COMPARATIVE ANALYSIS OF STRATEGIES FOR LINKING FARMERS TO MARKET: DISCOURSE ON GENDER EQUITY, COMMUNITY EMPOWERMENT AND SOIL FERTILITY MANAGEMENT IN MALAWI

By

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To my beloved children Opulukwa Jr. and Vanessa

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

ACDI-CIDA	Canadian International Development Agency
ADD	Agricultural Development Division
ADMARC	Agricultural Development and Marketing Corporation
ASSMAG	Association of Smallholder Seed Multiplication Action Group
CIAT	International Centre for Tropical Agriculture
FAO	Food and Agricultural Organization of the United Nations
GDP	Gross Domestic Product
ICRAF	World Agroforestry Centre
ICRISAT	International Centre for Research in Semi Arid Tropics
IFAD	International Fund for Agricultural Development
IFM	International Monetary Fund
IITA	International Institute of Tropical Agriculture
MAI	Ministry of Agriculture and Irrigation
MK	Malawi Kwacha
NAC	National Aids Commission
NASFAM	National Smallholder Farmers' Association of Malawi
NDP	National Development Policy
NSO	National Statistic Office of Malawi
SARPN	Southern African Regional Network
SDNP	Sustainable Development Network Program
SPSS	Statistical Package for Social Scientists
SSA	Sub Saharan Africa
UF	University of Florida
UNIFEM	United Nations Development Fund for Women
USAID	United States Agency for International Development
WRI	World Resources Institute
WHO	World Health Organization

Abstract of Dissertation Presented to the Graduate School
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My research compared and analyzed strategies for linking farmers to market and impacts on women in Malawi. I identified 14 organizations with strategies for linking farmers to markets in Malawi. These strategies varied in terms of gender integration and their focus on soil fertility management and community empowerment. However, the research attempts to portray potential lessons from a few selected strategies for linking farmers to markets in Malawi, with a view to determining and analyzing the extent to which women participate and benefit from each strategy. In addition, I analyzed the trade-offs on soil fertility management between food and cash crops.

I used qualitative and quantitative research methods to collect data from farmers both in groups and individually. A checklist was used to guide informal discussions with farmers and key informants, while formal questionnaires were used to collect information from farmers in groups and in a household survey. I conducted 17 farmers' groups and interviewed 170 farmer households. I used institutional frameworks to compare qualitative data on specific themes pre-determined to be of interest to this study. Then, the Statistical Package for Social Scientists (SPSS) was used to analyze data from household interviews.

My research found that the extent to which women farmers participated in the market and benefit from participating in the market varied by enterprise and by strategy. Women derived more benefits from crop enterprises than from livestock enterprises. On the other hand, I found that farmers invested more on soil fertility management technologies on food and cash crops. But, the data also show that farmers involved in these strategies are well above average in wealth and education than the rural poor Malawian farmers.

CHAPTER 1
INTRODUCTION

Background to the Problem

Africa faces significant challenges that must be addressed if the agricultural sector is to make a significant contribution to increased food productivity and improved food security (Food and Agriculture Organization of the United Nations (FAO)[1], 1999). Some of these challenges including a decline in soil fertility, the HIV/AIDS crisis and gender inequality are causing significant demographic changes among the farming population (Barrett et al., 2002; WRI, 2003). These changes also are affecting and lowering returns from agricultural production.

In Africa, the vital role women play in agricultural production is well-documented (UNIFEM, 1999; ACDI-CIDA, 2006). Women comprise 70-80% of the full-time farmers responsible for the daily food supply (SARPN, 2005; ACDI-CIDA, 2006). This important role of women in agricultural production implies that the success of agricultural production to improve food security and rural livelihoods will depend on women's access to productive resources and the assistance and training that women receive. Yet, studies consistently show that women's access to productive resources is less than that of men (USAID, 2004).

Gender inequalities affect women in terms of less access to major resources and inputs such as fertilizers, manure, land, income, agricultural extension, training and education that could assist them in agricultural production activities (UNIFEM, 1999; Barrett et al., 2002; and Gladwin, 2003). Women also lack power to make decisions and/or to have access, control and benefit from these resources at household, community and national levels (Sachs, 1996; Budelman and Defoer, 2002).

[1] Full name of organizations can be found in the abbreviations section beginning on page 14

Equally, gender inequalities and limited access to socio-economic support services including health services, education and infrastructure continue to make women the poorest of the poor (Green and Baden, 1994; Ngwira and Mkandawire, 2003; SDNP, 2007). Consequently, a high rate of poverty and food insecurity still exists to the majority of women and poor farmers in many African countries. The path out of this poverty for most women requires appropriate frameworks that address their exclusion from social and economic mainstreams.

Malawi is a drought-prone country that depends precariously on rain-fed agriculture for its economic development (ACDI-CIDA, 2006). Agriculture accounts for 38.6 % of the Malawi Gross Domestic Product (GDP), and it is still primarily for subsistence (ACDI-CIDA, 2006). Malawi typifies the experience of other Sub-Saharan African (SSA) countries, where agriculture is predominantly carried out by women (ACDI-CIDA, 2006). However, with deterioration of its natural resource base, farmers--particularly women--in Malawi face major constraints that inhibit overall agricultural growth of the country.

Women farmers in Malawi, much like other women elsewhere in Sub Saharan Africa (SSA), have faced serious challenges in improving agricultural production. These challenges include but are not limited to persistent drought conditions, decline in soil fertility and less access to resources such as income, credit, land and labor; less education; less training through agricultural extension; and less access to markets and information on markets and prices (ACDI-CIDA, 2006). Generally, access to markets is crucial for small-scale women farmers who constitute much of the agricultural labor force in Malawi. Access to markets may increase income that women could use to sustain their household needs--particularly purchasing of agricultural inputs such as seeds, fertilizers and pesticides; food, clothing and other household assets; and investing in children's education.

Studies conducted by ACDI-CIDA (2006) concluded that the gender imbalance that exists in Malawi is one of the major contributing factors that perpetuates poverty and prevents women from improving their own well-being, their children's education, and their voice in decisions affecting their lives. As a result of this gender imbalance and many other factors, women continue to remain among the poorest of Malawians.

Market reforms also have substantially affected women farmers in Malawi. Since 1971, marketing activities have been a sole responsibility of the Agricultural Development and Marketing Corporation (ADMARC). ADMARC is a Malawian parastatal organization mandated to market agricultural produce and inputs (Kutengule et al., 2007). Kutengule et al. (2007) assert that ADMARC was given a food security role in maize markets by acting as a buyer and seller in remote rural areas providing grain storage across seasons and supporting a large marketing structure with distribution or market centers located in urban and rural areas.

Over the years, ADMARC has deviated from its core mandate of agricultural development and food security to engage in other business activities such as investment in industrial activities in various sectors of the economy (Kydd and Christiansen, 1982; Harrigan, 1991). The importance of ADMARC in the marketing of agricultural commodities has declined since the late 1980s (Kutengule et al., 2007). Equally, ADMARC's supply of inputs has been reduced to 10 percent of the country's total input supply (Kherallah et al., 2001). Many reforms have liberalized agricultural markets over the last 20 years, a strategy supported by the International Monetary Fund (IMF) and the World Bank programs.

In Malawi, market reforms were initiated in the 1980s and early 1990s with intention to increase farmers' access to markets and to enable farmers to sell their produce to customers at reasonable prices (Gabre-Madhin, 2002). As part of the market reforms, the government of

Malawi also began allowing the private sector to operate freely and without price controls. However, a study by Gabre-Madhin (2002) indicates that market reforms have created more constraints and new challenges in agricultural marketing to the majority of farmers in Malawi.

According to Gabre-Madhin (2002), some of the challenges of the market reforms include changes in prices for agricultural produce and poor infrastructure (deterioration of rural roads), which have increased transport cost to the majority of farmers. Due to failure of ADMARC and impacts of market reforms, small-scale farmers have had difficulty in selling their agricultural produce. Underlying the challenges from market reforms, smallholder farmers in Malawi must also deal with severe environmental changes, population pressure, reduced land availability and the impacts of HIV/AIDS. Each of these challenges has contributed to poverty and widespread food insecurity among the majority of Malawians.

The government of Malawi has recognized the need to improve agricultural production for the country's economic growth and poverty reduction. Over the years, the government has instituted different policy reforms and development strategies. According to ACDI-CIDA (2006), the government recently announced its long-term objectives for Malawi in its strategy document entitled *Malawi Vision 2020*. These objectives address:

- Food security,
- Fair and equitable distribution of wealth,
- A sustainable managed environment,
- Development of smallholder agriculture, and
- Reliance on private sector and competitive markets to provide incentives for growth.

Many strategic plans to redress problems that women face in Malawi have been developed and implemented. The government of Malawi itself had to re-orient its structures and re-examine the national development policies (NDP) to reflect on the different needs of women and

men, and for the purpose of promoting gender equity and empowering rural communities to take a proactive role in agricultural production.

Nonetheless, the national and international organizations in Malawi put much emphasis on the promotion of crops and livestock (agroenterprises) through market links that could benefit farmers in terms of both food security and income generation. Dorward and Kydd (2005) point out that promoting access of poor farmers to available markets could have a direct impact on increased income of the rural poor who derive significant parts of their income as farmers or farm laborers. Promoting access to available markets could also improve the agricultural and economic growth of Malawi.

Generally, linking farmers to markets has now become an important strategy for many organizations that work at the grassroots level with rural communities. For instance, one of the strategies of the United States Agency for International Development (USAID) for supporting agricultural development focuses on linking producers to markets. The overall goal of the USAID strategy is to improve small-scale producers' competitiveness and efficiency in the marketing activities. The Citizen Network for Foreign Affairs (CNFA) is a Washington, DC-based, non-partisan, not-for-profit organization dedicated to stimulating economic growth around the world by nurturing entrepreneurship, private enterprise, and market linkages. CNFA is implementing the Agrodealer program in Malawi, Kenya and Tanzania that aims at strengthening the agricultural input supply and out put markets for improved food security and income of small holder farmers. FAO also has a program on agricultural marketing specifying different models and case studies to which farmers have been linked to markets worldwide.

Overall, linking farmers to markets is viewed as one of the pragmatic strategies for promoting gender equity, involving more women as beneficiaries and in sustainable utilization of

natural resources. For the last five years, many organizations in Malawi have linked farmers to different markets. In fact, organizations such as the National Smallholder Farmers' Association of Malawi (NASFAM) and the Association of Smallholder Seed Multiplication Action Group (ASSMAG) have more than five years' experience in linking farmers to different markets.

On the other hand, each organization that links farmers to markets in Malawi is unique in terms of the strategies they have used to link farmers to market. To-date, there are very few studies documenting the impacts of these varied strategies on rural communities and how women have been involved and derived benefit from each strategy. This study attempts to portray useful lessons from a few selected strategies for linking farmers to markets in Malawi, with a view to determining the extent to which women participate and benefit from each strategy.

Study Area Background

Malawi is a small country covering an area of 118,484 square kilometers or 45,747 square miles (Economic Intelligence Unit, 1995). It is located in southeast Africa and bordered by Mozambique, Zambia, and Tanzania (Figure 1-1). The country is divided into three regions (central, northern and southern) and eight Agricultural Development Divisions (ADDs) which include Karonga, Mzuzu, Kasungu, Salima, Lilongwe, Machinga, Blantyre and Shire Valley. This study was conducted in two regions: the central and southern regions (covering Kasungu, Lilongwe and Blantyre ADDs) and eight districts (Mchinji, Lilongwe, Dowa, Kasungu, Ntcheu, Zomba, Chiradzulu and Balaka).

According to the 2004 estimates (FAO, 2004; NSO, 2007), the country has a population of about 12.3 million people with an annual growth rate of 2.6%. The population density is 105 persons per square kilometer. At a regional level, the Northern Region is the least densely populated with 46 persons per square kilometer. The Southern Region is the most densely

populated with 146 persons per square kilometer followed by the Central Region with 113 persons per square kilometer.

Malawi's climate is generally subtropical with a diverse agroecology. A single rainy season runs from November through April. On average, the country receives annual precipitation ranging from 600 to 2000mm (Gilbert et al., 2002). Average rainfall varies by month, however, there is little to no rainfall throughout most of the country--particularly from May through October. According to Gough et al. (2002), in 1991, 1993 and 2003-2006 Malawi faced severe drought conditions that resulted in severe food shortages and chronic food insecurity among the majority of rural smallholders. However, food insecurity has also resulted from other factors such as too much dependency on maize as major staple food and production on small farm sizes.

Malawians depend mainly on maize as a staple food. A study by Gilbert et al. (2002) documented that over 90 % of the total cultivated land area in Malawi is planted with maize--mostly by resource-poor farmers. For the past four years Malawi has faced persistent drought conditions that affected the majority of smallholder farmers who cultivated large land area with maize. The drought, in turn, has resulted in chronic food insecurity for the majority of people who depend on maize as staple food.

In addition, farms are extremely small with many farms less than a half hectare (Anderson, 2002). Nevertheless, some farmers produce a variety of crops including maize (corn), beans, rice, soybeans, cassava, tobacco, and groundnuts (peanuts). Smallholder farmers produce these crops primarily for food and sell their surplus for income. According to FAO (2004), the country exports tobacco, sugar and tea as its three major cash crops.

According to Anderson (2002), the typical farming system in Malawi is a maize-based system, often intercropped or rotated with a legume crop such as beans, soybeans, groundnuts, cowpeas and pigeon peas. The legumes are used as relish in the diet, but farmers sell their surplus for income. Farmers also use mixed /intercropping and crop rotation systems as a means to enrich soil fertility. A sole cropping system is mostly practiced on large farms for crops such as tobacco, cotton, pulses, tea and rice. Some households also participate in off-farm activities such as working in grocery stores, selling food in restaurants, selling used clothes, purchase and sale of agricultural commodities, and casual labor, which is commonly known as *Ganyu*.

Livestock, on the other hand, constitute a relatively small sub-sector within agriculture in Malawi and contribute about seven percent of the total country's GDP. According to Matanya et al. (1998), the major constraint to the growth of livestock sub-sector has been lack of land for grazing or feed production. However, farmers also face other constraints that contribute to the poor growth of the livestock sub-sector including lack of money to invest in livestock management, lack of knowledge on feed formulation, poor management, high cost of artificial insemination and lack of markets.

In general, some of the challenges to the improvement in agricultural production in Malawi are viewed as unreliable rainfall, poor extension services, limited access to credit and input, impact of HIV/AIDS, low prices for farm produce and poor marketing channels (Estrada et al. 2005). The dependency on rain-fed agriculture, often with unreliable rainfall, and production on small land sizes have contributed to the poor growth of the agricultural sector of the country. Deeply entrenched poverty is a major obstacle to Malawi's development and overall economic growth (IFAD, 2007). Being one of the poorest countries in Africa, poverty is widespread in rural areas, where agriculture is the major source of livelihood.

On the other hand, agricultural extension systems aim to inform farmers about new technologies and opportunities (including access to markets, inputs and credit). New technologies and access to markets, inputs and credit could help farmers attain better returns from agricultural production activities. But, the agricultural extension systems in Africa have been criticized as being very ineffective in reaching the majority of poor farmers (Mtenga, 1997). In Malawi, women, when compared to men, are found to have much poorer access to extension services such as training meetings and research activities (SARPN, 2007). Hence, there is a need to fully understand relevant gender issues in order to help both men and women understand the importance of their participation in the extension services if they are to improve agricultural production, food security and income.

Lack of access to credit and inputs is a key constraint to the adoption of many useful agricultural technologies in Malawi. With a deteriorating natural resource base, farmers cannot attain better crop yields without using soil fertility management technologies (Thangata et al., 2002). With increases in price for the chemical fertilizer, farmers cannot afford to buy the amount of fertilizer recommended by extension workers. The Malawi government has been offering subsidies on chemical fertilizer to enable farmers to purchase enough to apply on their farms. Even with a subsidized price at 900 Malawi Kwacha (MK) (equivalent to US$ 6.87[2]) per bag of fertilizer, the majority of farmers--particularly women--cannot afford to buy chemical fertilizer.

With the need to replenish soil fertility and the high cost of chemical fertilizer in Malawi, some researchers believe that agroforestry technologies have the potential to improve soil fertility through the increase of soil organic matter and biological N_2 fixing from nitrogen fixing

[2] 1 US $ = 131MK in 2006

tree species (Thangata et al., 2002). The World Agroforestry Centre (ICRAF) has tested and disseminated different agroforestry technologies in Malawi to help farmers improve soil fertility (ICRAF, 2003, 2004). Some of these technologies include improved fallows, relay cropping, intercropping/mixed cropping and biomass transfer. However, when gender comes into play, the success of agroforestry technologies is likely to depend on its adoption by rural women--the major food producers in Malawi. Chapter Five of this study examines the adoption of agroforestry technologies by women farmers participating in the strategies for linking farmers to market.

With regard to pandemic diseases, Malawi is one of the countries in the southern Africa region that has the highest HIV infection rates (NAC, 2003). The epidemic has severely affected the agricultural sector, with the highest prevalence rate found between ages 15-49. Women and girls become more vulnerable to HIV infection which seems to increase in times of food crisis and poverty (NAC, 2003). Generally, the HIV/AIDS tragedy has increased the workload on women. In spite of the important role that women play in agricultural activities, they also have to bear much responsibility for taking care of the sick and orphans and participating in funeral ceremonies. All these have strong impacts on the time available for agricultural production activities, area planted, crop yields and overall, food security for the affected households.

Research Objectives

The overall objective of this study was to compare and analyze strategies for linking farmers to market in order to share lessons and experiences on how to involve and empower women to participate in the marketing activities, and how to benefit women involved while improving the soil natural resource base. The specific objectives were as follows:

1. To identify and analyze strategies used by organizations to link farmers to market using the institutional framework.

2. To determine and analyze the extent to which women farmers participate in the market.
3. To determine what benefits women farmers derive from participating in the market.
4. To analyze the trade off on soil fertility management technologies between food and cash crops.

Research Questions

a) What types of market linkage strategies/models are implemented in Malawi?

b) What are the benefits, if any, for women's participation in different market linkage strategies?

c) Which strategies most benefit women?

d) What enterprises are implemented by farmers across market-linkage strategies?

e) What enterprises most benefit women?

f) To which markets do women sell their produce?

g) On which crops did farmers mostly use soil fertility management technologies?

Operational Definitions of Terms

Gender. Gender is used to describe the characteristics, roles and responsibilities of women and men, boys and girls, which are socially constructed. Often, gender relates to how we are perceived and expected to think and act as women and men because of the way our societies are organized and not because of our biological differences (WHO, 1998).

Gender-disaggregated activity calendar. A gender-disaggregated activity calendar is a calendar that allows tasks (productive, reproductive, maintenance and community activities) to be identified by sex. The activity calendar may also be used to show the age group involved in the activities for instance, boys and/ or girls (Rao et al. 1991). This research focused on a seasonal calendar for production and marketing activities by farmers by sex.

Gender analysis. Gender analysis refers to the variety of methods used to understand the relationships between men and women, their access to resources, their activities, and the

constraints they face relative to each other. Gender analysis provides information that recognizes that gender and its relationship with race, ethnicity, culture, class, age, disability, and/or other status is important in understanding the different patterns of involvement, behavior and activities that women and men have in economic, social and legal structures (ACDI-CIDA, 2007).

Community empowerment. Community empowerment is a multi-dimensional social process that helps to foster the capacity of people to implement different activities that are of importance in their own lives and their communities (Page and Czuba, 1999).

Social capital. Social capital is a resource, a propensity for mutual beneficial collective action.

Enterprise/Agroenterprise. An agricultural activity carried out for food and income generation with support from organizational strategies for linking farmers to market. In this study agroenterprise and enterprise are used interchangeably.

Non-enterprise. An agricultural activity carried out for food and income generation without support from organizational strategies for linking farmers to market.

Participation in the market. This study defines participation in the markets, which is often socially constructed/has gender implications, based on the following variables that would be measured individually:

- Who sells to the market
- In which markets farmers sell
- Who transports produce to markets
- Who owns income at the household level
- Who decides on the use of income

Limitations of the Study

Several constraints may have limited the study. Factors such as environment (drought) may have affected the production, management, and marketing activities for different agroenterprises in which farmers--particularly women--were involved.

Language also may have imposed some research biases and complicated the research findings. To reduce this bias, the researcher used the following research methods:

- Use of trained enumerators and translators.
- Triangulation of research methods such as focus group discussions, household interviews and participant observation.
- Peer reviewing involving the researcher, CIAT and University of Florida (UF) mentors, field assistants and representatives from different organizations.

Significance of the Study

Women play an important role in agriculture in Africa. They produce between 60 and 80 percent of the food in most developing countries and are responsible for half of the world's food production. However, gender disparities, which are very common and widespread in African countries, undermine recognition of women and their contributions in agricultural production. Gender disparities affect African women and poor farmers in terms of access to and control of livelihood resources (natural, human, social, financial and physical resources), benefits accrued from these resources and their active participation in the decision-making.

Soils are a significant part of the agricultural environment and should be used in a sustainable manner to improve the livelihoods and food security of the majority of the rural poor. Malawi, like many countries in SSA, faces severe declines in soil fertility. Sustainable management of soils is very important for improved food security and income of rural smallholder farmers.

Access to market may increase farmers' incentives to invest in soil fertility management. If small-scale farmers have the resources, they are likely to adopt and invest in soil fertility management technologies for crops that lead to an improvement in food security and increase in income. Moreover, access to markets by farmers may ensure security of resource/assets (labor, land and capital, technology management and entrepreneurial skills) for sustainability of rural livelihoods.

In sum, the research is significant because it recognizes the critical role that women play in agricultural production, and attempts to draw potential lessons and experiences on how strategies for linking farmers to market benefit women farmers. Lessons and experiences from the research would be crucial and useful not only to organizations involved in this research, but to other organizations in Malawi and elsewhere in Africa that struggle to support farmers' inititiatives to ending hunger and poverty. Research recommendations will focus on how best the strategies for linking farmers to market could be implemented and coordinated to have a wider reach and impacts upon farmers' livelihood in Malawi.

Chapter Summary

Although Malawi women play an important role in agricultural production they face many constraints in trying to improve agricultural production and overall economic growth. One solution to overcoming such constraints is to link women farmers in ways that could involve and empower women farmers as beneficiaries, and improve access to markets by farmers as an economic incentive for them to invest better in soil fertility management.

Chapter One briefly described the study area in terms of its location, population density, climate and major crops produced by farmers. It also described the major farming systems used by farmers in Malawi and major challenges that farmers face for improved agricultural production.

Chapter One provided research objectives, major questions of interest to this research, operational definitions of specific terms, limitations of the study, and the significance of conducting the study.

Figure 1-1. Map of Malawi indicating its major cities and surrounding countries (Free Online Download: geography.about.com)

CHAPTER 2
LITERATURE REVIEW

The Importance of Agriculture to the Economic Development of Africa

Although the critical role of agriculture in Africa's development is well documented and acknowledged universally, its development is still very challenging. The performance of agriculture in Sub-Saharan Africa (SSA) has been poor as its growth has averaged less than two percent for more than the 40 past years (Cleaver, 1997). The limited agricultural growth has not kept pace with population growth, which is more than three percent per year (Cleaver, 1997). In addition, food production per capita is declining even with a rapid increase in food imports (up to 10 percent per year).

