2012) which estimated that the average farm size is 3.9 ha in Masvingo. This concurs with the findings of Kassie et al (2012:24) who documented that average land holding in rural Masvingo is 3 hectares. ALS (2013:64) illustrates that the annually cropped area averages 1.4 ha per household, with the remaining land either abandoned, fallowed, or under tree crops. The majority of crops are rain fed except for the vegetables and fruit trees, especially in the early days of establishment.

According to FAO (2004), access to natural and physical capital varies considerably between households, community and regions in the country. Evidence from the study area shows that smallholder farmers consistently employ practices that are less capital intensive than other producers. Smallholder farmers utilise the most available cost effective resources. The environment in terms of soil fertility and climate is increasingly being put forward as one of the most important drivers of food insecurity in the province. According to Misselhorn (2005) households, determinants of food security, go beyond climate and the environment, or land and tenure security. In a review of several studies of household food security in southern Africa, Misselhorn (2005) showed that climate/environment are the most commonly cited drivers of food insecurity, and poverty, property rights, human capital, market access and unemployment being the next most significant factors. Clearly, agricultural capital and levels of poverty are determinants

of food security. Therefore using Misselhorn (2005) findings it could be safely said that, a person who is poor is probably also food-insecure.

It should be noted that in discussing natural capital, rainfall is an important aspect worth to be discussed. Rainfall ranges from five hundred millimetres to eight hundred millimetres per annum in Masvingo(Agritex,2010).There are however slight variations with some areas just below five hundred millimetres or above eight hundred millimetres as illustrated in figure 1 below. However, irregular heavy rains are common around Great Zimbabwe and Lake Kyle (Balarin, 2002). The distribution of the rain is uneven and most of the rain is received between February and March. Towards the end of the dry season (August to December) rivers generally run short of water and others completely dry up (FAO, 2010).

Figure 1: Estimated rainfall per dekad for Masvingo province



Source FAO (2010)

#### 4.3.1.1 Soil nature

In discussing natural capital in the province it is imperative to discuss the soil type in the study area. The soils of Masvingo are largely sandy loams which in some places are greyish to reddish-brown and moderately shallow, coarse-grained sandy loams, dark-brown loams, and clay soils

which are either red or black to blue black in colour. The rocks in the province are mainly granite and ironstone (ALS, 2010). According to Agritex (2010) the soils in the Masvingo district are of the fersiallitic type. These soils are the most extensive soil types in Zimbabwe (Nyamapfene, 1991). The terrain in the district ranges from moderate to steep slopes (Chikobvu, 2008). In areas where slopes are high, soils shallow and of poor texture, the potential for erosion hazards exists. It should be noted that sandy soils which characterises the region are susceptible to erosion and generally infertile hence without fertiliser use the agriculture productivity will be severely impoverished.

### **4.3.2 Social Capital**

#### **4.3.2.1 Family structure of small scale farmers**

In analysing the nexus of social capital in the study area it is significant to discuss the household size of the smallholder farmers. A household size is defined as persons living together in one house. According to CSO (2002) there are a total of one hundred and fifty-two point nine hundred and twenty-three households in the Masvingo Communal areas, 90 % of which are engaged in peasant farming. Moyo's (2005) study found that the most common household in communal areas is made up of 3-5 members followed by ones with 6-7 members. The CSO (2002) concurs with these findings and also illustrates that an average household size is 5.5 . However, the latest Zimbabwe (2012) census estimates that there are 341 197 households in Masvingo with an average household size of 4.4 (ZIMSTATS, 2012:62). This suggests highly nucleated households in the study area. Findings from the AIAS (2009) survey show a similar picture in the newly resettled small scale farmers in Zimbabwe. It is noted that the most common household size is 3-5 across both resettlement models (A1 and A 2). The smallholder farmers in the study area are organized as both nuclear and extended family structures. According to Agritex (2010:23) 46 % of the households in Masvingo are headed by females and 34 % of the overall heads of households

are over 50 years of age. This situation has obvious repercussions for the viability of successful agricultural production, suggesting a relative weakness of the communal areas due to the absence of males, ageing of the heads of households and high dependency ratios.

#### **4.3.2.2 Farm size**

A farm size is one of the most important aspects of indicating the social capital in a smallholder agricultural system. A farm size is an arable area devoted to the primary goal of producing food. Kassie et al (2012) argue that the farm size and land tenure is the pillar of farming livelihoods under any circumstance. The average farm holding size in Masvingo Province is 5.3 acres in smallholder farmers (Agritex,2010: 44). This nature of small farms places a limit on the extension of cropped production area and emphasises the need for productivity increases. Therefore under this scenario productivity can be increased through the increased use of fertilisers, hybrid seeds and agro-chemicals. It should be noted that not all the land available to a household is utilized for food production due to the subsistence nature of the farm practices, where small areas of land are required to produce subsistence food. This implies that a major factor determining total output per smallholder farmer is the area under cultivation and not the available arable land (Mudimu, 2003). Limitations in the availability of arable land means that households with small pieces of land holding do not have access to adequate operational land for crop production which allows proper crop husbandry ,for example rotation and replenishment of fertility through fallow. More importantly because the province is largely situated in natural regions IV and V the main source of crop productivity increases has to lie in the intensification of irrigation which is almost absent in the region(ZIMSTATS, 2012:116).

#### **4.3.2.3 Gender composition**

APPRODEV (2002) provides a gender perspective of the agricultural system in Zimbabwe. The report illustrates that the minor crops in commercial terms such as beans, cow peas and

groundnuts are considered to be the crops for women. The major commercial crops which generate cash income are seen as men's crops, and these include tobacco, cut-flowers, raw sugar cane, cotton, chilled vegetables, coffee, fruit, tea (APRODEV, 2002). The report further notes that men are responsible for ploughing and applying fertiliser, while women are more responsible for seed selection, seed sowing, transplanting and weeding. APPRODEV (2002), also points out that the significant part of the crops that are produced commercially, are for market for cash income to enhance a better meal in rural households. On the other hand, most of the crops that are produced in the smallholder areas are for consumption.

#### **4.3.2.4 Extension services**

Moreover it should be noted in terms of agricultural assets and social aspects that the Masvingo rural smallholder farmers have a clear pattern of social differentiation. Agritex (2010) survey results suggest that both government and non-government institutions provide support to households in the study area. The survey by Agritex (2010) in determining the nature of support services received by smallholder farmers in Masvingo province led to the following findings: Among the NGOs, Christian Care was the dominant service provider in almost all Masvingo districts providing 36 % of the total extension services (Agritex,2010:16). For the adoption of new technologies, field demonstrations and field days were found to be very important with farmer participation evidently documented in the study area.

The government, through the Department of Agricultural Technical and Extension Services (Agritex), is the main provider of technical support for farmers in the province .The findings from the survey by Agritex (2010:14) illustrate that 36 % of the smallholder farmers in Masvingo province cited that Agritex is the mainstay in terms of technical support relating to agriculture. Africare was also mentioned by 8% in Masvingo as a source of agricultural technologies and support services. Agritex (2010) argues that access to timely and adequate information on the different aspects of farming is crucially important particularly for resource constrained farmers. The public

agricultural extension institutions and the public mass media are the prime sources of information for farmers. Evidence from the literature has shown that over 90% of smallholder farmers receive information on agricultural issues from the public agricultural extension system (Girma et al, 2013:64 Agritex 2010:14). These results also concur with ZIMSTATS (2012:67) illustrations that 94 % of the smallholder farmers in Masvingo made an indication that they had a discussion with an extension service worker prior to the agricultural 2012/13 season. Kassie et al (2012:54) survey on the effectiveness of the extension services in Masvingo led to the following conclusions: about 71%, 47%, and 67% small-scale farmers in the province attended field days, visited demonstrations and had discussions with extension agents about maize, respectively, over a one year period. Generally access to extension services in Zimbabwe seem to be evenly distributed. Kassie et al (2012:56) assessed the smallholder famers' knowledge about improved seeds and concluded that 100 % of the households in Masvingo knew the hybrid seeds and 94. % of the households in the study community was in use of the hybrid seed. Kassie et al (2012) point out that before the land reform programme 100 % of the households were reportedly in use of hybrid maize seed. On a different note Alice (2010:64) notes that less than 50 % of the smallholders in Masvingo receive an extension service from the government. This is mainly attributed to the brain drain and economic collapse for the past 10 years. FAO (2010) argues that there was not enough funding to support the extension workers hence low agricultural produce reported in most areas in Masvingo. Matshe (2009:8), documents the serious repercussions of late provision of extension services in Zimbabwe as he documents that there is evidence in the country that where smallholder farmers lack extension services it leads to decline in yields by 30 %.

Agritex provides education to farmers through correspondence at village and ward level farming schools. However Kassie et al (2012:54) lament that despite these attempts 60% of the farmers grow crops that they have not been trained to produce. Moreover, community radio programs are used as an information giving instruments. The Department of Agricultural Research and

Extension (AREX) plays a significant role in this aspect in Masvingo. It was found in the Angwa survey that 90% or more farmers, access information through the radio. There is no evidence of sharing agriculture information through community radio stations, tele-centres and information centres for farmers in Zimbabwe. In spite of all the attempts in the areas of training, development and extension services, Chimhowu (2013) identified a number of constraints being faced. For instance, there is a limited capacity of formal training institutions to meet demand of the extension services.

#### **4.3.3 Human capital**

Human capital is the availability of skills, knowledge, and skills embodied in the ability to perform labour so as to produce economic value. According to ZIMSTATS (2013) the average age of household heads in Masvingo is about 50 years, with a range of 22 to 87 years old. ZIMSTATS (2012:92) further illustrates that about half of the household heads attained primary level education, while about 44% attained secondary education. Only about 2% of household heads are illiterate. The most important source of farm labour in smallholder farming systems is the household itself (Agritex, 2010: 64). Therefore, the quantity of labour supplied by the household is an important indicator of the viability of the smallholder agriculture production. The educational level efficacy is always important when analysing a particular social group. Level of education and particular skills possessed have an influence on the nature of information accessed, and on the type of planning at farm level and community level. It should be noted that having acquired education is viewed as a status symbol in Zimbabwe. UNESCO (2010) indicates that education has a significant influence for processes of inclusion and exclusion within communities. Education is also considered a cornerstone in planning and evaluating policies. The study analysed literature on the educational levels of the smallholder farmers in Masvingo province. The low literacy levels have a bearing on agricultural development as it affects the understanding capacity of the farmers, eventually limiting the adoption of new agricultural technologies. This is a big challenge even to

the extension service as it affects the effectiveness of the agricultural extension service. FAO (2010) points out that enhancing agricultural productivity goes beyond increased farm output, farmers must operate like entrepreneurs, and this requires education of some kind to make reasonable decisions.

According to ZIMSTATS (2012:67), 96 % of the population aged 15 and above are literate in Masvingo. The literacy rate in Masvingo is estimated at 97.6 which is a 1.4 increase compared to the 2002s (Kassie et al 2013, ZDHS 2011). Kassie et al (2012:16) concur with the ZDHS (2011:44) findings by arguing that only 2 % of the population in Masvingo are illiterate. Generally there is high literacy rate in the province, which is a positive thing as far as extension services and agricultural knowledge are to be provided to the small scale farmers in the province. Providing information to a literate population saves time and contributes to a better informed decision in terms of better farming methods and choice of inputs.

Agritex (2010) documented the relationship of educational levels and poverty amongst smallholder farmers and came up with the conclusion that human capital is strongly related to the level of wealth. Heads of poorer households are reportedly generally less educated than those of richer households. According to Agritex (2010) generally more than 80 % of the household heads in Masvingo are married. It should be noted that just like in other provinces in the country smallholder farmers generally make crop production decisions jointly with their spouse.

The time spent at the farmhouse also influences key production practices and the management of the production process. Agritex (2010) points out that the majority of household heads are temporarily absent from their farms. Kassie et al (2012:66) sum up that 79% of the household heads are temporarily absent from their homesteads, while 9% are absent for at least 6 months of the year hence this is more likely to explain the reasons why smallholder farming is not taken to be operating at commercial level as less time is invested in the farm activities. There seems to be

general consensus from the literature that the main source of labour in smallholder agriculture production in Masvingo is family labour, complemented by limited hired labour (FAO, 2010, Agritex 2010, ZIMVAC 2012). In some cases during peak periods of labour demand, farmers resort to communal labour. For instance farmers can decide to come together and take turns working in each other's fields in a method locally called *humwe* (literally translated means together).

