LIVELIHOOD STRATEGIES OF SMALL-SCALE FARMERS IN NANKANGA CAMP OF KAFUE DISTRICT, ZAMBIA

A dissertation submitted to the University of Zambia, School of Humanities and Social Sciences in partial fulfilment of the requirements for the degree of Masters of Arts in Development Studies

By

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DECLARATION

I do hereby declare that this dissertation is my own work and effort and that it has not been submitted anywhere for any other award. Due acknowledgments have been done where other sources of information have been used.

Signature.....

Date .....

CERTIFICATE OF APPROVAL

We do hereby declare that this thesis is from the student's own work and effort and all other sources of information used have been acknowledged. This thesis has been submitted with our approval.

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ABSTRACT

This study examined the livelihood strategies of small-scale farm households, their food security status and the challenges they face to meet their livelihoods in Nakanga Agriculture Camp of Kafue District Lusaka. The research used both qualitative and quantitative methods. A survey was conducted with a sample of 60 farmers (30 were Farmer Input Support Programme (FISP) beneficiaries while 30 were non-beneficiaries). Ten focus group discussions were held with farmers. Key informant interviews were also conducted with Ministry of Agriculture and Livestock Field services officers and village headmen. The study revealed that the households depend mostly on agriculture for their livelihoods. The crops grown include maize, beans, groundnuts, sweet potatoes, cotton and sorghum. The average yield for maize, the staple food crop, is only about 1.7 tons per hectare, 57 percent below the minimum potential yield of at least 4 tons per hectare. Farmers keep animals such as cattle, goat and chickens. The results showed that farmers also engage in non-agricultural or off farming season activities that are sources of income for their households. These are sale of charcoal, petty trading, piece work, gardening and remittances. The study revealed that food security in the study area is a challenge, with about 87 percent reporting having food shortages during the year. The period with food shortages was between November and March with a peak food shortage in February. With regard to agricultural constraints, it was found that the most binding constraint was inability to buy hybrid seed and fertilizer mainly due to the high cost of the inputs. This was followed by lack of draught power and lack of human labour. Based on the findings, it is important that the government should improve farmer's access to financial capital through deliberate loan facilities that target small-scale agriculture. Development efforts should consider supporting small-scale farmers through extension training to use existing animals more effectively by improving management practices such as strategic feed supplementation and disease prevention so as to substantially increase draught power availability. The use of donkeys as an alternative to cattle for draught power should also be promoted through extension training.

DEDICATION

I dedicate this work to Mum and Dad, Mr. and Mrs. Chikopela. My three children Mutango, Mulema, and Sepo. My brothers and sisters.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABREVIATIONS

CSO	Central Statistics office
CSPR	Civil Society for Poverty Reduction
DFID	Department for International Development
FAO	Food and Agriculture Organization
FISP	Farmer Input Support Programme
FNDP	Fifth National Development Plan
FRA	Food Reserve Agency
GDP	Gross Domestic Product
GRZ	Government Republic of Zambia
MAL	Ministry of Agriculture and Livestock
MDGs	Millennium Development Goals
NAP	National Agriculture Policy
NGO	Non-Governmental Organization
PRSP	Poverty Reduction Strategy
RNW	Radio Netherlands World wide
SNDP	Sixth National Development Plan
UN	United Nations.
ZDHS	Zambia Demographic Health Survey

CHAPTER 1

INTRODUCTION

1.1 Background

Zambia is a landlocked country lying between latitudes 8 and 18 degrees south and between longitude 22 and 34 degree east. It shares borders with eight countries, the longest of which is with the Democratic Republic of Congo and Tanzania in the North. Malawi and Mozambique in the East, Zimbabwe and Botswana in the South, Namibia in the South West and Angola in the West (CSO, 2006). Zambia is divided into ten provinces for administrative purposes. The ten provinces are Northern, Muchinga, Luapula, Central, Copper belt, North-Western, Western, Eastern, Southern and Lusaka province.

The population size of Zambia is estimated at about 13,046,508 of which 6,394,455 are males while 6,652,053 are females (CSO, 2010). This represents 49 percent males and 51 percent females respectively. The average annual growth rate was estimated at 2.8 percent between 2000 and 2010 (CSO, 2010).

Zambia is sparsely populated with an average population density of 17.4 people per square kilometer. The country is one of the highly urbanized countries in Sub-Saharan Africa, with an estimated 42 percent of the population living in urban areas. The density in cities is high while that in rural areas is low. For example, Lusaka's population density increased from 63.5 persons per square kilometer in 2000 to 100.4 persons per square kilometer in 2010. Western Province had 6.1 in 2000, which increased to 7.0 persons per square kilometer in 2010 (CSO, 2010).

The majority of rural households in Zambia depend on consumption of their own produce. Therefore, high poverty levels in rural areas could be as a result of inadequate food in the majority of the rural households. Furthermore, poor road infrastructure and marketing systems still remain a major problem in rural Zambia. These have a negative impact on agriculture which is the primary source of rural livelihoods in Zambia (GRZ, 2006). Agriculture is the priority sector in achieving

sustainable economic growth and reducing poverty in Zambia. This is because the country has immense natural resources such as land, water and fertile soils to support agricultural activities. In addition, over 80 percent of the rural population depends on agriculture-related activities for their livelihood (GRZ, 2011). Agriculture is one of the basic livelihood strategies for the rural poor (Windle and Cramb,1997). However, small-scale farmers whose livelihoods are dependent on agriculture activities still remain poor because of low productivity (CSO, 2000).

Currently, the contribution of the agricultural sector to the Gross Domestic Product (GDP) is between 18 and 20 percent (GRZ, 2012). In recent years, the sector has also emerged as an important foreign exchange earner particularly in the horticultural and floriculture sub-sectors (GRZ, 2012). Given the vast resource endowment in terms of land, labour, water and fertile soils, Zambia has the potential to expand agricultural production. The growth of the agricultural sector is vital in attaining the long-term vision for Zambia which is to become "a prosperous middle income nation by 2030" (GRZ, 2011,Pg108).It is for this reason that the Zambian government has set the sector's vision in its Sixth National Development Plan (SNDP) as "an efficient, competitive, sustainable and export-led agriculture sector that ensures food security and increased income by 2030" with the goal "to increase and diversify agriculture production and productivity so as to raise the share of its contribution to 20 percent GDP," (GRZ, 2011,Pg110).

Zambia has vast resource endowment with high potential for agricultural development. The country has a total land area of about 75.2 million hectares (752,000 square km), out of which 58 percent (42 million hectares) is classified as medium to high potential for agricultural production, with rainfall ranging between 600mm to 1500mm annually and suitable for the production of a broad range of crops, livestock and fish. The country also has potential of over 423,000 hectares of irrigable land of which only about 100,000 ha is currently irrigated among the large-scale, emergent and smallholder farmers. With the country's abundant surface and underground water resources, there is potential to drastically increase the area under irrigation (Sitko, 2011).

Zambia has not fully exploited the high potential in the agricultural sector partly due to many challenges and constraints. Low investment in the sector and low productivity especially among the small-holder farmers still remain challenges affecting the sector. In recent years, the sector has also been threatened with the effects of climate change characterized by droughts, water logging, seasonal floods, increased temperatures, shortening of the rain season (crop growing period) and long dry spells coupled with poor rainfall distribution (Sitko, 2011).

Economically, Zambia is heavily dependent on the copper mining industry. The country's main export is copper, which accounts for over 70 per cent of export earnings. Gross domestic product (GDP) growth has averaged 6.4 per cent for the period between 2006 and 2010 (CSO, 2012). However, Zambia has in the recent past intensified efforts to diversify from copper dependence to other sectors, such as agriculture. Diversification efforts have been attempted through private sector-led initiatives or strategies. Thus, the country has embarked on the Private Sector Development Programme (PSDP), which is meant to attract both domestic and foreign investment in the various sectors of the economy (CSO, 2012).The mining industry has experienced exceptional growth in the last decade and prospects for further development are enormous. The sector therefore, is the major driver of growth, while it also provides impetus for value addition through the creation and expansion of the manufacturing industry. In addition, this is expected to create spillover effects through development of necessary infrastructure, especially those related to roads, railways, border facilities and reliable electricity supply. This has been complimented by redesigning of policies so as to encourage and attract private investment in exploration, re-investment and development of new mines through a stable and attractive fiscal and regulatory regime (GRZ, 2011). Despite these encouraging positive signs, poverty rates have remained persistently high at 77.9 per cent in rural areas as compared to their urban counterparts at 27.5 per cent in 2010 (GRZ, 2013).

The economic growth experienced during the last decade has not translated into significant reductions in poverty and improved general living conditions of the majority of the Zambians. Job creation has not been commensurate with the gains registered from economic growth. Among the factors that have attributed to this

phenomenon are low labour productivity, low absorption capacity of the labour market for new entrants, particularly the youth and the concentration of growth in highly capital-intensive and urban-based sectors like mining, construction and services (GRZ,2011). In developing countries, often 70 percent or more of the population live in rural areas. In that context, agricultural development among small-scale farmers provides a livelihood for people allowing them the opportunity to stay in their communities (Guarino, 2009). Provision of sustainable livelihood particularly in the rural population has been a key development challenge in Zambia since independence.

A livelihood in its simplest sense is a means of gaining a living (Chambers and Conway, 1992). Livelihoods are achieved when there are adequate stocks of food and cash to meet basic needs. A livelihood comprises of assets (stores, resources, claims and access) activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets and provide sustainable livelihood opportunities for the next generation (Chambers and Conway, 1992). However, most of Zambia's population has experienced serious challenges in having sustainable livelihoods. This is evident from the continued experience of food and nutrition security problems. Stunting rates in Zambia stand at 45 percent, with 21 percent being severe (ZDHS, 2007). Stunting remains the most common nutritional disorder affecting under five year children in Zambia. The stunting rates in Zambia are above the Sub-Saharan Africa average of 42 percent (ZDHS, 2007).

1.2 Statement of the Problem

Small-scale farming is a common farming system in Zambia for people in rural areas. Small-scale farmers are subsistence producers of staple foods with an occasional surplus for sale. Unfortunately, there has been decreasing productivity in this type of farming system. This is due to a number of factors such as low use of purchased input technologies, dependence on rain-fed production, and soil degradation as a result of long term practices of subsistence agriculture associated with use of maize mono-cropping and use of chemical fertilizers which leads to loss of soil organic matter, fertility and structure (Mwale *et al*, 2007).

Despite the government of Zambia spending money to improve livelihoods of small-scale farmers through a number of programs put in place such as the Farmer Input Support Program (FISP), there are high levels of poverty and food insecurity among rural households. Food insecurity is widespread in both rural and urban areas. For instance, in 2005, poverty was estimated at 78 percent in rural areas while in urban areas, it was estimated at 38 percent (CSO, 2005). Five years later CSPR (2010) observed that on average, 85 percent of people in rural areas and 34 percent in urban areas are still living under the poverty datum line.

These high levels of poverty in rural areas perhaps indicate that crop and livestock production have not adequately increased in quantity, quality as well as in terms of added value, to contribute to food security and significant increase in rural incomes. As a direct consequence of this challenge, much of the development agenda focuses on directing scarce resources to providing food to people in need or enabling them to acquire it themselves (Smith *et al*, 2006). Stagnant agricultural production is contributing to an emerging structural deficit of food crops in Zambia. Therefore, finding ways of effectively coping with this continued food deficit is critical for fostering economic growth, reducing poverty, and enhancing food/nutrition security for the people of Zambia.

Small-scale farmers' livelihoods are predominantly agriculture based, and due to primary dependence on subsistence crop production in the country, harvest failure usually leads to household food insecurity. The absence of off-farm and on-farm income opportunities may also lead to asset depletion. It is therefore important to reduce vulnerability of the poor through diversification of their sources of livelihoods as a means of reducing poverty and food insecurity in rural areas.

This case study aimed at assessing livelihood strategies, of small-scale farm households in Kafue district. The study examined the livelihood strategies of small-scale farm households, their food security status and the challenges they face in meeting their livelihoods. The finding of the study can be used as a basis for making suggestions that can enhance improvement in incomes and food security of small-scale farm households in Zambia.

1.3 Study Objective

The general objective of the study was to document the household livelihood strategies of small-scale farmers in Nankanga Camp of Kafue District, Zambia.

1.3.1 Specific Objectives

1. To describe the livelihood strategies of small-scale farmers in Nankanga Camp of Kafue District.
2. To identify the challenges small-scale farmers face in meeting their livelihood needs in Nankanga Camp of Kafue District.