Many researchers now agree that agricultural systems in SSA face challenges in environmental issues (including soils, water, forests and pasture), limited access to new agricultural technologies, weak markets and inadequate use of agricultural inputs (Cleaver, 1997; IFDC, 2006). The International Center for Soil Fertility and Agricultural Development (IFDC) (2006) emphasized that there are best agricultural technologies that have been developed to increase productivity in Africa, but farmers have not adopted them widely because they have not had access to inputs such as improved seed and fertilizer.

In addition, the HIV/AIDS crisis and gender inequality are causing significant demographic changes among the farming population (Barrett et al., 2002; WRI, 2003). Women now comprise between 70-80% of the full-time farmers responsible for the daily food supply (SARPN, 2005; ACDI-CIDA, 2006). This important role of women in agricultural production implies that the success of agricultural production to improve food security and rural livelihoods will depend on women's access to productive resources and the assistance and training that women receive.

The implications of these and other challenges are that agriculture--which is critical to Africa's food sufficiency, economic, social and rural development--has not yet achieved these intended objectives in many African countries. That is why many organizations now put much emphasis on the development and implementation of agricultural input-output market strategies for the purpose of not only increasing market access by farmers for income earning, but also to improve the soil resource base and overall food production and livelihood security of rural communities.

The agricultural sector of Malawi has faced major setbacks over the 40 past years (Kherallah and Govindan, 1997; Dorward and Kydd, 2004). Changes in macro-economic stabilization programs and the role government played in marketing have contributed to farmers' limited access to market and change in prices for agricultural commodities (MAI, 2000; Dorward and Kydd, 2004). To deal with these and many other challenges, the government of Malawi has structured its agricultural policies for the purpose not only of improving the agricultural growth of the country but also to benefit majorities of rural people, who constitute the large percentage of smallholder farmers. Different institutional arrangements have been made by both government and non governmental organizations (NGOs) to address many of the challenges that farmers are still facing in agricultural production and marketing.

Over the years, agricultural research and developmental organizations have made significant contributions to agricultural productivity for small-scale farmers in Malawi (Sanginga et al., 2004; IITA, 2004; ICRAF, 2003; 2004). However, more recent experiences indicate that agricultural growth depends on expansion of market opportunities that incorporate profitability and competitiveness (Sanginga et al., 2004; Diao and Hazell, 2004). It is increasingly evident

that small-scale farmers' key concerns would not only be to improve agricultural production for household food security, but also increase their access to better markets.

Gender and Agriculture in Africa

Gender refers to the social differences in roles and responsibilities between men and women that are changeable over time and have wide variations within and between cultures (Feldstein and Poats, 1989; Spring, 1995; WHO, 1998; Russo et al., 1989; Mukhopadhyay et al., 1999; Spring, 2003) According to Rao et al. (1991), gender inequalities exist in many developing countries and have contributed to the growing trend of widening disparities between men and women from the access to resources to the distribution of benefits such as income, assets and delivery of services.

Traditionally, women in Malawi exemplify the characteristics of women in many other African countries, where their major role has been perceived to be both reproductive and productive. According to Green and Baden (1994), women in Malawi hold responsibilities for the activities related to social reproduction such as childcare, family health care, fetching water and firewood, and food preparations. They are also responsible for productive activities such as production of crops and management of livestock for food and income, processing and marketing of agricultural produce and participation in wage/casual employment (*Ganyu*) for additional income.

According to FAO (2007b) men's participation in agricultural production is declining, often due to male migration from rural areas to urban towns and cities in search of paid formal employment. As men's participation in agricultural production declines, the role of women in agricultural production has become even more significant. According to UNIFEM (1999) women produce up to 80% of the food in most developing countries and are responsible for half of the world's food production.

Like elsewhere in SSA, women in Malawi play a critical role in agricultural production in that they constitute 70% of full-time farmers and are seen to dominate the agricultural sector, which is the basis of Malawi's economy (ACDI-CIDA, 2007; SARPN, 2007). Currently, women farmers in Malawi perform 87% of agricultural labor and produce 75% of the nation's food supply (SARPN, 2007). Even with the vital role they play as food producers and providers, women farmers are seen to have more difficulties than men in gaining access to resources such as land, credit, education and agricultural extension services.

In order for women and poor farmers--who are major producers and laborers--to make significant improvements in agricultural productivity and food security, they need to have better access to productive resources, markets and benefits accrued from agricultural activities. Emphasizing gender issues in agricultural and development activities could ensure equitable distribution of labor and benefits. Social and entrepreneurial organization are key to strengthen and empower women and poor farmers to take a proactive role in the production, management and marketing activities and in the decision-making at household and community levels.

The following section presents the research conceptual framework describing the interrelationships between resources, production, consumption and marketing that are required for women and poor farmers to improve food security and income. Subsequent sections provide a review of literature on gender and access to resources and markets, gender and decision making, the need for soil fertility management and community empowerment--all as important elements of the research conceptual framework. The last section describes the activities implemented by the organizations and strategies used to link farmers to markets.

The Research Conceptual Framework

The researcher adapted and modified the CIAT resource-to-consumption framework (Figure 2-1) to guide this research project. CIAT, through the Enabling Rural Innovation

approach, enhances the capacity of the rural poor to improve their livelihoods, while implementing sustainable management of natural and other resources (Kaaria, 2005). The resource-to-consumption (R-to-C) framework expands conventional production to consumption and natural resource management based on community assets to meet the needs of food production and income generation of the farm families (Kaaria and Ashby, 2000; Kaaria, 2005), thus interconnecting the links between Resources, Production, Consumption and Marketing paradigms.

The R-to-C framework aims to explain potential resources that farmers require to establish crop and livestock enterprises and the extent to which women participate in production and marketing activities. Organizing farmers into groups and building their capacity in production and marketing skills is considered very significant if farmers are to exploit existing potential markets and have stronger negotiation power. Gender is an important cross-cutting issue as well as an empowering strategy for women. The research and development services are very crucial in the R-to-C process particularly in identifying potential enterprises that farmers could get involved in for food security and income generation.

There are several categories of resources that are listed within the R-to-C framework. This study builds on the importance and availability of these resources for effective establishment and sustained management of different enterprises and also in addressing issues related to soil fertility management technologies. The framework also indicates the links between sustainable natural resource management, increased production for food security and income. Sustainable utilization of natural resources could help improve the soil natural resource base and overall, increased food security and income (Kaaria and Ashby, 2000). Thus, for more sustainability and

wider impacts, soil fertility management should be an integral part of all strategies for linking farmers to market.

Processing and packaging could ensure that the quantity produced lasts longer and could be sold at a higher market price compared to when farmers sold right after harvest at much a lower price. But, due to limited resources, the majority of farmers cannot afford the costs associated with the processing and packaging activities. Generally, increase in income by farmers could also increase the asset base, improve household welfare (education, nutrition and clothing), enhance farmers' ability to meet production and marketing costs and overall increase farmers' incentives to re-invest in soil fertility management for both food and cash enterprises.

The R-to-C framework is CIAT's approach which aims to meet food security needs while focusing on the production of crops and/or products that have a well-identified market opportunity (Kaaria and Ashby, 2000). Mutual learning among all participating stakeholders is crucial to empower rural communities and to create a sustained, collective capacity for innovation focusing on improving livelihoods and the management of natural resources. CIAT's R-to-C framework could complement other organizational approaches--which implement slightly different approaches--for improved soil quality, food security and income of rural communities.

Gender and Women's Access to Resources for Agricultural Production

Worldwide research experiences suggest that farmers' incentives to participate in agricultural production activities depend on the amount and level of access and control they have over major resources for agricultural production and/or benefits accrued from consumption and marketing (Place and Hazell, 1993; Besley, 1995; Sachs, 1995; Gavian and Fafchamps, 1996; Reij et al., 1996; Sjaastad and Bromley, 1997; Fernandez, 1998; Templeton and Scher, 1999; Reij and Waters-Bayer, 2001). Major resources include natural, human, social, financial and physical resources and support systems. Examples of these resources may include but are not

limited to agricultural inputs, agricultural extension and market infrastructure for improved access to internal local and central markets.

In many African countries, research experiences show that women and poor farmers have limited access to productive resources and support services (Amoloza, 1998). According to de Haan (2001) and Njuguna and Valdivia (2005), lack of access to and control over productive resources constrains women and poor farmers from participating in agricultural activities. In Malawi, women's limited access to essential agricultural productive resources such as land, labor, and agricultural services is viewed as one of the factors constraining women and poor farmers from participating in many agricultural technologies (Green and Baden, 1994), which in turn, reduces women's vital contribution to improved agricultural production for food security and income.

The last two decades, however, have seen a growing consensus on the need for new ways to work with local communities--particularly women--to improve the management of natural resources for improved agricultural production (Schmink, 2003; FAO, 2004). Major attention is now being placed on the integration of gender for the purpose of involving the majority of women as beneficiaries of agricultural technologies and for improved livelihoods of rural poor farmers.

Gender and Decision-Making in Agriculture

Social and economic developments have always been linked to the active participation of women in decision-making processes (IDRC, 2007). A study by Wakefield (2004) in the Afghanistan Panjao Islamic community found that local level gender roles, responsibilities and norms determine the type of decisions that different men and women are entitled to participate in and have influence and control over.

To date, however, the majority of women in general play a marginal role in the decision making process in rural communities in many parts of Africa. In fact, Tiruneh et al. (2001) contend that female-headed households may be more affected in terms of resources (land, labor and capital) when compared to their fellow married women. They also point out that the success of any agricultural technologies is affected by who owns productive resources, who decides what to produce, and how much to produce and sell.

Many writers worldwide have documented that an explicit integration of gender into research and development activities could help to address gender inequalities that exist in many societies. Spring (1995, 2003) points out that the integration of gender could provide a critical analysis and an understanding of the roles that women and men play within a given context. The analysis on gender also needs to reflect the adoption and re-investment patterns that women and men choose to make. For example, research conducted by Kaaria and Ashby (2000) indicates that some agricultural technologies previously introduced to farmers have had considerable impacts on increasing labor demand on women farmers, or shifting the access and control over benefits from those technologies to men. Women are unlikely to participate actively in agricultural technologies that add more to their workload.

Lilja and Ashby (1999) believe that gender analysis could help in the identification of potential links between and among different stakeholders in agricultural production. For this reason, the emphasis on gender must go beyond what can be done to better involve only men and women and include all other stakeholder groups that are involved in agricultural production. Lilja and Ashby (1999) suggest that gender analysis could be helpful in the following ways:

- Predicting how different members of the society or the household would be affected by different development efforts, and to what extent these members would be able to participate and reap benefits from development efforts,

- Forecasting whether or not the policy, program or project would be as efficient, effective, or equitable as possible for appropriate planning and policy dialogue.

According to Lilja and Ashby (1999), gender analysis could be integrated in the research and development in the following three ways:

- Diagnostic Gender Analysis: Diagnose stakeholders' different problems and preferences by gender that may not be perceived as obstacles to the adoption and re-investment in technological solutions.

- Design-oriented Gender Analysis: Describe stakeholders' constraints, needs and differences by gender. Research and development paths are then designed to take into account gender-based constraints, needs and preferences. This type of analysis may necessitate development of different technologies and dissemination methods for men and women farmers.

- Transfer-oriented Gender Analysis: Describe stakeholders' gender differences in their problems and preferences. Different adoption and dissemination paths are designed to overcome access to and adoption of a particular technology of similar importance to men and women. This analysis results in the same technologies being disseminated to men and women in different ways.

Gender assessment tools often are used to reveal what activities different types of stakeholders carry out and what type of resources, benefits and incentives different types of stakeholders have access to and control over (Rao et al., 1991; Spring, 1995). Rao et al (1991) emphasized the importance of using gender-disaggregated activity calendars to determine the roles and responsibilities of women and men in different development activities. This present research used gender-disaggregated activity calendars to understand the role of both women and men farmers in the production, management and marketing activities of different crops and livestock enterprises. The researcher also used benefits diagrams to document types of benefit that farmers derived from those enterprises. An example of gender-disaggregated activity calendar would be livestock management activities such as feeding, watering, construction of animal houses and selling of livestock to the markets. Activities are carried out by women and

men farmers separately or jointly as married couples and provide clues towards appropriate intervention points.

Trends in Agricultural Marketing

The Role of Agricultural Marketing

For many countries in Sub-Saharan Africa (SSA), agriculture is central to economic growth as well as poverty reduction. The urgency for increased farm production is not unique to Africa or to the factors that are inhibiting its agricultural development. For many years researchers have been examining the factors deterring the growth of the agricultural sector in developing nations. Bates (2005) reports some of these factors are related to the farmers' physical environment as well as the socio-economic conditions. Recently, a consensus has emerged that the most important of these factors is the economic incentives offered to producers (Townsend, 1999; Bates, 2005). The role of agricultural marketing is to improve economic incentives for smallholder farmers to invest in soil fertility management and overall agricultural growth in many countries in SSA.

Structural Adjustment and Changes in the Marketing Systems

The World Bank first applied the term structural adjustment to describe its program of policy-based lending which began in the early 1980s. The objectives of the structural adjustment program were not confined to restoring macro-economic balance but were intended to stimulate economic growth by removing distortions in the economy resulting from government intervention and central control over markets and labor (Crawford, 1997). Structural adjustments brought many dilemmas to the African governments--particularly as relates to markets because most of them did not know what to do with government marketing institutions.

In the case of Malawi prior to 1981, the government through the Agricultural Development and Marketing Corporation (ADMARC) impacted smallholder agricultural production and

marketing. ADMARC had a major responsibility for distributing inputs to and purchasing outputs from smallholder farmers at guaranteed but very low fixed prices and sold produce at higher prices on the world market to earn larger profits (Kherallah and Govindan, 1997; Uttaro, 2002). ADMARC also sold subsidized inputs to farmers.

Malawi, like many other countries in SSA, faced severe economic imbalances that forced it to embark on a series of structural adjustments and macro-stabilization programs supported by donor organizations such as the World Bank and the International Monetary Fund (IMF) (Kherallah and Govindan, 1997). Pressured by the structural adjustment programs, Malawi liberalized the marketing of both its exportable and food crops. The role of ADMARC in agricultural marketing gradually decreased as the private sector slowly took over responsibilities in marketing of agricultural produce (Uttaro, 2002). As a result of all these adjustments smallholder farmers in many rural communities have less access to markets.

The impacts of structural adjustments in Africa in general, and Malawi in particular, have been widely documented (Gladwin, 1991). However, looking at the positive and negative sides of structural adjustment programs, Africa has experienced more negative impacts than the positive contributions these adjustments have had on the livelihoods of the majorities of smallholder farmers (Gladwin, 1991, 2002; Kherallah and Govindan, 1997). The effects of structural adjustment programs have been extensive on women and poor farmers.

Gender and Access to Markets

Many writers continue to recognize that farmers' participation in agricultural production activities depends largely on access and control they have over major resources (natural, human, social, financial and physical resources). Of major importance to farmers is the access to local and central markets (Place and Hazell, 1993; Besley, 1995; Sachs, 1995; Gavian and Fafchamps, 1996; Reij et al. 1996; Sjaastad and Bromley, 1997; Fernandez, 1998; Templeton and Scher,

1999; Reij and Waters-Bayer, 2001). According to Amoloza (1998) and Mtenga et al. (2005b), the majority of women and poor farmers in some of the African countries have had limited access to markets particularly those located at regional (central) levels. In this research I found that constraints to women's access to central markets in Malawi were distance to the market, lack of marketing skills and household responsibilities--all aggravated by gender inequalities.

In general, access to markets provides income to farmers that could increase their incentives to improve soil fertility and agricultural productivity (Barrett et al. 2002; IFDC, 2006). An IFDC (International Center for Soil Fertility and Agricultural Development) research has linked more than 100,000 farmers to different markets in West African countries (IFDC, 2006). IFDC experiences in West African countries show that improved technologies can work when both inputs and markets are available. Equally, the Citizen Network for Foreign Affairs (CNFA) has linked farmers to input-output markets in eastern and southern African countries including Malawi through the established Agrodealer networks (CNFA, 2005). Agrodealers are rural entrepreneurs/farmers who sell inputs such as fertilizer, pesticides, seeds, tools, and provide valuable technical and market information to farm communities.

Research on gender dynamics elsewhere in Africa have shown that when a crop enters the market economy, men are likely to take over profitable crops from women (Quisumbing et al., 1995; Quisumbing, 1996; Kaaria and Ashby, 2000; Cornwall, 2003). However, many researchers believe that integrating gender into agricultural production activities could help break the gender divide on income benefits between men and women. Based on these assertions, strategies for linking farmers to market that explicitly integrate gender are likely to benefit women more than men.

In view of the critical role of agriculture in the economic development of many countries in Africa, many organizations (national and international) have initiated market interventions with the purpose of linking farmers to markets. Strategies for linking farmers to markets aim to support farmers' access to better markets for improved agricultural production, food security and income. However, as Henao and Baanante (1999) pointed out, increased production particularly of cereals crops would continue to deplete the nitrogen, phosphorus and potassium nutrients from the soil if no appropriate measures are taken to replenish the lost nutrients.

In order for different organizations to come up with appropriate market interventions, they also must engage in continuous on-farm experimentation for selecting appropriate crops and livestock and in conducting market research for market improvement based on consumer preferences and needs. These activities, however, require the support of many key players (national research institutes, agricultural institutes, agricultural extension and the private sector) in terms of conducting appropriate collaborative research on crops, livestock and potential markets, and also in terms of providing farmers with the necessary technical support and monitoring and evaluation, which are critical elements of research for development.

Soil Fertility Management

Soil fertility is the number one natural resource in Africa; yet its depletion on smallholder farms has led to stagnant or decreasing per capita food production all over Africa during the last two decades (Gladwin, 2002). A decrease in per capita food production directly affects economic growth, social improvement, and trade in Africa (Henao and Baanante, 1999). According to Henao and Baanante (1999), in 1993–95 the difference between nutrient inputs and nutrient losses in the continent ranged from –14 kilograms of Nitrogen, Phosphorus and Potassium (NPK) per hectare per year in South Africa to –136 kilograms in Rwanda. Malawi, in particular, has experienced rates of nutrient depletion above 100 kilograms of NPK per hectare

per year (IFDC, 2006). As reported by IFDC (2006), nutrient mining in Africa has increased in cereals such as rice and maize and in tuber crops such as potatoes, cassava and yams. This suggests that any effort to increase production--particularly cereals and tuber crops--and reduce hunger in Africa must address the severely depleted soils.

In Malawi, continuous soil fertility degradation is the most critical problem constraining food production and overall agricultural development (ICRISAT, 2001; Uttaro, 2002; Tchale, 2003). Malawi is one of the African countries with the highest estimated losses for NPK, which are very important soil nutrients (Henao and Baanante, 1999). Continuous cropping of cereals and tubers, limited use of crop rotation systems with legumes, inappropriate soil conservation practices, deforestation and inadequate use of fertilizer are major contributing factors to the decline in soil fertility in Africa (Henao and Baanante, 1999; Tchale, 2003). Underlying these are weak input and output marketing systems that could reduce farmers' economic incentives to improve soil fertility (IFDC, 2006). IFDC (2006) emphasized building rural input markets to improve farmer access to affordable fertilizer for improving the heath of the soil and for increased production and income.

Nutrient depletion and land degradation continue at even much higher rates, which is one of the major factors that has constrained farmers in Malawi from growing enough food to sustain an ever-increasing population in the country (Henao and Baanante, 1999). This implies that national and international organizations and donors should address the threat of nutrient depletion and land degradation. Moreover, strategies for linking farmers to market are among the potential programs that aim to improve access to output market by farmers as an incentive to improve soil fertility and increase in productivity. As emphasized by IFDC (2006):

> …unless markets are available, farmers have no incentive to increase productivity. No farmer will invest in better seeds or fertilizer if there is a risk he/she can not sell his/her product.

Over the years, Malawi has made many efforts in disseminating different soil fertility management technologies including agroforestry, chemical fertilizer, livestock and compost manure, and the use of terraces and vertiver grasses. A study by Uttaro (2002), however, found that farmers prefer to use chemical fertilizer for higher crop yields over such organic alternatives as intercropping with grain legumes, agroforestry innovations, compost and animal manures.

The government of Malawi continues to emphasize the importance of using chemical fertilizer to obtain better crop yields. But, the cost per fertilizer bag has been significantly higher than farmers can afford to provide enough fertilizer. Realizing the need for fertilizer use and the economic conditions of the smallholder farmers, the government of Malawi has been offering fertilizer subsidies to smallholder farmers to improve agricultural productivity and food crop production. Also, it implemented a starter pack program in the 1998/1999, 1999/2000 growing seasons to smallholder farmers (Gough et al. 2002).

According to Gough et al. (2002), the starter pack program was initiated by the Ministry of Agriculture in collaboration with numerous international donor agencies. The program aimed to distribute small packs of hybrid maize seed, fertilizer, and either groundnuts or soybeans to smallholders. Unfortunately, starter pack programs have been found to be very expensive programs that require extensive amounts of labor, planning and cooperation to reach the targeted audiences (Gough et al. 2002). With regard to fertilizer subsidies in general, IFDC (2006) cautioned that unlimited fertilizer subsidies without substantial resources for the basics of infrastructure, technology and training will not solve the food crisis in Africa.

The World Agroforestry Centre (ICRAF), conversely, has played a critical role in educating farmers on agroforestry innovations as an alternative to chemical fertilizer that farmers

could use to conserve and enrich their soils in order to obtain better crop yields (ICRAF, 2003). The following is a list of organic alternatives to chemical fertilizer that ICRAF tested and experimented with farmers in Malawi:

- Improved fallows: Experimental trials using *Sesbania* and *Tephrosia* had indicated higher crop yields. Maize, for instance, yields more than three times the unfertilized control trial.
- Relay cropping: Relay cropping of maize with *Sesbania*. *Sesbania* was planted two weeks after the maize germinates. The trees were left to grow after the maize was harvested and were cut down when they were ten months old. When growing, *Sesbania* fixes nitrogen in the soil and when cut, the leaves and twigs are incorporated in the soil as green manure. Relay cropping was more practiced in the Southern Malawi, which has a highly dense populated area.
- Intercropping or mixed cropping: In this practice, agroforestry tree species are intercropped with maize. Soil nutrients are added to the soil through nitrogen fixation and/or incorporation of pruning as green manure to the soil. An example is maize intercropped with *Gliricidia*.
- Biomass transfer: This practice involves the cultivation of tree species whose leaf biomass is used as mulch for higher value crops such as vegetables. Potential tree species identified include *Gliricidia sepium* and several *Leucaenas* and *Sesbanias*.
- Rotational woodlots: *Acacia* species had been identified and found to show remarkable growth and wood production capacity. An example of this practice includes rotation of maize and woodlots.