#### **4.3.4 Financial capital**

Financial capital availability is a significant tool in enhancing increased farm productivity. Agricultural credit is cited as an important factor for agricultural production, particularly as impoverished rural households have difficulty saving (Chimedza 1994). According to a survey by Agritex (2010) households in Masvingo communities generally lack sufficient cash resources to meet their needs and access to credit is very difficult. NGOs have been playing an important role in trying to address this challenge by providing the communities with seed and fertilizer relief.

The majority of the smallholder farmers are in need of cash, which is in short supply. Kassie et al (2012:100) illustrate that in 2012/2013 season 41 % of the sampled households reported receiving maize seed on credit, 38 % received credit for fertiliser and 15 % credit for other seeds. The general lack of credit can be attributed to absence of credit institutions, lack of collateral and reluctance by smallholder farmers to take loans

##### **4.3.4.1 Household possessions**

Information on ownership of durable goods and other possessions by smallholder farmers in Masvingo is presented in annexe 4 by residence. Findings from Agritex (2010) illustrate that in general, ownership of household effects, means of transportation, and agricultural land and farm animals are rough measure of a household's socio economic status. Agritex (2010:64) presents that in Masvingo with respect to household effects, 38%, 36 %, 62 % and 4 % of households are in possession of a radio, television and mobile telephone, respectively. 18 % of the households in

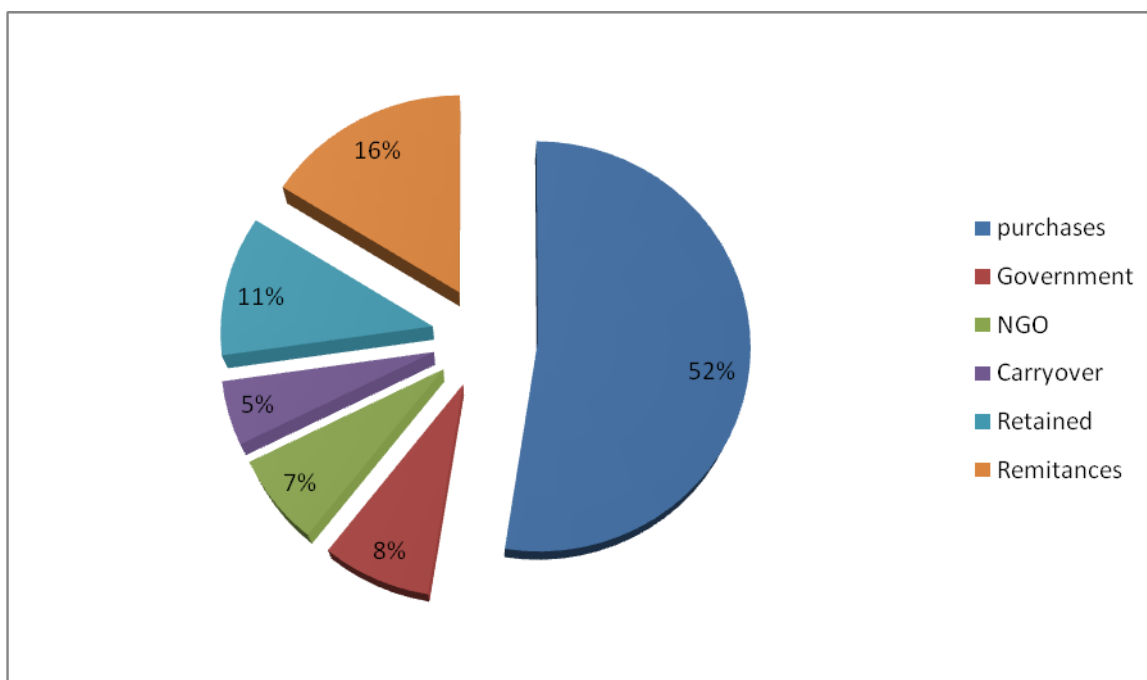
the study area own a solar panel, which may be a convenient means to power or charge electrical devices, especially in the absence of access to electricity that is available via powerlines. The most common means of transportation owned by communal farmers in rural areas is a wheelbarrow. According to Agritex (2010) of the interviewed communal farmers in Masvingo 34 % indicated that they own a wheelbarrow. Bicycles, owned by 24 % of rural farmers, are also a common means of transport. Around 1 in 4 rural households own an animal drawn cart (Agritex, 2010:44).

It should be noted that only a limited number of smallholder farmers in the study area owns a bank account. ZIMSTATS (2012) estimates that only 22 % of the smallholder farmers in Masvingo have a bank account. On a national perspective households in urban areas are over three times more likely than households in rural areas to have a bank account. ZIMSTATS (2012:33) estimates that 40 % households in the urban areas own a bank account against 12 % for rural households. These statistics provide a glimpse of the essential possessions of smallholder farmers in Masvingo. The general assertion that can be derived from this outlook is that generally rural smallholder farmers have limited substantial financial assets that can enable them to be used as collateral when taking credits to boost their capacity to buy agricultural inputs on time and at sufficient levels (Agritex 2010:62).

#### **4.3.4.2 Inputs**

The major agricultural farm inputs for the smallholder farmers in Masvingo include seed, fertilizer, chemicals and farm equipment (source). The key issues which relate to input supply include availability, distance to supply points and road access problems, timeliness of supply and affordability of inputs.

## Source of maize inputs for smallholder farmers in Masvingo Fig 2



Source: ZIMVAC (2012:25)

According to ZIMVAC (2012:25) purchases were the most common source of maize seed used in 2011/12 season in Masvingo. Generally smallholder farmers purchase their own source of inputs: as shown in fig 2 more than 52 % of the small scale farmers in Masvingo purchased their own inputs. Agritex (2010) notes that almost all smallholder farmers use hybrid seeds. However lament the issue that despite the high use of hybrids the use of complementary external inputs and mechanization is relatively limited. The low fertilizer usage by the smallholder farmers in Masvingo is mainly attributed to physical shortages on the market and unaffordability due to high prices. Anseeuw et al (2012), assert that with the liberalization of the economy, the market situation in the country has changed of late since many agricultural inputs used to be controlled commodities and supposedly channelled through government programs and agencies like Grain Marketing Board.

FAO (2010:44) notes the significance of input support programmes to the smallholder farmers in Zimbabwe. For example, a large scale input programme for the 2009/10 season spearheaded by the government predominantly targeting smallholder farmers, assisted in supporting a 20 % increase in the area planted under maize in the 2009/10 season (FAO,

2010: 23). The government of Zimbabwe plays a major role in subsidising the agricultural inputs so that they will be within the reach of communal farmers.

#### **4.3.4.3 Income and expenditure profiles of smallholder farmers**

According to Agritex (2010), smallholder farmers in Masvingo engage in agriculture and informal activities to generate income for their livelihoods. Fruit and vegetable sales are the most widely reported sources of income, contributing 85% of total sources of income (ZIMSTAS, 2012:68, Kapuya et al 2010:44, AIAS 2010:23). According to ZIMSTATS (2013:67) primary income (wages and salaries) contribute 66.2% to average annual gross income. Agriculture income contributes 17.5% to average annual gross income. Income from household enterprises constitutes 12.6% of average annual gross income. The results from the field survey by Alice (2010:69) showed that about half the households obtained income from petty trade, remittances, self-employment and livestock sales and only 38% of the interviewed households were getting (cash) income from crop sales. This concurs with ZIMSTATS(2012:70) findings as well which stated that 38 % of the sampled households in Masvingo province reported that crop sales contribute less than 20% of the rural households income sources. Campbell (2002) points out that dry-land crops contributes 23% to the smallholder farmer’s sources of income .See table 2.

**Table: 2 Household by income source Masvingo province**

<b>Household income</b>	<b>%age</b>
Dry-land crops	23 %
Livestock	21%
Remittances	21%
Woodlands	15%
Wages and home industries	12%
Gardens	8%

Source: Campbell et al (2002:46)

ZIMSTATS (2013) illustrates that in rural areas agriculture is the main source of income generating activity for more than half of the households. In the case of Masvingo household main source of income is the sale of agriculture produce which contributes to 55 % of the total income (Agritex, 2010:27).

Remittances are other main sources of income in rural Zimbabwe. It is observed that average annual remittances from abroad received by households in Masvingo are US\$ 1729, which is 8.3 % of the total income sources (ZIMSTATS, 2013:102).

ZIMSTATS (2013:104) estimates that US\$38 is the average expenditure spent on agriculture in Masvingo. This shows that there is poor prevalence of agricultural based income activities. According to ZIMVAC (2012:44) survey 31.4 % of Masvingo rural households reported that they survive on one income source, 38.4% on at least two income sources, 18.7 % on at least three income sources and 9.3 % on at least four income sources. This shows the diverse nature of rural household livelihood strategies. Food items constituted the greatest share of most rural households' expenditure at 53% as compared to the share of non-food items at 47%. ZIMVAC (2012:44) estimates that Masvingo spent 57% on food expenditure by May 2012 and 43% on non-food expenditure. PIECES (2012) reported that in the year 2012 agriculture households in Zimbabwe spent US\$75.6 million on capital formation which includes construction of tobacco barns, purchase of farm equipment and other equipments. It is also noted that most of the capital formation is carried out by households living in communal lands with 66.6% followed by resettlement areas with 10.85 and the rest of land use sectors have contributions to capital formations of less than 8.6% (Agritex, 2010:64).

#### **4.3.5 Physical capital**

Physical capital refers to factors of production, that is labour, inputs, machineries and capital stock. According to Agritex (2010:44) survey in the study area in 2010 there was evidence that 56% of the farm households owned brick dwellings with a roofing of either thatch or asbestos/zinc.

This is also substantiated by ZIMSTATS (2012:111) findings that 58% of the households in Masvingo reside in houses made of bricks under thatch. In terms of the physical assets owned by the smallholder farmers in the study area ZIMSTATS (2012) illustrates that the most common assets include wheelbarrows, draft animals, draft ploughs, radios, television sets, bicycles, and private wells. Very few smallholder farmers own tractors in Masvingo hence they are predominantly dependent on draft power for ploughing. Tractors are apparently used for carrying farm produce to the market. Normally, tractors are used for tilling, dicing, and harrowing agricultural fields as well as transporting farm inputs and produce. It should be noted that these limited assets have serious impacts on agricultural productivity. In most areas of Zimbabwe animal draft power is used in preparation of 70% to 90 % of the cropped area, tractor power for between 2%-15% and hand tillage for 5%to 15% (Chikobvu, 2008:16).

#### **4.3.5.1 Infrastructure**

There is poor infrastructure development in the province which can facilitate growth in agricultural development. According to ZIMSTATS (2012:25) about 40 % of the road network is in poor condition in the province and railway and freight traffic has declined by more than 80% since 1990. In Masvingo only 17.22 % of the population has access to electricity as noted by ZIMSTATS (2012:26). It should be noted that only 13 % of rural households have electricity in Zimbabwe (ZIMSTATS, 2012:32). Government is assisting in setting up some irrigation schemes in the province, for example, the Rozva Irrigation Scheme which is located in Bikita District is one such success. Hippo Valley estates in Chiredzi and Triangle use water from Lake Mutirikwi for irrigation purposes. The construction of the Tokwe-Mkosi dam is currently underway. This is a project which is coming on as a realisation of the dryness of the province. However (FAO, 2010) alludes that investment in agriculture in the province for the past decade has gone down as a result of the economic crisis that Zimbabwe currently experiences.

#### **4.4 Conclusion**

Masvingo Province is largely in the drought prone zone of Zimbabwe and yet smallholder farmers' main livelihood strategy is agricultural production and the majority of farmers grow maize as the main crop. The smallholder farmers in the study area operate with very limited human, financial and institutional capital in carrying out agricultural activities. Although the majority of the people depend on agriculture for their livelihood, there appears to be an increasing shortage of inputs and supportive services which limits the agricultural productivity, which is fundamental to address food security. The next chapter is going to provide with the main findings from the study.

## **Chapter five: Findings**

### **5.0 Introduction**

This chapter presents the main findings of the study. The contribution of smallholder agriculture to food security as illustrated by evidence from Masvingo province is illustrated through discussing production levels and production trends of major food crops essential for food security. The chapter also discusses the main challenges and opportunities faced by small scale farmers in ensuring food security.