1.3.2 Research Questions

i. What are the main livelihood strategies employed by the small-scale farmers in Nankanga Camp of Kafue District?
ii. What are the main challenges faced by the small-scale farmers in meeting their livelihood needs in Nankanga Camp of Kafue District?

1.4 Justification

Livelihood analysis aims at examining livelihoods in order to improve the design and implementation of poverty reduction efforts. High prevalence of poverty especially in the rural areas has forced rural communities to adopt various livelihood strategies, which vary from one place to the other depending on the socio-economic conditions and natural resources available.

This study will generate information that may contribute to the design of strategies that can lead to improved food security of small-scale farmers. Development practitioners are increasingly emphasizing the importance of understanding livelihood systems and the complexity of rural livelihoods for effective policy formulation (Deb *et al,* 2002). The concept of livelihood strategies has become central to development practice in the recent years (Brown *et al,* 2006). Livelihood approaches have the

advantage of placing the poor at the centre stage, and of exploring aspects of their livelihoods which are commonly neglected. These include the multi-dimensional nature of poverty itself, the diverse and dynamic nature of their portfolios and the complexities of accessing capital assets (Farrington *et al*, 2002).

The study area falls in Zambia's agro-ecological region II which is characterized by moderate rainfall. Therefore, droughts are common in some rainy seasons. Droughts have many devastating effects on communities and the surrounding environment. The amount of devastation depends on the strength of the drought and the length of time an area is considered to be in drought conditions. Drought has greater impacts on poorer communities than on more prosperous communities who have better opportunities to bring in resources from other areas. Droughts affect water availability which ultimately affects agriculture activities such as crop and animal production. One of the peculiar aspects of livelihoods in the study area is that there are high levels of charcoal burning which competes with agricultural activities. Such activities contribute to environmental degradation. Due to large-scale deforestation that has been going on over the past years, there are concerns about the sustainability of the environment and economic activities in the area.

This research, therefore aims at generating location specific data on livelihood strategies of rural households in Zambia's Kafue district. This study will therefore help to contribute to literature gap in the country and inform policy makers about the status of livelihoods at the micro or household level. Consequently, carrying out research in the study area will contribute to both basic (academic) and applied (practical) purposes. Thus, both public and private actors as well as local and international non-governmental organization interested in promoting rural development in the study area will benefit from the findings of this study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This Chapter is divided into two major parts, the first part looks at agricultural livelihood strategies in terms of the role of agriculture in improving livelihoods with particular focus on maize production, as a livelihood strategy of government interventions such as Farmer Input Support Programme in agriculture. In addition, non-agriculture livelihood strategies are discussed. The second part of this chapter looks at the theoretical orientation of the study, where a conceptual frame work of sustainable livelihood approach is discussed. The key issues of livelihoods, vulnerability, livelihood assets, livelihood strategies and livelihood outcomes are outlined. The above outline is necessary to enhance the understanding of household livelihood strategies, food security and related issues from various stand points and also to find a common ground for analysis.

2.2 Role of Agriculture in Improving Livelihoods and Food Security

It is generally accepted that agriculture is the major occupation for people in the rural areas. Therefore, most rural people derive food from agriculture activities. This is achieved through production of crops and rearing of animals. In some cases they use incomes earned from agriculture to purchase food that may not be directly produced on their farms. Therefore agricultural activities provide the people with both food and empower them with means of accessing other needs.

Agriculture in Zambia supports the livelihoods of over 70 percent of the population. However the contribution of the agricultural sector to GDP has declined from 16 percent in 2001 to 12.6 percent in 2009 (Sitko *et al*, 2011). Zambia has an abundance of potentially agriculture productive natural resources. Arable land is estimated at 42 million hectares out of which only 14 percent is cultivated. However, Zambian agriculture continues to be predominantly rain fed only utilizing 6 percent of the

irrigated potential and the rainfall continues to be the major determinant of the year to year production level (African Development Report, 1998).

Prior to 1990, the agricultural policies were restrictive, distortive and counterproductive due to heavy government intervention and participation and the dominance of maize. Since the mid-1990s, the agricultural sector has diversified with significant increases in the production of such crops as cotton, coffee, tobacco, horticultural and floricultural products (GRZ, 2006).

The overall objective for the agricultural sector, as set out in the National Agricultural Policy (NAP), is "to facilitate and support the development of a sustainable and competitive agricultural sector in order to ensure food security and income generation at household and national levels and maximize the sector's contribution to gross domestic product" (GRZ, 2003,Pg9). Therefore, the government has accorded attainment of food security in the country the highest priority on policy agendas.

2.2 Crop Production in Zambia

Small-scale farming systems in Zambia are overwhelmingly dominated by a single crop, maize. In the 2009/10 agricultural season, about 81.7 percent of small-scale farmers grew maize. Cassava cultivation was the second most important staple food crop. Cassava is geographically confined to the North and North-Western parts of Zambia. Groundnuts are the second most widely cultivated crop in Zambia and important source of protein in Zambian diets. Groundnuts are often considered a women's crop due to their importance for home consumption (Sitko, 2011).

Maize is an important staple food crop in Zambia grown by 85 percent of the 1,305,783 agriculture households in Zambia (CSO, 2005). In Zambia, maize is grown in most areas except in some exceptionally wet, dry and infertile places where sorghum, millets or cassava are better adapted. Maize is used for human consumption and is also used as livestock feed and for manufacture of industrial products. However, maize productivity is hampered by low soil fertility, frequent droughts and limited use of high yielding varieties and lack of or under application of inorganic fertilizers. Other constraints include under-developed markets and weak extension

services and technology delivery systems. As a result, most small-scale famers get very low yields of less than 2.0 t/ha (CSO, 2005).

One of the most notable features of Zambia's maize sector is the very wide range of yields attained by farmers across the country and within individual villages. Since the introduction of high yielding varieties in the late 1950s, maize has effectively been fragmented into two different crops, one which is grown at low cost and low yield for subsistence and one that is grown at high cost for sale. Traditional varieties generally yield less than one metric ton per hectare. In non-drought years, Zambia's climatic conditions are ideally suited to maize and individual yields of nine to ten metric tons per hectare are sometimes achieved by the best commercial farmers. On village lands, yields frequently drop to less than one ton per hectare even with the use of fertilizer and hybrid varieties (Saasa, 2003).

However, in the last two farming seasons improved access to maize hybrids and fertilizers through government subsidies such as the Farmer Input Support Programme (FISP), along with good rains, has contributed to increased production of maize in the country (FAO,2010). Despite the national surplus, several small-scale farmers across the country and especially the resource poor farmers and women who lack capital and assets to invest in improved production methods are deficit producers and net buyers of maize (FAO, 2010).

Other crops with significant investment potential in Zambia include cow peas, groundnuts, cassava, rice, sorghum, soya beans, sunflower, wheat, and dry beans. Production of these crops is spread throughout the country. Most of the crops are grown for subsistence purposes. Therefore exports of these crops are demand driven. The major markets for these products include; South Africa, the Democratic Republic of Congo, Tanzania, Zimbabwe, Gambia and Botswana. The market potential for these crops are huge because very few farmers are engaged in the production but there is significant demand for the crops both locally and internationally (ZDA, 2011).

Input use among small-scale farmers has trended upward since 2001. About, 60 percent of Zambian farmers still do not use fertilizer on their fields, while more than 60 percent do not use hybrid maize seeds. The market position in Zambia is that about

2 percent of small-medium scale farmers produce roughly 50 percent of the country's total maize supply. A further 19 percent produce the other 50 percent of surplus maize in Zambia (Sitko, 2011).

2.3 Livestock Production in Zambia

The livestock sector is economically important in Zambia as it accounts for about 35 percent of the total agricultural production (GRZ, 2006). The main livestock produced are cattle, goats, pigs and poultry. However, livestock production remains far below its potential due to several factors that include outbreaks of diseases such as corridor and foot and mouth. Traditional communal grazing has been blamed for the frequent outbreaks of cattle diseases in many rural areas. The recurrence of drought as often depleted animal grazing resources and drinking water, thus affecting the productivity of the livestock sector (GRZ, 2006).

The role of livestock in poverty alleviation and its potential for commercialization at household level is largely determined by ownership and the size of the herd. One key question is whether smallholder livestock producers have enough stock that can be tapped into through the emerging opportunities due to the changing market and consumption patterns. The livestock population among the smallholder sector has increased over time. The livestock population in 2001 was estimated at 1.5 million cattle, 1.2 million goats, 500,000 pigs, and 51,000 sheep. By 2008, the population of livestock had grown to about 2.8 million cattle, 2.4 million goats, one million pigs, and 157,000 sheep (Lubungu *et at*, 2012).

However, these increases have been spatially uneven with livestock populations even decreasing or remaining stagnant in some provinces. It is evident that about half of cattle, over a third of goats and close to 40 percent of sheep are found in Southern Province, while Eastern Province accounts for more than 60 percent of all pigs. For all the livestock species, Luapula, Lusaka, North-western, and Copper belt Provinces have relatively low populations (Lubungu *et at*, 2012).

2.4 Non-Agricultural livelihood strategies

While recognizing the urgent need to maintain a vibrant agricultural sector, it is increasingly becoming clear that the agricultural sector alone cannot be relied upon as the core activity for improving rural livelihoods and reducing rural poverty. One phenomenon that is gaining prominence in the rural development literature is the promotion and support for non-farm diversification opportunities (Stifel, 2010). Non-farm economic activities include seasonal migration off the farm to engage in wage employment, handicraft production, trading and processing of agricultural produce, charcoal production, provision of agricultural services, etc. Such non-farm activities provide a way of off-setting the diverse effects of shocks (relating to climate, finance, markets,etc) that are associated with agriculture and creates a way of smoothing income over years and seasons. Commercial wood fuel extraction such as charcoal production is done by most of the small-scale farmers as a non-farm economic activity. Charcoal production requires large volumes of timber, which in turn affects the forest resources and communities depending on such resource, (MNR, 2004).

2.5 Government Programs to Improve Livelihoods

The majority of small-scale farmers in Zambia use low levels of purchased input technologies, and as a result produces low yields and face chronic food insecurity for two to five months of the year. These households are therefore in need of support programs to increase their productivity and improve their livelihoods or food security. Smallholder subsidy programs such as Starter packs to all rural households, containing small packs of hybrid maize seed, fertilizer and either groundnut or soya bean seeds, have been implemented in some countries such as Malawi, Mozambique and Zambia (Kachule and Chilongo, 2007).

Governments have initiated several developmental programs to increase food security. The Farmer Input Support Program (FISP) is one of programs the Zambian government has put in place to help small scale farmers improve their livelihoods and food security. The principal objective of the Government was to stimulate sustainable increases in small-scale agricultural productivity as a poverty reduction strategy and

for the general improvement of rural livelihoods. Farmer Input Support Program (FISP) was introduced to catalyze small-scale agriculture by providing subsidized inputs (i.e. fertilizer and maize seed) over a fixed period of time. It was a transitional measure as the farmers were expected to require time to adjust to fully liberalized agricultural markets. Through this approach, eligible farmers have access to timely and adequate supply of inputs during the farming season. In turn, the farmers cultivate enough maize for domestic consumption and sale the surplus for cash income (ZNFU, 2008).

The Farmer Input Support Programme (FISP) started in 2002/2003 agricultural season and the programme assisted about 120,000 small holder farmers with 48,000 MT of fertilizer and 2,400 MT of maize seed at 50 percent matching grant basis to grow about 360,000 MT of maize, (GRZ, 2008).The input pack consisted of 8 bags of fertilizer (4x50kg) D compound- basal and 4x50kg top dressing-urea and 20 kg seed. By 2008/09 farming season the government further increased the subsidy level from 60 percent in 2007/08 to 75 percent leaving the small-scale farmer to contribute only 25 percent of the selling price of inputs. In the year 2009, the government reviewed the Farmer input support programme as it was deemed critical to Zambian's food security. The FISP programme had its implementation modalities reviewed because the old one had implementation weaknesses (GRZ, 2008).

The current programme has increased the number of beneficiaries' participation by reducing the size of input pack to four bags of fertilizer and 10 kg of seed (that is 2x50kg basal; and 2x50kg top dressing) for the 2009/10 farming season. The programme was planned to cover 500,000 small scale farmer as compared to 250,000 covered in 2008/09 farming season. The FISP is aimed at improving small scale farmers food security improve agriculture production, increase access of small scale farmers to seed and promote private sector participation in supply of inputs (GRZ, 2008). In a review study, Imboela (2005) observed that Farmer Input Support Program (FISP) in Kaoma district of Western province had not improved livelihoods of small scale farmers. The author highlighted some factors that inhibit FISP from being an effective poverty reduction instrument among small-scale farmers in Kaoma such as logistical problems of implementation like the late delivery of inputs, non-delivery of inputs, too many maize seed varieties and poor marketing facilities.