Generally, several measures have been put in place to better improve soil fertility in Malawi (Gough et al. 2002). Recent efforts, however, on the management of soil fertility have focused on the involvement of more women in soil fertility management (Gladwin, 2002; Barret et al., 2002; Cornwall, 2003). According to Gladwin (2002), women produce more than 70% of food in Africa. Hence, soil fertility management programs should be targeted and aim to reach women farmers who are major producers and laborers of food in many countries in Africa.

Community Empowerment

Strengthening mutual support among farmers is perceived to be an important strategy for empowering rural communities. Kabeer (1999) argues that it is important to define what

empowerment means to avoid much confusion that exists. Empowerment could be defined as an analysis of power; however, empowerment is about gaining power. Therefore, community empowerment is about farmers gaining the power to undertake and sustain activities with limited support from external organizations. This present research also considers empowerment as the ability of both men and women farmers to apply the knowledge and skills obtained from their participation in different enterprises to other similar or newly related enterprises on their own with limited support from the organizations in which they were involved.

When gender comes into play, women are seen to rely on mutual support and social interactions as a collective strategy for their empowerment. Therefore, integrating gender into food and market enterprises represents an opportunity for women who are working in groups to build strong social capital for their empowerment. Simultaneously, this strengthens their social relationships and interactions.

Social Capital (SC)

Social capital has recently gained acceptance in the eyes of a wide range of social science disciplines (Adler and Kwon, 2002). According to the World Bank (2007), a narrow view of social capital regards it as a set of horizontal associations between people, consisting of social networks and associated norms that have an effect on community productivity and well being. A broader understanding of social capital accounts for both the positive and negative aspects by including vertical as well as horizontal associations between people and includes behavior within and among organizations. The broadest and most encompassing view of social capital includes the social and political environment that shapes social structure and enables norms to develop. The broadest view of social capital extends the importance of social capital to the most formalized institutional relationships and structures such as government, the political regime, the rule of law, the court system, as well as civil and political liberties. Regardless of the theoretical

view of social capital, Portes (1998) highlights some positive and negative consequences of social capital. On the positive side, social capital is a major source of social and family support and benefits through extra familial networks.

The World Bank (2007) places great emphasis on strengthening social capital as a critical element in poverty alleviation and sustainable human and economic development. The World Bank (2007) defines social capital as norms and networks that enable collective action. Krishna (2003) defines social capital as a resource, a propensity for mutual beneficial collective action that communities possess to different extents. Portes (1998) defines it as the aggregate of the actual or potential resources that are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition. More broadly, Schiff (1992) defines the term as the set of elements of the social structure that affects relations among people. In this research social capital is a network of farmers within communities that enable collective marketing.

Social capital stands for the ability of actors to secure benefits by virtue of membership in social networks or social structures. Portes (1998) asserts that where economic capital is in people's bank accounts and human capital is inside their heads, social capital is based on the structure of their relationships. In addition, Portes (1998) points out that to possess social capital, a person must relate to others and it is those others, not himself/herself, who are the actual source of his or her advantage.

In Africa, social capital as a form of collective action is still considered important among farmers (Davis, 2004). Historically, in many African countries participation in agricultural production activities (for either food or income) has so far been dependent on the strength of existing social capital in different communities (Moser, 2001; Peters, 2002, Barrett et al., 2002;

Rogers, 2003). Strong social capital and organizational capabilities act as means of sharing available resources and knowledge on different agricultural activities (Johnson et al., 2002; World Bank, 2007). Experiences from CIAT- Enabling Rural Innovation (ERI) and ICRAF projects in Malawi have shown that strengthening social capital is an important strategy for enhancing and sustaining small-scale farmers' capacity to identify their potential and opportunities for collective production and marketing of different crops and livestock (ICRAF, 2004; Mtenga et al. 2005a). It is now becoming more evident that strategies for linking farmers to markets must build on or strengthen the existing social capital for farmers to benefit from different enterprises.

The Importance of Farmers' Groups and Social Capital for Collective Marketing

Many organizations have used farmers' groups as mechanisms for delivering information and other agricultural services as well as for scaling up agricultural technologies (Davis, 2004). Farmers' groups are widely used by national and international organizations as useful proxies for measuring social capital (Davis, 2004; World Bank, 2007). Farmers' groups are viewed as one way to strengthen social networks and reduce the transaction costs involved in the marketing process. According to the World Bank (2007), social capital also facilitates coordination and cooperation among farmers in groups.

Farmers' groups also are regarded as a valuable form of collective action that could give farmers opportunities for easy access to credit, inputs, and markets (Davis, 2004). However, the effectiveness with which groups and networks fulfill their roles depends on many aspects of these groups reflecting their structure, membership and the way they function (World Bank, 2007). Furthermore, the World Bank (2007) suggests that the key characteristics of formal groups that need to be measured include density of membership, diversity of membership and extent of connections to other groups. This researcher conducted focus group discussions

(FGDs) to obtain general information from farmers on group structure, membership, activities implemented by farmers, and how farmers organized collective marketing of different crops and livestock.

Importance of Indigenous Knowledge in Building Social Capital

Management of natural resources is characterized by social learning. Local inter-personal networks or groups are viewed as potential learning opportunities for women and poor farmers to experiment, adopt or participate in a particular agricultural technology (Rogers, 2003; Udry, 2003). Sharing indigenous knowledge among farmers instills power and confidence, creates strong social capital and provides greater incentives to participate and adopt different enterprises (Ashby, 2003; Rogers, 2003). According to Gorjestan (2000: pg 1-8):

> Indigenous knowledge is a critical element of global knowledge, a foundation of human, social capital and organizational capabilities, a gateway to empowerment and a key factor to sustainable technology development.

In many African countries, the majority of women farmers have a long-term experience of working in social networks to fulfill their social, agricultural and/or household needs (Fernandez, 1998; World Bank, 2007). In those countries, strengthening social capital and organizational capabilities could enhance women's access and control to major resources (Rouse, 1996; Barrett, et al., 2002). Strong social and organizational capabilities could therefore be a key incentive even for women and poor farmers to participate in crop and livestock enterprises.

Participatory Technology Development (PTD) Methods and Social Capital

In the late 1960s and early 1970s, researchers in many parts of the world did not involve farmers in the development of agricultural technologies (Horne and Stur, 1999; Collinson, 2000). During the 1970s and 1980s, however, there was growing dissatisfaction with the poor rates of adoption of agricultural technologies in resource-poor farming systems (Horne and Stur, 1999; Conroy and Sutherland, 2004). This poor adoption resulted partly because of the poor research-

farmer-extension linkage. According to Collinson (2000), Farming System Research (FSR) was developed and promoted to improve the relevance of agricultural research to the majority of small holder farmers in the developing world and to improve the linkage between researchers, extension workers and farmers.

Farming Systems Research (FSR) is defined as a diagnostic process, a basket of methods for researchers to elicit a better understanding of farm households, family decisions and decision-making processes (Collinson, 2000). FSR was an innovation in the research and development process, and emerged from field practitioners as an early effort to bridge the gap between the needs and capacities of small, resource-poor farmers and publicly funded agricultural research establishments. FSR's application to development has four stages: Diagnosis, Design, Testing and Dissemination.

According to Hildebrand and Russell (1996), on-farm research is central to FSR, ensuring close collaboration between researchers and farmers and allowing evaluations of technologies under the environment and socioeconomic conditions in which they will be used. They point out also that Farming Systems Research and Extension (FSRE) is designed to extend the linkages across research and extension and across boundaries of biological and socioeconomic research. In sum, FSRE was an approach to the generation, evaluation and diffusion of agricultural technologies particularly for small scale limited resource farming systems.

Collinson (2000) believes that the search for cost effective methods of gaining understanding to rural farming systems has led to the emergence, development and evolution of variant approaches and methods. Many of these approaches and methods are still incorporating major FSRE principles, which include: farmer and systems-orientation, problem solving and interdisciplinarity. The most popular approach is the Participatory Technology and

Development (PTD) in which representative farm families and farmer groups are engaged in technology development with researchers that are allowed to flow, often guided by the farmers.

PTD is an approach that actively involves farmers and researchers in every stage of technology development to identify, test and evaluate agricultural technologies that are appropriate to farmers' particular situation (van Veldhuizen et al., 1997; Conroy and Sutherland, 2004). Thus, PTD--much like FSRE--puts much weight on the heterogeneity and diverse environments of farming systems that requires different recommendation domains.

According to Horne and Stur (1999) and Kaihura (2001), the PTD process involves three major stages: assessment or diagnosis, experimentation or testing and evaluation, which are similar stages indicated in the FSRE process. The assessment stage, which is sometimes referred to as *Sondeo*, or Participatory Needs Assessment (PNA) or Participatory Situation Analysis (PSA), involves an analysis of community constraints and opportunities. The experimentation stage involves on-farm testing of different technologies by farmers on their farms using their own agricultural practices. At the evaluation stage farmers describe the most preferred technologies tested.

Different methods may be appropriate for different situations and/or goals. However, Participatory Rural Appraisal (PRA) sometimes referred to as Participatory Learning and Action (PLA) (or *Sondeo*) is the most common PTD method used by many organizations, researchers and practitioners. According to Chambers (1997), PRA is a growing family of approaches and methods to enable local people to share, enhance and analyze their knowledge of life and conditions, and to plan, act, monitor and evaluate. Other methods are Beneficiary Assessment (BA) and Self-Esteem, Associative Strength, Resourcefulness, Action Planning and Responsibility for Follow-through (SARAR) (Rietbergen-McCracken and Narayan, 1998).

These methods are relatively similar and complementary. They only differ in how they have been developed or evolved (by whom and for what purposes). As such, this present research focuses on PRA techniques.

PRA offers several techniques from which those most appropriate for a particular context could be selected. The most commonly used techniques are semi-structured interviews or discussions (individuals, households, FGDs and community meetings); mapping (community, personal and institutional maps); ranking (problem, preference and wealth ranking) and trend analysis using historical diagramming, seasonal calendars and daily activity charts (Chambers, 1997; Rietbergen-McCracken and Narayan, 1998; Ashby, 2003). This present research used techniques such as informal interviews and focus group discussions (FGD) to obtain general information on farmers' participation in different market-linkage strategies.

Generally, PTD methods and techniques are potential methods for identifying farmers' opportunities and designing appropriate agricultural technologies. When gender comes into play, PTD methods could act as a vehicle for gender equity and an important tool for strengthening social capital and community empowerment (Kabeer, 1999; Ashby, 2003). In fact, Paris et al. (2001) believes that gender-sensitive participatory approaches have potential for developing appropriate technologies for women that could assure the acceptability of these technologies by women, likelihood of success for and ability to empower women as actual users and beneficiaries.

In view of their importance, PTD methods should aim at providing lifelong social learning that builds and enhances farmers' social capital and organizational capabilities and enables sharing of agricultural technologies among farmers. The PTD methods and tools should be a potential means for analyzing gender and other production constraints facing women and men

farmers. These methods and tools could be used to increase awareness of the opportunities that women and poor farmers may have and/or they could use to improve household food security and income. It is believed that this study will bring greater understanding of how the use of PTD methods have contributed to or facilitated participation of women in the market.

Chapter Summary

Malawi is highly reliant on agriculture for its economic development. Although women constitute over 70% of small farmers and provide over 87% of agricultural labor, they have faced tremendous challenges in improving agricultural production and the overall agricultural growth of the nation. Chapter Two described some of these challenges, for instance, changes in macro-economic stabilizing programs and environmental issues (drought and decline in soil fertility), all aggravated by gender inequalities.

Chapter Two described the conceptual framework used by this researcher. The research conceptual framework explained the inter-relationships between resources, production, consumption and marketing paradigms. This research builds on the inter-relationships between these paradigms to determine and explain the extent to which farmers particularly women participated in the market.

This chapter also reviewed relevant literature on how gender inequalities constrain women's access to the resources they need for agricultural production and benefit accrued from different crops and livestock they produce and manage respectively. In addition, this chapter pointed out impacts of gender inequalities on decision-making and access to market by women farmers.

The importance of social capital and farmers' groups to empower farmers--particularly women--to take a pro-active role in agricultural production and marketing and in decision-making at household levels was discussed. A review also was provided on advantages of

indigenous knowledge, farming systems research and extension and participatory technology development methods in building and strengthening social capital and empowering rural communities.

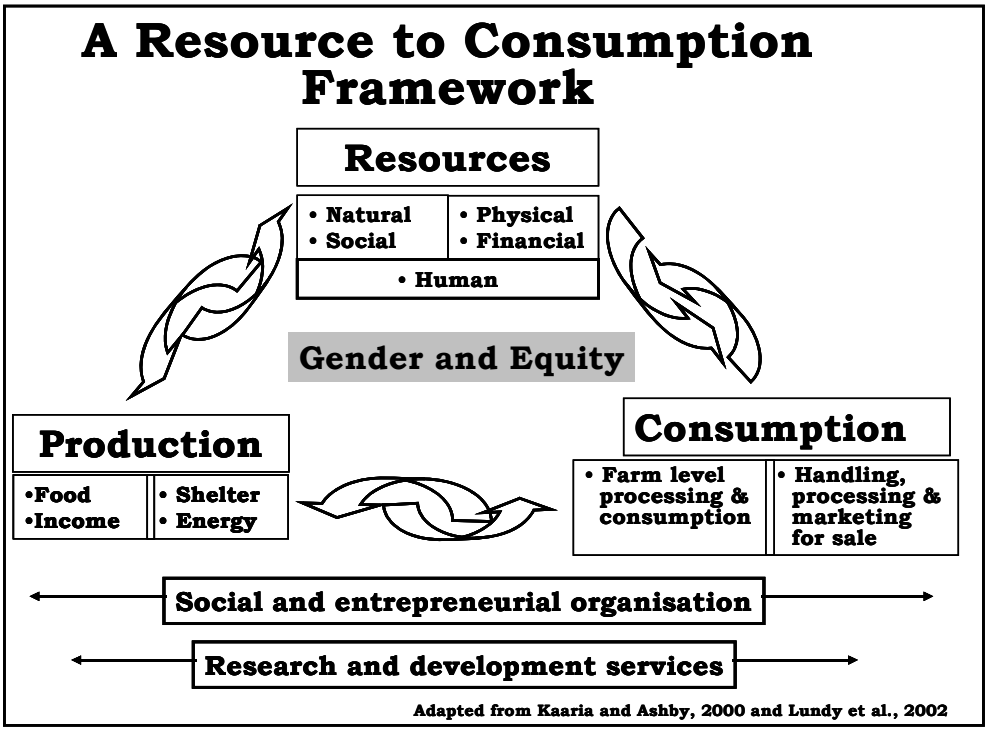

Figure 2-1. Resource - to- Consumption Conceptual Framework. Adapted from Kaaria and Ashby, 2000.

Figure 2-2. Masuku (left) and Baobab (right) propagated fruit trees at ICRAF Makoka nursery.

CHAPTER 3
RESEARCH METHODOLOGY

Introduction

This chapter describes the geographical area where this research was conducted, the population and the sampling procedures followed. It presents measurement techniques and statistical procedures used to collect and analyze information from key informants and farmers. Overall, this research intends to achieve the following specific objectives:

1. To identify and analyze strategies used by organizations to link farmers to market using the institutional framework.
2. To determine and analyze the extent to which women farmers participate in the market.
3. To determine what benefits women farmers derive from participating in the market.
4. To analyze the trade off on soil fertility management technologies between food and cash crops.

Description of the Research Area

This research was conducted in Malawi (See Figure 3-1), a land-locked country that lies at the southern tip of the Eastern Rift Valley, covering an area of 118,000 Sq. km. Malawi is bordered to the north and northeast by Tanzania, to the east, south and southwest by Mozambique, and to the west by Zambia (Government of Malawi, 2001; Tchale, 2003).

Malawi's economy is heavily influenced by agriculture. Over 80 percent of the Malawian people live in a rural setting, growing their own food as well as crops for selling. Women constitute 70% of full-time farmers and perform 87% of agricultural labor (ACDI-CIDA, 2006). Malawi experiences a tropical continental climate that is favorable for the production of crops such as maize, groundnuts (peanuts), fruits and vegetables, tobacco, sugar cane, and tea. However, farmers are faced with frequent and persistent drought conditions, hunger and poverty that make it difficult for them to improve production of these crops (Economic Intelligence Unit,

1995). These conditions, along with a high incidence of HIV/AIDS and land degradation, have contributed to a slowdown in agricultural growth in Malawi and, consequently, have increased food insecurity, hunger and poverty among majorities of rural communities. Nevertheless, various national and international organizations have initiated agricultural programs to redress the impact of these conditions and many other constraining factors to food security and income of the rural poor in Malawi.

This research was conducted in two major regions of Malawi--the central and southern regions. Eight districts were visited: three districts (Balaka, Zomba and Chiradzulu) in the southern region and five districts (Mchinji, Dowa, Kasungu, Lilongwe, and Ntcheu) in the central region. Data collection was divided into two phases, each used different research methodologies. The following sections describe the different research methods used for conducting research in each phase.

Research Phase One

Research Phase One (RPO) aimed to identify organizations with strategies for linking farmers to market. The following were research sub-objectives:

1. To compare and analyze strategies used by some of these organizations to link farmers to market using the institutional framework, and
2. To select strategies for a detailed study of the overall objectives 2-4, using focus group discussions and household interviews.

Identification and Selection of Organizations with Strategies for Linking Farmers to Market

Identification and selection of strategies for linking farmers to markets began with identification of organizations that implemented market interventions with farmers. This process built on the information obtained from organizations that were identified during preliminary dissertation work by the researcher in June 2004. At that time such organizations as the

Association of Smallholder Seed Multiplication Action Group (ASSMAG), National Smallholder Farmers' Association of Malawi (NASFAM), International Center for Tropical Agriculture (CIAT) and International Institute of Tropical Agriculture/Southern African Root Crops Research Network (IITA/SARRNET) were identified as having potential strategies for linking farmers to market.

Informal interviews were then conducted with key informants from each of these organizations to obtain information on strategies they used to link farmers to market. The informal interviews with key informants also served as a means of identifying other organizations with strategies for linking farmers to market. Key informants were asked whether they knew of other organizations with strategies for linking farmers to market. Through informal interviews, the researcher identified the following 14 organizations:

1. International Centre for Tropical Agriculture (CIAT)
2. Initiative for Development and Equity in African Agriculture (IDEAA)
3. International Institute of Tropical Agriculture/ Southern African Root Crops Research Network (IITA/SARRNET)
4. National Smallholder Farmers' Association of Malawi (NASFAM)
5. Association of Smallholder Seed Multiplication Action Group (ASSMAG)
6. Improved Livelihoods through Increased Food Security Development Assistance Program (I-LIFE DAP). This is a consortium including organizations such as Catholic Relief Services (CRS), CARE International/Malawi, the Salvation Army, Africare, Emmanuel International, Save the Children and World Vision.
7. World Vision
8. Catholic Relief Services (CRS)
9. World Agroforestry Centre (ICRAF)
10. Concern World Wide (CWW)
11. Concern Universal (CU)

12. International Crops Institute for the Semi–Arid Tropics (ICRISAT)
13. CARE International
14. Citizen Network for Foreign Affairs (CNFA)/Rural Marketing Development Trust (RUMARK)

A checklist of questions (see Appendix C) was used to collect information from key informants. This checklist of questions was pre-tested with a key informant working with CIAT and later modified to capture the necessary information required at this research stage. A follow-up was done with key informants through emails, phone calls and/or setting up additional appointment meetings with them to address specific questions or gaps that needed more information and clarification.

The institutional framework (IF) methodology was used to compare and analyze these 14 organizations. According to Lusthaus et al (1995) the institutional framework (IF) is a means of assessing the organizational capacity and a way to yield a comprehensive approach for diagnosing and documenting the strengths and weaknesses of different organizations. The International Development Research Centre (IDRC) and the World Bank have used IF to redress performance gaps in their funded programs (Lusthaus et al., 1995; Lusthaus et al., 2002).

The IF is descriptive rather than prescriptive and analytic, incorporating elements of historical time series analysis, case study methodology, and frequently comparative analysis (Lusthaus et al., 1995). The relative importance given to the various factors in the framework, and the way they are assessed (qualitatively, quantitatively or a combination of these), depends on the particular contexts in which it is used or on the issues being explored.

The IF used in this research was adapted and adjusted from the IDRC's framework for assessing performance of different organizations. The aim of adjusting the IDRC's framework was to make it more meaningful to this research in assessing strategies for linking farmers to

market using specific pre-determined criteria. The following is a list of pre-determined criteria that the researcher used to compare and analyze organizations with strategies[3] for linking farmers to market:

- Area of coverage
- Level of operation (individual farmers/groups or associations/communities)
- Number of farmers (men and women) reached
- Type of marketable enterprises (agroenterprises)
- Type of support offered
- Integration of gender and community empowerment
- Focus on soil fertility management (SFM)
- Type of strategy (model) used by each organization to link farmers to market

Using these pre-determined criteria, the researcher selected five organizational strategies for further analysis. These organizations are CIAT, ICRAF, NASFAM, World Vision and ASSMAG. Informal discussions using a checklist of questions (See Appendix C) were conducted with farmers working with these organizations as a follow-up to see whether these organizations met the pre-determined criteria for comparative analysis at farmers' levels.

Research Phase Two

Research Phase Two (RPT) consisted of a more detailed analysis of the five selected strategies for linking farmers to market using focus group discussions, household interviews and participant observation. A focus group discussion (FGD) is a group discussion of approximately 6-12 persons guided by a facilitator, during which members talk freely and spontaneously about a certain topic (Morgan, 1993; Krueger and Casey, 2000). This researcher used FGDs to obtain specific information from farmers on group structure, activities carried out, type of crops and livestock enterprises farmers produced and managed and marketing of these crops and livestock.

Lindlof and Taylor (2002) describe participant observation as a professional craft of experiencing and recording events in a social setting. This researcher used participant

[3] See Chapter Four for detailed comparison and analysis of these strategies using the pre-determined criteria.

observation to understand the social setting and activities that farmers carried out in each community. The researcher used household interviews to quantify specific information from farmers--particularly on the extent to which women farmers participated in the market, the benefit women farmers derived from each strategy and the trade off on soil fertility management technologies between food and cash crops.

Formal questionnaires (see Appendix C) were used to collect information from farmers in groups and individual household interviews. In this phase, the researcher aimed to achieve the following objectives:

1. To determine and analyze the extent to which women farmers participate in the market.
2. To determine what benefits women farmers derive from participating in the market.
3. To analyze the trade off on soil fertility management technologies between food and cash crops.