#### **5.1.1 The contribution of smallholder agriculture to food security in Masvingo**

According to Agritex (2010), crop production in Masvingo is mainly done for subsistence. In the 2011/12 survey by ZIMVAC 68% of the population was recorded to have planted maize in Masvingo. Kapuya et al (2010:44) argue that under normal circumstances Zimbabwe has the potential to plant 1.2 million hectares of maize to meet human consumption requirements of 1.825 million tonnes (Girma et al ,2013:27) illustrate that for the past three years maize share in the smallholder farmers ranged between 50 % to 70 %. In line with this argument Agritex (2010:29) estimated that average output per farm of maize and small grains was 200kg/household in the 2012/2013 season. Maize is an important staple food crop and, as such, every household grows it in Masvingo and about 90 % of the district arable area was planted with maize in 2011/12 season (FAO, 2012:56). This shows the significance of maize in addressing food security. There is evidence from the literature that communal farmers generally produce for home consumption while the large-scale farmers produce for commercial purposes.

Agritex (2012:12) estimates that during the 2011/2012 season average farm cereal production at farm levels was 41 kg/household in smallholder farms in Masvingo. According to FAO(2012:48) smallholder farming sectors (Communal Areas (CA), Old Resettlement (OR), A1 and Small Scale

Commercial Areas (SSCA) in the study area contributed more than 90% of the area planted to maize with the communal sector contributing about 64% in the 2011/12 season(FAO,2012:49).

According to SADC (2013:12), Cereal production in the country is down by 19% compared to 2010/11 season and it indicated that the number of people who are at risk of food insecurity are up by 32% compared to 2012. Crop production in Zimbabwe continues to be affected by unfavourable weather condition experienced in some parts of the country. Maize, which is the main staple food, dropped by about 18% from about 968,000 tonnes during the 2011/12 agricultural season to 799,000 tonnes in 2012/13 agricultural season (FAO, 2012:57). The country is projected to face a cereal deficit of about 1.62 million tonnes in the 2013/14 marketing year which is slightly higher than the 1.46 million tonnes cereal deficit recorded in 2011. According to the ZIMVAC (2012:32) report the number of people at risk of food insecurity is estimated at about 2.21 million people during the 2013/14 marketing year, representing a 32% increase from the 1.67 million recorded in the previous marketing year.

**Table: 3 Average months of own production consumption by smallholder farmers in Zimbabwe by province.**

Province	Duration in months
Midlands	7
Matebeleland South	3
Masvingo	4
Mashonaland East	4
Mashonaland central	6
Manicaland	6

Source (ACIF, 2013:63)

It should be noted that for the 2012/13 season, households had between three to six months, supply of grain from own production as shown in Table 3 above. This clearly shows that Zimbabwe is unable to be food self-sufficient as most households run out of food even before the midway through the year.

### **5.1.2 Crop husbandry**

It should be noted that smallholder farmers grow diversified food crops on their small pieces of land to balance their food nutrition. Besides maize discussed above, some other agricultural produce from the smallholder farmers include, groundnuts, cotton, beans, vegetables, meat and milk (Juana et al, 2005). According to Agritex (2010) groundnuts are viewed as important because of their substitution as cooking oil and they have become more popular with an increase in the scarcity of cooking oil in the Masvingo area. Groundnuts and sunflower are also considered as important since they are supplementary food and cash crops in the region. This view is also supported by findings from APPRODEV (2002) who illustrated that the principal crops produced in the Zimbabwean communal areas are maize, cotton, sugar, groundnuts, beans and cow peas. The cash crops grown in the province are sugar cane and cotton. There are plenty of sugar beans, onions and sugar cane grown in the irrigation schemes albeit sugar cane is mainly grown on estate plantations. In galvanising the most important crops grown in the province Agritex (2010:41) analysed the percentage distribution of land allocated to a specific crop and came up with the following findings; hybrid maize accounting for at least 30–40% of the crop area, followed by groundnuts (24–26%) and small grains (9-14%). However it is perplexing that despite the province being semi-arid the farmers do not favour growing small grain crops which are drought resistant.

### **5.1.3 Trends in crop production**

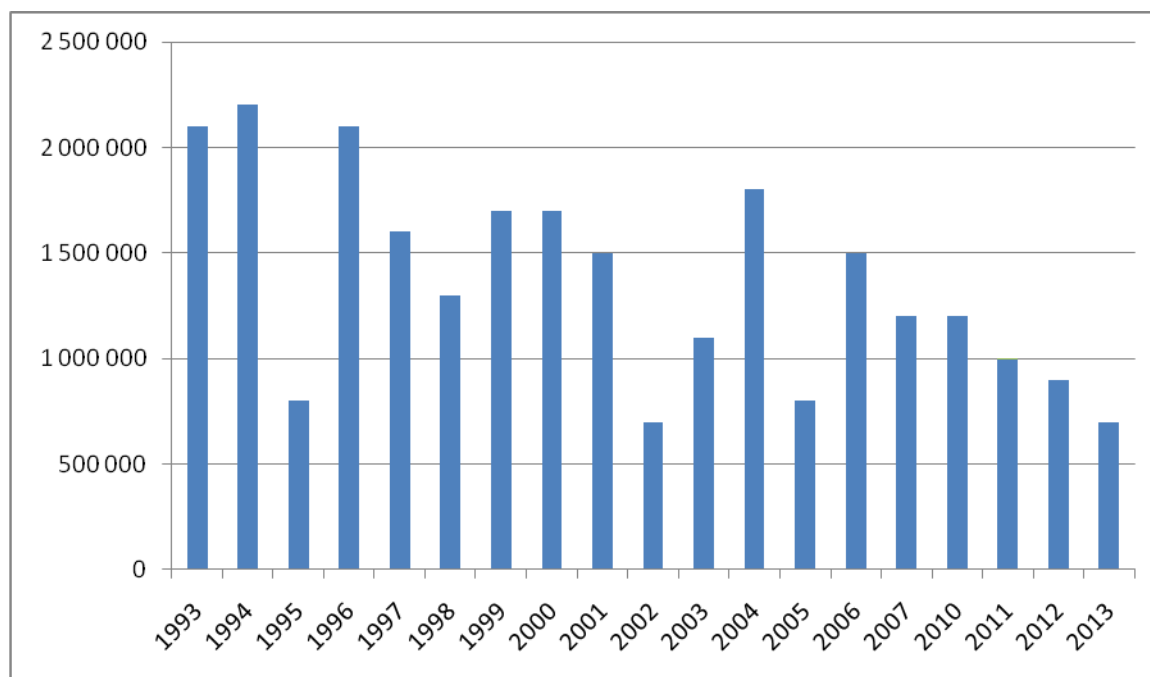
Maiyaki (2010) concludes that maize is one of the major crops in Zimbabwe. There is empirical evidence that smallholder farmers in Zimbabwe have continued to expand their production of maize despite annual fluctuations (see annexe 5). From 1980 to 2001, the annual production of

maize in Zimbabwe had been well above 200,000 metric tonnes with the exception of 1990 when it fell drastically to 1,585,800 as illustrated in annexe 5. This drastic reduction was mainly accounted for by the low production in the commercial sector. The communal sector however, continued to witness a general expansion in maize production despite annual fluctuation and inefficient production. The drop in the national production of maize is mainly linked to the drastic reduction in productivity (from 4.2 tons/ha to 1.5 tons/ha (Anseeuw, 2012:33). The reduction in productivity has mainly been attributed to the controlled pricing of maize, which has not kept pace with rising input costs and hyperinflation. The smallholder sector, however, remained stable, with an increase of the area under production, but with a low, stagnating (700–800 kg/ha) productivity (Sukume et al 2009:23). In 2009, the national production of maize (mainly by smallholders) was 130% higher than in 2007/08 (FAO, 2010:23). The increase in production is related to the significant extension of the area under production, from 1.2 million ha to 1.6 million ha (FAO, 2010:24).

According to WFP (2013:29) 2011/2012 crop production was estimated at 1 076 776 mt which is 33% lower than the 2010/2011 season which was 1 607 711 mt. Reduced cereal production for the 2012 season was mainly due to lower cropped area for maize (19% down from the previous year), as a result of late starts of rains in most areas, prolonged dry spells especially in the southern half of the country, late distribution and poor access to crop inputs (seed and fertiliser).

The Zimbabwe maize production trends are illustrated in figure 3. There has been a drastic reduction in maize production for the past three years from 1993 to 2013. There are fluctuations in the maize production in the country and since 2000 the country has not been able to match the 1994's maize production of above 2 million tonnes which is estimated by GoZ to be sufficient to feed the population of Zimbabwe (Anseeuw, 2012).

**Figure 3 maize production trends in tonnes 1993-2013 in Zimbabwe**



Source:ZIMSTATS (2013:66)

The poor agricultural practices, lack of diversified livelihoods and macroeconomic challenges characterised by rising cost of living have contributed to low maize production levels in the country. This is combined with unfavourable rainfall pattern and a relaxation of market controls on input prices (ZIMVAC, 2012:44).

#### **5.1.4 Trends in maize production by smallholder farmers**

The trend in maize production in the province has been fluctuating for the past 10 years. According to GIEWS (2012) the maize output from the 2011/12 season cropping season registered a sharp 33% decline compared with the 2010/11 season. Millet and sorghum production also decreased to below 2011 levels, while declines were also recorded for groundnuts, soyabeans, sunflower and sugar beans. Generally the total maize area planted trend has been increasing over time, with marginal declines in 2003 and 2006 in Masvingo (Agritex, 2010: 69).

Evidence from the literature shows that total area harvested has remained above 1.317 million hectares since 2000 and has been above the 1990s average of 1.301 million. (FAO, 2010: 42, ZIMVAC, 201:73 Girma et al 2012:29). According to FAO (2013:97) maize area harvested peaked in 2005 and 2007 to above 1.7 million hectares, an effect of expanded communal and smallholder area. In the 2012/13 season government estimates that 1.7 million hectares have been planted which is 19 % lower than the 2011/12 season's 2.1 million hectares (GIEWS, 2013:19). This decline is attributed to a late start of the rainfall season and inconsistent rainfall patterns. As a result of the poor rainfall maize crop is estimated to be 960 0141 tonnes or 30 % lower than the 2011/12 output (FAO, 2012:13).

### **5.1.5 Production trends of other major food crops in the study area**

FAO (2010) asserts that there was a strong negative trend in aggregate grain production in the country from 1980 to 2002. The fluctuations in production reflect the vulnerability of Zimbabwe to climatic changes. For example in 1991/1992 and 1994/1995 agricultural seasons, production was lower than the preceding seasons due to drought. The 1997/1998 production was destabilised by Cyclone Eline that affected the Eastern and Southern parts of Zimbabwe resulting in reduction in crop yields especially sugar, maize, seed cotton and wheat agricultural production and productivity. Maiyaki (2010) argues that Zimbabwe's farming sector has the potential to produce surpluses of cereal and considerable amounts of cash crops. FAO (2010) further adds on that Smallholder farmers in Zimbabwe can produce, and have produced in the past, exportable surpluses of maize and certain other food crops. But severe constraints on prime land use have resulted in less than full capacity utilization of its natural resources.

However, there has been a negative trend in the production of maize and wheat, the main staple cereals among others, in the period leading to and after the 2000 Fast Track Land Reform and Resettlement Programme (Ministry of Finance, 2011). Anseeuw (2012) also concurs with these findings by illustrating that the period between 2000 and 2008 saw a steady decline in the

production volumes of staple commodities and increasing reliance on food aid and imports from neighbouring countries. FAO (2010:39) envisages that during the past decade, national maize production has averaged around 1.1 million tons, with production peaking in only two seasons: 2001/02 (at 1.5 million tons) and 2004/05 (at 1.7 million tons). Extreme levels of less than a million tons were experienced in the 2005 drought periods, but the worst year of the decade was 2008/09, when the country produced only 0.47 million tons (Table 4) (AIAS, 2010:70).

**Table 4: Trends in production ('000 tonnes) of selected crops (1994-2012)**

<b>Crop</b>	<b>1994</b>	<b>2000</b>	<b>2005</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Maize	2,109	1,620	905	471	1,240	1,328	1,452	968
Small grains	205	77	66	93	270	200	156	109
Wheat	239	350	229	39	48	41	42	na
Tobacco	180	200	83	70	59	123	131	144
Horticulture	34	64	60	60	35	43	na	na

Source: FAO (2012:44)

### **5.1.6 Livestock production**

Livestock and fisheries contribute about 40 % of the agricultural GDP in Zimbabwe (MAMID, 2009:2). Livestock production plays an important role in the national agricultural economy and as sources of animal protein necessary to enhance a better nutrition. Smallholder farmers are the major owners of livestock in Masvingo. About 80 % of the cattle, sheep, goats and donkeys are owned by the smallholder farmers in the province (FAO, 2010:20). Goz (2009:120) provides more detailed analysis of livestock ownership of Zimbabwe as it estimated that about 95 % of the goats are reared in the smallholder farming sector. Moreover the bulk of the poultry population is also in

the smallholder sector in which over 96 % of households own poultry, with average flock sizes of 15–20 birds (Goz, 2009:76).