2.6 Conceptual Framework of Livelihoods Approach

The framework that informed this study is the Livelihoods Approach. Livelihoods Approach is a way of thinking about the objectives, scope, and priorities for development activities and focuses on the way the poor and vulnerable live their lives and the importance of policies and institutions (Serrat, 2008). The livelihoods framework provides a comprehensive and complex approach to understand how people make a living. It can be used as a loose guide to a range of issues which are important for livelihoods or it can be rigorously investigated in all aspects (Kanji *et al,* 2005). Livelihood approaches emphasize understanding of the context within which people live, the assets available for them, livelihood strategies they follow in the face of existing policies and institutions, and livelihood outcomes they intend to achieve (DFID, 2000).

Figure 1, presents the key analysis components of the sustainable livelihoods framework: (i) Vulnerability context; (ii) livelihood assets of households consisting of five categories of livelihood capital; (iii) transforming structures and mediating processes which influence access to livelihood assets; (iv) livelihood strategies adopted by households comprising of activities facilitated by the interaction of assets and opportunities and (v) livelihood outcomes (DFID, 1999).

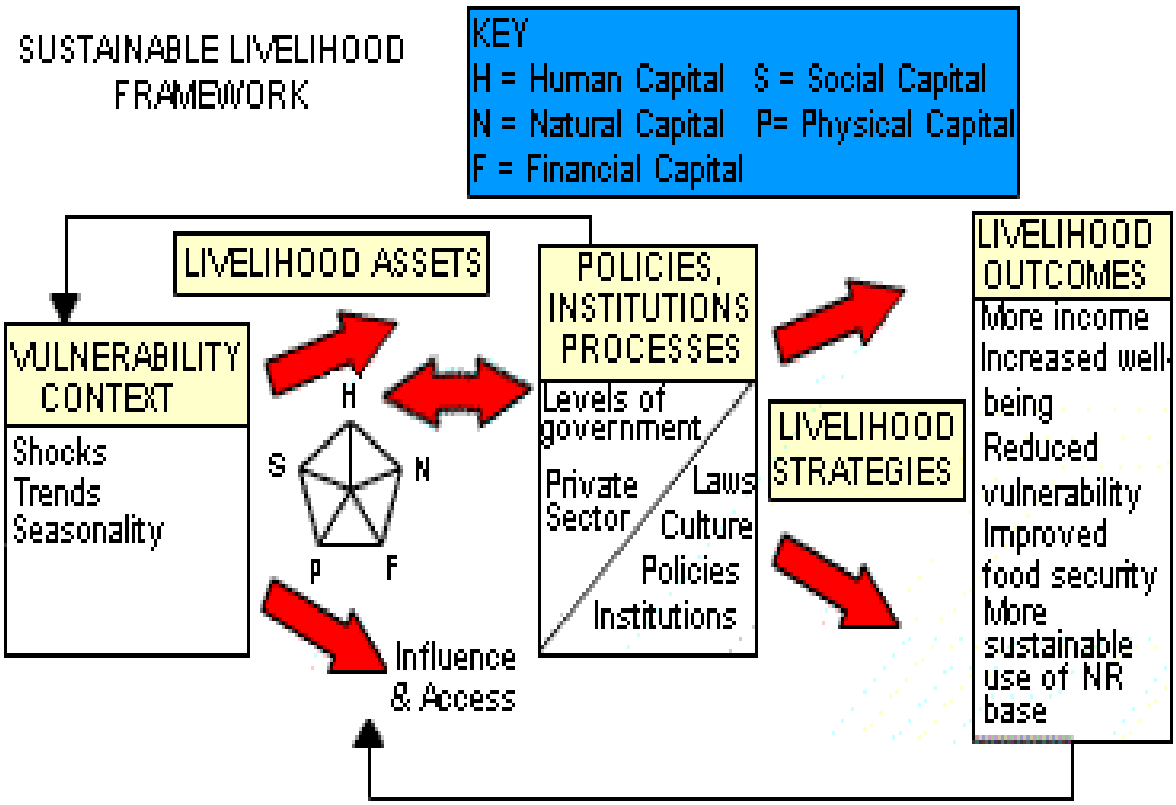


Figure 1: Sustainable Livelihoods Framework
Source: DFID, 1999

The asset portfolio, represented by the pentagon is a key component to understanding a household strategy, the focus is on the conceptualization and quantification of the households asset portfolio as an input into the explanation of a household's livelihood strategy (Jansen *et al*, 2004). The pentagon provides a useful starting point for household livelihood analysis, as it encourages investigators to take into account all the different kinds of assets and resources that are likely to play a role in household livelihood resources (or combinations of capitals) required for different livelihood strategy combinations is a key step in the process of analysis. Soussan et al (2000) for example note that successful agricultural intensification may combine in some circumstances, access to natural capital (e.g. land) with economic capital such as technology or credit. While in other situations social capital e.g. social networks associated with labor sharing arrangements, may be significant. Thus the livelihoods approach is concerned first and foremost with people. So an accurate and realistic understanding of the people's strengths (assets or capital) is crucial to analyze how they endeavor to convert their assets into positive livelihood outcomes (Bezmir and Lerman, 2002). Of particular interest in this framework is the institutional process

(embedded in a matrix of formal and informal institutions and organizations) which mediate the ability to carry out such strategies and achieve (or not) such outcomes, (Scoones, 1998).

The concept of livelihood strategy has become central to development practice in recent years (Brown *et al* 2006). The concept is increasingly important in the development debate. More attention is being paid, by policy makers, researchers and other development practitioners to the diverse portfolio of activities engaged in by poor households as a means to develop and engage in creative poverty reduction strategies that recognize the diversity of these activities (Jansen *et al*, 2004). The framework can be applied to a range of different scales, from individual, to household to cluster, to extended kin grouping, to village, region or even nation, with sustainable livelihood outcomes assessed at different levels. The specification of the scale of analysis is therefore critical, as analysis of the interactions between levels in terms of net livelihood effects both positive and negative (Lovendal *et al*, 2004).

2.6.1 Livelihoods

A popular definition of livelihoods is that provided by Chambers and Conway (1992), where they note that livelihoods comprise the capabilities assets (both material and social assets) and activities required for a means of living. Briefly, one could describe a livelihood as a combination of resources used and the activities undertaken in order to live (DFID, 1999). A livelihood is sustainable when it can cope with and recover from stress and shocks maintain or enhance its capabilities and assets, while not undermining the natural resources base (Chambers and Conway, 1992).

2.6.2 Vulnerability Context

Vulnerability context refers to seasonality trends and shocks that affect people's livelihoods. The key attribute of these factors is that they are not subject to control by local people themselves, at least in a short and medium term (DFID, 1999). It is the trend of changes and variability in these factors that affect livelihoods, and in particular describes structural processes, that can materially disrupt different aspects of livelihood processes (Soussan *et al*, 2000). Shocks destroy assets directly. They also result in the erosion of assets indirectly as a consequence of enforced sales and

disposals made in order to buffer consumption during the sequence of responses that occur at times of disaster (Ellis, 2000). Vulnerable groups comprise people who are likely to fall or remain below a certain welfare threshold in the near future while most of those who are presently below the threshold may face a high probability of being so in the future (Lovendal *et al*, 2004).

2.6.3 Livelihood Assets.

Livelihood assets are resources on which people draw in order to carry out their livelihood strategies (Farrington *et al).* The members of a household combine their capabilities, skills and knowledge with the different resources at their disposal to create activities that will enable them to achieve the best possible livelihood for themselves. Everything that goes towards creating that livelihood can be thought of as a livelihood asset (Messer and Townsley, 2003). Chambers and Conway (1992) classified livelihood assets into two. These are tangible (stores and resources), intangible (claims for material, moral or practical support and opportunity to access resource). The UNDP (1998) grouped livelihood assets into six groups. These are human, social, natural, physical, economic and political capitals.

2.6.4 Human Capital (H)

The skill, knowledge, ability to labour and good health are important to pursue different livelihood strategies and achieve their livelihood objectives (DFID, 2000, Scoones 1998). A household's human capital is comprised of those individual characteristics of its members, both qualitative and quantitative that helps them to generate income. The main characteristics of human capital are age, education, gender, health status, household size, dependency ratio and leadership potential (Bezemer and Lerman, 2003).

2.6.5 Physical Capital (P)

Physical capital comprises the basic infrastructure and producer goods needed to support livelihoods (DFD, 1999). Infrastructures consist of changes to the physical environment that helps people to meet their basic needs and be more productive. The

following components of infrastructure are usually essential for sustainable livelihoods. Affordable transport, secure shelter and buildings, adequate water supply and sanitation, irrigation machinery, clean affordable energy and access to information (communications) (Bezemer and Lerman, 2003).

2.6.6 Social Capital (S)

Social capital in the context of the livelihood framework is taken to mean the social resources upon which people draw in the pursuit of livelihood objectives (Messer and Townstey, 2003). These are developed through networks and connectedness, either vertical (patron/client) or horizontal (between individual with shared interest) that increases peoples trust and ability to do work together and expand their access to wider institutions. For instance, political or civic bodies, membership of more formalized groups which often entails adherence to mutually agreed or commonly accepted rules, norms, sanctions, and relationships of trust, and reciprocity (UNDP, 1998).

2.6.7 Financial Capital (F)

Financial capital denotes the financial resources that people use to achieve their livelihood objectives (DFID, 1999). It comprises the important availability of cash or equivalent that enables people to adopt different livelihood strategies (Kolmair and Gamper, 2002). Sources of financial capital include household saving, credit (borrowing), and remittances from family members working outside the home (Bezemer and Lerman, 2002).

2.6.8 Natural Capital (N)

Natural capital is the natural resources stocks from which resources flows and services useful for livelihoods are derived. There is a wide variation in the resources that make up natural capital, from intangible public goods such as the atmosphere and biodiversity to divisible assets used directly for production (trees, land, etc). It includes the natural resources stocks from which resource flows are useful for livelihoods. (e.g. land, water, wildlife, biodiversity, environmental resources) (DFID, 1999).

2.6.9 Political Capital (P)

Political capital is the ability to use power in support of political or economic positions and so as to enhance livelihoods. It refers to both the legitimate distribution of rights and power as well as the illicit operation of power which generally frustrates efforts by the poor to access and defend entitlements and use them to build up capital assets. One way of looking at poor men and women access to rights is through a notion of political capital (UNDP, 1998).

2.7 Mediating Factors

Institutions policies and processes mediate rural households access to and controls over resources (DFID, 1999). Institutions are the social cement which link stakeholders to access to capital of different kinds to the means of exercising power and so define the gateway through which they pass on the route to positive or negative(livelihood)adaption (Scoones,1998).

2.8Livelihood Strategies

According to DFID (1999), the term livelihood strategies are defined as the range and combination of activities and choices that people make in order to achieve their livelihood goal, including productive activities, investment strategies, and reproductive choices etc. These choices are reflected in the way that people use their assets and as such are in an important part of household behavior, while determining well-being. Livelihood strategies are composed of activities that generate the means of household survival and are planned activities that men and women undertake to build their livelihood (Ellis, 2000).

Livelihood strategies include how people combine their income generating activities, the way in which they use their assets, which assets they chose to invest in, and how they manage to preserve existing assets and income (DFID, 2002). Livelihood strategies are generally understood as the strategies that people normally use in peaceful and stable times to allow them to meet basic needs and contribute to future well-being (Ellis, 2000). They are more than a response to contextual factors and the

assets available, however they are also the result of men's and women's objectives and choices. These in turn are affected by individual and cultural preferences (Farrington *et al*, 2002).

2.9 Livelihood Outcomes

Livelihood outcomes are the achievement of livelihood strategies, such as more income (e.g. cash), increased well-being (e.g. non material goods like self-esteem, health status; access to services, sense of inclusion); reduced vulnerability (e.g. better resilience through increase in asset status); improved food security (e.g. increase in financial capital in order to buy food) and a more sustainable use of natural resources (Scoones, 1998). Outcomes help to understand the output of the current configuration of factors within the livelihood framework, they demonstrate what motivation stakeholders have to act as they do their work and what their priorities are (Singh and Gilman 1999).They might give us an idea of how people are likely to respond to new opportunities and which performance indicators should be used to access support activity. Livelihood outcome directly influence the assets and dynamically change their level (DFID, 2000).