Selection of Groups for Focus Group Discussions

Before conducting focus group discussions (FGDs), the researcher obtained a list of all active groups/associations and members working with each strategy. The groups were characterized in terms of the following criteria:

a) Type of groups or associations (women only or mixed)
b) Number of years the groups/associations have operated
c) Formed vs. existing groups
d) Type of agroenterprises implemented by farmers

Based on the characterization process, the researcher aimed to select four groups (mixed or women only) from each strategy, making a total of 24 FGDs. The number of participants in each FGD was 10-12 (75:25 female to male ratio for the mixed groups). However, depending on the actual number of active groups in each strategy, the researcher conducted 17 FGDs indicated as follows:

- Demand Driven (DD)/ICRAF: Two groups
- Enabling Rural Innovation (ERI)/CIAT: Three groups
- Linkage through Farmers Association (LF)/ASSMAG, Trader-Led (TL)/NASFAM and Area Development Program (ADP)/World Vision: Each, four groups

Selection of Farmers for Household Interviews

Individual farmers were systematically and randomly selected for household interviews from the list of active groups that worked with each strategy. The researcher aimed to interview 50 farmers (40 women and 10 men) from each strategy, making a total sample size of 250. The focus of this research was to obtain more information from women; hence, it was decided to select and interview more women than men. However, based on the characterization and composition of the active groups in each strategy, the researcher interviewed 170 respondents (137 women, 33 men). The difference between expected and actual sample size was due to the minimum number of active farmers groups working with CIAT (three groups) and ICRAF (two groups). In addition, ICRAF had the least number of farmers in the groups. For example, the Magomero fruit-processing group had only five women farmers out of ten farmers.

The Development of Instruments

The study used both qualitative and quantitative research methods. The researcher used informal and formal interviews, and participant observation to collect data from key informants and farmers. This researcher built on the expert panel within CIAT and University of Florida, and a pilot study (pre-dissertation field work) to develop informal and formal questionnaires (Appendix C). Appendix D presents the methodology framework that this researcher developed with an expert panel from CIAT and used as a guide in collecting specific information required by this research to identify variables of interest and methods for data collection and analysis.

Reliability and Validity of the Results

Validity means the closeness of a research finding to physical reality (Chambers, 1997; Davis, 2004)). On the other hand, reliability is the extent to which an instrument is consistent in measuring, or to which a particular technique will always yield the same results (Lindlof and Taylor, 2002; Davis, 2004).

The validity and reliability of participant observation and FGDs qualitative research methods used were achieved by evaluating multiple forms of evidence. Hence, triangulation and multiple observers were used to overcome the style and any biases or shortcomings of the principal researcher. According to Ary et al (2002) and Lindlof and Taylor (2002), triangulation requires that multiple sources of information be brought to bear on the interpretation of a particular indicator thereby guarding the interpretative bias of the analyst. This research used multiple sources of information (key informants, observations, FGDs and household interviews) to dispel doubts about the reality of the research findings and to reach a mutual agreement of emerged themes between the researcher and other observers. In addition, this researcher pre-tested the instrument used for FGDs and household interviews to ensure validity and reliability of data collected from farmers.

Variables of Interest to this Research

The variables for this research are categorized based on the following three main objectives:

Objective Two: To determine and analyze the extent to which women farmers participate in the market using the following indicators.

Research Variables:

- Quantity sold
- Enterprise produced
- Whether women are selling in central markets (who sells)
- Which markets women sell in

- Price per kg sold
- Total income obtained
- Who owns income
- Who decides on the use of income

Objective Three: To determine what benefits women farmers derive from participating in the market.

Research Variables:

- Amount controlled by women vs. amount controlled by men
- How income was spent? (investment patterns)

  -Food and nutrition

  -Soil fertility management

  -Children's education

  -Asset building (new houses, restaurants, grocery stores, livestock etc.)
- Capacity development (knowledge and skills obtained)
- Empowerment (application of knowledge gained)
- Gender-related benefit: decision-making, roles and responsibilities, wife-husband relationships, self-confidence, social networks/relationships and women's workload.

Objective Four: To analyze the trade off on soil fertility management technologies between food and cash crops.

Research Variables:

- Percentage of farmers who used soil fertility management technologies (SFMTs)
- Which were the most used SFMTs (which technologies were most used by women)
- Variation in use across different crops (trade off between food and cash crops)

These variables would be analyzed by the SPSS computer program using descriptive statistics such as means, counts, cross tabulations, frequency and percentages. Advanced analyses using correlations would be used as found necessary. The following are major assumptions for this research.

a. Linking farmers to markets improves participation of women farmers in the central markets.

b. Women farmers derive benefits from participating in the strategies for linking farmers to markets.

c. Enhanced market opportunities improve food security among farmers.

d. Enhanced market opportunities increases investments in soil fertility management for food and cash crops.

Chapter Summary

Chapter Three describes the geographical area in which this research was conducted and methods used to collect and analyze data from key informants and farmers. Since the research was divided into three phases, the researcher described methods for data collection and analysis by research phase. Chapter Three also covers the methods used to select groups for focus group discussions and farmers for household interviews. In addition, the researcher explained how instruments for informal and formal interviews were developed, measures taken to ensure the validity and reliability of the results and the informed consent procedures followed.

Chapter Three briefly describes the organizations involved in this research and highlighted strategies used by each of these organizations to link farmers to the markets. A more detailed description and analysis of these strategies will be covered in Chapter Four.

Figure 3-1. Map of Malawi indicating location of central and southern regions (Free Online Download: geography.about.com)

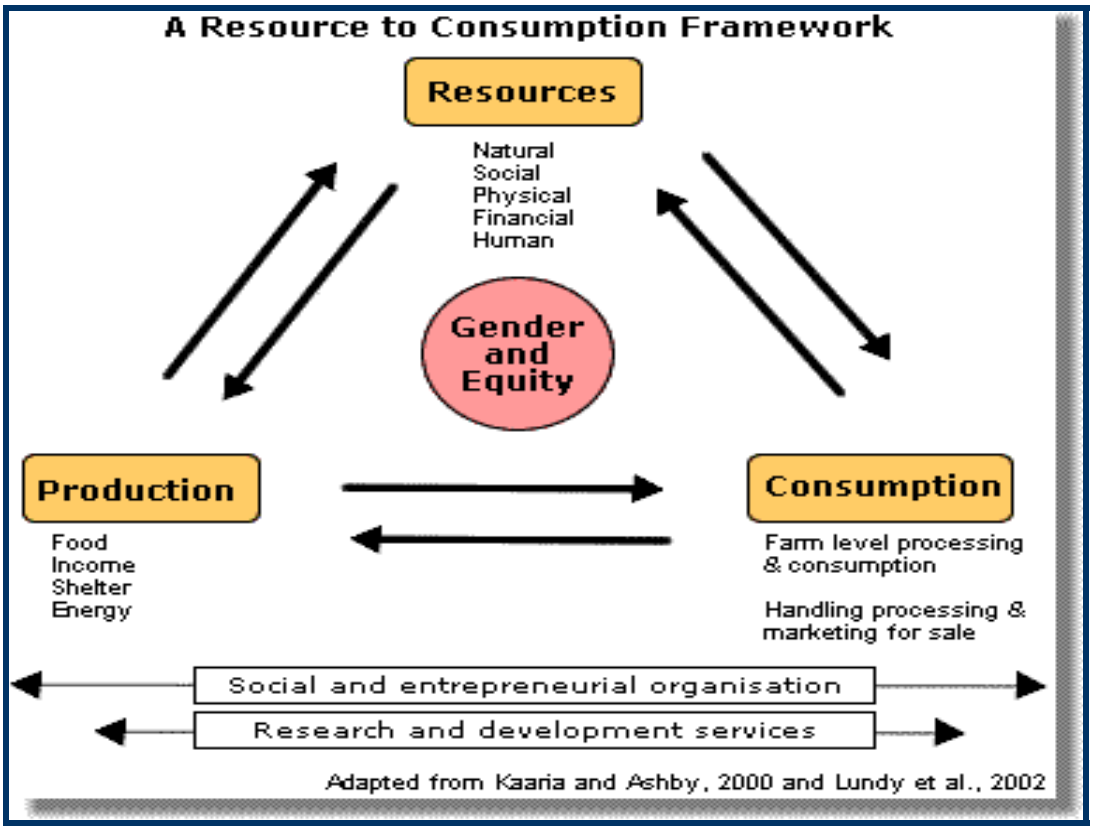

Figure 3-2. The resource-to-consumption framework. (Internet source: CIAT 2006)

CHAPTER 4
RESULTS AND DISCUSSION

Introduction

Chapter Four presents results and discussion of the research beginning with the characteristics of the sample. Then, results for the four research objectives will be presented covering analyses of strategies for linking farmers to market using pre-determined criteria set forward by the researcher, the extent to which women farmers participated in the market, benefits that women farmers derived from participating in the market and trade-off on soil fertility management between food and cash crops.

Farmers' Characteristics

This section presents the general characteristics of farmers interviewed under the research, and compares these characteristics across strategies. The discussion in this section focuses on farmers' sex, marital status, farmers' headship, levels of education and land ownership. In addition, this section presents characteristics of farmers based on ownership of other assets such as livestock; household assets such as foam mattress, chairs and bicycles; hard assets such as houses and automobiles and type of non-enterprise crops that farmers produced.

Farmers' Sex, Marital Status and Farmer's Headship

In many parts of the world today there is an increasing trend towards the feminization of agriculture (FAO, 2007b). As men's participation in agriculture declines, the role of women in agricultural production becomes ever more dominant. Different factors have reduced the rural male population including, but not limited to, migration of men from rural areas to towns and cities in search of paid employment and sickness and death from HIV/AIDS. In Malawi, the rural male population dropped by 21.8 percent between 1970 and 1990 (FAO, 2007b). During the same 20-year period, the rural female population declined by only 5.4 percent.

This trend has resulted in an increase in the proportion of households headed by women (both de Jure and de facto) in many countries in Sub-Saharan Africa (SSA). Studies have shown that women heads of household tend to be less educated than their male counterparts (FAO, 2007b). They also generally have less land to work and even less capital and farm labor to help them improve agricultural productivity (Ngwira, 2007). Recognizing the very important role played by women in household food production in Africa overall, and in Malawi in particular, this research chose to target more women than men, but still recognizing the need to obtain perceptions of men toward the benefits that women farmers derived from participation in the market.

This researcher interviewed 170 farmers, 137 (80.6 %) were women and 33 (19.4 %) were men. Table 4-1 reports the percentage distribution of farmers for marital status, land ownership and farmers' headship by sex. The results indicate that 116 (68.2%) of the farmers were married. Of the 54 non-married farmers, one farmer was a man and 53 were women. Hence, this researcher interviewed 117 (68.8 %) male-headed households and 53 (31.2%) female-headed households. When comparing characteristics of respondents by strategies, the results show that women regardless of their marital status were more represented than men, which is expected because the focus of this research was to interview more women than men. There was, however, about equal representation of farmers who were married and those who were not married across strategies.

Land ownership by farmers

Malawi is on the verge of a land reform process that was initiated in 1995 when the World Bank took a leading role in providing support for a Policy Planning Unit in the Ministry of Lands and Valuation to guide the land policy reform process and strategic action plan (Enemark and Ahene, 2002). The goal of the Malawi National Land Policy is to ensure tenure security and

equitable access to land and to help people improve their socio-economic conditions through sustainable utilization of land based resources. Despite the potential for the land reform process, property ownership and inheritance rights are still socially constructed and continue to create social and economic insecurity among women and disadvantaged people in Malawi (Ngwira, 2007). Nevertheless, using the new National Land Policy (NLP), the Malawi government has achieved the following:

a) Promoted the decentralization of Land Registry Offices to local government areas

b) Initiated programs to empower communities through the establishment of Village Land Committees (VLC) to directly negotiate their own demarcation and registration

c) Institutionalized the role of Traditional Authorities (TAs) to oversee land management issues including the formalization of property rights and specifications of land ownership

d) Improved customary tenure systems and provided more opportunities for individuals and family land ownership

The general results in Table 4-1 show that 164 (96.5%) farmers owned land and six (3.5%) did not own land for agricultural activities. The same Table 4-1 shows that all 33 male farmers owned land, implying that the six farmers who did not own land were female farmers. Out of six female farmers who did not own land, four were female headed-households. This researcher, however, noted that married females co-shared land with their husbands. Moreover, farmers who owned land and those who did not own land also rented land for agricultural activities.

Table 4-2 reports land ownership by farmers across strategies. On average the majority of farmers across strategies owned land. Very few farmers--particularly those who worked with LF, ERI and TL--did not own land for agricultural activities. Table 4-3 presents percentage distribution of farmers who owned land by sex across strategies. This research found that a majority of farmers--particularly women--owned an average of between 2.1-10 acres. In addition, LF and TL women farmers owned an average of land above 25 acres. This finding is

not a typical example of land ownership by the majority of smallholder farmers in Malawi as documented by Anderson (2002). Anderson (2002) found that the majority of farmers in Malawi owned small land holdings between 1-2 acres.

Table A-1 of Appendix A reports the results on land ownership by farmers' headship. The results show that female-headed households within LF and DD strategies owned more land than male-headed households. Otherwise, male-headed households within ERI, TL and ADP owned more land compared to female-headed households.

Levels of education

Education in Malawi has experienced major changes since the advent of Multiparty Democracy and the introduction of free primary education in 1994. As a result of free primary education, school enrollment almost doubled from 1.8 million to 3.2 million between 1994 and 1997 (Commonwealth education, 2003). Despite the increase in enrollment, the education system in Malawi is facing serious challenges including the impact of HIV/AIDS on teachers, shortage of classrooms and gender disparities which often has resulted in high dropout rates for girls (Commonwealth education, 2003). This situation led to a major shift in Civil Society/NGOs activities from service/relief delivery to educational interventions such as school construction and the provision of school materials, policy and advocacy to improve the quality of education in Malawi.

Table 4-4 indicates farmers' levels of education by sex. The general results indicate that 11.8% of all farmers interviewed had no formal education, 64% had primary education (28.8% had standard 1- 4 primary education and 35.9% had a standard 5-8 primary education), 19.4% had secondary education and 4.1% had tertiary education (college certificates and diplomas). Women represent the highest percentage of responses for those farmers who had less than 8th

grade education. Over 81 percent did not go past 8th grade compared to 57 percent for men farmers.

Table 4-5 reports the levels of education of farmers across strategies. LF farmers were fairly distributed across all levels of education. In fact, LF was the only strategy having more than one farmer who went to the tertiary (college) level of education. With the exception of the ERI strategy, other strategies represented a fairly large number of farmers who went through secondary level of education.

Ownership of other assets

In addition to land ownership and levels of education of farmers, this section reports characteristics of farmers based on ownership of other assets such as livestock, television, radio, mats, foam mattress, bicycle, houses, and vehicles. According to the farmers interviewed, they considered themselves wealthy if they owned these assets and poor if they did not own them. The researcher categorized these assets into household, livestock and hard assets.

For the household assets, the majority of farmers studied owned radios locally known as *wireless* and bicycles. This researcher observed that the majority of people in rural areas in Malawi used radios as major means of communication to learn what was happening in the outside world. Farmers also received radio news from agriculturally designated programs on prices for agricultural commodities, markets where farmers could sell agricultural produce and sources of agricultural inputs including fertilizer and seed. Farmers used bicycles as a major means of transportation. Farmers reported they purchased these assets with income obtained from selling crops and livestock they produced and managed with market-linkage strategies. Detailed information on the ownership of livestock and other assets by farmers can be found in Figure 4-1 and in Appendix A respectively.

Non-Enterprise Crops Produced by Farmers for Home Consumption or Sale

Apart from implementing crops and livestock enterprises with strategies for linking farmers to market, farmers also produced and marketed non-enterprise crops and livestock at household levels. However, this researcher did not go into the detail of amount of these crops and livestock that farmers produced and sold. Figure 4-2 presents percentage distribution of all farmers studied by non-enterprise crops they produced. Results show that the majority of farmers produced hybrid maize, groundnuts, sweet potatoes, soybeans, local maize and tobacco. Very few farmers produced cassava and paprika. Farmers produced these crops either for food only, income generation only or for both food and income. Additional information on percent distribution of non-enterprise crops produced by farmers across strategies can be found in Table A-5 of Appendix A.

Objective One: Identify and Analyze Strategies Used by Organizations to Link Farmers to Markets using the Institutional Framework

This section begins by describing the organizations and strategies they used to link farmers to market. Then, it analyzes strategies used by organization to link farmers to markets using the institutional framework (IF). The IF is a means of assessing the organizational capacity and a way to yield a comprehensive approach for diagnosing and documenting the strengths and weaknesses of different organizations using specific criteria.

Description of Organizations and Strategies used to Link Farmers to Market

International Center for Tropical Agriculture (CIAT)

The International Center for Tropical Agriculture (CIAT) is one of the centers of the Consultative Group on International Agricultural Research (CGIAR), which is a strategic partnership of countries, international and regional organizations and private foundations. It fosters sustainable agricultural growth through high-quality science aimed at benefiting the poor

through stronger food security, better human nutrition and health, higher incomes and improved management of natural resources.

CIAT, as a not-for-profit research and development organization, is dedicated to reducing poverty and hunger while protecting natural resources in developing countries. According to CIAT (2006), the tropical world is facing tremendous challenges in poverty, malnutrition and environmental degradation. CIAT believes that with the right kind of support, rural people across the tropics, who account for most of the world's poor, are capable of improving and sustaining rural livelihoods. Hence, CIAT's core mission is to reduce hunger and poverty in the tropics through collaborative research that improves agricultural productivity and natural resource management. CIAT operates in Latin America, Africa and Asia, with headquarter in Colombia.

CIAT's research program in Africa aims to help rural communities in the region to build sustainable livelihoods. In Africa, CIAT has engaged with national and international organizations to form wide ranging partnerships around three core areas: enabling rural innovation, managing natural resources and developing and accessing agro-biodiversity (CIAT, 2005).

CIAT used the Enabling Rural Innovation (ERI) strategy to enhance the capacity of the rural poor to improve their livelihoods and to link farmers to markets (Kaaria, 2005). Through ERI, CIAT also implements sustainable management of natural and other resources. ERI is an integrated approach for research and community development that focuses on building local capacities and strengthening social organization and entrepreneurial skills of farmers, using a mutual, collective learning process for empowering rural communities to better manage their resources (Kaaria, 2005). ERI organized and strengthened farmers groups. Moreover, ERI

identified and developed potential agroenterprises with farmers for improved food security and income.

The ERI approach used the resource-to-consumption framework (Figure 2-1) that expands conventional production to consumption and natural resource management based on community assets to meet the needs of food production and income generation of the farm families (Kaaria and Ashby, 2000; Kaaria, 2005). In the ERI project, the major assumption was that increased income from markets could lead to improvement in food security and provide farmers with stronger incentives to adopt and invest in natural resource management (NRM) (Kaaria, 2005).

According to Kaaria (2005), ERI key principles included such aspects as farmer participatory research approaches, market orientation and competitiveness, effective partnerships between communities and research and development service providers. ERI also focused on equity and gender considerations, investment in NRM, community empowerment, agroenterprise development, building capacities of communities and partners, and building on farmers' assets and opportunities for income generation (Kaaria, 2005). The ERI program has been implemented in Uganda, Tanzania and Malawi. In Malawi, ERI worked in collaboration with the Malawi government, Plan International-Malawi and the private sector (Mtenga et al., 2005a). ERI operated in the central region of Malawi covering Lilongwe, Dedza and Kasungu districts. However, in 2006 initiatives were underway to expand the project's activities to the northern region covering the Mzuzu district.

The World Agroforestry Centre/ICRAF

The International Council for Research in Agroforestry (ICRAF) was created in response to a visionary study in the mid-1970s led by forester John Bene of Canada's International Development Research Centre (IDRC) (ICRAF, 2007). The study called for global recognition

of the key role trees play on farms. This led to the establishment of ICRAF in 1978 to promote agroforestry research in developing countries.

During the 1980s ICRAF operated as an information council focused on Africa. It joined the Consultative Group on International Agricultural Research (CGIAR) in 1991 to conduct strategic research on agroforestry at a global scale, changing its name from Council to Centre. The Center's goal is to reduce poverty, increase food security and improve the environment--through two means--overcoming land depletion in smallholder farms of sub-humid and semi-arid Africa, and searching for alternatives to slash-and-burn agriculture at the margins of the humid tropical forests. ICRAF operates in Latin America, South and Southeast Asia and Africa.

The World Agroforestry Centre/ICRAF Southern Africa (ICRAF-SA) program covered Malawi, Mozambique, Zambia, Zimbabwe and Tanzania. The program aimed to address problems such as low agricultural productivity due to loss of soil fertility, decreasing access to fuel wood, fodder, gender imbalances and the adverse impact of HIV/AIDS in agriculture (ICRAF, 2003, 2004). The global research and development themes of ICRAF were broad and covered land and people, environmental services, strengthening institutions, and trees and markets. However, this research was on one of the ICRAF's projects that focused on domestication of indigenous fruit trees for instance, masuku *(uapaca kirkiana*) and Masau (*Ziziphus mauritiana*); processing and commercialization of tree-based products such as jams, juice, wine and pulp and raw fruits.

ICRAF used the demand driven (DD) strategy to build the capacity of farmers in the production, processing and marketing of indigenous and exotic fruits and to link farmers to the markets. According to ICRAF (2004), the demand driven strategy aimed to restore and sustained local trees and their products for improved food security and quality of soil. Hence, this strategy

engaged in research on local trees and markets that involved the process of fruit tree domestication, processing and commercialization. The following are major reasons for the implementation of fruit tree domestication, processing and commercialization project in Malawi:

- Wild sources decline due to genetic erosion, over exploitation and/or difficult access,
- In forest reserve areas, for instance, Zomba in Malawi, agroforestry and domestication and commercialization of indigenous fruit trees were important strategies for sustainable utilization and management of natural resources and biodiversity conservation,
- To meet the growing demand for tree products from higher population increases for new and/or external markets,
- To make local people appreciate the value of fruit trees such as *masuku (Uapaca kirkiana*) (See Figure 2-2) and *Masau* (*Ziziphus mauritiana*) for increased food security and income generation.

The project on domestication, processing and commercialization of fruit trees focused more on women and children. Women and children were the major sellers of fruits alongside roads during fruit seasons in Malawi (ICRAF, 2004; Mtenga personal observation, 2005-2006). School children participated in training events in nursery management. Informal discussions with key informants showed that six women's groups were trained in the processing and marketing of indigenous fruit tree (IFT) products. However, this researcher found that only two women's groups actively involved in the processing and marketing of by-products from indigenous fruits in Zomba and Chiradzulu districts.

Generally, the IFT processing and marketing project was a potential source of livelihood to small-holder women farmers. Many of the indigenous fruits and their oils have potential for market and home consumption. They have strong sweet flavors and are rich in minerals, vitamins and essential amino acids (ICRAF, 2004). The products from indigenous fruit trees were also used for carving masks and medicinal purposes. For instance, some of the fruit tree extracts were used as substitutes for anti-retroviral drugs for people living with HIV and AIDS.