Livestock serves different purposes amongst smallholder farmers which includes; providing services such as draft power, milk and manure for cropping and as stores of wealth. Livestock provides for income when sold, meat for household consumption, manure for crop production, and are used for various social functions such as rituals and marriage ceremonies. Investment of crop income in cattle ownership leads to capital growth as the herd grows through reproduction. However it should be noted that smallholder farmers rarely sell cattle as they prefer to raise cash through selling small-stock (usually goats and chickens) to meet occasional cash requirements. According to Agritex (2010) households keep livestock to diversify their livelihoods and manage risks. Overall in Masvingo, the herd averages 0.88 cattle, 2.15 goats, and 6.59 chickens (Agritex, 2010). Agrisystems (2009:44) concurs with these findings by illustrating that smallholder farmers own over 68% of all cattle, 98% of goats, 84% of sheep, and 60% of pigs in Zimbabwe.

### **5.1.7 Major functions of cattle in a smallholder system**

Most of the cattle owned by smallholder farmers in Masvingo are mostly indigenous , for example unimproved mashona type, ngoni and tuli , among other breeds. Social and economic aspects of communal cattle production in Zimbabwe have been examined by numerous scholars over the past years (Avila 1987, GFA 1987, Cousins et al. 1988, Scoones 1990, and Barrett 1991). The functions most frequently identified as being important have been classified by Barrett (1991) in his analysis of the main functions of livestock in a smallholder system in Zimbabwe.

There is much evidence that cattle production is closely interrelated with crop production. Crop production increases as herd size increases. Table 5 below illustrates the relationship between cattle ownership and maize output in a smallholder sector as developed by Rukuni (1994). Rukuni (1994) argues that farmers who own cattle till their lands timeously leading to higher crop yields. Moreover, cattle manure is used as an organic fertiliser which improves soil structure and fertility

thereby reducing the amounts of inorganic fertilisers that have to be purchased. Cattle owners therefore obtain higher crop yields and incomes than non-cattle owners and greater food security is associated with cattle ownership.

**Table 5: Relationship between size of the cattle herd and maize production in the smallholder sector.**

<b>Herd size</b>	<b>Area under maize (ha)</b>	<b>Area manured (ha)</b>	<b>Manure applied (tonnes)</b>	<b>Maize yield (kg ha<sup>-1</sup>)</b>
1-4	1.0	0.38	4.01	903
5-8	1.2	0.57	4.19	1148
9-12	1.3	0.69	4.21	1249
>12	1.3	0.94	4.57	1831

*(Source: Rukuni, 1994).*

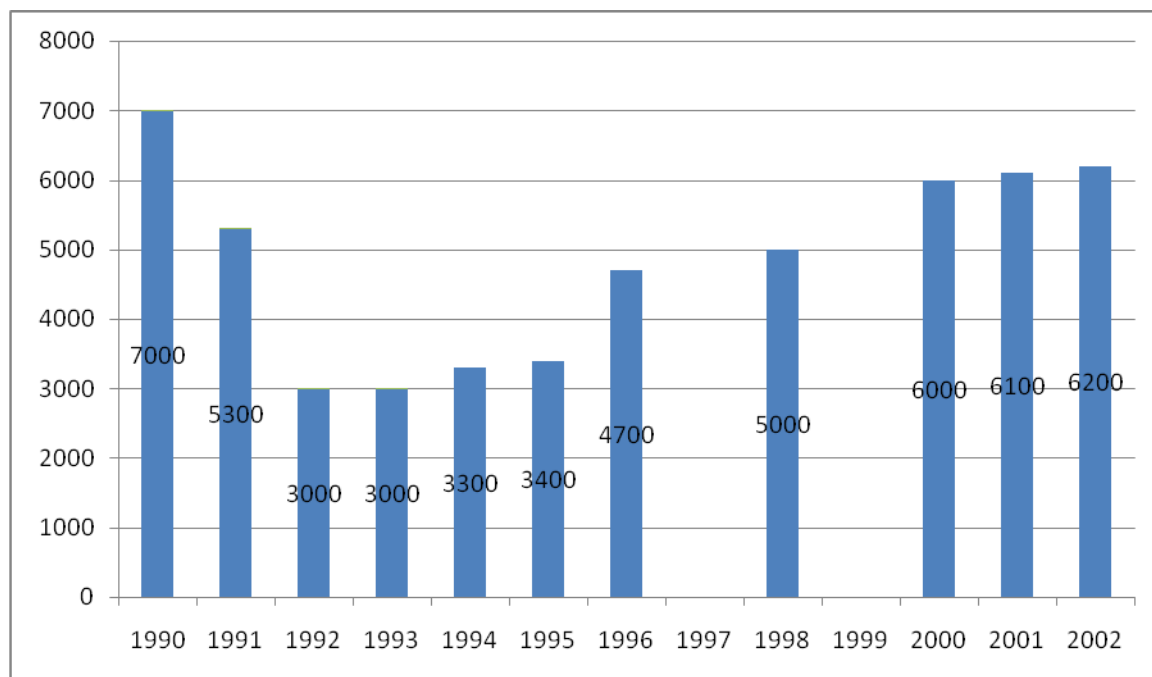
### **5.1.8 Masvingo province livestock population owned by smallholder farmers**

The figure 4 below shows the population of livestock owned by smallholder famers from 1990 to 2002, there is generally stability in the ownership of livestock with no declines noticed since 1991. The main reason which explains for stability in terms of livestock ownership in Masvingo is that cattle are used mainly for draft power and are sold mainly when there is a crisis with the household. The ownership of cattle in the province is significant since the success of an agricultural productivity depends on the size of cattle herd. There has been an increase in terms of cattle ownership in Masvingo from 3000 to about 6000 in the 2000s (Agritex, 2010:87).The motive behind is to have the essential assets in terms of ploughing the fields. Generally in Masvingo province smallholder farmers do not raise cattle for commercial purposes hence there is consistent

stability in terms of cattle ownership. Therefore, it is clear that although there is no high use of machinery for filed tillage there is a significant amount of cattle herds that can be used to ensure successful agricultural production to contribute to food security at farm level (Agritex, 2010:89).

**Figure 4 Masvingo province livestock populations owned by smallholder farmers 1990-2002**

**Source DVS (2004:23)**



Kassie et al (2012) are of the view that in comparison with cropping, productivity levels for livestock are low. Moreover, Anseeuw et al (2012) are of the view that livestock production contribution to national agricultural sector performance is not fully recognized compared to that of the crop sub-sector For example, the calving rates of cattle are 45 % per annum or less, while milk yields average 7kg/cow/day (FAO, 2010:14). Evidence from the literature shows that there is potential to double these productivity levels, as demonstrated under commercial farming conditions in the past. The reasons for the poor performance include poor nutrition, animal disease outbreaks and general poor management. Various nongovernmental organisations, for example Food and Agriculture Organisation, have been involved in

supporting smallholder farmers with rehabilitation of dip tanks as well as vaccinations for major diseases such as Foot and Mouth and Newcastle diseases (FAO,2010:16).

According to AIAS (2009) findings before the land reform programme, the structure of the livestock subsector was dualistic, with the large-scale commercial sector dominating in the production of formally marketed livestock and livestock products, such as beef, milk, chicken and eggs. According to FAO (2010) livestock numbers are difficult to assess in Zimbabwe as dipping tanks are normally used as census points and their use is very infrequent. The influential role of smallholder farmers in livestock production has been witnessed especially in the early 2000s after the fast track land reform programme which saw the demise of the commercial ranching of livestock. Due to the land reform programme, from 2001 onwards, cattle on large-scale farms have declined significantly, from about a quarter of the national herd to between 9% and 13% (see appendices 2) (Scoones et al 2009: 22).

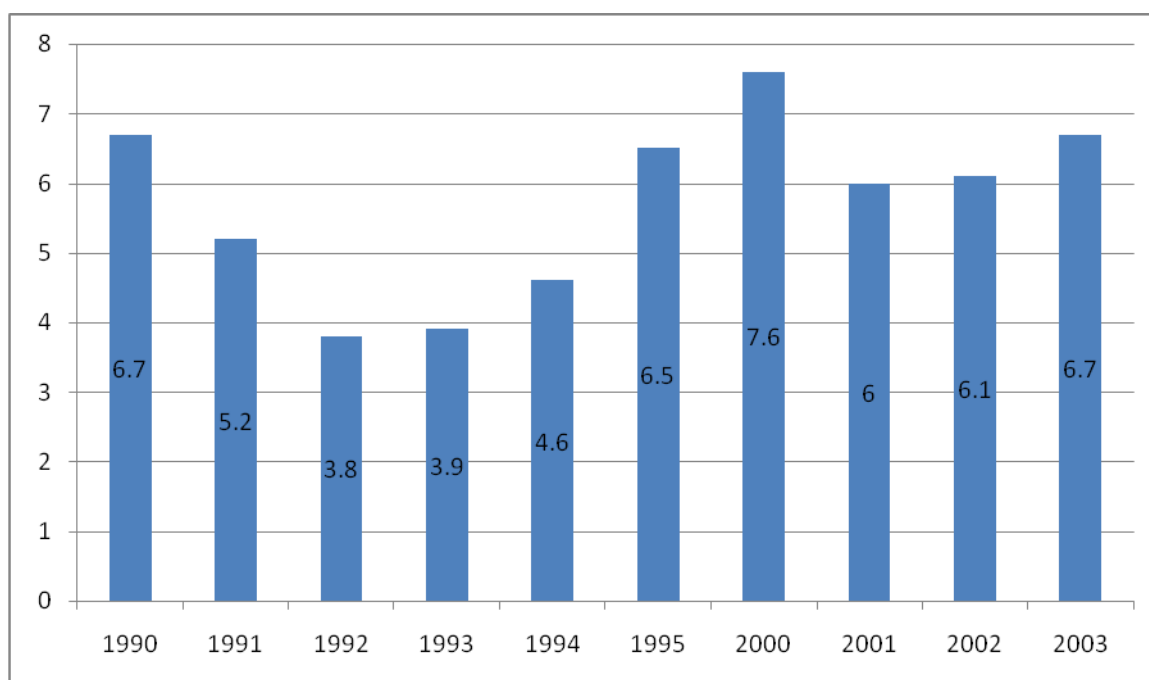
On the one hand, in the period after the land reform, production is still marginal on the A2 resettlement farms (which replaced the large-scale commercial farms), with most of the newly settled farmers trying to grow their livestock holdings (Sukume et al 2009). On the other hand, since 1998, the number of cattle in the small-scale sector has been increasing (see Table 12). Although export earnings from beef exports declined from US\$48 million in 1998 to less than US\$1 million in 2005 (Sukume et al 2009:109), the shortage of beef from the large-scale sector has increased the demand for smallholder cattle. This is demonstrated by the increase in slaughtering from that sector since 2001, leading to higher prices being offered for smallholder cattle.

Domestic animals are an important measure of wealthy and status within an area because they are a source of food (meat and milk) and instruments of production (manure and draught power). Kassie et al (2012) point out that livestock ownership is important capital assets for smallholder farmers in Zimbabwe. Therefore this does not put Masvingo as an exception, livestock ownership

is viewed as a strategic asset owned by the better off farmers (ZIMVAC, 2012). According to Agritex (2010) in terms of cattle ownership, 43% of the households own no cattle at all while another 35% own less than five cattle. This reveals a high level of poverty, especially for an area suited to livestock rearing. On the other hand, 12 % of the households have over ten acres while 7 % of them have more than ten cattle per household and only 2.8 % of the households had been granted loans by the Agribank of Zimbabwe (Girm et al, 2012:96)

The bulk of the livestock units in the province are cattle. Farmers also own poultry, goats, donkeys, sheep and pigs (ALS, 2002). The condition of grazing areas and the livestock is poor in the Communal areas but fair in the resettlement areas. Although the majority of the farmers keep chickens for home use, there are individuals and groups who rear broilers and layers for the market (AGRITEX, 2010).