2.10 Livelihood Strategies and Food Security Linkages

In the context of food security analysis, the most important aspects of livelihood to understand are the means by which people produce food for themselves, and the means by which they obtain income to buy food from others. Thus, the framework (Figure 1) has a number of relevant elements. It takes into account of the livelihood assets at the disposal of households; and policies and institutions that influence their decisions on what are the most appropriate livelihood strategies to consider. These strategies may lead to more or less satisfactory livelihood outcomes (food security in this case). Food insecurity is the result of unsatisfactory livelihood strategies (Messer and Townsley, 2003). The livelihoods based analytical framework to generate improved approaches to understanding poverty and food security has great potential (Devereux *et al*, 2004). As depicted in Figure 1, of the analytical frame work, linkages between livelihood strategies and improved food security is one among the outcomes of livelihood strategies pursued by rural households (Scoones, 1998).

Thus, an analysis of the food security of different livelihood groups will lead to the identification of different interventions for each group. However, to determine whether or not households are successful in pursuing their livelihood strategies, it is important to look at a number of outcome measures that capture need or well-being satisfaction (Tesfaye, 2003). Nutritional status is often considered one of the best outcome indicators for overall livelihood security since it captures multiple dimensions, such as access to food, health care and education (Ellis, 2000). Therefore, the major achievements of a livelihoods approach to food-security assessments have been a broadening of horizons. A livelihoods approach recognizes the co-existence of different risks, and consequently the need for simultaneously addressing life-threatening risks and the more insidious erosion of livelihoods in the longer term (Young *et al*, 2001).

Incorporating a livelihoods approach to the analysis of food security would have numerous advantages. Livelihoods approaches can provide an effective and practical vehicle for linking rights based approaches, measurement and action to reduce food insecurity (DFID, 1999). It would also move analysis and action from a narrow focus on agriculture towards a range of interventions to support diversified, non-agricultural livelihood strategies and the allocation of a range of resources that enhance food security (Young *et al*, 2001). It would highlight the need for food security analysis to begin by understanding people's experiences of hunger and the relationship between food insecurity, the constraints and opportunities to their existing livelihoods prior to identifying interventions (Hussien, 2002).

Literature suggests that livelihoods approaches (Carney *et al.,* 1998), are essential for understanding the complex inter-relationships that influence food security and livelihoods approaches. Food security (amount of food consumed, its nutritional quality, and the reliability of access to it over time) is only one desired outcome of household livelihood strategies alongside others such as more income. Thus, an advantage of using livelihoods approaches to consider food security issues is that they highlight the need to understand better all the various factors influencing livelihoods in order to strengthen availability, access and utilization of food successfully (Devereux *et al*, 2004).

It is critical to recognize that rural people have their own strategies to secure their livelihood which vary from household to household depending on numerous factors such as their social-economic status, education and local knowledge, ethnicity, and stage in the household life cycle. Even in the same locality there can be a big contrast between the strategies of those with different social-economical background, for example, for those with more land and those who have less land or are landless (Wagayehu, 2004).The analysis of livelihood diversification opportunities available in the rural areas is therefore important. This analysis includes the productivity and returns offered by such activities especially those in which the poor are engaged. Further, identification of the factors that may affect the ability of the poor to raise productivity and returns in their activities or move to activities yielding higher returns is important (Devereux, 2000).

The choice of livelihood strategies determines whether one will enjoy a successful or sustainable livelihood or experience food insecurity among rural household (Testaye, 2003). Further, the choices made should help one unravel the complexity and diversity of people's lives rather than relying on simplified assumption about how rural economies work. Paramount importance should be placed on the choice of livelihood strategies and clustering the households into a limited number of categories that pursue similar livelihood strategies may be useful to policy makers by enabling them to better target households with certain common characteristics. This implies that livelihood studies are useful for policy makers to understand what is really happening in the people's lives, and what enables some people to escape from poverty (Ashey et al, 2003).

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter presents the method and materials used in this study. The following aspects are covered in this chapter, the research methodology, study area, data sources, primary data, population and sample size, research design, sampling method, measurement of concepts, data analysis, interviews, secondary data and limitation of the study.

3.2 Research Methodology

The research used both quantitative and qualitative methods. For quantitative methods, a survey was carried out. Qualitative data was collected through use of focus group discussions and in-depth interviews. Focus group discussions and interviews gave insights of the livelihoods of small-scale farmers. Secondary data sources involved collection of information from articles, journals, periodicals, reports and books.

According to Kumar (2005) research methodology is a process of inquiry or path by which a researcher seeks to find out answers to the research questions posed. For Kumar (2005) this process of inquiry takes two forms, these are the structured approach and the unstructured approach. Kumar (2005) indicated that the structured approach constitutes quantitative research. Bryman (2008) argues that this research is a strategy that puts greater emphasis on quantification in data collection and analysis. Kumar (2005) further argues that in quantitative research, all that forms the research process, that is, the objectives, design, sample and the questions to ask the respondents are predetermined. In other words, an assumption that there is adequate knowledge about the phenomenon in advance that would warrant the posing of a research question about a set of variables and would aid to develop a precise objective and indicators of the variables that can be counted is made (Rubin and Babbie, 2005).

Bryman (2008) argues that qualitative research can be understood as that research strategy that emphasizes words rather than quantification in the collection and analysis of data. According to Rubin and Babbie (2005) qualitative research emphasizes the need to elicit a deeper understanding of the phenomenon and its subjective meanings as it occurs in the natural environment. As opposed to the quantitative method where a researcher goes to the field with preconceived variables, in qualitative research the researcher does not get to the field with predetermined categories of variables in which behavior and experience are coded, rather the researcher enters the field with an open mind and this minimizes the influence of preconceptions and avoids imposing existing preconceived categories on the respondents (Pomuti,2008). Webb *et al.* (2004) argues that using more than one way of measuring a concept enhances the confidence in the findings of a study.

3.3 Study Area

The study was carried out in Nankanga agricultural camp of Kafue District, Lusaka Province in Zambia. As of the 2010 Zambian Census, Kafue District had a population of 242,754 people. The district is administratively divided in four Agriculture blocks and twenty Agriculture camps under the Ministry of Agriculture and Livestock.

The study population consisted of the small-scale farmers located in Nankanga agriculture camp of Kafue district. The population size is 500 households. The rationale for choosing this area is that it is a rural setting with the majority of the people being small-scale farmers. This was an important research requirement. Further, it is in the rural setting where livelihood strategies are a challenge.

Kafue district is in region II, which constitutes the central plateau with rainfall of 800mm to 1,000mm (Mwale et al, 2007). The region generally contains inherent fertile soils. Permanent settled systems of agriculture are practiced. The soils are productive, therefore, farmers cultivate sorghum, maize, groundnuts, cow peas and a range of cash crops including sunflower, irrigated wheat, soybean and horticultural crop (Mwale et al,2007).

The rains start from the north and progress to the south. Therefore, the growing season is shorter further to the south. Some variability in the start and duration of the season exists. Generally, planting is done from November to December, however early planting (October) is practiced in parts of the country, especially the north. The main harvesting takes place from April to June for all rain fed crops except cassava, which is harvested all year round. The green (early) harvest takes place between February and March which characterizes the end of seasonal hunger period. The region sometimes experience unstable rainfall, unstable rainfall affect water availability which ultimately affects agriculture activities such as crop and animal production. Another peculiar aspect of livelihoods in Nankanga Camp is that there are high levels of trading in charcoal which competes with agricultural activities. Farmers spend much of their time cutting down trees for charcoal which is taken to Lusaka town for sale.

3.4 Data Sources

Both primary and secondary data were collected. For primary data, a survey was conducted among small-scale farmers along with ten focus group discussions conducted among men and women. The composition of the participants in focus group discussions is shown in Table 2 on page 28. Interviews with field staff in the Ministry of Agriculture and Livestock were also held to get more information. Secondary data sources involved collection of information from articles, journals, periodicals, reports and books.

3.4.1 Primary Data

Questionnaires and interviews (specifically Focus Group Discussions and Key Informant Interviews) were utilized in this study. A structured questionnaire was distributed to a sample of 60 small-scale farmers. The research was carried out at household level. Most of the questions included in the questionnaire were adapted from the Sustainable Livelihood frame work. A holistic analysis of livelihood systems began with understanding the context of Nankanga Agriculture Camp. In order to understand the macro-level factors that influence the range of possibilities for livelihood systems, the social, economic, political, environmental, demographic, historical, and infrastructural information was collected and analyzed. It was this information that gives the parameters within which livelihood strategies operate. As

outlined above, the study used the Sustainable Livelihood Approach as a framework to guide the collection of primary data in Nankanga Agriculture camp as shown in Table 1 below.

Table 1: Measurement of Concepts Used in the Study

Concept	Questions
• **Vulnerability** o Shocks o Trends o Seasonality	What are the major threats and challenges facing the well-being of households? How do households respond to these threats?
• **Livelihood Assets** o Human capital o Physical capital o Social capital o Financial capital o Natural capital	What are the ages, literacy levels and household sizes? What types of transport, houses, and waters sources do households have? Which community-based groups are operating in the community? Does the community support each other in times of needy and how? What are the earnings of the household from different sources? Do people have access to land and trees? What is the nature of the land and how is it used?
• **Policies, institutions and processes** o Government development program	Do farmers belong to co-operatives such as Farmer Input Support? For how long have farmers been on the program?
• **Livelihood Strategies** o Agriculture strategies o Non Agriculture strategies	Do people grow crops and keep animals? What are the crop yields and number of animals kept? What are the non-agriculture sources of income?
• **Livelihood outcomes** o Incomes o Food security	How much do households make from sale of crops, animals and non-agriculture products? Do households have food (maize) throughout the year?

3.4.2 Sampling Method and Sample Size

The study used both purposive and probability samplings, two groups of farmers were purposively picked in Nankanga agriculture camp. The list had both Farmer Input Support beneficiaries and non-beneficiaries. Thirty (30) small-scale farmers where picked from each group to a total of sixty (60) farmers. The study also adopted probability sampling by use of the simple random sampling technique. Farmers were selected at random from the two complete lists of all small scale farmers in Nankanga agriculture camp.

The sample of 60 small scale farmers was picked from a population of 500 households. According to Sverke (2007) the size of the sample in quantitative research is an important aspect as it has a bearing on the accuracy and likely precision of the information collected. The larger the sample size the more accurate the estimates are likely to be (Bryman, 2008). This is because a larger sample generates what is called statistical power for obtaining significant results, (Patton, 2002). The aim of quantitative survey research is to collect data that is representative of the population to enable the researcher to use the information gathered to generalize findings based on the drawn sample back to the population within the limits of random error, determining sample size and dealing with the non-response bias within the survey design is critical (Bartlett *et al.*, 2001).

According to Rubin and Babbie (2005), sampling is a process of selecting observations. They argued that as most studies are conducted to determine some issues about the characteristics of a particular population, it is seldom possible that all the elements of that population can be investigated as it is not only impractical but it would also be resource consuming. A proportion of that particular population is therefore drawn and used in the investigation as a basis for the conclusions and generalizations about the entire population (Bryman, 2008). The process of drawing a proportion from the whole population is what is referred to as sampling. Several authors identify two types of sampling methods which are probability sampling techniques and non-probability sampling techniques (Bryman, 2008). Probability sampling is a method whereby a sample is drawn randomly (Rubin and Babbie, 2005).Other types of probability sampling include the systematic sampling, stratified

sampling and multistage cluster sampling approaches (Bryman, 2008). Bryman (2008), indicates that in non-probability sampling, on the other hand, samples are not selected using random techniques. Instead, they follow logic and do provide useful samples for social inquiry. Kumar (2005) identify three types of non-probability sampling which includes convenience sampling, snowball sampling and quota sampling.

3.4.3 Focus Group Discussions and Key Informant Interviews

Qualitative data was collected using two approaches namely, Focus Group Discussions (FGDs) and Key Informant Interviews (KII). FGD was done to assess the perspective of small-scale farmers including those from potentially marginalized groups on issues of livelihoods, while KII was aimed at gaining information on specific areas where key informants were likely to have specialized knowledge on what goes on in the community.