ICRAF was actively involved in soil fertility management through sustainable utilization of natural resources (land/soil, water and wildlife), protection of endangered species, protection of water and soil resources including soil microorganisms, and in reducing water and soil erosion. ICRAF aimed to involve and reach more women in its project areas; hence, beginning in the year 2003, ICRAF's policy started to explicitly integrate gender and HIV/AIDS dimensions in each plan of work. Although the project on domestication and commercialization of indigenous fruit trees operated only in the southern region, ICRAF worked on a number of other projects across all three regions. In partnership with NGOs, the Malawi government and farmers groups, ICRAF operated in the following areas:

a. Southern region: Zomba, Chiradzulu, Blantyre, Thyolo, Mulanje, Chikwawa, Machinga, Phalombe and Balaka
b. Central region: Lilongwe, Salima, Kasungu, Mchinji, Dedza, and Ntcheu
c. Northern region: Rumphi and Mzimba

National Smallholder Farmers' Association of Malawi (NASFAM)

NASFAM is a member-owned organization providing business services to its smallholder farm members. Founded on the principles of collective action and self-reliance, NASFAM empowered farmers at the grass-roots level as they formed cohesive village-based clubs and financially independent business associations in order to improve incomes and contribute to overall economic development of Malawi (NASFAM, 2005).

NASFAM used the trader-led (TL) strategy to promote farming as a business and to link farmers to potential markets at national and international levels. According to FAO (2007c), this category of linkage shows the importance of both farmers and traders to develop markets together and the critical role that external organizations could play to facilitate the linkages. In the present research, NASFAM TL strategy is slightly different from that identified by FAO in

Bangladesh and El Salvador, where traders and farmers developed markets together. NASFAM TL strategy organized farmers to produce quality groundnuts and made contractual and price agreement for marketing of crops. NASFAM purchased crops from farmers, owned the crops and sold to the identified markets. Farmers were paid cash at the time of sale.

The trader-led strategy was a four year collaborative strategy between NASFAM and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) that began in 2003. ICRISAT is another CGAIR center that serves the poorest of the poor in the semi-arid areas of the developing world. The collaborative TL strategy was initiated by ICRISAT and aimed at improving smallholder farmers' livelihoods through technology development and market improvement. This strategy mainly focused on groundnuts (Estrada-Valle and Siambi, 2003). ICRISAT also implemented the trader-led strategies with Plan International, World Vision and IDEAA.

The NASFAM-ICRISAT trader-led strategy was supported by a USAID project entitled *Promoting Growth in Malawi's Groundnuts and Pigeonpea Trade through Technology and Market Improvement*. NASFAM was supported by ICRISAT in areas of crop production and marketing. The TL strategy was built on the supply and demand-side interventions by:

- Identifying high-value market opportunities,
- Identifying grades and standards required by final markets and developing quality management systems,
- Developing and disseminating market-specific natural resource and crop management strategies,
- Structuring sustainable private-sector driven seed supply systems, and
- Engineering partnerships between smallholder organizations, NGOs and private sectors agents.

NASFAM offered training and communication programs to individual members, association leaders and staffs to build their capacity on crop production and supply of quality crops (NASFAM, 2005). The training programs focused on agricultural and business development and management skills. Moreover, NASFAM focused on improvement of marketing systems and rural infrastructure and adult literacy training that gave farmers increased power to conduct farm business.

NASFAM collaborated with a number of organizations (NGOs, government and private) and operated in all three regions focusing primarily on only a few major crops: tobacco, rice, chilies, groundnuts, and cotton. Crops such as soybeans, sorghum, pigeon peas, paprika and sunflower were given secondary importance by NASFAM. The association management centers were located in Karonga, Rumphi, South Mzimba, Kasungu, Mchinji, Lilongwe, Ntcheu, Balaka, Namwera, Zomba and Mulanje. NASFAM involved 86,312 members (57,008 men and 29,304 women).

An informal discussion with key informants showed that NASFAM considered soil fertility management as one of its priority activities. Through partnerships with ICRAF, Natural Resource College (NRC) and Bunda College, NASFAM trained member associations in different soil management technologies including chemical fertilizer, water and conservation farming practices such as contour banding, organic manure, crop rotation, irrigation farming and tree planting activities.

Similarly, gender integration was considered very important in order to involve more women and empower them to derive more benefits from agricultural production. NASFAM strengthened the activities of Association Gender Offices (AGOs) and sub-committees to carry out gender awareness campaigns and sensitization programs at the local association level.

Gender training programs covered aspects of intra-household relationships, women's leadership, women's participation in agricultural production and resource ownership.

World Vision

World Vision is a Christian relief, development and advocacy organisation dedicated to working with children, families and communities to overcome poverty and injustice (World Vision, 2007). Inspired by Christian values, World Vision is dedicated to working with the world's most vulnerable people. World Vision operates in 96 countries world wide and has reached more than 100 million people.

The World Vision-Malawi (WV) project was initiated 1982 with the aim to improve infrastructure for education that involved building school structures particularly for primary education. But, due to problems of food shortages, children failed to go to schools to use the structures that were built by the project. Due to this realization, World Vision added a food security program in order to improve food security among the rural farmers. World Vision implemented both developmental and relief programs. However, this research focused only on developmental activities--particularly the production and marketing of crops and management of livestock for improved food security and increased income by farmers. Activities under the developmental program included seed multiplication for maize, groundnuts, beans, sorghum, sweet potatoes, cassava and soybeans; general farming; small-scale and large-scale irrigation; community grain banks and soil and water conservation.

World Vision used an Area Development Program (ADP) strategy to improve agriculture and food security to facilitate marketing of crops and livestock produced and managed by farmers. According to Mandere et al. (2004), the ADP is a multi-sectoral integrated strategy that aimed at bringing about transformational development in social, economic, environmental and spiritual aspects for marginalized groups of people in rural communities. Mandere et al.

(2004) defined transformational development as a process and action through which children, families and communities move towards wholeness of life with dignity, peace, justice and hope. The ADP strategy is child-focused, community-based, sustainable and holistic. World Vision collaborated with the University of Malawi, Bunda College, CIAT, ICRISAT, International Maize and Wheat Improvement Centre (CIMMYT), ICRAF and World Fish. World Vision-ADP strategy covered 25 districts in Malawi.

Informal discussions with key informants revealed that World Vision integrated gender components to all its activities (Kusamale and Phiri, 2005). Besides, World Vision involved more women in the following:

- Capacity building training programs in areas of production, marketing, group work, leadership and gender issues. Training in gender covered aspects of equal opportunities, gender relationships, sharing roles and decision making, and benefits at household levels. Moreover, World Vision trained farmers to conduct gender analysis at household levels.

- Selection of women farmers that participated in the project. World Vision aimed at ensuring gender equity in terms of equal representation and benefits derived from different activities. In different committees, about 40 percent of women farmers were represented in various decision-making roles.

- Financial management and how both women and men should differentiate money and wealth (assets)/asset building.

World Vision put much emphasis on environmental conservation--particularly soil fertility management--in order to bolster food security and income of the farmers in Malawi. Apart from using chemical fertilizer, farmers collaborating with World Vision also used improved fallow technologies including Tephrosia and intercropping maize with Gliricidia.

ASSMAG (Association of Smallholder Seed Multiplication Action Group)

The Association of Smallholder Seed Multiplication Action Group (ASSMAG) is an umbrella organization for various Seed Marketing Groups (SMAGs) of smallholder farmers in Malawi (ASSMAG, 2005). ASSMAG operated at SMAG levels for easy procurement of inputs

and loans. Two to three SMAGs joined to form affiliate associations at the Agricultural Development Division (ADD) level. From each affiliate association, leaders were elected to represent smallholder farmers. These leaders joined and formed ASSMAG as a national association. ASSMAG operated at the national level and had 2,400 farmers.

Funded by the European Union (EU), ASSMAG was launched in November 2001 with an overall objective of making available to farmers reliable, affordable and sustainable high quality seed. The association produces various seed crops through smallholder farmers and market seed as a group to various organizations and individual farmers. Popular seed crops produced by members in different groups included: open pollinated maize (OPV) varieties, groundnuts (CG7 and jL24 varieties), beans, cassava, sweet potatoes, sorghum, soybeans, rice, fruit-tree seedlings for mangoes, oranges and banana.

Specifically, ASSMAG aimed at empowering smallholder farmers through capacity building training programs in areas of production and marketing of high quality seed focusing on: farm management, group dynamics, leadership skills and record keeping. ASSMAG was managed by farmers themselves with technical support from EU in areas of financial management, governance and law. In addition, ASSMAG performed an extension role through farmers' demonstration plots, and made contractual agreement with lenders on behalf of individual associations.

Generally, ASSMAG organized marketing activities of all seed crops produced by farmers. Through ASSMAG, member affiliate associations have been linked to different buyers. FAO (2007c) identified this type of market-linkage as linkage-through-farmers (LF) strategy. This researcher found that LF strategy for linking farmers to market organized farmers to produce seed of different crops, identified markets for seed crops produced by farmers and made price

and contractual agreements with buyers. This strategy also organized transportation of seed crops to warehouses for processing and then to buyers and sold seed crops on behalf of farmers. Farmers were paid later after ASSMAG sold seed crops to buyers.

The Malawi government was one of the buyers of seed produced by ASSMAG farmers. The Malawi government bought seed from ASSMAG and distributed the seed as starter packs in different communities. In 2005, the Malawi government bought more than 5,000 metric tons of seed from ASSMAG. Other potential buyers included the Association for Promotion of Sustainable Agriculture in Malawi (APSAM), World Vision, Concern Universal, World relief, Action Aid and church organizations. Some of these organizations bought raw seed, while others purchased processed seed.

The Agricultural Productivity Investment Program (APIP)--European Union program, the Ministry of Agriculture, and the Chitedze research station were major partners of ASSMAG. The Chitedze research station served as a major seed source and also trained farmers as seed - and para-inspectors for seed quality assurance. APIP played a facilitation role in the procurement of cash loans by ASSMAG and the EU provided financial support to cover most of the training programs, inspection and office costs.

The association did not explicitly integrate gender into its seed multiplication activities, but encouraged equal participation of both men and women in seed multiplication activities. According to informal discussion with ASSMAG leaders, about 40 percent of women participated in farming and leadership roles at SMAGs levels. However, this research found that very few women participated in leadership roles at the ASSMAG level.

ASSMAG put considerable emphasis on soil fertility management--particularly using crop rotations. All ASSMAG members were required to practice crop rotations. If a farmer did not

employ crop rotations he or she could be disqualified from being a member of ASSMAG. Farmers also used a number of land conservation methods such as ridging, contour bands and vertiver grass.

In sum, this research found that the organizations implemented distinct strategies for linking farmers to market. However, these strategies shared a common understanding and recognition of the following:

- The crucial role women play in the agricultural production activities and that efforts to improve agricultural production and overall food security and income must focus on women as major stakeholders and of agricultural technologies.
- Women's empowerment is an important consideration for them to take a pro-active role in household as well as community decision-making processes.
- The need to involve farmers-- particularly women--in different enterprises for improved food security and income and overall reduce hunger and poverty among rural communities.
- Improved market access is very important to help farmers increase their income as an economic incentive to reinvest in soil fertility management.

Analysis of Strategies Used by Organizations to Link Farmers to Markets using the Institutional Framework

This researcher set forward comparable criteria as guides for analyzing strategies for linking farmers to markets using the institutional framework. The following is a list of pre-determined criteria that the researcher used to compare and analyze strategies for linking farmers to market:

a) Area of coverage
b) Number of farmers (men and women) reached
c) Level of operation (individual farmers/groups or associations/communities
d) Type/diversity of crops and/or livestock enterprises implemented by farmers
e) Integration of gender and community empowerment
f) Focus on soil fertility management
g) Type of support offered

Table 4-6 presents a summary of this analysis using an index score of x for low, xx for moderate and xxx for highest. This analysis was performed based on the information collected from key informants and farmers during informal interviews and focus group discussions. In terms of analyzing quantitative information--area of coverage, number of farmers reached and enterprises implemented--the lowest index score represents the lowest area covered, number of farmers reached and enterprises implemented.

The analysis of qualitative information such as the integration of gender focused on whether strategies have a gender unit and on gender training offered to farmers. The analysis on soil fertility management focused on whether the strategies implemented soil fertility management technologies and type and number of soil fertility management technologies implemented by farmers. There was a variety of support offered by each strategy, which include training, inputs, capital or credit and market linkages. This researcher, however, focused on how each strategy sustained market linkages.

Geographical Area Covered and Number of Farmers Reached by each Strategy

The geographical area is the scale at which the strategies for linking farmers to market operated. LF and TL are national farmers' organizational strategies, ADP is an international church organizational strategy operated in different countries world-wide. ERI and DD are international organizational strategies.

TL, LF and ADP strategies covered a larger geographical area and reached more farmers than did ERI and DD strategies. They operated in all eight Agricultural Development Divisions (ADDs) of the country. Hence, they received higher scores (xxx) than did ERI and DD strategies that received lowest scores (x) on scales of operation.

TL has reached 86,312 farmers (29,304 women) and LF has reached 2,400 farmers (960 women). ERI strategy worked in the central and northern region covering 13 farmers groups, while DD strategy operated only in the southern region covering six farmers' groups. However, the actual total number of farmers that ERI, ADP and DD worked with was not available.

Levels of Operation

There are two tiers (levels) through which each strategy could operate with farmers--individual farmers and farmers in groups. This research found that all strategies for linking farmers to the market worked with farmers in groups. During the focus group discussions (FGDs), farmers mentioned different reasons for them to work in groups. Table A-6 of Appendix A provides a summary of the major reasons for farmers to work in groups rather than individually. Increase in income, easy marketing and training were the major reasons listed by farmers across groups. In sum, this researcher found that while farmers worked in groups as a form of collective action in marketing and as a strategy to increase access to resources and services, they also produced and managed their crops and livestock enterprises individually at household levels.

Diversity of Enterprises Implemented by Farmers

Type of enterprises (agroenterprises) means crops and livestock produced and managed by farmers in each strategy. Diversity of enterprises means a variety of enterprises produced and managed by farmers in each strategy. Figure 4-3 displays the general results on types of enterprises implemented by all farmers studied, where the majority of farmers produced groundnuts. About one third produced Open Pollinated Variety (OPV) maize, beans and soybeans. A few farmers processed fruit products, mushroom or chilies.

In the case of livestock enterprises, only ADP and ERI strategies focused on the management of livestock enterprises. LF farmers managed improved pigs and dairy cows and

LF farmers managed improved and local goats and chickens. The following is a summary of type of enterprises implemented by farmers in each strategy:

LF Maize, groundnuts, soybeans and beans,
ADP Maize, groundnuts, soybeans, beans, mushroom and improved goats,
TL Soybeans, groundnuts and chilies,
ERI Beans, pigs and dairy cows, and
DD Indigenous and exotic fruits, fruits and food products

The Extent to Which Gender was Integrated in each Strategy

This researcher found that all strategies for linking farmers to the market involved women in production and management of crops and livestock enterprises. However, ERI, DD, TL and ADP explicitly integrated gender in implementing these enterprises. Table 4-6, indicates highest scores (xxx) for ERI, TL and ADP that covered a wide range of issues on gender, a moderate score (xx) for the DD strategy that covered limited issues on gender and a low score (x) for LF because it did not explicitly integrate gender.

Gender issues addressed varied by the strategy where the main gender issue addressed by LF was an equal representation of women and men into different interventions--particularly at Seed Multiplication Action Groups (SMAGs) levels. The DD strategy focused on women's enterprises and also focused on shared roles and responsibilities. ERI, ADP and TL strategies included aspects of equal opportunities and representations, leadership, household roles and responsibilities, decision-making, group work, conflict and conflict resolutions, group and intra-household relationships as major components to address issues of gender.

Informal discussions with women farmers revealed that gender awareness training programs in terms of equal representations and opportunities, leadership, household roles and responsibilities and decision-making have increased their freedom and confidence to participate in different interventions and in leadership roles. Overall, some of the women reported improvement in intra-household relationships and decision-making at the household level.

Examples were seen in ERI communities where women commented on improved intra-household relationships, increased confidence levels in public speaking, negotiation power, decision-making, shared roles and responsibilities and women's freedom to use household income accrued from different enterprises. Here is one farmer's story from a focus group discussion with regard to effect of gender training:

> …in the past, women here could kneel 3-5m away from the man if they were asking for money to purchase something, but this has changed. I can now take maize to the mill and pay without asking money from my husband… by ERI-female farmer.

Focus on Soil Fertility Management

Soil fertility management was an integral component of almost all strategies as each involved farmers in conservation farming methods to improve soil fertility. Major soil fertility management technologies that farmers used include crop rotations, contours and ridges, vertiver grass, agroforestry, chemical fertilizer, compost and animal manure.

As presented in Table 4-6, the DD strategy mainly focused on soil fertility management and hence received the highest score (xxx) compared to other strategies. The TL and ADP strategies partnered with the DD strategy or used most of DD's recommended technologies to improve soil fertility in the communities they worked with. The TL and ADP strategies received moderate scores (xx) on the focus on soil fertility management.

The ERI strategy emphasized the importance of integrating natural resource management (NRM) in its activities, but, ERI farmers showed limited participation in the soil fertility management technologies. Likewise, LF farmers reported participating in crop rotation rather than other soil fertility management technologies. The ERI and LF strategies received low scores (x) because they did not explicitly focus on soil fertility management at farmers' levels.

Focus on Community Empowerment

Community empowerment aims to point out whether strategies for linking farmers to market had any specific programs to empower the communities they worked with. The ERI, ADP and TL are community-based strategies reported having specific units with the role to empower communities to take a pro-active role in production and marketing of crops and livestock. Table 4-6 shows that the ERI, ADP and TL strategies received a higher score (xxx) on community empowerment than did the LF and DD strategies.

Type of Support Offered

Strategies for linking farmers to the market offered different types of support to help farmers establish crops and/or livestock enterprises. However, the type of support offered varied across these strategies. Some of the supports offered were provided free, while others were in-kind support where the strategies asked farmers to pass on to other farmers in the community the same amount of support given to them.

This researcher, however, focused on sustained market linkages or services as one of the support offered by each strategy. ADP and TL had strong and sustained market linkages that farmers became aware of even before they produced their crops. ERI, DD and LF had weak and unsustainable market linkages that made it difficult for farmers to sell their crops and or livestock. Nonetheless, the following sections provide more understanding of various support actions offered by each strategy and contributions made by farmers to establish crops and livestock enterprises.

The Enabling Rural Innovation: CIAT

ERI farmers were involved in the production of crops and management of livestock enterprises. For crop enterprises, farmers mainly focused on beans as their potential enterprise crops. For livestock enterprises, farmers focused on dairy cows and improved pigs. To establish

bean multiplication enterprises, farmers contributed land and labor for the management of beans. When individual farmers wanted to produce more seed crops, farmers also contributed cash to purchase the additional amount of seed needed. The ERI strategy supported farmers with the following:

- Initial free seed in the amount of 10 kg per community that was distributed to the first 10 households
- Initial free fertilizer
- Technical support in the production and management of crops and livestock enterprises
- Training programs that covered production and management of crops and livestock enterprises, diseases and pests control, marketing, leadership, HIV/AIDS and gender
- Linking farmers to potential buyers and to other agricultural service providers such as agricultural extension and research institutes.

For livestock enterprises, 10 initial households were selected to establish dairy cow and pig enterprises. For dairy cows, each initial household contributed 15,000MK for medicine/vaccines. The initial households involved in livestock enterprises contributed grasses for thatching, bricks for constructing animal houses (kola), nails and labor for the management of livestock (cleaning animal houses, feeding and watering). ERI, in collaboration with Plan Malawi for implementation of dairy cows, and with Lilongwe ADD for implementation of pigs, supported farmers with the following:

- Dairy cows that farmers purchased for a price of 15,000MK per cow,
- Free Improved pigs,
- Training programs in the following areas:
  - Enterprise development and management
  - Construction of animal houses
  - Preparation of animal feed/feed formulations
  - Marketing skills (how to identify markets, make contract with buyers and record keeping)
  - How to identify an animal in heat
  - How to identify an animal when sick

The Demand-Driven Strategy: ICRAF

The DD strategy worked in partnership with other organizations to support two women's groups--the Magomero and Chitukuko. The Magomero group initially worked with Community

Partnerships for Sustainable Resource Management (COMPASS) and Chitukuko group worked with the Malawi Hunger Project. The difference in collaborative initiatives was also a major cause of difference in support that farmers in these two groups received for initial investment in fruit processing enterprises. Farmers in both groups contributed labor for the daily management of their fruit processing enterprises.

In the case of the Chitukuko group, the DD strategy supported farmers with fruit processing machines (mango pulp) and training in fruit processing. The Malawi Hunger Project supported farmers with the initial capital to purchase processing equipment and utensils, and also offered training programs in food processing, gender equality, HIV/AIDS, group work and interactions among group members.

The Magomero fruit processing group was initiated by COMPASS, an organization that provided the group with the initial capital to purchase processing machines and other fruit processing utensils. COMPASS also paid rent on behalf of the group for the processing facility that the group was using. In addition, farmers were trained on how to process indigenous fruits, business management and HIV/AIDS. COMPASS supported farmers for one year, and then DD strategy took over and provided the following additional support to the group:

- Training in the production and processing of fruit products
- Supported group members training tours in areas such as Mzimba and NkhataBay to meet and learn from other farmers who were involved in processing activities
- Provided the group with a free processing machine (mango presser)
- Provided cash for farmers to pay rent for the processing facility they were using
- Organized contract training of other groups by farmers
- Introduce group members to national and international visitors
- Linked the group to potential markets, for instance, Annie's Lodge.

The Area Development Program: World Vision

This is a unique strategy in that one household could implement multiple seed crop enterprises, or a combination of crops and improved goat enterprises. To support the establishment of seed multiplication activities farmers contributed land, labor, manure and capital to hire additional labor, purchase additional seed and fertilizer, and they paid registration and annual fees (1,000 MK in total). The ADP strategy supported farmers with the following to help them establish the seed crop multiplication enterprises:

- Free seed of all crops, but only for the first year
- Free other materials such as treadle pumps, fertilizer, pesticides and sprayers
- Training in the following areas:
  - Seed multiplication
  - Crop management
  - Agroforestry
  - Leadership
  - Conflict resolutions
  - Gender – shared roles and responsibilities
  - Marketing skills (how to identify markets and how to keep records)
  - Linkage to potential buyers and other organizations such as Chitedze research station for seed and land verification/certification.
  - Market information

In addition to crop enterprises, two LF farmers' groups managed improved goats. Farmers preferred to manage meat rather than dairy goats because dairy goats did not acclimatize to their local farm conditions, hence, many of the dairy goats died. Farmers contributed animal feed, labor for the management of goats, material for the construction of animal houses and capital (15,000MK) to purchase animal drugs. The ADP strategy offered support to farmers in terms of the following:

- Free improved goats, but farmers had to contribute the initial capital to purchase animal drugs
- Linkage to buyers

- Training in the construction of animal houses, vaccination and identification of signs and symptoms of animal diseases
- Regular supervision and monitoring

The Trader-Led Strategy: NASFAM

TL farmers engaged in the production of groundnuts, soybeans and chilies, as enterprise crops. Among the four farmers groups visited, three produced groundnuts and soybeans and one group produced chilies. Despite the differences in crops that farmers produced, this study found that TL farmers contributed land and their own labor to support the initial establishment of the crop enterprises. For the production of groundnuts and soybeans, the TL strategy supported farmers with the following:

- Seed loans
- Purchase (buy - back) crops from farmers
- Training in the following areas:
  - Production and management of crop enterprises
  - Grading and packaging
  - Market research (how to identify markets, negotiate with buyers, and how to conduct cost and benefit analysis)
  - Gender – shared roles and responsibilities
  - Leadership
  - Conflict resolution
  - HIV/AIDS
  - Agroforestry technologies, and
  - Adult literacy

The chilies' group had a different experience working with the TL strategy. Before they registered with the TL strategy, individual farmers informally sold chilies to the TL strategy. However, when they sold individually to TL, farmers complained that TL offered a much lower price for chilies when compared to the registered farmers. The TL strategy encouraged non-registered farmers to form this group in order for them to receive higher prices. After they were registered, farmers paid a membership fee and also contributed labor to support the establishment

of chilies enterprises. Farmers reported that the TL strategy contributed only the initial seed and did not offer other support such as training programs as it promised/or did to other groups.