**Fig 5 Number of cattle per household in Masvingo province:**



**Source:( DVS 2004:26)**

As Figure 5 shows, livestock holdings at a household level have averaged around 6 over the past 10 years, with major declines recorded in 1992 and 1993 which could be as a result of the

1991/1992 drought which resulted in the death of much livestock throughout the country (Agisystems, 2000). All in all it could be asserted that smallholder farmers maintain stability in livestock production since most smallholder farmers do not raise livestock for commercial purposes but to supplement in terms of labour supply in crop production and only sell for cash in times of crises.

## **5.2 Challenges faced by smallholders in ensuring food security in Zimbabwe**

The second objective of the study is to investigate the challenges faced by smallholder farmers in Zimbabwe.

### **5.2.1 Limited resource base in terms of assets**

The first dimension of the challenges addresses natural and productive assets which includes: physical, human, financial and social capital. The discussion on the assets of the rural smallholder farmers in Masvingo province have been given a detailed discussion in the preceding sections hence there is no need to repeat the challenges which have been discussed related to the assets. However a brief summary of the main challenges as far as assets are concerned will be discussed. As derived from the discussion on the assets of the Masvingo province it is of paramount importance to conclude that in a smallholding sector the natural resource endowment is a crucial factor. Therefore, it can be asserted that the most binding constraints to smallholder farmers in Masvingo in ensuring food security comprise limited access to sufficient productive land, limited investment in human, financial and social capital, among other factors (FAO, 2010). It goes without saying that that the limited resource base in terms of assets or capital (human, natural, social, physical and financial) is the main hindrance to successful development of the smallholder sector to sufficient levels to contribute to food security. Therefore, the smallholder resource base is considered to be too small, that it is often barely able to sustain an acceptable livelihood.

## **5.2.2 Markets**

The second category of the challenges addresses markets and market related constraints which include: unfavourable conditions such as lack of access to favourable markets and infrastructural development .These factors are a hindrance to small farmers' capacity to contribute successfully to food security.

### **5.2.2.1 Market access**

The study illustrated that ever since the start of implementing of the liberalisation policies in Zimbabwe, the government has struggled unsuccessfully to find a policy framework for smallholder farmers, which would allow farmers to produce for the market with confidence to ensure both national and household food security. The study revealed the challenges which are transaction costs in accessing the nearest state market outlet for agricultural inputs and outputs which have a negative influence on the area cultivated by the smallholder farmers in Masvingo. Access to agricultural markets and related improvements in rural infrastructure and marketing institutions are essential for adoption of new technology and transformation of subsistence-oriented smallholder agriculture. In addition, access to other infrastructural services such as telecommunications and electricity also remain limited in the study area (Agritex, 2010:123). Since infrastructural services play a very vital role in agricultural development, the challenge is to achieve high accessibility rates for infrastructural services among the rural population, given the low base.

Marketing is one of the most hindrances cited by many scholars to be affecting agricultural productivity in Masvingo. In most parts of Masvingo, more than half the population lives 6 hours or more from a market centre (ZIMSATS, 2012:28). Smallholder farmers face high transaction costs in the marketing of agricultural products and accessing inputs (Mudimu, 2003). The road networks are generally poor in Masvingo and the farming areas are poorly served by external transportation

systems with frequent breakdowns resulting in loss of time and delays in marketing of produce. Anseeuw (2012) argues that transportation charges are high taking 25-40% of the crop value in addition to the high transaction costs that affect real incomes of households in rural areas. It should be noted that due to the marketing problem smallholder farmers who produce for the markets end up reducing production levels and moreover focus on producing mostly on food crops for subsistence. Mudimu (2003) further points out that limited marketing information in situations where farmers market through traders have meant that farmers ends up in a compromising position in terms of bargaining. Therefore, the farmers are not in favourable position to benefit directly from higher product prices that the markets may offer. Poor communication channels and underdeveloped infrastructure for radio and television informational systems limit the ability of the farmers to receive and utilize market information (Anseeuw, 2012:120).

The main source of market for the smallholder farmers in Masvingo is the Grain Marketing Board (GMB) which is a state parastatal (FAO, 2010, Mapfumo 2009, Moyo, 2009). Maize and wheat, and to some extent other commodities, are officially traded through GMB. It should be noted that no movement of maize and wheat is allowed with the exception of small quantities less than 150 kg beyond which is referred to as “farmer-to-farmer” sales (ZIMVAC,2010:59).However in crisis situations farmers prefer to trade informally through private traders due to price discrepancies. However ,FAO (2010) identifies that following the market liberalisation reforms in 2009, which has made a positive contribution to national food availability and security, GMB’s main function is now that of buyer of last resort, as a means to help maintain floor prices to support domestic producers. FAO (2010) argues that since 2009, the marketing of all agricultural commodities has been deregulated, with the Grain Marketing Board (GMB) maintaining a minimum floor price on maize and wheat as a buyer of last resort. In regards to market, GMB competes with other private traders. Kapuya et al (2010) assert that a severe constraint affecting the GMB’s capacity to function effectively is a lack of capital and enormous size of its workforce adding to very high

overhead costs. In most cases farmers rely on selling their produce in the local communities and informal marketing systems (GoZ, 2012). Furthermore, farmers are burdened with the cost of transporting their produce to GMB depots, which presents an additional problem for farmers wanting to sell their maize to GMB.

### **5.2.3 Limited access to inputs**

The poor access to inputs is a serious challenge to smallholder farmers' capacity to address food security in rural Masvingo. Improved access to input and output markets is considered a key precondition for the transformation of the agricultural sector from subsistence to commercial production. Baiphethi et al (2009) recommend the need to increase access to assets, as household assets are the major determinants of the smallholder farmers' ability to participate in agricultural production, contribute to market supply and establish a strong livelihood base. Due to the small size in smallholder farms the use of improved inputs has been suggested as one measure of promoting intensification of production in light of the low productivity of agriculture in Masvingo (Mapfumo, 2009). However, it should be noted that this can only be possible if farmers have easy access to input markets such as fertiliser, animal traction, organic inputs, and water. Well functioning markets play a significant role in ensuring that the benefits of productivity are passed on to the consumers.

Agritex (2010) argues that limited access to credit and inputs is one of the main risks perceived by smallholder farmers during the course of agricultural production in the study area. Evidence from literature shows clearly that one of the major reasons leading to poor agricultural output is late delivery of inputs (FAO 2010,WFP 2012,ZIMVAC 2012).In the province it was established that a six week delay in the planting of maize yields leads to a drop in yields up to 30 % (DRSS, 1994: 64).Therefore, in order to mitigate the impact of the limited access to inputs smallholder farmers resort to participation in NGOs and government programs to source inputs for crop production,

since these are difficult to find on the open market. However it should be noted that generally seed and fertilizer relief packages are typically not sufficient to meet farmer needs.

#### **5.2.4 Institutions**

The third category in the set of the challenges is institution and policy design. Evidence from the study shows that there is limited institutional and policy framework which supports the smallholder farmers. Therefore since supportive institutional framework is essential for the successful agricultural production the absence of it renders the capacity of small-scale farmers to ensure food security limited as outlined below.

#### **5.2.5 Lack of a well defined smallholder agriculture policy**

Most scholars cite the main challenge to smallholder agriculture development as a result of lack of a relevant and well-defined policy drafted best suited for the needs of the smallholder farmers in Zimbabwe. There is a lack of institutional framework and well defined development strategy to enhance smallholder agriculture productivity in Masvingo and Zimbabwe in general (Kapuya et al., 2010). The policies which prioritise the needs of the smallholder farmers are not evident in Zimbabwe. Mwaniki (2005) argues that poor policies have greatly affected the food production capacity in Africa. It should be noted that most agricultural policies in Zimbabwe exclude the smallholder farmers.

#### **5.2.6 Budgetary resource constraints to support subsidies**

One other important factor that affects the capacity of smallholder farmers in Masvingo is the issue of resources. This is especially the case as evidence from the study shows the failure of the smallholder farmers to afford the means of production on their own thereby necessitating the state to intervene in promoting crop production. The early 1980s government policy of providing Agricultural Inputs Subsidies to smallholder farmers demonstrates the significance of the provision

of inputs in order to achieve food security (Agritex, 2010). These interventions had huge budgetary implications on the government, given the financial constraints in Zimbabwe's, this poses a question on the feasibility of such interventions at the moment. It should be noted that Zimbabwe has over time implemented a series of economic reforms and instituted agricultural policy as well as strategic frameworks. However a positive and sustainable result in as far as food security is concerned remains unmet. Even though Zimbabwe has instituted several agricultural reforms and strategies including the equity with growth in the early 1980s and national agricultural strategy framework most of the policies had no significant impact on the majority smallholder farmers (Anseeuw, 2012). The smallholder farmers still receive a disproportionately small amount of developmental resources. The weak administrative and technical capacity particularly in the ministries of agriculture has been inconsistent and largely inadequate (FAO, 2010).

#### **5.2.7. Lack of agriculture extension**

A lack of efficient and effective support to agriculture, such as research and agricultural extension, affects the smallholder farmers' capacity to be productive. Lack of efficient support leads to a limited transfer of technology from research and restricted dissemination of productive farm technologies. The low level of education among small scale farmers, especially women who form the bulk of the agricultural labour force is a major constraint to the adoption of modern farming techniques and the ability to access other inputs necessary for increased productivity in the sector. The situation in Masvingo reflects that research and extension services have been disintegrated and ineffective for any significant agricultural development to take place. On average evidence from the case study area shows that Zimbabwe spends 0.9 % of agricultural GDP on research (Kapuya et al, 2010). On the other hand some countries, especially the developed ones, spend up to 3 % (FAO, 2009:79). Mapfumo (2009) asserts that the effectiveness of extension services in Masvingo has been on a decline due to the economic meltdown and increased brain drain. Currently extension services are mainly focused on increasing production on short-term technical

packages, without paying attention to farmers' circumstances, markets, and sustainability (FAO, 2010). Furthermore, Chimhowu (2010) argues that the linkages between research, extension and training are weak, and collaboration between public and private partners severely limited.

### **5.2.8 Land Tenure**

Land tenure is a significant aspect which determines the level of investment and access to credit facilities by smallholder farmers. However, it should be noted that there is a lack of tenure on most household farmers in Masvingo; this situation is worse to the newly resettled smallholder farmers who despite benefiting from land reform are struggling to get leases to secure ownership of the land.

## **5.3 Opportunities available for smallholder farmers to ensure food security**

The last objective of the study is on looking at opportunities which are available for smallholder farmers in Zimbabwe to improve their capacity to ensure food security and to be resilient amongst the above mentioned challenges. These are outlined below.

### **5.3.1 Success stories from the previous smallholder agricultural revolution**

Eicher (1995) documents the success story of the pro-smallholder agriculture policy in Zimbabwe just after independence which saw the smallholder farmers producing enough food for the country and enough surplus to export to the SADC region. After independence in 1980 the government followed a policy of promoting Small scale farmers in the communal areas. Agricultural extension services to the smallholder farmers was expanded considerably coupled with increased provision of hybrid seed and increased use of fertiliser and irrigation. For example Eicher (1995:94) reported that nearly over 90 % of all Zimbabwean farmers used fertiliser in that agricultural period. Market services were improved remarkably as well and the GMB increased the number of depots to over 100 by 1985. Credit was made available for the first time to the smallholder farmers. Human

development was witnessed also in that period as Eicher (1995) noted that real expenditure per capita on health, clinics and primary education increased throughout the communal areas.

With these improved services the smallholder farmers produced about 60% of the marketed maize by 1986 and over 50 % of cotton 99 % of sunflowers and most of the small grains and groundnuts that were formally marketed (Eicher, 1995, Mudimu 1992,Rohrbach 1988). Such was the success of the interventions in the 1980s that this period is referred to as Zimbabwe's smallholder revolution (Rukuni and Eicher, 1994) and is attributed mainly to the linkage between technology, service organization and institutions (or parts thereof) developed specifically to deliver on the policies adopted to enhance smallholder agricultural development. Chirwa et al (2007) note that similar success at a small scale was recorded by coffee farmers in Malawi.

The growth rate of peasant production of maize over the 1980s was 9.0 % with the yield per hectare rising 6.7% while comparable figures for cotton were 26.5% and 1.3% (Rukuni,1994: 24).Through these supportive services from the government smallholder farmers managed to be food self sufficiency building up a stockpile of maize between one and two years supply from which they were able to sell to the Grain Marketing Board.