Focus Group Discussions involved a small number of small-scale farmers ranging from 8 to 12 that were purposively selected based on their relevance to livelihood strategies they employ in their households. These were ten groups as shown in Table 2 below, and on average, there were nine people per focus group .Six groups were mixed groups of men and women, two groups were for women and another two groups was for men. In addition, Key Informant Interviews were conducted using semi-structured questionnaires with key stakeholders identified from the Ministry of Agriculture and Livestock, Department of Agriculture.

Table 2: **Participants in Focus Group Discussions and Villages involved.**

Village	Mwachisakulo	Mulendema	Shamajanji	Chilimbamume	Malonga
	Group 1 Mixed group 10	Group 2 Mixed group 11	Group 3 Women group 8	Group 4 Men group 10	Group 5 Mixed group 9
Village	Mpande	Mukwamba	Mukwamba	Nanduba	Kayula
	Group 6 Mixed group 10	Group 7 Men group 8	Group 8 Mixed group 10	Group 9 Women group 10	Group 10 Mixed group 12

n =10

Rubin and Babbie (2005) indicated that a focus group is a qualitative method which is based on structured, semi-structured or unstructured interviews and allows the researcher to pose questions to several individuals in a systematic and simultaneous manner. According to Rubin and Babbie (2005), Focus Group Discussion involves a small number of people ranging from 8 to 15 that are purposively selected based on their relevance to the topic under discussion. Bryman (2008) asserts that the original design of a focus group interview is to allow people who are perceived to have a certain experience to be interviewed in an unstructured way about that experience.

3.5 Secondary Data

In this research, secondary data was collected from the Ministry of Agriculture and Livestock (MAL). These were government publications such as Fifth National Development Plan (FNDP), Sixth National Development Plan (SNDP), National Agriculture Policy (NAP) and Poverty Reduction Strategy (PRSP). Some information was obtained from reports, journals and books from the University of Zambia library both published and unpublished articles. Additional information was got from some master's theses. Information was also obtained from past reports and books from Zambia Agriculture Research Institute Library on food security research reports and from Food and Agriculture Organization reports (FAO) Reports. Some information was obtained from census reports from Central Statistics Office. Finally some data was obtained from computer outputs on the internet, on Sustainable Livelihood Approach from Department for International Development (DFID). Secondary data was used because much of the background work needed has already been carried out.

Kumar (2005) argues that secondary data sources provide second hand data. Kumar (2005) further explains that secondary data sources are used in cases where information required is already available but need only to be extracted. Therefore, secondary data sources involve the use of sources such as the government publications (for example, census data) and the use of journal articles, magazines, periodicals and reports to obtain information relevant to the research questions.

3.6 Data Analysis

Data which was collected from small-scale farmers by use of structured questionnaires results were entered and analyzed with aid of the computer software, Statistical Package for Social Science (SPSS).To analyze the quantitative data, an SPSS coded template was developed in which quantitative data was entered and frequencies were run to aid in cleaning of all data entry errors and the subsequent generation of summary statistics.

Data from focus group discussions and interviews was used to get elaborations and details about pertinent study issues. The qualitative data was categorized into key issues/themes and analyzed thematically.

3.7 Limitation of the Study

The quantitative questionnaire and the focus group questions were done in English but the interview was conducted in Tonga, a local language spoken in the area which the researcher could not speak. This was taken care by use of a translator. Another challenge that was faced was that data collection was done during the rainy season. There is poor physical infrastructure in Nakanga Camp, including impassable roads during the rainy season, thus we could not reach some households. Therefore, we had to replace some households with those which were accessible.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results and discussion of the research. Quantitative data is presented and discussed with the incorporation of the findings on the same theme from the qualitative data, obtained through the focus group discussions and key informant interviews. Furthermore, the chapter presents the answers to the research questions while at the same time using knowledge obtained from the literature review as provided in Chapter two as the basis of discussion.

4.2 Social Economic Characteristics of Respondents

There were a number of social economic characteristics that were examined and these included gender, age, marital status, education level, household size, and length of stay in the village. Table 3 shows the socio-economic characteristics of the respondents in the study.

4.2.1 Gender

In the sample, 77 percent were males. In Zambia, generally males in the household culturally assume the role of head of household. The questionnaire targeted heads of households, therefore more males were interviewed. Only 23 percent of the women interviewed represented the female-headed households and most of them occurred in situations where the women were single, divorced or widowed.

4.2.2 Age Distribution

The age distribution of respondents ranged from 24 years to 85 years. Fifty-nine percent of the household heads where aged below 50 years and only 25 percent were aged above 61 years (Table 3). Age distribution is an important parameter in determining livelihood strategies that households adopt. In this study, particularly with reference to food security, it was important to assess whether age had a bearing

on the farmers ability to grow more food. Age analysis at national level indicates that about 68 percent of the household heads belongs to the age groups that are below 50 years, which is the economically active population (CSO, 2010). However, those people aged above 50 years makes up about 40 percent of the sample (Table 3). This age profile means that the majority of the household heads was predominantly below 50 years and could be regarded as potentially productive farmers with capacity to adopt new farming practices.

Table 3: Characteristics of Sample Household Heads

Characteristic	**Number**	**Percentage**
Gender		
Male	46	77
Female	14	23
Age		
20-30	10	16.7
31-40	15	25.0
41-50	11	18.3
51-60	9	15.0
61+	15	25
Marital Status		
Single	3	5.0
Married	41	68.3
Divorced	6	10.0
Widowed	10	16.7
Education		
No formal education	6	10
Primary	40	67
Secondary	12	20
Tertiary	2	3
Length of Stay in the community (Years)		
0-5	12	20.0
6-10	10	16.7
11-15	9	15.0
16-20	14	23.3
21+	15	25.0

4.2.3 Marital Status of Respondents

The four categories of marital status in the study area were single, married, widowed and divorced as shown in Table 3. By far, most of the respondents were married (68 percent). Only 5 percent of the respondents were single.

4.2.4 Level of Education

In terms of education, the distribution of respondents was as shown in Table 3. The results indicate that 67 percent of the respondent had attained primary school education, and only 3 percent had tertiary education.

4.2.5 Length of Stay in the Village

The length of stay in the community reflects a sense of security and belonging in the community and therefore might be a determining factor in the farmer's ability to grow more crops through experience, and therefore improve food security at household level. As shown in Table 3, about 63 percent of the respondents had stayed in Nankanga camp for over ten years, and only 20 percent had lived there for 5 years.

4.3 Household Access to Capital Assets

As was elaborated above, the livelihoods approach is founded on a belief that people require a range of assets to achieve positive livelihood outcomes. The assets which people or farmers need are human, natural, physical, financial and social capital. These assets are discussed in the paragraphs below. According to DFID (1999), Human capital represents the skills, knowledge, ability to labour and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives. Natural capital refers to the natural resource stocks from which resource flows and services useful for livelihoods are derived. There is a wide variation in the resources that make up natural capital, from intangible public goods such as the atmosphere and biodiversity to divisible assets used directly for production (trees, land, etc.). Therefore, the natural capital assets discussion in the following sections considers total farm land under cultivation annually.

Physical capital comprises the basic infrastructure and producer goods needed to support livelihoods. Hence, farmers' acquisitions of various durable and liquid assets are discussed under physical assets. Financial capital denotes the financial resources that people use to achieve their livelihood objectives and hence the credit facilities available to farmers are discussed under financial assets. Social capital refers to the

social resources upon which people draw in pursuit of their livelihood objectives. These are developed through networks and connectedness; to membership formalized groups; and relationships of trust, reciprocity and exchanges that facilitate co-operation and may provide the basis for informal safety nets amongst the poor. Hence, farmers' access to social support networks is discussed under social capital, (DFID, 1999).

4.3.1 Access to Human Capital

The size of the household ranged from one member to eighteen members. It was observed that most of the households (62 percent) had members between 4 and 9 members, while only 7 percent of the respondent's families had over 13 household members as shown in Table 4. The average household size in the sample is 7 members. The recent average household size estimates in Zambia is 5 (CSO, 2010). Household size has a bearing on family labour as most rural households depend on family labour for agricultural production. The larger the family size, the more the family labour.

Table 4: Household Sizes of the Sample Households

Household Size	Number of Households	Percentage
1-3	11	18.0
4-6	23	37.0
7-9	15	25.0
10-12	7	12.0
Over 13	4	7.0

At a household level human capital is a factor of the amount and quality of labour available; this varies according to household size, skill levels, leadership potential, health status, etc. With an average of 7 persons per household, family labour is not likely to be a limiting factor among the household. They also access labour through extended families. In terms of education, most of the respondents (90 percent) had attained formal education with about 67 percent of these respondents having completed primary school, 20 percent attained secondary school and 3 percent had tertiary education. Thus, this education was enough to allow them to read and write.

4.3.2 Access to Natural capital

Table 5 shows the two categories of land ownership status in the study area. These are customary land (land held without title deeds) and borrowed or rented land. Most of the respondents (97 percent) were on customary land, and 3 percent were on borrowed or rented land and none had legal title to the land (own with title deeds). Land is one of the major assets on which small scale farmers depend to generate food and cash incomes. Most of the respondents interviewed possessed land under customary land tenure system. Land was acquired mostly through traditional leadership of the community. One of the critical factors governing agricultural performance is the land tenure system (Serageldin, 2004). Lack of legal title to land is a disincentive to capital investment and thereby contributes to failure to increase agricultural productivity.

Table 5: **Land Tenure Characteristics of Small-scale Farmers**

Land tenure characteristic	**Number**	**Percentage**
Customary	58	97.0
Borrowed/Rented	2	3.0

The land tenure system in the study area and the rest of Zambia can therefore be described as predominantly traditional or customary. Customary land is usually vested in traditional leaders (local Chiefs and Headmen) who are the custodians. Individuals or households have a right to land. However, access to land is granted by the community's chief or headman who allocates pieces of land on which the households can establish their homesteads, cultivate crops and raise their livestock. The individuals or households allocated the land do not own it but have usufructuary rights over it for their production and sustenance. Within the households, the heads (usually men) apportion the land to family members for farming and building purposes. The usufruct rights are usually lifelong and transfer of these rights upon the death of the holder is common. The inheritance of land use rights ensures that future generations of the family are guaranteed land use rights (Kalinda and Kapunda,2009).

The majority of the households had customary ownership of the land they cultivated which they inherited from their parents or relatives and some had access to communal land obtained from local chiefs and headmen. Very few households used rented land or have formal title deeds for their land. The respondents in the community had access to agricultural land and water. They also have access to forests and communal land areas. All households owned relatively large areas of land ranging between 2 hectare and 15 hectares. Water is also available and accessible to all households throughout the year. However, the fertility of the land in some areas was poor due to continuous unsustainable agricultural practices which include conventional ploughing and maize mono-cropping.

4.3.2.1 Land under Crop Cultivation by different Households in the 2009/10 Season

Although Zambian farmers have access to large amounts of land they are unable to cultivate most of this land thus limiting agricultural production. The average land under maize cultivation was 1.3 hectares. All farmers grew maize with a maximum of 10 hectares, but not all farmers grew groundnuts and beans (Table 6). According to GRZ (2006) agricultural productivity among small-scale farmers in Zambia is affected by inadequate access to oxen, limited access to agricultural inputs, high transport costs, diseases and pest attacks on crops and livestock, inadequate agricultural services, particularly credit and markets, and effects of diseases like HIV/AIDS.

Table 6: Land Areas (Ha) under Cultivation in Nankanga Camp for the 2009/10 Agricultural Season.

Land/crop	Mean Area (ha)	Standard Deviation	Minimum Size	Maximum Size	Number of farmers
Maize	1.3	1.4	0.25	10	60
Beans	1.6	0.3	0	2	27
Groundnuts	0.2	0.4	0	2.5	32

These constraints have had a negative impact on agriculture. For example, lack of fertilizer, lack of seeds and lack of finances portray lack of resources to invest in

production. Inadequate labour and lack of draft power and illness constrain agricultural production activities. As a result, households reduce land under cultivation. Given that the majority of the people in the community under study derive their livelihoods from farming, these constraints have undermined their productive capacity and the end result has been perpetual poverty among households, because the areas under cultivation have reduced to levels were it is no longer profitable.

4.3.3 Ownership of Physical Capital

Physical capital comprises the basic infrastructure and producer goods needed to support livelihoods. Infrastructure consists of changes to the physical environment that help people to meet their basic needs and to be more productive while the producer good are the tools and equipment that people use to function more productively. The following components of infrastructure are usually essential for sustainable livelihoods: affordable transport, secure shelter and buildings, adequate water supply and sanitation, clean affordable energy and access to information (communications) (DFID, 1999).