Linkage through Farmer Association: ASSMAG

The LF strategy engaged in seed multiplication activities for different crops. Open Pollinated Maize (OPV) was the major seed crop produced by the majority of farmers. However, a few farmers also produced other seed crops such as groundnuts, beans and soybeans. LF offered training programs in land selection and ensured that farmers met the requirements for seed multiplication such as isolation distance particularly for maize, agronomic practices and grading. Other training programs that farmers received were leadership, para-inspection[4], conflict resolution and marketing skills.

For marketing skills, this researcher noted that the training programs in marketing skills such as the identification of market (market research), negotiation, contractual arrangements, record-keeping and how to conduct cost and benefit analysis were offered only to the marketing committee at the association level, but not to the majority of farmers at lower group levels. Gender training was very limited and only offered to treasurers at each extension planning area (EPAs)--who were supposed to train fellow farmers on gender issues. Other supports offered by the LF strategy included the following:

- Free initial seed or initial capital for farmers to buy the initial seed particularly in 1999/2000 when multiplication of seed crops by farmers was established
- Identification of potential buyers for seed crops produced by farmers
- Market information and marketing of seed crops produced by farmers
- Linking farmers to other potential organizations and /donors, for instance, APIP.

[4] Pre-inspection before the actual inspection done by seed certification agents

Farmers contributed land and their own labor to support the establishment of seed multiplication enterprises. When individual farmers wanted to produce more seed crops, they contributed cash to purchase the additional amount of seed needed.

Objective Two: Analyze the Extent to which Women Participate in the Market

This section compares and analyzes strategies for linking farmers to markets in terms of the extent to which women participate in the market. The analysis begins with a summary of gender-disaggregated production activities that women and men carried out in each strategy, followed by results on specific marketing information from individual farmers' interviews. In this research, participation to market--which is socially constructed-- is an index that involves the following variables that would be measured individually:

- Average amount of crop harvested and consumed
- Average amount of crop sold
- Average price per kg sold
- Total average income obtained
- Average amount of income controlled by women vs. amount controlled by men
- Who sells produce to the market?
- To which markets farmers sell their produce?
- To which markets women sell produced?
- Who transports produce to the market?

The Extent to which Women and Men Participate in the Production Activities

This researcher conducted a gender-disaggregated activity calendar with farmers' groups to understand more about various production and marketing activities that women and men carried out across enterprises across strategies. Gender-disaggregated activities varied across farmers' groups hence, the detailed results are reported by group in Appendix A.

In most cases, all household members were involved in production, pesticide application and harvesting activities. However, men performed primary roles in marketing and control of income. Exceptions to this were the Kasiya and Chinseu groups of the LF and ERI strategies

respectively. For the Kasiya group, women controlled the income but men still made decisions on use of that income. For the Chinseu group, women controlled most of the income, but they shared decisions with men on use of that income. One of the men responded as follows when asked why women controlled much of the income:

> ...we prefer our wives to own money from beans because many of us are mobile, and some of us drink too much beer that may lead to inadequate income to women when they need money to sustain household needs. By ERI male farmer.

Production of Crop Enterprises by Farmers

The results presented in this section focus on the data collected during 2004/05 production and marketing season. Table 4-7 shows the percent distribution of farmers who produced different crops in the 2004/05 season. The results show that 45.9% of farmers produced groundnuts, 25.9% of farmers produced beans, 25.3% produced OPV maize and 20.6% produced soybeans. Very few farmers processed fruit products or produced chilies or mushrooms.

Table 4-8 presents the number of farmers who produced different types of crops across strategies. In summary, groundnuts were produced by LF, TL and ADP farmers while beans were a favorite of ERI and ADP farmers. OPV maize was produced by the majority of LF and ADP farmers. The majority of TL farmers also produced soybeans. LF and ADP farmers produced crops enterprises as seed, but also consumed part of while ERI, DD and TL farmers produced crops as grains (food).

The Extent to Which Farmers Participate in the Market by Crop Enterprises

Open Pollinated Crop (OPV) Maize

As reported in Table 4-9, only farmers who worked with LF and ADP strategies produced and sold OPV maize. On average, LF farmers cultivated more land for OPV maize than ADP farmers, which is also reflected in the higher amount of seed used by farmers and amount of seed they harvested. Based on results in Table 4-9, this researcher calculated the percentage of OPV

maize consumed and sold by farmers. The results in Figure 4-4 show that LF farmers sold 84.1% and consumed only 15.9% of the harvested OPV maize. ADP farmers consumed nearly as much OPV maize as they sold, which was 47.8% and 52.6% respectively. This particular result may reflect the different emphasis that ADP and LF have placed on production of these crops by farmers. For example, it is well known that ADP strategy emphasizes both--food security and income generation. Hence, the majority of farmers were found to consume a substantial amount of OPV maize they produced, but, also sold surplus for income earning. LF farmers considered production of OPV maize as a seed business; that's why they sold the largest amount of OPV maize produced, although some of the farmers also consumed part of it.

As reported in Table 4-9, the average price that farmers sold OPV maize varied between LF and ADP strategies. On average, LF farmers sold OPV maize at a lower price of 46.17 MK per kg than ADP farmers who sold maize seed at an average price of 56.74 MK per kg. The variation in price might have been caused by factors such as the quality of OPV maize produced and the different markets to which farmers sold their OPV maize. Nonetheless, because of the higher amount of land planted with OPV maize that relates to the higher amount of OPV maize harvested by LF farmers, the lower price these farmers received did not lower the total average amount of income they obtained. On average, LF farmers obtained higher total income of 268,346.67 MK than the average total income of 46,562.50 MK obtained by ADP farmers.

Table A-10 of Appendix A shows percentage of farmers by different markets where they sold OPV Maize. The results indicate that the majority of LF and ADP farmers sold OPV maize to the LF strategy and to the Kafulu association respectively. In addition, LF farmers also sold OPV maize to vendors. Usually, ADP farmers sold OPV maize to vendors, but for 2005 marketing season, none of the ADP farmers interviewed sold OPV maize to any vendors. The

detailed information on the different markets to which farmers sold OPV maize and who transported OPV maize to the markets are found in the Appendix A.

Table 4-9 also reports income controlled by men and by women. Over 55% of maize income was controlled by women in the LF strategy while about 41% by women in the ADP strategy. Figure 4-5 clarifies more on the control of income from OPV maize by women and men. In sum, LF women controlled more income from OPV maize than men. But, for ADP, men controlled more income from OPV maize than women.

Groundnuts (Peanuts)

As reported in Table 4-10, groundnuts were produced and sold by farmers who worked with the LF, ADP and TL strategies. LF and ADP farmers produced and sold groundnuts as seed, while TL farmers produced groundnuts as high quality grains (food). On average, LF farmers planted 3.03 acre of land with groundnuts, followed by TL-farmers (2.2 acre) and ADP farmers (1.9 acre). The higher average amount of land planted with groundnuts also reflects the higher average amount of seed farmers planted. But the average amount of groundnuts harvested varied between ADP and TL strategies. Although farmers who worked with TL planted more land with groundnuts, they harvested less (365.41 kg) when compared to ADP farmers whose harvests averaged 758.40 kg. In view of this, ADP farmers sold more groundnuts (434.35 kg) than TL farmers who sold an average of 268.65 kg of groundnuts. LF and ADP farmers produced groundnut as seed hence, the extra effort in the management of the seed for quality assurance could be a better reason to explain an increase in average amount of groundnuts harvested by ADP farmers compared to TL farmers whose major focus was to produce and sell groundnuts as grains.

In the same Table 4-10, results indicate that the average price that farmers sold groundnuts varied across the three strategies. As demonstrated by Figure 4-6, ADP farmers sold groundnuts

at a much higher price of 43.63 MK per kg than LF and TL farmers who sold their groundnuts at 36.24 MK and 38.50 MK per kg respectively. The price difference was due to different markets to which these strategies sold groundnuts produced by farmers. Nonetheless, because of the large farm size planted with LF farmers, they also received higher average total income of 180,841.18 MK, followed by ADP and TL farmers whose total income averaged 20,496.36 MK and 12,380.30 MK respectively.

Table A-12 of Appendix A shows the percent distribution of farmers by markets to which they sold groundnuts. The majority of LF farmers sold groundnuts to vendors while a few LF farmers also sold groundnuts to LF and World Vision. TL farmers sold groundnuts to the TL strategy and none of them sold groundnuts to any vendors. For ADP, the majority of farmers sold groundnuts through the Kafulu association, although a few farmers also sold groundnuts to ADP and vendors. In sum, this researcher found that women sold groundnuts to markets--particularly when farmers sold to vendors. See Appendix A for the detailed information on markets to which farmers sold groundnuts and for the results on who transported groundnuts to the market centers.

Figure 4-7 shows results on the control of income from groundnuts by women and men. The percentage of income controlled by women varied by strategy with women controlling over 80% income in LF followed by 45.5% in TL and about 37% in ADP. In sum, LF women controlled much more income from groundnuts than women in TL and ADP strategies.

Beans

LF, ERI and ADP are three strategies that engaged in production and marketing of beans. While LF and ADP farmers produced and sold beans as seed, ERI farmers produced and sold beans as food grains. Table 4-11 reports the average amount of acreage planted with beans, amount of beans harvested, consumed and sold, price per kg of beans sold and total income

obtained after selling beans. The results show that LF farmers planted an average of 1.4 acre while ADP and ERI farmers planted 1.32 and 0.93 acres respectively. The amount of beans that farmers harvested was higher for LF farmers, 650 kg, than for ADP and ERI farmers, which were 282.05 kg and 128.4 kg respectively.

Table 4-11 also reports that ADP and LF farmers sold beans at average prices of 95.9 MK and 81.7 MK respectively, much higher compared to ERI farmers who sold their beans at 65.1 MK per kg. This difference in price could be attributed to the difference in seed grade produced by farmers across the strategies. ADP and LF farmers produced beans as seed, thus they also sold beans at seed market price. ERI farmers produced beans as grains, thus farmers sold beans at a lower price compare to ADP and LF farmers. Beans are important relish for the majorities of farmers in Malawi; hence, farmers who produced beans generally sold at a higher price compared to other legumes such as groundnuts and soybeans.

Table A-15 of Appendix A shows the percent response by markets to which farmers sold beans. LF farmers sold beans to the LF strategy while ADP farmers sold beans to the ADP strategy and through the Kafulu farmer association. The majority of ERI farmers sold beans to vendors, but a few farmers sold beans to the markets outside their communities. ERI women represent the majority of farmers who sold beans to vendors. Additional information on the markets to which farmers sold beans and who transported beans to the markets is found in Appendix A.

Figure 4-8 shows the distribution of total average income obtained from beans by farmers across the three strategies, which is higher for LF (38,750.0 MK) than for ADP (17,447.73 MK) and ERI (6,747.1 MK). Figure 4-9 displays the control of an average total income from beans by

women and men, which varied by strategy. Women controlled 100% of income in LF followed by 90.6% in ERI and about 30% in ADP.

Soybeans

As reported in Table 4-12, only farmers who worked with the LF, ADP and TL strategies produced and sold soybeans. For the LF and ADP strategies, farmers produced and sold soybeans as seed while for TL, farmers produced and sold soybeans as grains. Table 4-12 also presents the average amount of acreage planted with soybeans, amount of soybeans harvested, consumed and sold and total income obtained after selling soybeans. The results show that LF farmers planted an average amount of 1.2 acres while ADP and TL farmers planted 0.9 and 0.8 acres respectively. Generally, the amount of land planted with soybeans, the average amount of seed used, harvested and sold by farmers were higher for LF than for ADP and TL strategies.

As indicated in Table 4-12, ADP farmers sold at much higher price than LF and TL farmers. LF farmers sold at 30 MK while TL and ADP farmers sold at 16.8 MK and 34.0 MK respectively. This researcher found that the difference in prices was contributed by the quality of soybeans farmers produced and on the type of markets to which farmers sold soybeans. Nevertheless, LF farmers obtained much higher income from soybeans, which was 11,416.67 MK, than for ADP and TL farmers who obtained 7,460.00 MK and 3,368.70 MK respectively.

Table A-18 of Appendix A presents percent response by markets to which farmers sold soybeans. The results show that the majority of LF and TL farmers sold soybeans through their strategies. For ADP, the majority of farmers sold through Kafulu association and a few farmers sold soybeans to ADP. Additional information on market to which farmers sold soybeans and who transported soybeans to the markets can be found in Appendix A.

Figure 4-10 displays the control of an average total income from soybeans. The percentage of income controlled by men and women varied by strategy with men controlling 100% income in LF while women controlled over 50% income in TL and ADP.

Chilies

Table 4-13 reports results on production and marketing of chilies by farmers. Only one group that worked with TL produced and sold chilies. On average less than an acre was planted with chilies, which also indicates the limited amount of chilies sold by farmers to the market. Significantly, few chilies were consumed by farmers as farmers mainly produced chilies for income generation.

As indicated in Table 4-13, farmers sold chilies to TL at 76.1 MK per kg and obtained an average total income of 1,747. Some of the chilies also were sold to vendors, who purchased chilies from farmers' houses. While women were more involved in selling chilies to vendors, TL was more responsible for selling chilies to other identified markets. With regard to who controlled income, this researcher found that women controlled the total income obtained from chilies.

Mushroom

As in the case of chilies, only one group of farmers who worked with the ADP strategy produced and sold mushrooms. As reported in Table 4-14, farmers averaged 5.8 bottles of mushroom seed (spawn), from which they harvested an average of 7.4 kg of mushrooms. Apart from producing mushrooms for income generation, farmers also consumed mushrooms, mostly as a relish with *Nsima*--a favorite Malawian staple food consisting of maize flour. Mushrooms were sold at the highest price compared to all crops produced and marketed by farmers under this study. The major reason that mushrooms were a high value crop is because farmers sold it to such potential markets in Malawi as the Italian restaurant-Mama Mia and shopping centers such

as Shopprite and Peoples Trading Centers (PTCs). Some of the farmers also sold mushrooms to local village markets.

Mushrooms were mostly managed by women who also participated in selling mushrooms to the central as well as to the local village markets. When selling to central markets, the market committee, in which most women participated, was more responsible for transporting and selling mushrooms to Shopprite, PTCs and Mama Mia restaurant. Farmers have used public transport (*Matoola*) to deliver mushrooms to these markets. This study found that women controlled income from mushrooms.

Processed fruit products

The DD strategy worked with farmers (Jali and Magomero groups) that engaged in processing and marketing of indigenous and exotic fruits and products. Apart from processing fruit products--mainly juices--Figures 4-11 provide an example of other products processed by farmers in the Jali group, which include wines, vegetables, sweet potatoes, cassava starch, refined oil from groundnuts and soybeans powder that was used to add broth to vegetables or meat stews. Farmers in the Magomero group mainly processed different types of juice.

Table 4-15 reports results on quantity (liters) of juices sold by farmers, price per liter sold and total income obtained. In 2005, the Magomero group sold 841 liters of juice at a price of 150 MK per liter and obtained a total amount of 126,150 MK, which they shared among themselves. The Jali group sold 41 liters of juice at a price of 75 MK per liter and 22 bottles of banana wine each at a price of 160 MK. The Jali group obtained a total income of 6,595 MK, in which farmers kept the money in a joint group bank account. Women in both groups controlled most of the income from fruit products.

As far as selling of processed fruits is concerned, farmers in Jali group shared the marketing activities. Generally, farmers did not have a specific market in which they could sell

juices. Each member carried the same quantity of juice and other products to sell either to local markets, to neighbors in the same village, to neighboring villages as they walked back home from the processing unit, or to school children. Apart from these markets, farmers also sold centrally from the processing unit, where each member took a turn selling juice and other products. All members determined the price to sell their products; hence, customers did not have an opportunity to negotiate for discounted prices.

Similarly, farmers in Magomero group also shared marketing activities. This group had a contractual agreement to deliver fruit juices to Annie's Lodge, a market link that was facilitated by the DD strategy. However, through their own initiatives, farmers also identified other markets such as Peter and Lions Lodge and supermarkets such as Shopprite and PTCs. Farmers in this group also sold fruit juices to children in different schools and to other people in local communities.

The Extent to Which Farmers Participate in the Marketing of Livestock

As described earlier, only ADP and ERI farmers engaged in the management of livestock enterprises. In the case of livestock management activities, this researcher found that all household members were involved in the management of improved pigs and dairy cows. However, for ADP, men were more involved in the management of improved pigs than women.

Table 4-16 reports the number of farmers who managed livestock enterprises. The results show that 43 farmers out of 170 farmers studied, managed livestock enterprises. ERI farmers managed dairy cows and improved pigs, while ADP farmers managed improved goats.

Table 4-17 shows growth of livestock enterprises by farmers among ERI and ADP farmers. The results show that ERI farmers started with one livestock unit--either a dairy cow or an improved pig. ERI farmers who managed dairy cows continued to have one dairy cow per household, but for those who managed improved pigs, the number increased up to seven units.

In the case of ADP, farmers were free to purchase improved goats from fellow farmers or wait for a goat to be passed on to them by fellow farmers. As reported in Table 4-18, on average, farmers started with two improved goats, with ADP providing one goat through a pass on mechanism. Farmers purchased additional numbers of goats from fellow farmers. In this way, farmers were able to manage up to 27 units of improved goats.

As reported in Table 4-17, ERI farmers lost more livestock--mostly improved pigs--than ADP farmers. ERI farmers lost more piglets at the outset of the livestock enterprises because of lack of feed and water due to drought conditions, diseases and poor knowledge in proper management of pigs and feeding. Informal discussions with ADP farmers also revealed the same major reasons for animal loss. In addition, some of the improved goats--particularly dairy goats--died because these goats did not acclimatize to the farmers' local conditions.

Table 4-18 shows that out of 43 farmers who managed livestock, only 22 farmers sold livestock in 2005. Farmers who managed dairy cows did not sell any of their animals. Only three households started milking the dairy cows where women controlled all the income from milk. This researcher observed that ADP farmers preferred not to sell improved goats unless in desperate need of cash for household requirements. For these farmers, improved goats were kept as assets and also for paying dowry during marital ceremonies. Since farmers engaged in dairy cows did not sell their animals, subsequent analysis of livestock enterprises will be based only on improved pigs and goats.

As reported in Table 4-18, farmers sold pigs and goats at different prices with ERI farmers selling pigs at higher prices (more than twice) than ADP farmers. The average amount of income obtained by ERI farmers was also much more than the average amount obtained by ADP farmers. This difference might be attributed by the high demand of pigs' meat compared to

improved goats. Nonetheless, ERI men controlled over 90% of income from pigs while for the ADP strategy, men and women shared about 88% of the income from improved goats.

In the case of marketing, ERI farmers sold pigs to vendors and to farmers within and outside the community. By the time this research was carried out, farmers did not have specific markets to sell pigs. However, ERI was working with farmers to re-identify potential markets to which farmers could sell pigs. On the other hand, ADP farmers sold improved goats through Kafulu association, to fellow farmers in the communities or to the ADP strategy. Because farmers preferred to keep improved goats rather than selling them, ADP farmers did not have much difficulty selling improved goats. Regardless to which market farmer sold livestock, men were more involved in selling livestock to buyers than women in both strategies.

Summary: Objective Two

In sum, this researcher found that the majority of participating farmers--particularly women--across strategies owned between 2.1 to 10 acres of land. This finding does not represent a typical example of land ownership by smallholder farmers in Malawi, in which other researchers found that the majority of farmers owned small land holdings between 1-2 acres. In terms of levels of education, LF farmers were fairly distributed across all levels of education. Nonetheless, other strategies represent a fairly large number of farmers who went through secondary education. Based on farmers' characteristics, this research concludes that strategies for linking farmers to market--particularly LF, ADP and TL--worked with higher resource farmers than did ERI and DD strategies. In addition, LF, ADP and TL supported farmers more in terms of market links than did ERI and DD strategies.

The researcher looked at the extent to which women farmers participated in the production and marketing of various crops, which varied across crops enterprises across strategies. In most cases, all household members were involved in production, pesticide application and harvesting

activities. However, men performed primary roles in marketing and control of income from crop enterprises. Exceptions to this were LF, DD and ERI strategies where women controlled most of the income from their enterprises.

For the livestock enterprises, this researcher found that all household members in the LF strategy were involved in the management of improved pigs and dairy cows. For ADP, men were more involved than women in the management of livestock. Marketing of livestock was done by men in both the ERI and ADP strategies. Nonetheless, ERI men controlled much more income from livestock than women while in the ADP strategy, men controlled only a slightly higher income from livestock than women.

Objective Three: Analyze Benefits Women Farmers Derive from Participating in the Market

The third objective of this study was to determine what benefits women farmers derived from participating in the market. This researcher considers both quantitative benefits (income obtained vs. income owned by women farmers) and qualitative benefits that often tend to be overlooked. The qualitative benefits of interest to this study include investments that farmers have made from the total income obtained (specifically children's education, food security and asset building), capacity development, empowerment (application of knowledge gained) and gender-related benefits (wife-husband relationships, change in roles and responsibilities of women and men, and decision-making at the household level).

Benefits based on Income Ownership

This study found that income was the major benefit mentioned by the majority of farmers. However, the average income obtained by farmers varied by crop enterprises as well as by strategies. As illustrated in Figure 4-12, farmers who produced maize seed obtained the highest

amount of income, followed by farmers who processed fruits, groundnuts, beans, soybeans, mushrooms and chilies.

Table 4-19 presents average income obtained by farmers across strategies. The results show that LF farmers obtained the highest income across all crops when compared to farmers in other strategies. This research found that the difference in average income was impacted by the amount of land holdings, type and quantity of crops that farmers produced and sold and the price in which these crops were sold.

Figure 4-13 and Table 4-20 present the general results on the average amount of income controlled by women across crop enterprises. Table 4-21 presents percentage of income controlled by women across strategies. In fact, women controlled income from all crops they produced. LF women controlled 55.6% of income from maize, 89.8% of income from groundnuts and 100% of income from beans while DD women farmers controlled 100% of income from fruit products. ADP women controlled about 41% of income from maize, 36.9% of income from groundnuts, 30% of income from beans, 65% of income from soybeans and 100% of income from mushroom. TL women controlled 45.5% of income from groundnuts, 56.9% of income from soybeans and 100% of income from chilies. ERI women controlled 90.6% of income from beans.