During this period the GMB administered a guaranteed prize of maize that was an average 12 % above world market prices (Rukuni, 1994 55). Zimbabwe's experiences during the first decade of independence confirms the ability of smallholder farmers to self finance their transformational development from subsistence agriculture to diversified market oriented agriculture contributing to higher incomes ,greater resilience and better food security prospects (Eicher,1996). Moreover it should be noted that with improved access to technology and markets under this period, area under cultivation, yields of maize and cash crops increased beyond subsistence needs, creating the space and financial surplus for small-scale farmers to explore high value cash production opportunities. Therefore , drawing from the example of such successes recorded in the country by smallholder farmers it is imperative that given support, the smallholder farmers are capable of

producing enough food to ensure food security at both the household and national level; therefore the opportunity is available if the government reinvigorates the commitment which used to be provided to the smallholder sector just after 1980.

### **5.3.2 The positives drawn from the land reform**

There are positive outcomes from the newly resettled farmers in the study area on the capacity of the smallholder farmers to grow sufficient food to ensure food security. Scoones et al (2009) carried out a well documented research on the production capacity, livelihoods strategies and social composition of the land reform beneficiaries in Masvingo province. The conclusions drawn from the interviewed smallholder A1 farmers indicated that there is potential in smallholder farmers in ensuring food security. On food security Scoones et al (2009) found that smallholder farmers had sufficient foods and in the 2009 agricultural season a third of all interviewed households reported selling their surplus to the market. Scoones et al (2009) documented that compared to beef ranches which employed relatively few people the new farms were generating employment although poorly paid and with limited labour rights but nevertheless a source of livelihood strategy for many. Looking at maize production on the resettlement farms in Masvingo, Scoones et al (2009) tracked production on all farms over seven seasons from 2002-2003 and the data showed a steady increase in output over time as farmers became established. The trend was not smooth however and the major droughts saw low yields. In the better rainfall years of 2005-06 and 2008-09 the proportion of households producing more than a tonne of maize sufficient to feed an average family for a year was significant across all surveyed households. For example, following the 2009 harvest between 63% and 100 % of households in Mwenezi produced more than a tonne of maize. These findings show that smallholder based agricultural revolution can generate livelihoods and be a motor of wider growth. As evidenced by the success stories of the newly resettled farmers there are high chances for growth in the smallholder sector and the potential to address food insecurity in the country if given the opportunity and provided with support.

#### **5.3.4 Availability of land**

It should be noted that Masvingo is endowed with abundance of land sufficient to sustain livelihoods of the rural population. Most of the soil in the province is fertile, which requires minimum or no application of fertiliser. This is an opportunity for the rural poor small scale farmers who cannot afford fertilisers. The land reform programme implemented by the government in 2000 also provided enough access to land to the smallholder farmers. Moreover the fact that there is a agrarian structure composed of almost entirely smallholder farmers means the potential of shift of policy to target small-scale farmers something which was absent in the previous dual agricultural structure whereby large scale commercial farmers were the beneficiaries of most government programmes in agriculture.

#### **5.3.5 Increased technology**

The emergence of increased technology and internet services can act as a best way in enhancement of agricultural and rural development. It should be noted that in Zimbabwe there is a project developed by local companies called e-hurudza to educate smallholder farmers. The programme is a result of a developed software package that enables farmers to plan their work and to realise their full potential of investment (Chikobvu, 2008).The programme provides timeous access to agricultural information to all regions in the country. Moreover Econet launched a 3G technology in 2009 that allows subscribers to access internet on their mobile phones (Chikobvu, 2008).This technology will enable farmers to engage in e business and e agriculture. There is also an Interactive 3d learning object initiated in the country by a South African company called NALEDI3D and World Links Zimbabwe. The focus of the project is to focus on development of agricultural skills. The programme targets small scale farmers to share indigenous knowledge on the best farming methods through visually interactive media (Chikobvu, 2008). All these new initiatives help empower smallholder farmers to make quick and informed decisions that will enhance their productivity.

## **5.4 Recommendations**

### **5.4.1 Institutional support**

Since there is general consensus amongst stakeholders and development thinkers in Zimbabwe that there is acute food insecurity in the country, there is a need to draw a clearly defined policy framework that targets the smallholder farmers. There is an urgent call for the Government of Zimbabwe to create a conducive environment for smallholder farmers to recognise their full potential in addressing food security. There is need to draw an institutional framework to address the needs of the smallholders and enhance their productive capacity. The availability of institutional development will provide an efficient system of farmer support institutions, to enhance accessibility of improved technology to the smallholder farmers and promote the market of the agricultural output. There is need of a collaborative role between the different institutions from the private sector especially the seed companies and government to ensure the smallholder farmers access inputs on time.

There is need for development practitioners to examine what incentives and property rights are essential to encourage private sector to play an increasingly important role in rural development and set up farmer support services for more than one million smallholder farmers in the country. It can be concluded that smallholder agriculture can be made more productive and sustainable by, improving price incentives and increasing the quality and quantity of public investment; making product markets work better; improving access to financial services and reducing risks; enhancing the performance of producer organisations; promoting innovation through science and technology. Therefore, the public research and extension institutions and farmer organizations need to be strengthened to ensure the efficient provision of research and extension services. In view of the low productivity of agriculture in Zimbabwe, long-term food security can be improved by encouraging farmers to pursue sustainable strengthening of production through the use of improved inputs. Well functioning input and output markets need to be established as they help

farmers acquire and use improved inputs as well as market their produce. Improved markets effectively reduce transaction costs and risks. Furthermore, well functioning markets ensure that the benefits of productivity are passed on to the smallholder farmers. Increasing productivity will reduce pressure on marginal lands, as the intensification of cultivated land will reduce the need to expand production into fragile marginal lands

Moreover, there is a need to increase access to assets. Assets are the major determinants of these farmers' ability to participate in agricultural production and markets and to secure livelihoods through subsistence agriculture. The lack of assets for agricultural production is predominant in Zimbabwe, as evidenced by unsustainably small and falling farm sizes and poor-quality land, and the fact that investment in irrigation is negligible. In addition, poor health services and education further limit productivity of agriculture and access to other livelihood options.

#### **5.4.2 Strengthening the smallholder farmer's resource base.**

In order to ensure successful agricultural production by smallholder farmers there is a need to strengthen the resource base in the form of natural, physical, social and financial capital. It is noted from the study area that there is less investment in terms of human development, infrastructural development and financial service provision; therefore the capability to address these loopholes will result in smallholder farmers increasing agricultural productivity hence addressing food security adequately. There is evidence from the study area that there are various opportunities available in the province like the availability of land, various dams which can be utilised for irrigation development and generally a literate population. Therefore the Government of Zimbabwe should develop supportive systems to ensure sufficient utilisation of the available resources in addressing the rural problems like poverty and food insecurity in the province.

### **5.4.3 Gender**

The role of women in food security needs to be fully appreciated and strengthened by enabling access to the means of production .There is need to promote gender sensitive development if smallholder agriculture is to be successful. Women are important as food producers, managers of natural resources, income earners and caretakers of household food security. Agricultural productivity has been said to increase by as much as 20 % when women are given the same inputs as men.

The education of women is known to produce significant effects on nearly every dimension of development, that is from lowering fertility rates to raising productivity, and to improving environmental management. If women are to be fully effective in contributing to food security, discrimination against them must be eliminated and the value of their role promoted. However, care should be taken not to aggravate the male gender while pursuing the noble task of empowering women. An inclusive approach where men and women complement each other to achieve set objectives should be used. Men and women need equal schooling, incomes, and therefore agricultural investment will be visible. Since women constitute more than half of the population in the country the failure to provide equal opportunities for men and women in terms of education can result in only half of the labour force being able to read and write and contribute productively to the society. There is unquestionable need to address issues related to women's low status that is evident in their minimal access to resources like inputs, land and credit. Issues like women's low income and literacy also need to be addressed. There is a tendency for planners and policymakers to think that rural women do not know their own problems. These women can clearly articulate their problems based on their own experience. It is not enough for the poor to have property rights over land, water, trees, or other assets unless there are services to make those assets productive. Such services include roads, transport, access to market, and communications.

#### **5.4.4 Utilising smallholder's coping strategies**

It should be noted that smallholder farmers are resilient to harsh circumstances like drought and floods. The smallholder farmers should also be given credit for managing to grow crops under limited resources. Smallholder farmers have an idea as to what strategies and implementation tactics would work best for them, given their socio-cultural framework. There is need to learn from them and build on strategies that have worked for them as interventions are made to alleviate food insecurity. The empirical evidence shows that smallholder farmers have strong family bonds that allow them to pool resources. Every member of the family occupies a specific role for example the elderly assist by being caretakers of the young children during working hours. Moreover young children assist the wellbeing of the family by performing tasks such as house care, fetching water, selling at the family kiosk or herding cattle. Smallholder farmers have strong loyalty to their chiefs and elders, religious leaders, midwives and traditional doctors. Each of this group of leaders provides specific functionality that sustains the society. Midwives serve as consultants for the mothers who depend on childcare, healthcare and nutritional education. Chiefs and elders serve as security officers and information sources in the society. Therefore, when rendering a food security intervention strategy all these factors need to be taken into consideration.

#### **5.4.5 Promoting good governance**

It should be noted that good governance is an ideal basis towards achieving certain goals in a community. In order to realise the full potential of smallholder farmers in rural development there is need for good governance. Good governance is made possible by the presence of ideal political institutions. Political leadership ensures that there is incorporation of various decisions like mobilising and reinvesting some of the agricultural surplus back into essential public investments in the agricultural sector such as rural infrastructure, rural electrification and agricultural research to achieve a higher rate of growth of the agricultural sector in the future. Political leadership is

crucial in facilitating the participation of the rural majority in making the case of its economic interests in the political arena. There is need to strengthen and capacitate the unions representing the smallholder farmers in Zimbabwe. Good governance is essential in promoting strategies that can work in a peaceful, corruption free environment. Good governance provides for the minority and promotes total inclusiveness in its decision making. There is need to delink political interests from the basic needs of a nation. More often than not food security measures are long-term strategies, which need to be protected from volatile political interests of leaders. If this means that departments dealing with such issues need to be stable, food security measures should prevail. Good governance promotes equal access to opportunities without political interference from the government.

## **5.5 Conclusion**

The smallholder agricultural production trends tend to be fluctuating for the past 10 years and for the past decade smallholder farmers have not been able to grow enough food to ensure food security at both household and national levels. The findings from the study, in line with the study objectives, which are the contribution of smallholder agriculture to food security and the challenges and opportunities faced by small scale farmers have been discussed. The next chapter is going to present the conclusions.

## **Chapter six: Conclusions**

This chapter consolidates the work done from the first chapter where the research problem was presented up to the outcomes of the study in chapter five. Summaries on contribution of smallholder agriculture in Zimbabwe, challenges and opportunities available for smallholder farmers in ensuring security were presented. Based on the findings of the study, some conclusions regarding the effectiveness of the smallholder agriculture are deduced. The smallholder sector comprising communal farmers, A1 households and old resettlement households, now constitutes over 90% of farmers in Zimbabwe and the farms they make use of constitute 75% of the total area under agricultural production in Zimbabwe.

### **6.1 Smallholder agriculture and food security nexus**

This study is based on a sufficient amount of evidence that shows the contribution of smallholder agriculture, numerous challenges faced and opportunities which are available for the better development of the sector particularly in terms of financial and institutional sustainability. Unfortunately smallholder farmers in Zimbabwe are struggling to ensure food security. This is mostly seen as a result of poor policy in as far as food security is concerned in Zimbabwe. Using the sustainable livelihoods approach for analysis a common understanding is available, the effectiveness of smallholder agriculture in addressing food security mainly depends on the availability, strengths and weaknesses of the local assets and structures paying particular attention to a local context of each different area. On the contrary the government has failed to sustain the capacity of smallholder's contribution to food security. Serious rethinking of the fundamental aspects of the smallholder sector is needed. Building on the contribution capacity, and on the numerous challenges impeding the smallholder development presented in the previous chapters, this thesis aims to prove that a lot of support is needed if smallholder farmers are to be successful. The aim should be on building the needed institutional structures and setting in place

the basic financial pillars that enable the smallholder farmers to establish their full potential in ensuring food security.