This section discusses farmers' access to physical capital such as household liquid and durable physical assets. The sample households own various assets. The most common and important durable and liquid assets include bicycles, radios, poultry, draft animals (cattle), and farming implements. The respondents own livestock, farming implements and other household assets. It was found that 75 percent of the respondent owned animals. As for cattle there was an average of 3.2 heads of cattle per household, whereas with goats the average was 3.8 goats per household. Chicken is the most predominant owned type of livestock with most of the respondents indicating owning chicken with an average of 6.4 chickens per household. The farming implements predominantly owned included hoes with all the respondents indicating ownership. Other farming implements included ploughs, harrows, ridgers, sprayers and rippers. Households also were found to own household assets such as bicycles, oxcarts, radios, cell phones, motor bikes, television sets and at least two respondents indicated owning motor vehicles (Table 7).

Table 7: Types and Number of Assets Owned by different Households in Nankanga Camp

Asset	Mean	Standard Deviation	Minimum number	Maximum number	Number of farmers
Ox carts	0.23	0.46	0	2	13
Ox drawn harrows	0.23	0.43	0	1	15
Plough	0.4	0.72	0	3	17
Ridging plough	0.02	0.13	0	1	1
Hoes	3.5	2.2	1	12	60
Ripper	0.63	1.3	0	6	15
Planter	0	0	0	0	0
Sprayers	0.42	0.87	0	4	15
Bicycles	0.95	1.03	0	5	37
Motor bikes	0.05	0.22	0	1	3
Radios	0.77	1.44	0	2	34
Cell phones	1.02	1.03	0	4	40
Television sets	0.5	0.81	0	2	20
Motor vehicles	0.08	0.33	0	2	4
Tractors	0	0	0	0	0
Hammer mills	0.01	0.13	0	1	1

As can be seen in Table 7, the respondent's households own various assets. The most common, important durable and liquid assets included bicycles, radios, cell phones and farming implements. All small scale farmers owned hoes and the highest number of hoes per household was 12.

4.3.4 Access to Financial Capital

Financial capital denotes the financial resources that people use to achieve their livelihood objectives. The definition used here, however, limits itself to try to capture an important livelihood building block, namely the availability of cash or equivalent that enables people to adopt different livelihood strategies. The section thus considers sources of financial capital obtained through credit-providing institutions. Most farmers in developing countries like Zambia generally have limited access to credit from financial institutions and thus lack financial resources to meet immediate cash needs and other important requirements such as farm inputs like fertilizer and seed. Since credit is usually in short supply, it is often very costly when available. There appears to be a reasonable number of farmers who had access to input credit. About 50 percent of the farmers in the survey admitted having received input credit under

the Farmer Input Support Programme. Despite the fact that some farmers are on Farmer Input Support Programme (FISP), they need financial resources from regular banks to buy more inputs and pay for labour. Unfortunately, the involvement of commercial banks in the small and medium scale agricultural sector is negligible basically due to high collateral and poor repayment culture by small-scale farmers.

Some NGOs attempt to fill the vacuum of lack of access to credit by providing either cash or input credits to farmers. The government also attempts to fill the vacuum of lack of access by providing subsidized input credit to selected farmers under the Farmer Input Support Programme (FISP) and the Food Security Pack Programme.

The Farmer Input Support Programme (FISP) who's overall objective was to increase small scale farmer's productivity in order to contribute to improved household and national food security started in 2002/2003 agricultural season. The programme assisted about 120,000 small holder farmers with 48,000 MT of fertilizer and 2,400 MT of maize seed at 50 percent matching grant basis to grow about 360,000 MT of maize (GRZ, 2008).The current programme had increased the number of beneficiaries' participation by reducing the size of input pack to four bags of fertilizer and 10 kg of seed, 2x50kg basal; and 2x50kg top dressing for the program in 2009/10. The programme was planned to cover 500,000 small scale farmers as compared to 250,000 covered in 2008/09 farming season. FISP is aimed at improving small scale farmers food security, improve agriculture production, increase access of small scale farmers to seed and promote private sector participation in supply of inputs (GRZ, 2008).

According to a Ministry of Agriculture and Livestock (MAL) Extension Officer, the allocation of FISP inputs for Nankanga Camp was targeted at 1,000 farm families but only 400 applied and were approved in the 2009/2010 farming season. This was a fair distribution given that Nankanga camp has about 500 farm families.

4.3.5 Access to Social Capital

Social capital highlights the idea that livelihoods are rarely constructed on an individual basis, but rather that they are embedded in the interpersonal networks

(Place *et al*., 2005). This includes relations of trust, reciprocity and exchange between individuals, connectedness, networks and groups including wider institutions. In the community under study, social networks exist. Most of the respondents live in close proximity with extended families. There are a lot of reciprocal relationships, especially expressed in the way labour is provided where one household would, for example, go and provide labour for another household on a particular day and the other household would do the same on another day. There are groupings also that facilitate, for example, the acquisition of inputs through government and also facilitate the sale of agricultural produce and the access to extension services.

4.3.5.1 Main Sources of Agricultural Information

Farmers were asked to identify the sources of agricultural information in the households. Two sources of agricultural information were identified. These were Ministry of Agriculture and Livestock extension staff and Non-governmental organizations. Most of the respondents reported that extension workers were their main source of information and most of the information provided was on input procurement.

Table 8: **Sources of Agricultural Information among Small-scale Farmers in Nankanga Agricultural Camp**

Source of Information	Number	Percent
Extension officer	42	95.5
NGO's 2	4.5	
Total	44	100

n=44

In terms of awareness of Farmer Input Support Programme (FISP), most of the farmers (96.7%) are aware of the Farmer Input Support Programme. Results indicate that most of the farmers have been on the programme between 4 to 6 years. About 70 percent of the Farmer Input Support beneficiaries said their farming needs are not being met and 30 percent of the respondent said their farming needs are being met.

4.4 Household Livelihood Strategies

Rural households engage in various livelihood strategies to earn a living. This section examines some of these livelihood activities which the surveyed rural households are involved in. The respondents were asked to indicate what they considered to be major activities that are sources of income for their households. The results showed that the households depend mostly on agriculture for their livelihoods. On-farm income comes from the sale of crops (cereals and legumes), as well as livestock products. Off-farm income includes cash income from both agricultural work and non-agricultural activities like charcoal burning and sales, piece work, petty trading, remittances and others.

4.4.1 Agriculture Livelihood Strategies

Agriculture livelihood strategies denote the range and combination of agriculture activities and choices made by households in order to sustain themselves and contribute to the economic capital of the household (Oquist, 2005). Households in the survey were asked to name the agriculture activities they are involved in and the results suggest that all farmers are involved in some agriculture activities as explained below.

4.4.1.1 Crops Grown in Nankanga Camp

Crop production is one of the most important enterprises that impact directly on household food security and income status of individual farm families. Results of this survey showed that maize is a predominant crop cultivated by all small scale-farmers in the sample households. Both local and hybrid maize varieties, were cultivated by the surveyed households. The planting of different types of seeds is a risk management strategy adopted by Farmers. Farmers use different types of seeds, usually they plant a combination of varieties as shown in Table 9. The results indicated lack of access to improved maize seed as most farmers in the study area either use local maize seed, recycled seed or a combination with hybrid maize. The maize crop is predominantly grown as a rain-fed crop, and like in many parts of Zambia, maize is the main cash as well as staple crop of the area.

Table 9: Type of Maize Seed used for Planting

Type of seed	Frequency	Percent
Local	7	11.7
Hybrid and OPV	27	45
Recycled	11	18.3
Local and Hybrid	11	18.3
Recycled & Hybrid	4	6.7
Total	60	100

Note: OPV denotes Open pollinated varieties.

Other important crops cultivated were groundnuts, beans, cotton, sweet potatoes and sorghum. The planting of different types of crops can be considered a risk management strategy adopted by farmers for household food security. The common cereal crop grown by the majority households was maize, while food legume crops such as groundnuts and beans were second in importance going by the number of households growing.

Crop productivity in the study area was an issue of concern. The household survey showed that crop productivity in the study area was quite low. As shown in table 10, the average yield for maize was only 1.7 tons per hectare, which was below the minimum potential yield of at least 4 tons per hectare by a margin of about 58 percent. Beans were the second important crop farmers grew. Groundnuts were the third important crop farmers grew, and it had a comparative advantage in terms of yield because it exceeded the minimum potential yield of 1 ton per hectare.

Table 10: Productivity of Crops grown in Nankanga Camp by small scale farmers.

Crop	Mean (kg/ha)	Standard deviation	Minimum	Maximum	Number of farmers
Maize	1710	2019	150	11000	60
Beans	49.5	136	0	900	22
Groundnuts	143	363	0	2500	27
Sweet potatoes	62	329	0	2500	8

4.4.1.2 Crops Sold by Respondents in Nankanga camp

Most of the household income comes from maize sales as can be seen in Table 11. The average contribution of maize to household income is K 1,120. Maize the staple food is sold more than the other two crops. The Focus Group Discussions with women established that apart from maize, beans and groundnuts are also sold to fellow farmers to raise money for non-food items such as paying for school fees and medical fees.

Table 11: Crops Sold by Respondents in Nankanga Camp

Crop	Mean (ZMK)	Standard Deviation	Minimum	Maximum	Number of farmers
Maize	1120	1236	0	10,000	24
Beans	14.7	61.9	0	450	7
Groundnuts	40.8	20.8	0	1,500	5

4.4.1.3 Crop Consumption by Respondents in Nankanga Camp

The average maize consumption per capita for an adult person as determined by relief organizations in Zambia is approximately 14 kilograms per month, implying that each member of the household requires a maize consumption per capita of about 168 kg per annum to be secure. Consequently, a family of 9, as is the case for the overall total would probably require not less than 1,512 kg of maize to be secure (Kalinda and Kapunda, 2009). In this study, on average, maize consumption was about 661.7 kg per family. This indicates that farmers in the study area are not food (maize) secure (See Table 12).

Table 12: Crop Consumption by Respondents in Nankanga Camp

Crops	Mean (Kg)	Standard Deviation	Minimum	Maximum	Number of farmers
Maize	661.7	453.5	150	2250	60
Beans	29.1	53.4	0	250	24
Groundnuts	82.7	125.1	0	600	30

4.4.1.4 Average Crop Production for Consumption and Sale

The ratio of what farmers consume to what they sale can be used as a proxy indicator of surplus production. In case of maize, close to twice of what farmers produced from the 2009/10 seasons harvest was sold (Table 13). The reason for this feature may not been entirely due to occurrence of surplus but also due to the need to secure income to meet other basic requirements of life. Similarly, only half of the total quantity of beans produced was consumed, leaving the other two thirds for sale. As for groundnuts two thirds of the total quantity produced was consumed leaving only one third for sale. The exhibited disparities between consumption and sale for most food crops suggest that the farmers are of the subsistence type with limited surplus for sale. It should be understood that the ratio of consumption to sale in any given season will vary depending on the level of production (Kalinda and Kapunda, 2009).

Table 13: Average Crop Production for Consumption and Sale

Crop	Production (Kg)	Consumption (Kg)	Amount sold (Kg)	Consumption: Sale ratio
Maize	1710	661.7	1120	1:1.7
Beans	49.5	29.1	14.1	1: 2
Groundnuts	143	82.7	40.8	2: 1

4.4.1.5 Maize Marketing in Nankanga Camp

According to the respondents, agricultural products were mostly consumed (51.7 percent) Table 14, shows that most of the farmers reported that they do not sale their maize, and some of it was sold to Food Reserve Agency (FRA), a government institution that is mandated to maintain the national food reserves to ensure national food security. McEwen (2003) however, noted that FRA is a buyer of last resort for selected crops in outlying areas as it has been mandated to provide markets to these small-scale farmers as a response to the slow response of the private sector to provide marketing services.

Table14: Maize Marketing Systems used by Farmers in Nankanga camp

Type of Buyer	Number	Percent
Private Buyers	6	10
Food Reserve Agency	21	35
Grow for food only	31	51.7
Both private buyer and FRA	2	3.3
Total	60	100

McEwen (2003) in a study of macro and micro factors influencing livelihoods trends in Zambia reports similar results, that high transport costs and the conditions of the Zambian rural road network restrict the opportunities for investment in outlying areas. The most affected being the small-scale farmers living far from the main road network resulting in high costs of bringing inputs to the farm and outputs to the market and therefore leaves the farmer with little choice but to produce only for home consumption and limited level of marketing. Among those who sale maize, 82 percent of the farmers experienced problems in marketing the crops. Most of the farmers reported that the main problem is transport and only a few faced other problems.