With regard to gender and control of income by women, this researcher found that women across all strategies have benefited from the control of income across different crop enterprises. Specifically, LF women benefited more from maize, groundnuts and beans while TL women benefited more from soybeans and chilies. ERI women benefited more from beans, DD women benefited more from fruit products and ADP women benefited more from groundnuts and soybeans. Moreover, ADP men benefited more from maize and beans than women.

Several reasons could explain the difference in control of income by women across strategies. LF men commented that because the majority of men worked outside their communities, women had more opportunity to control income from different enterprises. The DD strategy involved only women as the fruit processing enterprise is considered women's enterprise. Hence, women had more control of the enterprise and income accrued from fruit products. For the ERI strategy, the gender training offered to farmers, which was much more extensive compared to the gender training offered by TL, DD and ADP strategies could be a major reason for an increase in control of income by women farmers.

Benefits based on Income-Investment Patterns

This study developed benefits diagrams to show how farmers used income from different enterprises. Figures B 1-10 of Appendix B demonstrate some of the farmers' benefits diagrams. In addition to the diverse benefits that farmers derived from their participation in the market, this research provides detailed analysis of such benefits as investment in food and nutrition, children education, soil fertility management and asset building. For better analysis, this researcher has categorized all farmers' investments into food security, children's education, soil fertility management, household and hard assets.

Investments Made by Farmers

Table 4-22 presents general results on percent response by type of investments made by farmers. The results show that over 55% of farmers studied invested more in clothing, chemical fertilizer, kitchen items and food. A few farmers also invested in children's education, livestock, new houses, bicycles, mattresses, grocery stores, televisions, chairs and automobiles *(garimoto*). The grocery stores were small stores that farmers stocked with food and other household items such as laundry and bath soap to sell to other farmers in the communities.

This researcher assumed that participation in the market could increase food security among farmers. However, 44.7% of the farmers interviewed did not use their total income to purchase food for their households. Because participating farmers had more resources and were better educated than the average Malawian farmers, they had less need to purchase food and could use their discretionary cash for other things.

Table 4-23 provides detailed results of farmers' investment patterns, which varied across strategies. The investment patterns are divided into household items, agricultural inputs, livestock, education and hard assets. Hard assets are permanent assets or permanent structures; for instance, houses and automobiles.

As Table 4-23 reports, for the household items, the majority of LF, ERI, TL and ADP farmers invested in clothing while for DD, the majority of farmers invested in kitchen items. For livestock, the majority of LF, DD, TL and ADP farmers purchased livestock but, for ERI, the majority of farmers purchased livestock feed. Farmers across all strategies invested in animal housing, chemical fertilizer and children's education. Moreover, the majority of LF farmers invested in grocery stores, new houses and automobiles compared to farmers in other strategies.

Figure 4-14 displays results on farmers' investment in food with TL farmers investing more in food than farmers in other strategies. Figure 4-15 shows that LF and ADP farmers invested more in chemical fertilizer for soil fertility management than farmers in other strategies. In addition, farmers who managed livestock were able to obtain enough manure for soil fertility management. As one of the farmers commented:

> ...we now get enough manure from the pigs we raise, which is enough to supplement the inorganic fertilizer we buy from the market. By ERI woman.

As indicated in Figure 4-16, TL farmers invested more in livestock than farmers in other strategies. In the case of children's education, results in Figure 4-17 indicate that LF farmers

invested more in children's education than farmers in other strategies. In sum, participating in the market has increased farmers' income that helped farmers to solve a variety of household needs. As one of the married couple emphasized:

> ...we sold four pigs and used the money to buy maize bran, fish meal, lime and salt ingredients for feed formulations. From the pig money, I also bought household items such as cooking oil, soaps, body oil and chitenge. My husband and I plan to use the money remaining to purchase fertilizer for this upcoming crop production season. By ERI married couple.

> ...the number of houses constructed and electrified, assets purchased and farmers' income has increased as a result of our participating in the market. By ADP farmer.

Other Benefits Women Derived from Participating in the Market

Change in Human Capital (Capacity/Knowledge/Skills Development)

This research found that each strategy built farmers' capacity for improved production and marketing of different crops and livestock enterprises. Table 4-24 presents results of farmers' responses on whether their knowledge and skills improved as a result of their participation in different marketing strategies. Overall, 94.3% of all farmers responded that their knowledge and skills improved as a result of participating in the marketing strategies. When farmers were asked why their knowledge and skills have improved, some of the farmers responded:

> Through training, I have acquired knowledge and skills in seed multiplication and livestock management that have improved food production and income. With additional training in gender, I can even now afford to manage my family. By ADP female farmer.

> Being a member of the group I have an access to processing machines, which have increased my knowledge in operating the machines. I use the skills acquired to train other farmers with similar interest. By DD female farmer.

> I feel more empowered to manage our pigs more confidently. The training programs offered through ERI approach has increased my skills in crop management practices, market research and enterprise management. By ERI female farmer.

Within strategies however, 74% of TL farmers responded that there was no change in knowledge and skills since they started collaborating with TL strategy. The main reason for this

was that there were a lot of new members who were not trained on the production and management of crop enterprises. Another reason--particularly for the chilies' group--was inadequate training offered to farmers as one out of seven farmers emphasized:

> The knowledge acquired from chilies was not adequate because I still need to be supervised to increase chilies' production. By TL chilies' farmer.

Social Networks and Social Relationships (Social Capital)

The majority of farmers also mentioned that their social networks and relationships have changed as a result of their participation in the market-linkage strategy. As Table 4-24 indicates, 91.4 % of all farmers mentioned improvement in social networks and relationships. Similar responses also were seen for the majority of farmers across strategies. When farmers were asked why their social networks and social relationships have improved, some responded:

> Social networks and relationships among people have improved and increased by working together in groups. We also meet more often now than we used to be, which has increased sharing knowledge among ourselves. The number of visitors has increased and we have more opportunities to exchange ideas with visitors and also to build social relations with them. By ERI farmer.

> The group work helped us to learn from others new things that we never knew before. By ERI female farmer.

> Our relationships with fellow farmers and other people across regions have increased. Our social understanding of what is going on in other parts of the world has increased through watching TVs that we purchased from the crops we produce and sell with the World Vision. By ADP farmer.

Self confidence

This study also looked at farmers' responses to the changes in self confidence as a result of participating in the market-linkage strategy. Self confidence here means the ability of farmers to communicate in public. As indicated in Table 4-24, 94.8% of farmers mentioned that that their self confidence has improved. Farmers commented, generally that women's confidence has

increased because they no longer feel shy to talk in front of public meetings or openly engaging in a dialogue with men. As some of the farmers put forward:

> Women's confidence has now increased compared to the way women used to be in the past. Women can now talk even in front of their in-laws. By ERI male farmer.
>
> I can now make jam from my house, and my family is now healthy because we are using natural fruits that I make my self. By DD farmer.

Position-status in the community

Table 4-24 presents results of farmers' responses with regard to changes in their position-status in the community. Change in the position-status means that farmers become more recognized because of what they do in the communities. The results show that 92.5% of all farmers studied responded that they became more recognized in their communities as a result of participating in the market strategies. Farmers perceived that increase in income--particularly for those who used to do casual labor (*Ganyu*) to earn addition income--has improved their status and recognition in their communities.

Gender-Related Benefits Women Derived from Participating in the Market

One of this researcher's interests was to bring more understanding of the gender-related benefits that farmers derived from their participation in the market-linkage strategy. Table 4-25 and Figure 4-18 show results on farmers' responses by changes in wife-husband relationships, roles and responsibilities and decision-making among married farmers. The results indicate improvement in wife-husband relationships, roles and responsibilities and decision making at the household level.

Change in Wife-Husband Relations

Table 4-25 indicates that 90.7 % of married farmers commented improvement in wife-husband relationships a result of participating in a market-linkage strategy. One of the ADP women asserted that due to the benefits she and her husband obtained from participating in seed

multiplication activities, they were finally living in peace and loving each other more than in the past. As reported in Table 4-25, a few LF, DD and ADP farmers commented that wife-husband relationships remained the same. This researcher found that most of the farmers who responded that their wife-husband relationships remained the same were either widow, widower, divorced or separated before they started working with strategies for linking farmers to market. Also, one farmer each from LF, ERI and TL commented that the wife-husband relationship became worse after they started participating in the marketing strategies.

Change in Roles and Responsibilities between Women and Men at Household Level

Table 4-25 indicates improvement in the roles and responsibilities that both women and men played at household level across all the strategies. One of the ERI farmers, for instance, commented that participation in the market has increased sharing of responsibilities between men and women for both reproductive and productive activities. As reported in Table 4-25, the majority of farmers across strategies indicated that women's work load had been reduced while some of the farmers across strategies also commented that women's work load worsened.

In general, this research found that change in women's work load varied by strategy and by income that farmers obtained from different enterprises. An informal discussion with farmers indicates that the increase in income enabled them to hire addition casual labor (*Ganyu*). Hence, even if there was an increase in work load, the increase in income helped these women reduce the work load by hiring additional labor. On the other hand, if the household has limited income, it implies that women had to perform most of the activities without support from casual laborers.

Change in Decision making at the Household Level

Table 4-25 presents results of farmers' responses to changes in the decision making among married farmers across strategies. The results show that the majority of farmers across strategies

commented improvement in decision making among married farmers. One of the women interviewed commented:

> I am now involved more in the household decision-making than before. I can now make decisions even in the absence of my husband and give him feedback later when he comes back home.

This researcher concludes that women farmers have directly and indirectly benefited from different enterprises across strategies. Through access to income from different enterprises, women are seen to use that income to improve the quality of their lives and to solve different problems that they faced at household levels.

Benefits based on Farmers' Empowerment (Application of Knowledge and Skills Gained)

One of this researcher's interests was farmers' benefits based on whether they could apply the knowledge gained into other new but similar types of enterprises with limited support from the market-linkage strategy. This section analyzes empowerment based on two aspects: with limited support from market-linkage strategy can farmers produce and sell new crop enterprises?

As presented in Table 4-26, the results indicate that 50% of LF farmers responded that they could produce the new crop without help from the LF strategy. Similarly, 48.8% of TL and 36.0% of ADP farmers respectively responded that they could produce the new crop without help from their strategies. Conversely, 56.0% of ADP farmers reported that they could not produce the new crop without some help from ADP. LF and TL also represent higher percentages of farmers that responded that they could only produce the new crop with some help from LF and TL strategies. This implies that ADP, LF and TL farmers were not yet empowered enough to be confident to produce new but related seed crops without support from their strategies.

Also, Table 4-26 shows responses to whether farmers could go outside their village to identify best markets for the new crop. The results show that 53.5% of TL farmers responded

that they could not at all go outside their villages to identify best markets for the new crop, while 13.8%, 50.0% and 56.0% of ERI, LF and ADP farmers respectively responded that they could go outside their village to identify best markets for the new crop with some help from their market-linkage strategy. About 71% of the DD farmers responded that they could go outside their village to identify best markets for the new crop without any help from their market-linkage strategy.

These responses clearly show that ERI and DD farmers could go outside their villages to identify best markets for the new crop. This could be because they were highly involved in identifying markets for the enterprises they managed. Only a few LF, TL and ADP farmers were involved in identifying a market for the crops that farmers produced. Hence, it was only these few farmers that confidently answered that they could go outside the villages to identify market for new crop.

Chapter Summary

This chapter first presented characteristics of farmers studied under this research. This present research found that characteristics of farmers varied by strategies. In terms of levels of education, ADP and TL strategies represent the lower percentages of farmers who attended either primary, secondary or tertiary levels of education than other strategies. ERI, DD and LF strategies represent the highest percentages of farmers who attended primary and secondary levels of education respectively. LF strategy represents the highest percentage of farmers who attended tertiary levels of education. With regard to levels of education, this researcher realized that some improvements in the educational system in Malawi might have motivated and encouraged more parents to send their children to school to enroll for primary education who subsequently joined secondary and tertiary levels of education.

Ownership of assets by farmers also varied across strategies. In the case of land ownership, LF represents the highest percentage of farmers who owned large amounts of land and hard assets. One of the reasons for this result could be that LF farmers had more income than farmers who worked with other strategies. In addition, this researcher observed that LF farmers were more entrepreneurial and business focused and generally were more educated at college diploma levels than farmers in other strategies. Some of the LF farmers used the income obtained from crops and livestock enterprises to purchase and invest more in, for instance, additional land, open restaurants and grocery stores, and some farmers purchased trucks that were then hired to other farmers for transportation purposes, hence bringing in more money.

This researcher also found that the type of non-enterprise crops produced by farmers varied by strategy. Malawi depends on maize traditionally known as *chimanga* as its major staple food. This researcher consistently found that the majority of farmers across strategies produced either local or hybrid maize, which was to a large extent cultivated for food, although farmers sold surplus for income. Farmers produced other crops such as beans, groundnuts, soybeans that they used as relish with *Nsima*, but, sold surplus for income earning. Farmers produced tobacco for income earning.

Based on the results on land ownership, levels of education and ownership of other assets by farmers, this researcher concludes that the LF strategy worked with more endowed farmers in terms of land resource, income, education levels particularly at secondary and tertiary levels. The ownership of other assets varied by strategies in which the LF strategy shows a higher distribution of farmers who owned household and hard assets than other strategies. Following LF are the ADP and TL strategies that had more representation of farmers with formal education,

household and hard assets. DD and ERI strategies had the lowest percentage of farmers who owned household and hard assets.

Objective one analyzed strategies used by organizations to link farmers to market using the pre-determined criteria set forward by the researcher. These criteria included (a) area of coverage (b) number of farmers--women and men reached (c) levels of operation (d) diversity of crops and livestock enterprises implemented by farmers (e) integration of gender and community empowerment (f) focus on soil fertility management and (g) type of support offered to farmers.

Based on geographical coverage, this researcher found that the LF, TL and ADP strategies covered a larger geographical area and involved more farmers than the ERI and DD strategies. Similarly, these strategies also focused on a wider variety of crops than did ERI and DD strategies. Diversification of crops by farmers involved in LF, TL and ADP strategies could be an opportunity for them to improve food security and income than for farmers that worked with ERI and DD strategies.

Based on the gender integration, this researcher found that ERI, DD, ADP and TL strategies explicitly integrated gender more than did LF strategy. For ERI, DD, ADP and TL strategies, gender training covered aspects of equal representation, leadership, shared roles and responsibilities, groups and intra-household relationships. However, LF ensured equal representation of women and men in the production of seed crops at the SMAG levels.

This research found that soil fertility management was an integral component in all strategies for linking farmers to the market. Farmers in each strategy were involved in different conservational farming methods to improve soil fertility. A more detailed discussion on the type of soil fertility management technologies used by farmers will be discussed in the subsequent sections.

From the results on support services offered to farmers, this researcher found that all strategies for linking farmers to market offered potential support that farmers needed to establish both crop and livestock enterprises. However, in terms of sustained marketing services, ADP and TL strategies offered more support to farmers than did the ERI, LF and DD strategies. Marketing services involved such services as providing market information to farmers, linking farmers to actual buyers or purchasing of crops and livestock from farmers.

Objective Two analyzed the extent to which women participated in the market. This researcher found that the extent to which farmers, particularly women, participated in the production and marketing activities varied by the crop and by strategies. For production activities, all members of the households were involved in land preparation, planting, and weeding and in harvesting. Women across all strategies were found to be involved more in processing activities. However, men also engaged in processing activities for OPV maize. Men were more involved in transporting crops from fields to the households, packaging and selling the crops.

This researcher found that the markets to which farmers sold different crops varied by strategies. The majority of LF farmers sold OPV maize, beans and soybeans to the LF strategy while the majority of LF farmers who produced groundnuts sold to vendors. When farmers sold to LF, the market committee was mostly involved in transporting and selling seed crops. But when farmers sold to vendors, farmers did not have to transport their produce to the marketing centers as vendors purchased from farmers' households. Thus, LF women were more involved than men farmers in selling seed crops--particularly groundnuts, beans, and soybeans--to vendors.

The majority of TL farmers sold to the TL strategy that, in turn, was much more involved in transporting crops to the storage warehouses. This researcher found that men were more involved in selling crops to the TL strategy than women. The majority of ADP farmers sold through farmers' associations, and sometimes to the ADP strategy. The marketing committee was more involved in transporting and selling crops to the market. Although ADP farmers did not sell to vendors, women farmers also participated in selling seed crops either to Kafulu association or to ADP strategy.

For the ERI strategy, the majority of farmers sold beans to vendors, but some of the farmers also sold beans to central markets such as Jenda Trading Center and Plan Grain Bank. When farmers sold to central markets, the market committee was more involved in transporting and selling beans to these markets. However, when farmers sold to vendors, women were found to be more involved in selling beans to vendors than men. Since the DD strategy involved women farmers, marketing activities were mainly done by women.

Generally, this researcher found that the average prices at which farmers sold different crops varied by strategies. This researcher considers the difference in price to be contributed to the quality of seed produced by farmers and the market to which farmers sold their crops. Overall, farmers sold at higher prices when they sold through their strategies compared to when they sold to vendors.

The amount of income that farmers obtained also varied by crops and by strategies. Farmers who produced maize seed obtained the highest income compared to farmers who produced other crops. Fruit products represent the second highest income to all farmers interviewed. Groundnuts and beans were other type of crops from which farmers obtained much more income. The extent to which women controlled income accrued from different crops also

varied by crops and by strategy. Moreover, women were found to own income across all crops and to a greater extent across strategies.

In terms of livestock enterprises, both women and men participated in the management of livestock enterprises. However, men were more involved in the marketing of livestock than women. For ERI strategy, men were more involved in selling improved pigs and controlled much more income from improved pigs than women. Although men were more involved in the selling of livestock in the ADP strategy this researcher observed more sharing of income between men and women from improved goats.

Objective Three analyzed benefits women farmers derived from participating in the market. This researcher found that farmers derived benefits from participating in the markets. However, benefits derived varied by strategies and by enterprises. Farmers, in general, mentioned income as the major benefit they derived from different enterprises. For this income benefit, LF farmers benefited most, followed by farmers involved in DD, ADP, TL and ERI strategies respectively. As pointed out earlier, the income benefit varied by enterprises. Farmers who produced maize seed, groundnuts and beans and those who processed fruit products obtained higher income than farmers who produced soybeans, chilies and mushroom or those farmers who engaged in livestock management. However, farmers who engaged in livestock management--particularly improved goats and dairy cows--preferred not to sell these animals. Thus, there was limited information on income obtained and control of income from livestock enterprises. Moreover, women farmers controlled more income across crops than from livestock enterprises.

Farmers reported a wide range of benefits derived from crops and livestock enterprises. Using income from crops or livestock enterprises, farmers were able to invest in one or a

combination of items that included food, children's education, agricultural inputs (seed and fertilizer), new houses, health care services, clothing and automobiles. In sum, farmers invested more in food, clothing, cooking and dining utensils. A few farmers also invested in new houses, livestock and automobiles.

This researcher also presented and discussed results on other and specific gender-related benefits that farmers derived from participating in the market. These benefits were improvement in knowledge and skills, self confidence, social networks, farmers' positions in the communities, wife-husband relations, decision-making and roles and responsibilities--particularly for married farmers. The researcher found improvement in knowledge and skills, self confidence, social relationships and farmers' position in the communities. The findings also show improvement in gender-related benefits--wife-husband relationships, roles and responsibilities and decision making at the household level.

Farmers who engaged in LF and TL strategies sold crops through these two strategies. LF and TL farmers had limited marketing skills to enable them to sell existing or new crops on their own. In fact, the majority of TL farmers commented that they could not go outside their community to identify or sell crops on their own without any support from the TL strategy. On the other hand, DD and ERI farmers were found to have adequate marketing skills, but lacked the necessary support to link these farmers to appropriate markets. ADP farmers were found to be more skilled in marketing and also involved the majority of farmers in the marketing process for different crops and livestock, but still required the support from ADP strategy. In fact, the majority of ADP farmers commented that they could go outside to identify and sell to markets with some help from ADP strategy.

In sum, the results of this research varied by strategies. This variation among strategies was being contributed by the following factors:

- Type of enterprises implemented by farmers and amount of land planted with crop enterprises varied among strategies. Farmers who produced OPV maize--particularly those who worked with the LF strategy--planted more land with OPV maize, they sold more OPV maize and earned the more income than did farmers who processed fruit juice and produced such types of crops as groundnuts, beans, soybeans, mushrooms and chilies.

- The price at which crops were sold to the markets varied among enterprises and among strategies. This researcher found that farmers who planted more land; for instance, those who planted more land with OPV maize, also earned more income even if they sold OPV maize at a much lower price compared, for instance, to beans. Farmers who produced beans earned much lower income than farmers who produced maize, because beans were produced only on less than 1.5 acres of land. Results also varied with high value products such as fruit juice and mushroom. DD farmers sold fruit juices at much higher prices and they also earned more income while ADP farmers who produced mushrooms sold it at the highest price compared to all enterprises studied, but earned lower total income because farmers produced only a limited amount of mushrooms.

- The markets where farmers sold their enterprises varied by strategy. The price at which farmers sold their enterprises varied by the markets where farmers sold their enterprises. Nonetheless, the total average income accrued was determined by the amount of enterprises sold by farmers. For instance, LF farmers sold more OPV maize at a much lower price and earned more income than did ADP farmers who produced a small amount of mushrooms but sold it at the highest price and overall earned lower total average income.

- The characteristics of farmers studied varied by strategy. Although farmers studied were generally better off--particularly in terms of education, land and asset resources--the wealthiest farmers benefited most from improved income.