In terms of ensuring food availability this research shows that in the Zimbabwean context smallholder agriculture development is an effective development strategy that forms the significant livelihood base for the smallholder farmers. However the sad part is, while smallholder production has been shown to be important for food security, the productivity of the sector is critically low and incapable of single-handedly addressing the food security situation in Zimbabwe without utilising other livelihood strategies. Therefore, it could be deduced that the main factor contributing to food insecurity in Zimbabwe is low productivity levels from the smallholder farmers; this is as a result of low level of capital endowment, leading to limited inputs and consequently to low yield. The sustainable livelihoods framework articulates that a poor asset base impacts negatively on the sector's ability to provide adequately for the needs of the community. Since most smallholder farmers rely on agricultural production for a significant share of their income, increasing agricultural productivity is intimately related to reducing food insecurity and rural poverty. It is apparent that with a stable macro-economy and strong consistent policies on institutional support, production of food and other agricultural commodities can improve the food security situation of poor smallholder farmers in Zimbabwe. Efforts to boost agricultural productivity must largely focus on increasing smallholder production and strengthening their livelihood options.

Policies to support smallholder productivity, including increased access to land and institutional support, boost food availability and lower local food prices hence generating higher incomes paramount to address food security. The land reform policy is one of the factors used to address food security in Zimbabwe. This is because there cannot be smallholder production and household food security if households do not have access to land of enough quantity and quality to make a difference in either the quantity produced or the income from the produced output.

Evidence from the study leads to the conclusion that food access levels in rural Zimbabwe are highly compromised by the poor infrastructural development. As shown by evidence from the study, it can be clearly articulated that limited access to livelihood assets, institutional support and absence of a favourable economic environment play a detrimental role in smallholder agriculture capacity to produce and significantly contribute towards reducing food insecurity in Zimbabwe. An enabling economic policy environment that ensures development of essential rural market infrastructure, roads and communication systems is vital for enhancing efficiency in production and consumption choice. Current agricultural policy in Zimbabwe has adversely affected the production of maize due to market distortions. There seems to be little incentive for farmers to produce beyond their subsistence needs, given the lack of alternative marketing channels and price controls with static procurement prices in an environment of hyperinflation.

The study leads to the conclusion that despite the smallholder farmers' significant role in increasing crop production to ensure food utilisation there are still high and persistent malnutrition levels. This situation calls for a recommendation that inclusion of the dietary needs of the rural smallholder farmers should form one of the fundamentals of the agricultural and food security policies. It is highly recommended that nutrition should be addressed directly in a country's agricultural policies beyond the need to produce adequate food. There is a need for an open food and nutrition policy that takes into account the following aspects: the causes and extent of nutritional status for the different social economic groups, to identify the most vulnerable sections of the population, and the most effective instruments for meeting the nutritional needs of the affected segments of the population.

There is need to implement nutrition educational programmes to the smallholder farmers to encourage them to grow all the different crops in their fields sufficient to enhance a nutritional value in their meals. As discussed earlier that food security in the country is exclusively based on

maize for the rural smallholder farmers, there is need to come up with strategies to develop or promote other foods to diversify food security sources. There are no strategies in place to developed alternative foods, especially improving technologies to reduce production costs.

The evidence from the study leads to the conclusion that despite the smallholder sector making up the majority of farmers in Zimbabwe, they are looked down upon by policy makers and excluded in the policy making. There are limited mechanisms to engage smallholder farmers in terms of policy making. In the early 1980s, the government of Zimbabwe offered improved agrarian support to smallholder farmers leading to the period experiencing significance increase in agricultural production levels. The smallholder sector made a significant contribution to national production levels of key crops like maize and cotton. In addition to a very supportive macro-economic environment, the country managed to ensure food security at the national level. However, the paradox in this smallholder agriculture revolution in the 1980s conceals the fact that there were some indications of food insecurity in some parts of the country. For example, within the region four and region five the smallholder farmers were not able to produce enough food to sustain them for the whole season. There were no systems which were put in place by the government to ensure food access to those vulnerable areas hence food insecurity existed at the farm level throughout the 1980s and 1990s.

Although there was an increase in overall levels of production, food security at national level and improved livelihoods amongst smallholder farmers, especially in favourable regions, the benefits were not sustained and inclusive for the whole population. Generally, the government failed to address the inherent challenge of food insecurity among smallholder farmers in drier regions like Masvingo province. Food insecurity levels in rural areas continued to be high, and the early production gains of the 1980s slowly began to diminish in the 1990s as government support for the smallholder sector began to decline. All in all it could be summed that there is an effort by the

government to address the smallholder plights; however, there are inconsistencies in the implementation of the measures. This can be attributed to the fact that there is no overall development framework which was developed to address the problems of food insecurity amongst the smallholder farmers in the country. Therefore, the repercussions are increased poverty levels and insecure livelihoods amongst smallholder farmers.

Another major conclusion drawn from analysing the trends of smallholder agriculture production in Zimbabwe is that the smallholder sector is still viewed with the fallacy that it is only growing crops for subsistence purposes. Currently, due to the outcomes of the land reform programme most smallholder farmers have access to better quality land however, there is no support to kick-start the potential that lies in the smallholder agriculture sector. This is indicated by the fact that production levels are still low amongst the newly resettled smallholder farmers.

In terms of policy making it can be concluded that the Zimbabwean state has generally adopted a top-down, one-size fits all approach to solving the food security crisis in the country. The policies are mainly centred on the distribution of agricultural inputs and strict regulation of markets for key food crops like maize and wheat. However, this approach is not sustainable since it is not structured within a clear rural development strategy which targets both the smallholder farming sector to ensure sustained agricultural production and improved rural livelihoods. The policies adopted by the GoZ to revive agriculture, which are highly centralised and controlled, have not produced the incentives for smallholder farmers to produce key crops like maize beyond household consumption needs.

Therefore, it can be concluded that the challenge of food insecurity in Zimbabwe for the past decade is not necessarily a new phenomenon but it is only different in nature and extent to the mid-1980s food insecurity problem. The situation has however, been exacerbated by the harsh

macro economic conditions prior to the fast track land reform programme. The GoZ acknowledges the significance of the smallholder agriculture sector but agrarian policy and the reality on the ground show that there are no systems in place to support the sector to contribute significantly to the economy of Zimbabwe and general upliftment of the standards of living. It should be realised that, without adequate financial capital and market incentives, smallholder agricultural productivity cannot be sustained to offer an ideal solution to the food insecurity problem in the country.

The study concludes that the main challenge facing smallholder farmers, capacity to lead to successful agricultural productivity is the lack of credit facilities. Smallholder farmers are viewed by the corporate sector as very risky due to their lack of infrastructure like irrigation and the lack of acceptable forms of collateral. The state needs to be at the forefront of this drive to boost private sector confidence in the abilities of the smallholder sector (in order to increase private sector investment levels), and incorporating the newly resettled A1 farmers who have been able to access better quality land. Regrettably despite general consensus that smallholder agriculture is the new outlook of the agriculture sector of Zimbabwe the state-assisted programmes still continue to place greater emphasis on the commercial agricultural sector through much support given to newly resettled A 2 farmers at the expense of communal farmers and A 1 smallholder famers.

The study indicates that most smallholders depend on their own sources for inputs and have not been major beneficiaries in the subsidised input loan schemes. However, as the limitations and unsustainability of government support becomes evident to smallholder farmers, they have had to adopt alternative strategies. Smallholder farmers have tried to continue to produce despite the harsh macro-economic conditions. In most households this has involved reducing the area under production and limiting growing cash crops which require a lot of inputs. Whilst state intervention is necessary, there is therefore need for more organised lobbying and advocacy by the smallholder sector if local communities are to have a say as to what happens with their lives and land.

Smallholders in Zimbabwe are represented by the Zimbabwe Farmers Union (ZFU) which assists in representation around the areas of provision of extension services and inputs to the smallholder farmers.

The smallholder sector prior to the fast track land reform programme, provided the bulk of the country's domestic maize requirements, and any programmes which are adopted should restore the capacity of households to produce and ensure sustainable livelihoods. There is need for review of the policy framework to create a conducive environment and supportive framework for the smallholder farmers. It is significant to note that although the government recognizes that under the right conditions, small scale farming can be a motor for wider economic growth, the policy environment for much of the period in Zimbabwe save for the early 80s has not been supportive. The agricultural policy environment, especially from 2000 until 2009, was characterised by heavy state intervention and distortion of the role of the market. As evidenced by literature review Zimbabwe has never had either a clearly articulated agricultural policy or one on food security until 2002. The food security strategies in the country are based on political reactions to unfolding situations. As a result, there were inconsistencies whereby one strategy contradicted another with respect to food security. Due to lack of a food policy, the strategies adopted did not follow or develop into a consistent framework for addressing food insecurity in the country.

The Zimbabwean agricultural policy has to be tailored, taking into consideration that the agriculture sector has been entirely restructured, with smallholders (including a significant proportion of resettled farmers) currently producing more than 50% of the national total. As such, in view of the changes in the agricultural sector over the last decade, the approach to reviving the sector should give due consideration to adapted policy measures that take into account several new key issues. These include the fragmentation of land holding, the absence of tenurial arrangements and title deeds, the prominence of small-scale agriculture, the collapse of the

economy and the agricultural support system, and distrust in the overall public environment and all aspects that differ strongly from the well-developed agricultural sector that existed before 2000.

It should be concluded that despite agriculture production being the cornerstone of livelihood option for the smallholder farmers, there is increased need for diversification of livelihood strategies. The evidence from the study shows that there has not been much diversification from maize as the dominant source of food security in Zimbabwe. Despite the persistent drought periods in the country the smallholder farmers seem reluctant to grow more drought resistant crops like small grains (millets, sorghum). Small grains play very little role in food security in the rural areas. However good news is that the smallholder farmers use the hybrid seeds suited for their agri-ecological regions and almost all the smallholder farmers know the significance of growing hybrid crops. It can be concluded that maize is the mainstay of food security amongst smallholder farmers. Small grain crops, sweet potatoes, cassava and yams play very little role as regular sources of household food security even in areas where they are produced. They become important when there is a shortfall in maize production

## **6.2 Areas of further research**

In light of the findings of the study there is need for further research in the following areas

- 1) The study finds out that maize is the predominant crop grown by smallholder farmers in the study area; however it is very prone to total crop failure in the event of a drought. However there is evidence that smallholder farmers grew small grain crops on a lesser scale which are more resistant to drought. Despite the potential role of utilising the small grain as a substitute for maize to address food security in the region, smallholder farmers are reluctant to be engaged in full production of grain crops. Therefore under such a background there is need for full investigation on the potential role of small grain crops as a substitution of maize in addressing food security.

2) There is also the need to investigate the significance of cash crops in addressing food security in the region. It should be noted that since the region under study is very dry, there is potential for growing cash crops like cotton which grow well in dry conditions. There is need to find out if it is feasible for smallholder farmers in dry regions of the country to focus on growing cash crops and buy food from the market and the regions which receive high rainfall concentrate on growing food crops.

### **6.3 Concluding Remarks**

The study sought to explore the contribution of smallholder agriculture to food security and came up with the conclusion that smallholder agriculture under the right conditions and support is the best option in tackling food security in rural Zimbabwe. Using sustainable livelihoods framework as the tool of analysis, it became clear that smallholder farmers have not maximised their full potential to ensure sufficient food production. The research established that the nature and extent of smallholder farmers' capacity to ensure food security depends on complex and dynamic processes ranging from the available assets, socio economic factors and policy environment. The study confirmed that smallholder agriculture is the main livelihood option for the rural population in Masvingo and in rural Zimbabwe in general; however, Zimbabwe's capacity to ensure food security is affected by many challenges like poor institutional framework, climate change, HIV/AIDs and population growth. It is only through a significant effort from all stakeholders government, NGOs, private sectors to create a favourable conducive environment for smallholder farmers to participate fully in agricultural production that the problem of food insecurity in Zimbabwe can be successfully resolved. To realise the full potential of smallholder agriculture, there is need to reduce the constraints that hamper the smallholder's capacity to ensure food security. Concrete actions to enhance smallholder development should target improving the resource base of rural assets, improving markets and improving institutions for smallholder farmers.