4.4.1.6 Livestock Farming in Nankanga Camp

Farmers were asked to name the different types of animals they keep in the households. The results in Table 15 indicate that most (75 percent) of respondents reported keeping animals (cattle, goats and chickens). Results further shows that most of the small scale farmers kept chicken with an average of 6.3 chickens per household, followed by goat and cattle (Table 16).

Table15: **Farmers keeping Livestock in Nankanga Camp**

Parameter	Response	Number	Percentage
Household keeping livestock	Yes	45	75
	No	15	25
Total		60	100

Table 16: Types and Numbers of Livestock kept by Farmers in Nankanga camp

Livestock type	Mean	Standard deviation	Minimum	Maximum
Cattle	3.2	2.6	0	25
Goat	3.8	2.8	0	24
Chicken	6.3	5.3	0	28

4.4.1. 7 Income from Animal Sales and its Utilization.

Farmers were asked to give incomes on animal sales. Table 17 shows that farmers got an average of K120, 000 on cattle sales. Traditionally the role of livestock in rural Zambia is for social prestige. Therefore, incomes from animal sales are low compared to crops and non-agricultural incomes. Further information on the sale of animals is given in Table 18. Results indicate that 55 percent of the farmers sold their livestock and the revenue derived from selling domestic animals was mainly used for non-food items with about 81.8 percent of the income being used to pay for school fees, medical fees and labour.

Table 17: Incomes from Animal Sales in Nankanga Camp

Animal Sales	Mean (K)	Standard Deviation	Minimum	Maximum
Cattle	120,000	106,000	0	3.500,000
Goat	65,666	14,666	0	1.500,000
Chicken	16,866	38,282	0	210,000

Table 18: Utilization of Money from Animal Sales in Nankanga camp

How money is used	Frequency	Percent
Food items	3	9.1
Non-food items	27	81.8
Purchase inputs	3	9.1
Total	33	100

n =33

4.4.2 Non-Agricultural Livelihood Strategies

The respondents were asked to indicate what they considered to be non-agricultural or off- season activities that are sources of income for their households. The results shown in Table 19 indicate that the households depend mostly on sale of charcoal for their livelihoods. Off-farm income includes cash income from both agricultural work and non-agricultural activities like petty trading, piece work, gardening, remittances and others. The average income from charcoal sales was high at K1,296,693 followed by gardening .

Table 19: Other Sources of Income for Farmers in Nankanga Camp

Other incomes	Mean (ZMK)	standard deviation	minimum	maximum
Petty trading	25,033	919,325	0	6,000,000
Gardening	467,518	923,028	0	4,000,000
Remittances	18,339	83,343	0	500,000
Piece Work	24,900	825,931	0	6,000,000
Sale of charcoal	1,296,693	13,450,551	0	7,000,000

NOTE: Gardening is agriculture strategy usually done off season under irrigation.
Data is in Kwacha before rebasing.

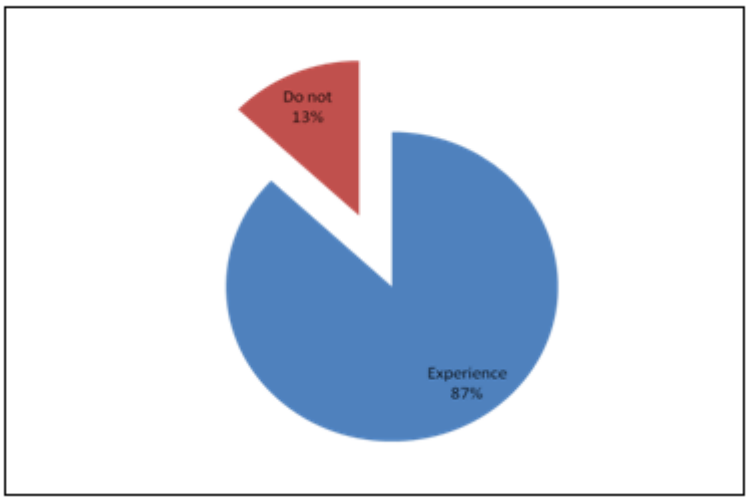
4.5 Food Security Status of Farmers in Nankanga Camp

According to Beer and Swanepoel (2000) the World Bank definition of food security is access of all people at all times to enough food to live an active healthy life. Therefore, household food security can be considered as the capacity of household to produce or purchase stable and sustainable basket of adequate food. In this study we looked at maize the staple food to represent availability and access to food. Food security in Nankanga camp is a rural area where the majority of residents are small scale farmers who are both food crop producers and food consumers. Small-Scale farmer food security is dependent on their ability to produce sufficient amounts of food crops in their fields for their own consumption (subsistence production).Those farmers who do not produce enough for subsistence can purchase food from other farmers who have harvested a surplus (Kodamaya, 2011).

4.5.1 Food Security Status and Occurrence of Food Deficits

Respondents were asked if they experienced food shortages during the year. The results in Figure 2 shows the number of households among the respondents who reported shortage of staple food during the year 2010. In total, 87 percent reported experiencing food shortages during the year.

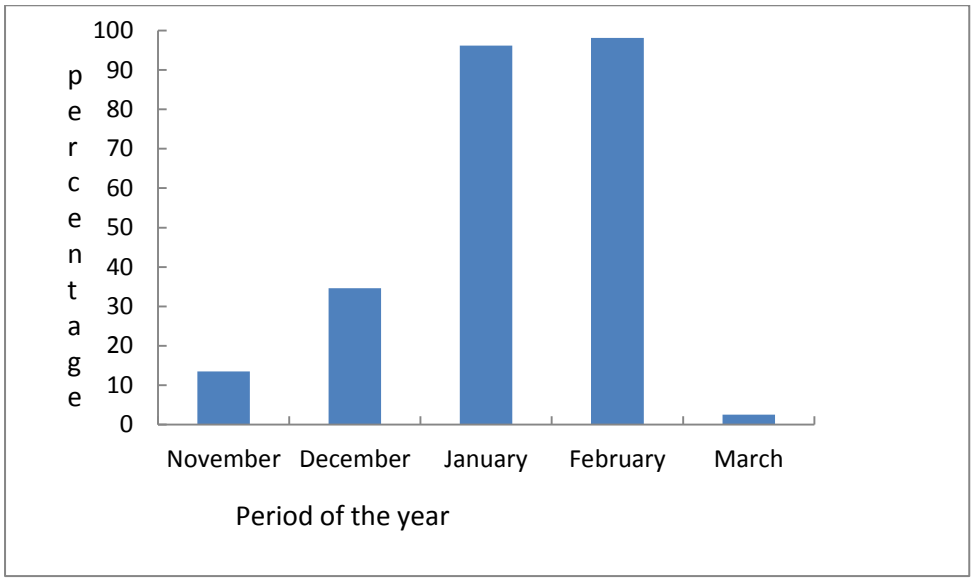
Figure 2: Food Security Status of Respondents in Nankanga Camp



4.5.2 Occurrence of Food Deficits in Nankanga camp

The experience of food shortage occurrence varied during the year. The period that respondents reported food shortage was between November and March. The peak is in January and February and falling thereafter to less than 5 percent in March (Figure 3).

Figure3: Occurrence of Food Deficit in study area expressed as a Percentage of Households experiencing Staple Food Shortage.



When there is enough food in the households most of the respondents said they had three meals a day (73.3 percent). The focus group discussion with female farmers reported that "Our families had adequate food just after the harvest in May, few months later in November households started experiencing maize shortages".

Table 20: Number of Meals taken during Food Secure Periods.

No. of meals/day	Frequency	Percent
Two	16	26.7
Three	44	73.3
Total	60	100

The focus group discussion with a mixed group of males and females reported that "towards the rainy season in November families experienced maize shortages, and one of the strategies was to reduce the number of meals per day". When there are food shortages in the households most of the respondents said they have two meals a day (62 percent) (Table 21).

Table 21: Number of Meals taken by Respondents during Food Insecure Periods

No. Meals/day	Frequency	Percent
One	18	30
Two	37	62
Three	5	8
Total	60	100

4.5 Coping Strategies during Periods of Food Deficits

Farmers were asked to indicate the coping strategies they engage in when they is limited food in their households. Table 22 shows the coping strategies farmers have developed to deal with food deficits. Most of the respondents (71.7 percent) reported resorting to selling charcoal and firewood to access food. This was followed by asking for assistance from relatives. Ellis (2003), argued that the major determinant of coping strategies and extent to which households are resilient to shocks is the state of household assets. In the study farmers had access to forests, and therefore. Most of them resorted to selling charcoal and firewood.

Table 22: Food Deficit Coping Strategies

Strategy	Frequency	Percent of respondents
Borrow Money	1	1.7
Getting assistance from relatives	7	11.7
Selling charcoal and firewood	43	71.7
Trading in non- agricultural commodities	3	5.0
Selling livestock	1	1.7
Others	5	8.3
Total	60	100

4.7 Challenges Farmers face in meeting their Livelihoods

Farmers were asked to name some of the constraints that affect their agricultural production activities. Table 23 shows information with regard to the constraints that impede agricultural productivity among small-scale farmers and which hence have a

negative impact on livelihoods. There were various constraints that respondents identified as hindrances to agricultural productivity. The agricultural related constraints and challenges were reviewed to aid in explaining the low crop productivity observed among the farmers. By ranking the constraints/challenges in order of the most pressing constraint, it became apparent that the number one constraint was about farmers not being able to buy fertilizer because they did not have resources to do so (lack of finances). Lack of draught power and high cost of inputs was second, while the lack of human labour was the third prevailing constraint. Others (in descending order of priority and rank) are indicated in Table 23.

Table 23: Agriculture constraints scores in ranking order

Constraints	Score	Ranking
Lack of finances	49	1
Lack of draught power	47	2
High cost of inputs	47	2
Lack of human labour	41	3
Unstable weather patterns	19	4
Insufficient land	15	5
Poor price from buyers	12	6
Poor soils	7	7
Pests and diseases	5	8
Poor storage	1	9
Theft	0	10

n=60. Note: these were multiple answers

These constraints have also been cited in the literature with regard to Zambian agriculture. For instance, Ngona (2013), argued that all the farmers interviewed in his study indicated that they lack access to credit schemes offered by financial institutions. This can be attributed to the fact that the cost of borrowing in Zambia is high and not favorable to the small scale farmers. According to GRZ (2006) agricultural productivity among small-scale farmers in Zambia is affected by inadequate access to oxen, limited access to agricultural inputs, high transport costs, diseases and pest attacks on crops and livestock, inadequate agricultural services, particularly credit and markets, and effects of diseases like HIV/AIDS. These constraints have had a negative impact on agriculture. For example, lack of fertilizer, lack of seeds and lack of finances portray lack of resources to invest in production.

Inadequate labour and lack of draught power and illness constrain labour requirements. As a result, households reduce land under cultivation.

The Focus Group Discussion with male farmers revealed that the perception of farmers towards the causes of food insecurity was that, “we cannot farm properly without financial resources, we need money to buy inputs and pay for farm labour”. In addition, they need animal draught power as their animals had died from diseases. The end result is persistent wide spread food insecurity in homes.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This chapter presents the conclusions of the study findings and gives recommendations on the basis of these findings. The chapter first gives the Sustainable Livelihoods Approach, different livelihood strategies that small-scale farmers were engaged in, the food security status of small-scale farmers and the challenges they face to meet their livelihood needs are discussed. Lastly, the chapter presents the recommendations emanating from the study.

The Sustainable Livelihoods approach assisted in evaluating people's livelihoods and their access to control of different forms of capital, as well as examining the activities they engage in to ensure their productivity and survival. Respondents are engaged in agriculture and non-agriculture livelihood strategies for their survival.

Farming was the main preoccupation of all respondents and was the main source of livelihoods. Small-scale farmers engage in various livelihood strategies to earn a living these are both agriculture and non-agricultural strategies. For agriculture livelihood strategies, they planted different crops and kept livestock. Maize the staple crop was grown by all the farmers in the study area. Both local and hybrid maize varieties were cultivated by the surveyed households. Other important crops cultivated are groundnuts, beans, cotton, sweet potatoes and sorghum. Most of the household income came from maize sales. The average contribution of maize to household income was K 1,120.000. In addition, maize is consumed more than any other crop in the study. The average yield for maize, the staple food crop by farmers was 1.7 tons per hectare, which was below the minimum potential yield of at least 4 tons per hectare.

Most of the respondents in the study area reported keeping animals such as cattle, goats and chickens. Incomes from animal sales were low compared to crops and non-agricultural incomes.

Off-farm incomes from non-agricultural activities were from petty trading, charcoal, piece work, gardening and remittances. The average sale of charcoal was higher than others at K1,296,000 followed by gardening.Despite all these livelihood strategies, the small scale farmers reported experiencing food shortage during the year (2010). The period that respondents reported food shortage was between November and March with a peak in February.

When there was enough food in the households most of the respondents said they had three meals a day, while during food shortages in the households most of the respondents said they had two meals a day. This study established that food security in the study site is absent. The maize production per capita as a proxy indicator of household food security proved that most households do not meet the minimum staple food requirements. The average maize consumption per capita for an adult person as determined by relief organizations in Zambia is approximately 14 kilograms per month, implying that each member of the household requires a maize consumption per capita of 168 kg per annum to be secure.

There are various constraints that respondents identified as hindrances to agricultural productivity. The agricultural related constraints and challenges were reviewed to assist explain the low crop productivity observed among the farmers.
By ranking the constraints/challenges in order of the most pressing constraint, it became apparent that the number one constraint was about farmers not affording to buy fertilizer because they did not have resources to do so (lack of finances).The lack of draft power and high cost of inputs were second and the lack of human labour was the third.

Agricultural productivity among small-scale farmers in Zambia is affected by inadequate access to oxen, limited access to agricultural inputs, high transport costs, diseases and pest attacks on crops and livestock, inadequate agricultural services, particularly credit and markets. These constraints have had a negative impact on agriculture.

6.1 Recommendations

The recommendations are based on the findings of the study. These recommendations will be useful to stakeholders including the Zambian government/policy makers, managers and development partners who are interested in working with the small scale farming communities.

- There is need for the government in Zambia to provide deliberate loan facilities that target small-scale agriculture. This calls for a redefinition of government's role in agriculture credit so that loans must be made accessible to the farmers. The study revealed that low crop productivity is a challenge among small-scale famers therefore farmers are still food insecure. The study also revealed that most of the respondents reported experiencing food shortage during the year (2010). Small-scale farmer's lack of finances was one of the major constraints that stand in their way to invest in agricultural related activities and achieve food security. Reducing participation fee in FISP program could be one option of increasing participation but this would greatly increase cost to government that is funding this scheme. Additional cost may impede the government's ability to provide other social services.

Draught animal power technology is appropriate and relatively cheap for most farmers. However there is need to ensure that current farmer's needs are met through the following means:

- The government extension services must support small-scale farmers to use existing animals more effectively. Improving management practices including strategic feed supplementation and diseases prevention will substantially increase draught power availability for those with animals.
- There is need for greater government involvement in encouraging draught animal power contractors. The fact that some contracting already occurs is an indication of the existing market. It should be expanded by encouraging higher market prices. The provision of government subsidized tractors hire schemes will undercut both private tractor and draught animal contractors who are currently providing the service. This would reduce the cost and improve the service as currently the contractors only work on part time basis. Such a service will greatly improve crop production.

- The government and nongovernmental organizations should come up with some initiatives such as the cattle restocking programme and many other projects involved in passing on livestock to farmers should be encouraged to increase cattle population among small scale farmers.
- Finally, use of donkeys is another option. There is a tradition of using oxen only as draught animals. Therefore, farmers should consider the use of donkeys as draught power. Where as donkeys are basically kept for transport, farmers should be encouraged to use donkeys for cultivating their fields. The government through field services should encourage the use of donkeys as draught power.

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APPENDICES

QUESTIONNAIRE

Questionnaire Serial number ☐

LIVELIHOOD STRATEGIES OF SMALL- SCALE FARMERS IN NAKANGA CAMP OF KAFUE DISTRCT-ZAMBIA

SECTION A

1.0 Household Identification

1.1 District Name _____

1.2 Block Name _____

1.3 Camp Name _____

1.4 Village Name _____

1.5 Chiefdom _____

1.6 Name of household head _____

2.0 Socio-demographic Information

2.1 Age ☐

2.2 Sex of household head ☐

1, Male 2, Female

2.3 Marital status ☐

1, Single
2, Married
3, Widowed/widower
4, Separated

2.4 What is your level of Education? ☐

1, Primary
2, Secondary

3, Tertiary
4, None
5, Others (specify) ----------

2.5 Nationality ☐
1 Zambian
2 Non Zambian

2.6 Household size ☐
1, 1-3
2, 4-6
3, 7-9
4, 10-12
5, Over 13

2.7 How long have you stayed in this village ☐
1, 0-5 years
2, 6-10 years
3, 11-15 years
4, 16-20 years
5, Over 21 years

2.8 What is the ownership states of the field/plot? ☐
1, Own with deeds
2, Own without deeds/customary
3, Rented
4, Borrowed
5, Others(specify) ----------

SECTION B

3.0 Livelihood Assets and Livelihood Strategies of Small-scale Farmers

3.1 Livelihood Assets

Does household posses any of the following assets	Quantity	Means of acquisition 1-bought, 3-inherited 2-gift, 4.others
Ox carts		
Ox drawn harrows		
Ox drawn harrows		
Cultivators		
Ridging plough		
Hoes		
Rippers		
Planters		
Sprayer		
Bicycles		
Motor bike		
Radios		
Cell phones		
T.V sets		
Motor vehicles		
Tractor		
Hammer mill		
Others(specify)		

3.2 Livelihood Strategies

3.2.1 In the last season, what crops did you cultivate, what was the hectarage, yields and how did you make use of the produce?

	Crop	Ha	Yield(kg)	Sold (bags)	Price (Total)	Gave out	Consumed (bags)
1							
2							
3							
4							

3.2.2 How much land did you Cultivate and crops harvested (kg) in the past 2 years?

Year/ Land	Maize	Beans	Sorghum /millet	sunflower	groundnuts	Sweet potatoes	cassava	Others	Others
2008/09									
Land Ha									
2007/08									
Land Ha									

3.3.3 What tillage method did the household use in the field last Season?

1, Conventional hand hoe
2, Planting basin
3, Zero tillage
4, Ploughing
5, Ripping
6, Ridging
7, Others (specify) ----------

3.3.4 What type of Maize seeds did you use in the

1, local Varieties
2, hybrid/OPV
3, recycled seed
4, local and hybrid

3.2.4 Do you keep any livestock?

1. Yes 2. No

3.2.5 If YES, fill in the table below

	Type of animals	Number of animals kept	Number given out	Number sold last year to date	Price/ animal	Total value
1						
2						
3						

3.2.6 What do you use the money from animal sales for?

1. Purchase food items 2.Purchase Non- food items
3. Purchase agriculture inputs

3.2.7**Financial Asset**

Does household receive income from the following	1-yes 2-no 3-n/a	Estimated monthly income (zmk)	Estimated Annual income (zmk)
Petty trading			
Gardening			
Remittances			
Piece work			
Sale of charcoal			

Section C

4.0 Household Food Security Status in Nankanga

4.1 Do you experience food shortages?

1, Yes 2, No

4.3 Did you experience any Food shortages before you started benefiting from FSP/FISP

1, Yes 2, No

4.4 In the past year, Which months did you experience food shortages? (Tick)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Non
Food available													

4.5 How many meals do you have per day when you have no Food Shortages?

1. One
2. Two
3. Three.

4.6 How many meals do you have per day when you experience Food Shortages?

1. One
2. Two
3. Three.

Are you Aware of the Farmer Input Support Programme?

1, No 2, Yes

3.2 Does this household participate in Farmer Input Support Program?

1, No 2, Yes

3.3 (If YES) when did you get your first FISP package?

1. 2 years or less
2. 3-4 years ago
3. 5-6 years ago
4. Over 6 years ago

3.4 (If NO to 3.2) What are the reasons for not benefiting from FISP?

1, Not aware
2, Lack of funds to pay for the 50 % contribution
3, Request to join was rejected
4, Political differences (non member of dominant party in area)
5, Others specify? ----------

3.5 How many bags of fertilizer (50 kg) and seed (10 kg) have you received past 3 years?

Year	**Seed**			**Fertilizer**	
	Maize	Beans	Others	Basal	Top Dressing
2009/10					
2008/09					
2007/08					

3.6 How many bags of fertilizer and seed have you bought past 3 years from other sources (non FISP)

Year	**Seed**			**Fertilizer**	
	Maize	Beans	Others	Basal	Top Dressing
2009/10					
2008/09					
2007/08					

3.7 Do you belong to any association or group?

1, yes 2, no

3.8 (If yes) why

1. To access more inputs
2. Other reasons (specify) ----------

3.9 What type of organization do you belong to?

1, Cooperatives
2, Private sector
3, NGO's
4, Faith based organization
4. Individual
5. Others (specify) ----------

3.10 What help do you receive from the organization you belong to?

1, Input procurement
2, Marketing of produce
3, Learning improved agricultural skills
4, Access credit
5, Others (specify) ----------

3.11 Are your agricultural needs being met by help you receive from these organizations?

1, yes 2, no

3.12 If not what recommendations would you suggest?

1, Input procurement
2, Marketing
3, Learning improved agricultural skills
4, Increase inputs under FISP
5, Others (specify) ----------

4.0 Causes of food insecurity in Households

4.1 What are the Causes of food insecurity in Households?

Causes of food insecurity in Households	Choose 4 and rank them 1-4
Low yields due to weather patterns	
Theft	
Lack of sufficient land	
High cost of inputs	
Poor prices from buyers	
Crop waste through poor storage	
Crop waste through pests	
Low yields due to poor soils	
Lack of draft power	
Lack of human labour	
Lack of finances	
Others specify	

4.1 What are the food security coping strategies you adopt when cultivated food is not enough?

1, Buy
2, Get assistance from relatives
3, Selling of firewood and charcoal
4, Trading in non agricultural commodities (second hand clothes, beer etc)
5, Sell livestock
6 Others (Specify) ----------

Section D

5.0 Marketing and extension services

5.1 Do you receive any agricultural advice on your farm? ☐
1, yes 2, no

5.2 If yes, from where ☐
1, Extension officer MACO
2, NGO
3, Others (specify) ----------

5.3If yes in 5.1, Specify the type of marketing services you receive?
1, Input procurement ☐
2, Planning of crop combinations to grow ☐
3, Purchasing of crops other than maize e.g. beans ☐
4, Access to credit beyond FISP
5, Others (specify) ----------

5.4 Is the advice adequate to make you successful in your farming? ☐

1, yes 2, no

5.5 If no, what recommendations can you make?

5.6 Where do you sell your products? ☐

1, Private buyers
2, Food Reserve Agency
3, Market
4, Exchange with consumable goods
5,Only grow for Food
6, Private buyer and FRA
7, Others specify ----------

5.7 Do you face difficulties in selling of your produce? ☐

1, yes 2, no

5.8 If yes, what types of difficulties? ☐

1, Low price
2, Lack of transport
3, Inadequate demand
4, Others specify ----------

End of Questions, Thank you.

Interview Guide 1

Interview Guide for focus group discussions for community members

1. What are the activities which you do in this community to ensure that your households are food secure?
2. Where does most of the household income came from?
3. Do you experience food shortages in this community, if so which months do you experience food shortages and how many meals do you eat in times of food shortages?
4. What are the causes of food shortages in this community?
5. What are the food security coping strategies do you adopt when cultivated crops is not enough?
6. Are the inputs you buy enough to grow crops/ maize to feed your families all year round?
7. If not what are the reasons for not growing enough crops/maize?
8. Are your agriculture needs being met?
9. Do you belong to FISP?
10. Do you belong to any other organizations that support farming rather than FISP, and what farming support are you receiving?
11. In the last three Seasons did you grow enough crops to feed your Families all year round?
12. In the last three Seasons did you grow surplus crops for sale?
13. What problems do you face in maize marketing?
14. What recommendations would you suggest to improve your food production?

Interview Guide 2

Key informant guiding questions

1. Do people in the community belong to co-operatives?
2. What are the benefits of joining a co-operative?
3. What was last season's allocation of inputs?
4. Which community based groups are operating in the community?
5. Do people have access to land and trees?
6. Do households face food insecurity in the community?
7. What is the nature of land in the community and how is it used?
8. Are there any non-governmental organizations working in the community?
9. What are the major threats and challenges facing the well-being of households?
10. How do they respond to these threats and challenges?
11. What laws, rules and regulations affect households?