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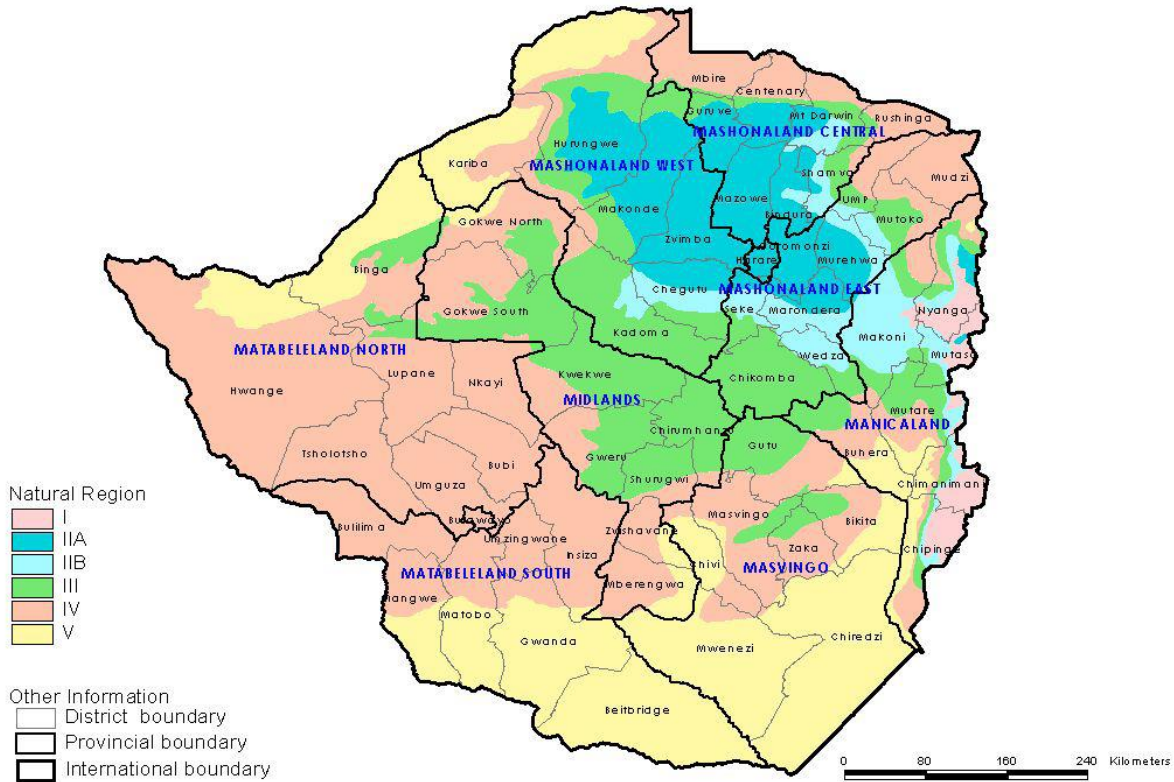
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Annexeure 1 Map showing natural regions of Zimbabwe

Map 1: Zimbabwe Agro-Ecological Zones



**Annexeure 2 Agro-ecological zones of Zimbabwe and the recommended farming systems in each zone (Vincent and Thomas, 1960).**

<b>Natural Region</b>	<b>Area (km<sup>2</sup>)</b>	<b>Rainfall (mm yr<sup>-1</sup>)</b>	<b>Farming system</b>
I	7 000	>1 000	Specialised and diversified farming
II	58 600	750 – 1 000	Intensive farming
III	72 900	650 - 800	Semi-intensive farming
IV	147 800	450 - 650	Semi-extensive farming
V	104 400	<450	Extensive farming

Annual rainfall is highest in Natural region I which covers approximately 2% of the land area. It is a specialised and diversified farming region with plantation forestry, fruit and intensive livestock production. Tea, coffee and macadamia nuts are grown in frost-free areas. Natural region II covering 15% of the land area, receives lower rainfall than region I, nevertheless is suitable for intensive farming based on crops or livestock production.

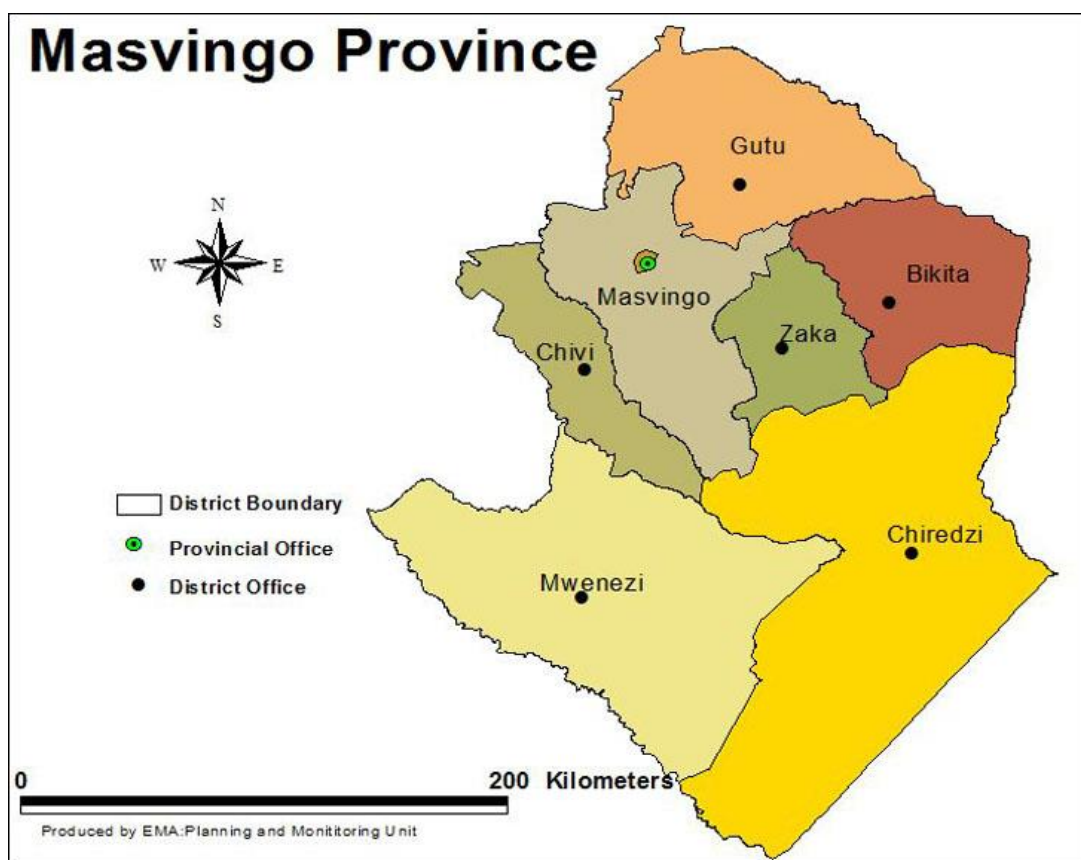
Natural region III is a semi-intensive farming region covering 19% of Zimbabwe. Although rainfall in this region is moderate in total amount, severe mid season dry spells make it marginal for maize, tobacco and cotton, or for enterprises based on crop production alone. The farming systems are therefore based on both livestock (assisted by the production of fodder crops) and cash crops.

Natural region IV is a semi-extensive farming region covering about 38% of Zimbabwe. Rainfall is low and periodic seasonal droughts and severe dry spells during the rainy season are common. Crop production is therefore risky except in certain very favourable localities, where limited

drought resistant crops are grown as a sideline. The farming is based on livestock and drought resistant fodder crops.

Natural region V is an extensive farming region covering about 27% of Zimbabwe. Rainfall in this region is too low and erratic for the reliable production of even drought resistant fodder and grain crops, and farming is based on grazing natural pasture. Extensive cattle or game ranching is the only sound farming system for this region.

### Annexeure 3 Map of Masvingo Province



**Annexeure 4: %age of households possessing various household effects, means of transportation, agricultural land, livestock/farm animals, and bank account by residence, in Masvingo Zimbabwe 2010-11**

<b>Possesion</b>	<b>Residence</b>		
	<b>Urban</b>	<b>Rural</b>	<b>Total</b>
<b>Household effects</b>			
Battery/generator	11.0	13.2	12.4
Solar panel	5.1	24.7	18.1
Radio	48.9	32.3	37.9
Television	73.7	17.3	36.3
Mobile telephone	90.1	48.0	62.2
Non mobile telephone	11.0	0.6	4.1
Refrigrator	45.9	4.3	18.3
Computer	10.2	0.8	4.0
<b>Means of transport</b>			
Bicycle	20.7	23.5	22.6
Animal drawn cart	9.6	23.9	19.0
Motorcycle/scooter	1.6	0.9	1.1
Car/truck	15.6	3.1	7.3
Boat	0.6	0.1	0.3
Wheelbarrow	26.5	33.5	31.1
Tractor	1.0	0.7	0.8
Ownership of agricultural land	30.9	79.6	63.2
*Ownership animals	31.1	80.0	63.5
Ownership of bank account	40.4	12.2	21.7

\*Cattle, horses, mules/donkeys, goats, sheep, pigs, rabbits, (Source ZDHS 2011)

## Annexeure 5: Maize production disaggregated by farm type in Zimbabwe

Harvest year	Smallholder			Commercial		
	Area	Yield		(mt)	Area	Yield
	(mt)	(ha)	(kg/ha)		(ha)	kg/ha)
1980	600 000	900 000	667	910 700	277 700	3 279
1981	1 000 000	1 000 000	1 000	1 833 400	363 400	5 045
1982	595 000	1 100 000	541	1 213 400	316 400	3 835
1983	285 000	1 050 000	271	624 800	283 900	2 201
1984	670 000	1 136 000	590	678 500	224 600	3 021
1985	1 558 000	1 018 000	1 530	1 153 000	238 000	4 845
1986	1 348 000	1 074 000	1 255	1 064 000	240 000	4 433
1987	1 064 000	627 700	1 695	466 000	147 100	3 168
1988	1 609 300	1 149 500	1 400	643 800	150 000	4 292
1989	1 188 200	1 030 000	1 154	743 000	168 300	4 415
1990	1 262 300	971 000	1 300	731 500	178 800	4 091
1991	1 019 300	926 200	1 101	566 500	175 000	3 237
1992	115 200	728 000	158	245 800	153 000	1 607
1993	1 133 600	1 040 000	1 090	878 250	198 000	4 436
1994	1 313 600	1 169 200	1 124	1 012 400	232 000	4 364
1995	399 400	1 209 200	330	440 200	188 700	2 333
1996	1 687 000	1 330 000	1 268	922 000	205 000	4 498
1997	1 453 000	1 483 000	980	738 370	157 100	4 700
1998	727 550	1 057 000	688	690 480	166 800	4 140
1999	845 300	1 262 000	670	674 260	184 400	3 657
2000	938 709	1 212 540	774	680 942	160 577	4 241
2001	993 940	1 084 100	917	532 388	155 888	3 415

2002	310 638	1 199 021	259	294 120	128 833	2 283
2003	817 446	1 225 791	667	241 340	126 577	1 907
2004	1 505 970	1 400 800	1 075	180 181	93 010	1 937
2005	837 304	1 659 424	505	78 062	70 443	1 108
2006	1 385 957	1 650 158	840	98 882	62 841	1 574
2007	1 080 624	1 390 132	777	80 986	55 683	1 454

Source Answeel et al (2012)

### Annexeure 6 Trends in the national cattle herd, 1980–2005

Year	Commerc ial (‘000)	Commun al (‘000)	Resettle ment (‘000)	A1 (‘000)	A2 (‘000)	Total (‘000)
1980	2 410	2 869	–	–	–	5 279
1981	2 391	2 895	–	–	–	5 286
1982	2 400	3 240	52	–	–	5 692
1983	2 358	3 105	83	–	–	5 546
1984	2 231	3 087	147	–	–	5 465
1985	2 090	3 231	178	–	–	5 499
1986	2 126	3 453	204	–	–	5 783
1987	2 013	3 609	296	–	–	5 918
1988	1 990	3 501	314	–	–	5 805
1989	1 994	3 555	301	–	–	5 850
1990	2 046	3 777	395	–	–	6 218
1991	2 138	3 803	433	–	–	6 374
1992	1 948	3 620	346	–	–	5 914
1993	1 748	2 964	308	–	–	5 020

1994	1 670	3 138	332	–	–	5 140
1995	1 617	3 070	305	–	–	4 992
1996	1 642	3 104	332	–	–	5 078
1997	1 625	3 427	323	–	–	5 375
1998	1 560	3 495	395	–	–	5 450
1999	1 680	3 690	468	–	–	5 837
2000	1 550	3 793	612	–	–	5 955
2001	1 291	4 398	505	–	–	6 195
2002	329	4 055	471	169	24	5 048
2003	360	3 944	548	169	93	5 116
2004	377	3 755	535	307	52	5 027
2005	–	3 604	520	324	319	4 768

Source Anseeuw et al 2012