Table 4-1. Percentage of Farmers who were Married, Owned Land and Head of Households by Sex (n = 170)

	Married		Owned Land		Farmer's Headship	
Sex	Frequency	Percent	Frequency	Percent	Frequency	Percent
Male	32	97.6	33	100	117	68.8
Female	84	61.3	131	95.6	53	31.2
Total	116	68.2	164	96.5	170	100

Table 4-2. Percentage Distribution of Farmers who Owned Land by Strategy (n = 164)

Strategy	Frequency	Percent
LF (n = 34)	31	91.2
ERI (n = 29)	28	96.6
DD (n = 14)	14	100.0
TL (n = 43)	41	95.3
ADP (n = 50)	50	100.0

*Six farmers did not own land

Table 4-3 Percentage Distribution of Farmers who Owned Land (acres) by Sex across Strategies

Strategy	Sex	N	1-2 Acres		2.1-5 Acres		5.1-10 Acres		10.1-25 Acres		>25 Acres	
			f	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
LF (n=34)	M	7					3	8.8	3	8.8	1	2.9
	F	24	2	8.3	12	50.0	3	12.5	2	8.3	5	20.8
ERI (n=29)	M	6			3	10.3	2	6.8			1	3.4
	F	22	3	13.6	7	31.8	8	36.3	4	18.8		
DD (n=14)	M											
	F	14	5	35.7	4	28.6	5	35.7				
TL (n=43)	M	10			2	4.6	5	11.6	3	6.9		
	F	31	4	12.9	11	35.5	10	32.3	3	9.6	3	9.6
ADP (n=50)	M	10			4	8.0	1	2.0	4	8.0	1	2.0
	F	40	3	6.0	17	34.0	13	26.0	7	14		
Total		164	19	11.2	63	37.05	51	30.0	26	15.3	11	6.4

Table 4-4. Farmers' Level of Education by Sex (n = 170)

Sex	No formal education		Primary education (1-4)		Primary education (5-8)		Secondary education		Tertiary education		Total	
	f	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
Participating Male	1	3.0	6	18.2	12	36.4	13	39.4	1	3.0	33	100.0
Average Rural Male				45.9		9.3		3.9		0.3		
Participating Female	19	13.9	43	31.4	49	35.8	20	14.6	6	4.4	137	100.0
Average Rural Female				22.5		2.4		0.8		0.1		
Total Participating Farmers	20	11.8	49	28.8	61	35.9	33	19.4	7	4.1	170	100.0

*Participating farmers had higher levels of education than average poor farmers

Table 4-5. Farmers' Level of Education by Strategies (n = 170)

Strategy	No formal education		Primary education (1-4)		Primary education (5-8)		Secondary education		Tertiary education		Total	
	f	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
LF	3	8.8	7	20.6	9	26.5	9	26.5	6	17.6	34	100.0
ERI	5	17.2	8	27.6	15	51.7	1	3.4			29	100.0
DD			3	21.4	5	35.7	6	42.9			14	100.0
TL	9	20.9	18	41.9	9	20.9	7	16.3			43	100.0
ADP	3	6.0	13	26.0	23	46.0	10	20.0	1	2.0	50	100.0

Table 4-6: Results Score on Analysis of Strategies for Linking Farmers to Markets[1] Using the Institutional Framework

Organization	Strategy	Scale of Operation (No. & Area covered)	Diversity of Enterprises	Extent to Which Gender is Integrated	Focus on Soil Fertility Management	Focus on Community Empowerment	Level of Support: Production /marketing
CIAT	ERI	x	x	xxx	x	xxx	xx
ICRAF	DD	x	x	xx	xxx	xx	xx
World Vision	ADP	xxx	xxx	xxx	xx	xxx	xxx
NASFAM	TL	xxx	xx	xxx	xx	xxx	xxx
ASSMAG	LF	xxx	xx	x	x	xx	xx

[1] Index: x = low, xx = moderate, xxx = highest.

Table 4-7. Percent Distribution of Farmers who Produced Crop Enterprises (n = 170)

Crop	*f*	Percent
groundnuts	78	45.9
Beans	44	25.9
Maize	43	25.3
Soybeans	35	20.6
Fruit processing	14	8.2
Chilies	7	4.1
Mushroom	6	3.5

*Percentage do not count to 100 percent because farmers had multiple responses

Table 4-8. Number of Farmers who Produced Crop Enterprises across Strategy (n = 170)

Crop	LF (n=34)	ERI (n=29)	DD (n=14)	TL (n=43)	ADP (n=50)
Groundnuts	18			35	25
Beans	4	18			22
Maize	18				25
Soybeans	3			26	6
Fruit processing			14		
Chilies				7	
Mushroom					6

T/Y = Total Farmers/Yes, Produced the Crop; Blank = did not Produce

Table 4-9. Average Area Planted with OPV Maize, Amount of Seed Used, Harvested, Sold and Consumed, Average Price per kg OPV Maize Sold and Total Income Obtained

Strategy	Statistic	Area (acre) Planted with maize	Amount of Maize Seed (kg) Used	Quantity of Maize seed (kg) Harvested	Quantity of Maize seed (kg) Sold	Quantity of Maize (kg) Consumed	Price (MK)per kg Maize Sold	Total Income (MK) Obtained	Amount of Income (MK) from Maize kept by Husband	Amount of Income (MK) from Maize kept by Wife
LF (n = 18)	Mean	6.4167	168.33	5872.22	4938.89	933.33	46.17	268346.67	118996.67	149350.00
	Maximum	29.00	2000	23750	23750	3900	75	950000	950000	533500
	Minimum	1.00	10	500	0	0	25	12000	0	0
	Std. Deviation	6.80019	461.430	6248.605	6150.575	1134.616	14.215	294493.865	293887.704	196032.382
	Range	28.00	1990	23250	23750	3900	50	938000	950000	533500
ADP (n = 25)	Mean	2.3200	23.20	1675.60	882.00	801.67	56.74	46562.50	33416.67	13145.83
	Maximum	8.00	60	4500	3000	3750	100	157500	157500	157500
	Minimum	1.00	10	600	0	0	40	9750	0	0
	Std. Deviation	1.86154	15.152	1020.362	679.611	897.937	16.328	30880.483	34912.230	37213.236
	Range	7.00	50	3900	3000	3750	60	147750	157500	157500
Total (N = 43)	Mean	2.8357	41.47	2203.85	1392.66	818.84	55.52	71205.19	42925.56	33557.41
	Maximum	29.00	2000	23750	23750	3900	100	950000	950000	533500
	Minimum	1.00	10	500	0	0	25	9750	0	0
	Std. Deviation	3.22827	167.405	2745.000	2599.207	928.483	16.402	121664.289	104090.841	83266.100
	Range	28.00	1990	23250	23750	3900	75	940250	950000	533500

* MK → Malawi Kwacha: 1 US $ → 131 MK

Table 4-10. Average Area planted with Groundnuts, Amount of Seed Used, Harvested, Sold and Consumed and Total Average Income Obtained (n = 78)

Strategy	Statistic	Area (acre) Planted with Groundnuts	Amount (kg) of Groundnut seed used	Quantity (kg) of Groundnut Harvested	Quantity (kg) of Groundnut sold	Quantity (kg)of Groundnut Consumed	Price (MK) per kg Groundnu t sold	Total Income (MK) Obtained from Groundnut Sold	Amount of Total Income (MK) from Groundnut kept by Husband	Amount of Total Income (MK) from Groundnut kept by Wife
LF (n = 18)	Mean	3.0278	101.39	3046.11	2523.33	522.78	36.24	180841.18	18382.35	162458.82
	Minimum	1.00	15	200	0	0	0	3000	0	0
	Maximum	12.50	450	28750	28750	5800	85	2443750	172000	2443750
	Range	11.50	435	28550	28750	5800	85	2440750	172000	2443750
TL (n = 35)	Mean	2.2000	42.68	365.41	268.65	108.47	38.50	12380.30	6482.55	5633.83
	Minimum	.50	10	75	0	0	20	1000	0	0
	Maximum	5.00	100	1938	1788	500	43	67944	58444	24000
	Range	4.50	90	1863	1788	500	23	66944	58444	24000
ADP (n = 25)	Mean	1.9100	36.71	758.40	434.35	361.20	43.63	20496.36	12919.09	7577.30
	Minimum	1.00	15	90	60	30	25	2400	0	0
	Maximum	7.50	100	4050	1650	3240	90	66000	66000	58500
	Range	6.50	85	3960	1590	3210	65	63600	66000	58500
Total (n = 78)	Mean	2.2981	54.70	1119.66	860.59	289.73	39.58	56472.88	11539.91	45739.35
	Minimum	.50	10	75	0	0	0	1000	0	0
	Maximum	12.50	450	28750	28750	5800	90	2443750	172000	2443750
	Range	12.00	440	28675	28750	5800	90	2442750	172000	2443750

Table 4-11. Average Area planted with Beans, Amount of Seed Used, Amount Harvested, Consumed and Sold and Total Income Obtained (n = 44)

Strategy	Statistic	Area (acre) Planted with Beans	Amount (kg) of Beans Seed Planted	Quantity (kg) of Beans Harvested	Quantity (kg) of Beans Sold	Quantity (kg) of Beans Consumed	Price (MK) per kg of Beans Sold	Total Income (MK) Obtained from Beans	Amount of Total Income (MK) from Beans kept by Husband	Amount of Total Income (MK) from Beans kept by Wife
LF (n = 4)	Mean	1.4375	40.00	650.00	450.00	200.00	81.67	38750.00	.00	38750.00
	Minimum	.75	10	50	0	0	60	5000	0	5000
	Maximum	3.00	50	2000	1500	500	100	90000	0	90000
	Range	2.25	40	1950	1500	500	40	85000	0	85000
ERI (n = 18)	Mean	.9250	19.67	128.44	73.72	39.17	65.14	6747.14	632.86	6114.29
	Minimum	.25	4	0	0	0	30	300	0	0
	Maximum	3.00	60	520	480	180	75	36000	3250	36000
	Range	2.75	56	520	480	180	45	35700	3250	36000
ADP (n = 22)	Mean	1.3182	31.14	282.05	197.32	84.73	95.91	17447.73	12152.27	5295.46
	Minimum	.50	5	20	16	0	35	1600	0	0
	Maximum	3.00	80	1200	750	450	150	50000	50000	50000
	Range	2.50	75	1180	734	450	115	48400	50000	50000
Total (n = 44)	Mean	1.1682	27.25	252.66	169.73	76.57	83.77	15245.13	7082.31	10117.95
	Minimum	.25	4	0	0	0	30	300	0	0
	Maximum	3.00	80	2000	1500	500	150	90000	50000	90000
	Range	2.75	76	2000	1500	500	120	89700	50000	90000

Table 4-12. Average Area planted with Soybeans, Amount of Seed used, Amount Harvested, Sold and Total Income Obtained (n = 35)

Strategy	Statistic	Area (acre) Planted with Soybeans	Amount (kg) of Soybeans Seed used	Quantity (kg) of Soybeans Harvested	Quantity (kg) of Soybeans Sold	Quantity (kg) of Soybeans Consumed	Price (MK) per kg Soybeans Sold	Total Income (MK) Obtained from Soybeans	Amount of Total Income (MK) from Soybeans kept by Husband	Amount of Total Income from Soybeans kept by Wife
LF (n = 3)	Mean	1.1667	41.6667	450.00	383.33	66.67	30.0000	11416.67	11416.67	.00
	Minimum	1.00	25.00	150	100	50	25.00	3000	3000	0
	Maximum	1.50	50.00	600	550	100	35.00	17500	17500	0
	Range	.50	25.00	450	450	50	10.00	14500	14500	0
TL (n = 26)	Mean	.7788	14.3200	161.46	134.23	26.15	16.8174	3368.70	1450.00	1918.70
	Minimum	.25	5.00	30	0	0	15.00	680	0	0
	Maximum	2.50	30.00	430	380	50	33.00	9500	6000	9500
	Range	2.25	25.00	400	380	50	18.00	8820	6000	9500
ADP (n = 6)	Mean	.8750	20.3333	348.33	287.00	109.17	34.0000	7460.00	4510.00	2950.00
	Minimum	.25	2.00	50	20	15	25.00	1200	0	0
	Maximum	2.50	80.00	1150	1000	240	60.00	25000	20000	6750
	Range	2.25	78.00	1100	980	225	35.00	23800	20000	6750
Total (n = 35)	Mean	.8286	17.7941	218.23	178.68	43.86	133.1613	4807.42	2908.06	1899.35
	Minimum	.25	2.00	30	0	0	15.00	680	0	0
	Maximum	2.50	80.00	1150	1000	240	3300.00	25000	20000	9500
	Range	2.25	78.00	1120	1000	240	3285.00	24320	20000	9500

Table 4-13. Average Area planted with Chilies, Amount of Seed Used, Amount Harvested, Sold and Total Income Obtained

Strategy	Statistic	Area (acre) Planted with Chilies	Amount (kg) of Chilies Seed used	Quantity (kg) of Chilies Harvested	Quantity (kg) of Chilies Sold	Quantity (kg) of Chilies Consumed	Price (MK) per kg Chilies Sold	Total Income (MK) Obtained from Chilies	Amount of Total Income (MK) from Chilies kept by Husband	Amount of Total Income (MK) from Chilies kept by Wife
TL (n = 7)	Mean	.6250	.1250	22.7857	21.5000	.5714	76.0714	1747.8571	.0000	1747.8571
	Minimum	.25	.05	7.00	7.00	.00	50.00	630.00	.00	630.00
	Maximum	1.00	.20	38.00	38.00	4.00	90.00	3420.00	.00	3420.00
	Range	.75	.15	31.00	31.00	4.00	40.00	2790.00	.00	2790.00
Total (n = 7)	Mean	.6250	.1250	22.7857	21.5000	.5714	76.0714	1747.8571	.0000	1747.8571
	Minimum	.25	.05	7.00	7.00	.00	50.00	630.00	.00	630.00
	Maximum	1.00	.20	38.00	38.00	4.00	90.00	3420.00	.00	3420.00
	Range	.75	.15	31.00	31.00	4.00	40.00	2790.00	.00	2790.00

Table 4-14. Average Area planted with Mushroom, Amount of Seed Used, Amount Harvested, Sold and Total Income Obtained

Strategy	Statistic	Amount of Mushroom Seed (bottles) used	Quantity (kg) of Mushroom Harvested	Quantity (kg) of Mushroom Sold	Quantity (kg) of Mushroom Consumed	Price (MK) per kg Mushroom Sold	Total Income (MK) Obtained from Mushroom	Amount of Total Income (MK) from Mushroom kept by Husband	Amount of Total Income (MK) from Mushroom kept by Wife
ADP (n = 6)	Mean	5.8333	7.3783	5.7533	1.6667	375.0000	2085.8333	.0000	2085.8333
	Minimum	3.00	1.50	1.50	.00	300.00	500.00	.00	500.00
	Maximum	10.00	19.30	13.30	6.00	450.00	4400.00	.00	4400.00
	Range	7.00	17.80	11.80	6.00	150.00	3900.00	.00	3900.00
Total (n = 6)	Mean	5.8333	7.3783	5.7533	1.6667	375.0000	2085.8333	.0000	2085.8333
	Minimum	3.00	1.50	1.50	.00	300.00	500.00	.00	500.00
	Maximum	10.00	19.30	13.30	6.00	450.00	4400.00	.00	4400.00
	Range	7.00	17.80	11.80	6.00	150.00	3900.00	.00	3900.00

Table 4-15. Amount of Juice Produced (liters), Price per Liter Sold and Total Income Obtained

Farmers' Group	Quantity Sold	Price per Liter/bottle	Total Income
Magomero	841	150	126,150
Jali	63 (22 bottles of banana wine, 41 juice)	160 and 75	6,595
Total	904		132,645

Table 4-16. Percentage Distribution of Farmers who Managed Livestock by Strategy (n = 170)

Response	ERI T/Y	ADP T/Y	Total
Dairy cow	29/9		170/9
Improved Pigs	29/8		170/8
Improved Goats		50/26	170/26
Total	29/17	50/26	170/43

T/Y = Total farmers, Yes = Managed livestock; Blank = did not manage livestock

Table 4-17. Number of Livestock Farmers Started with, Have had and Lost (n = 43)

Strategy	Statistic	Number started with	Number farmers have had	Number lost
ERI	Mean	1.00	2.00	4.00
	Minimum	1	0	0
	Maximum	1	7	34
	Range	0	7	34
	N	17	17	17
ADP	Mean	2.00	5.00	1.00
	Minimum	1	1	0
	Maximum	5	27	4
	Range	4	26	4
	N	26	26	26
Total	Mean	2.00	4.00	2.00
	Minimum	1	0	0
	Maximum	5	27	34
	Range	4	27	34
	N	43	43	43

Table 4-18. Number of Livestock Sold, Average Income Obtained and Amount of Income Owned by Men and Women (n = 22)

Strategy	Statistic	Number Sold in 2005	Price (MK) per Livestock Sold in 2005	Total Income (MK) Obtained in 2005	Amount of Money (MK) Controlled by Men in 2005	Amount of Money (MK) Controlled by Women in 2005
ERI	Mean	1	9,450.00	11,450.00	10,500.00	950.00
	Minimum	0	3800	3,800	3,800	0
	Maximum	2	13000	16,000	16,000	3,800
	Range	2	9200	12,200	12,200	3,800
	N	13	4	4	4	4
ADP	Mean	3	3,977.78	8,177.78	8,177.78	7,177.78
	Minimum	1	2800	4,000	0	0
	Maximum	8	5000	20,000	38,000	38,000
	Range	7	2200	16,000	38,000	38,000
	N	9	9	9	9	9
Total	Mean	1	5,661.54	9,184.62	8,523.08	5,261.54
	Minimum	0	2,800	3,800	0	0
	Maximum	8	13,000	20,000	38,000	38,000
	Range	8	10,200	16,200	38,000	38,000
	N	22	13	13	13	13

Table 4-19. Average Total Income (MK) obtained by Farmers across Strategies

Strategy	Maize	Groundnut	Beans	Soybeans	Mushroom	Fruit Juice	Chilies
LF	268, 346.67	180,841.18	38,750.00	11,416.67			
DD						132,645.00	
ADP	46,562.50	20,496.36	17,447.73	4,510.00	2,085.83		
TL		12,380.30		3,368.70			1747.85
ERI			6,747.14				

Table 4-20. Average Total Income Controlled by Women across Strategies

Strategy	Maize	Groundnuts	Beans	Soybeans	Mushroom	Fruit Juice	Chilies
LF	149,350.00	162,458.82	38,750.00	X			
DD						132,645.00	
ADP	19,083.33	7,577.30	5,295.46	2,950.00	2,085.83		
TL		5,633.83		1,918.70			1,747.86
ERI			6,747.14				

* X means women did not control income from soybeans

Table 4-21. Percentage of Total Income Controlled by Women across Strategies

Strategy	Maize	Groundnuts	Beans	Soybeans	Mushroom	Fruit Juice	Chilies
LF	55.6	89.8	100.0	X			
DD						100.0	
ADP	40.9	36.9	30.3	65.4	100.0		
TL		45.5		56.9			100.0
ERI			90.6				

* X means women did not control income from soybeans

Table 4-22. Percent Response on Investment Patterns Made by Farmers (n =170)

Investment	Frequency	Percent
Clothes	125	73.5
Chemical Fertilizer	114	67.1
Kitchen Items	99	58.2
Food	94	55.3
Children Education	81	47.6
Livestock	77	45.3
New house	76	44.7
Bicycle	59	34.7
Mattress	38	22.4
New grocery stores	12	7.1
Television	12	7.1
Chairs	6	3.5
Vehicles	2	1.2

*Total frequencies and percentages do not account for 100 because farmers had multiple answers

Table 4-23. Percent of Yes Response on Investment Patterns by Farmers across Strategies

	LF (n = 34)		ERI (n = 29)		DD (n = 14)		TL (n = 43)		ADP (n = 50)	
Item invested in	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
Household Item										
Clothes	27	79.4	16	55.2	4	28.6	39	90.7	39	78.0
Kitchen utensils	22	64.7	6	20.7	5	35.7	34	79.1	32	64.0
Food	20	58.8	9	31.0	4	28.6	33	76.7	28	56.0
Bicycle	19	55.9	5	17.2			17	39.5	18	36
Mattress	14	41.2	1	3.4	4	28.6	8	18.6	11	22.0
Television	11	32.4					1	2.3		
Chairs	2	5.9					1	2.3	3	6.0
Agricultural Inputs										
Chemical fertilizer	30	88.4	15	51.7	5	35.7	25	58.1	39	78.0
Seed	28	82.4	2	6.9	2	14.3	13	30.2	28	56.0
Livestock										
Livestock	16	47.1	3	10.3	4	28.6	28	65.1	26	52.0
Built Livestock house	6	17.6	1	3.4	1	7.1	2	4.7	18	36
Livestock feed	4	11.8	7	24.1					13	26.0
Education										
Children school fees	27	79.4	7	24.1	3	21.4	20	46.5	24	48.0
Hard Assets										
New house	15	41.2	1	3.4	1	7.1	10	23.2	15	30.0
Grocery stores	5	14.7	1	3.4	1	7.1	2	47.0	3	6.0
Vehicle	2	5.9								

Table 4-24. Other Benefits Farmers Derive from Participating in Strategies for Linking Farmers to Market

Variable	Strategy	N	Improved		The Same		Worse	
			Frequency	Percent	Frequency	Percent	Frequency	Percent
Change in Knowledge and Skills	DD	14	14	100.0				
	ERI	29	27	96.4	1	3.6		
	ADP	50	48	96.0	1	2.0	1	2.0
	LF	34	29	85.3	5	14.7		
	TL	43	10	23.2	32	74.4	1	0.02
	Total	170	160	94.3	7	4.4	2	1.3
Social Network and Relationships	DD	14	14	100.0			4	15.4
	LF	34	32	94.1	1	2.9	1	2.9
	ERI	29	26	92.9	2	7.1		
	ADP	50	44	89.8	3	6.1	2	4.1
	TL	43	22	84.6				
	Total	170	138	91.4	6	4.0	7	4.6
Self Confidence	DD	14	14	100.0				
	ADP	50	49	98.0	1	2.0		
	ERI	29	26	96.3	1	3.7		
	LF	34	32	94.1	1	2.9	1	2.9
	TL	43	25	86.2	1	3.4	3	10.3
	Total	170	146	94.8	4	2.6	4	2.6
Position-Status	LF	34	32	94.1	2	5.9		
	ADP	50	47	94.0	3	6.0		
	ERI	29	25	92.6	2	7.4		
	TL	43	19	90.5	1	4.8	1	4.8
	DD	14	12	85.7	2	14.3		
	Total	170	135	92.5	10	6.8	1	.7

Table 4-25. Farmers' Response on Changes on Specific Gender Issues: Wife-Husband Relationships, Roles and Responsibilities and Decision-Making among Married Farmers across Strategies

Variable	Strategy	N	Improved		The Same		Worse	
			Frequency	Percent	Frequency	Percent	Frequency	Percent
Wife-husband relationships	LF	16	88.9	1	5.6	1	5.6	
	ERI	16	94.1			1	5.9	
	DD	7	87.5	1	12.5			
	TL	15	93.8			1	6.3	
	ADP	34	89.5	4	10.5			
Household roles and responsibilities	LF	14	77.8	1	5.6			
	ERI	17	94.4					
	DD	8	100.0					
	TL	18	85.7			3	14.3	
	ADP	30	78.0	4	10.5	4	10.4	
Household decision-making	LF	15	83.5	3	16.3			
	ERI	14	82.4	3	17.6			
	DD	5	62.5	3	37.5			
	TL	15	88.2	1	5.9	1	5.9	
	ADP	33	86.8	5	13.2			
Women's work load	LF	34	20	60.6	3	9.1	10	30.3
	ERI	29	11	39.3	1	3.6	16	57.1
	DD	14	1	11.1	4	44.4	4	44.4
	TL	43	16	80.0	2	10.0	2	10.0
	ADP	50	24	48.0	8	16.0	18	36.0

Table 4-26. Farmers' Responses on whether they can Produce and Manage the New Crop and/or Livestock Enterprises with Limited Support from the Market-Linkage Strategies (n = 141)

Variable	Response	LF (n =34)		DD (n = 14)		TL (n = 43)		ADP (n = 50)		ERI (n=29)	
		f	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
Production of new crop	I cannot do it at all	3	8.8			6	14	4	8.0		
	I can do with some help	14	41.2			16	37.2	28	56.0		
	I can do without help	17	50	14	100	21	48.8	18	36.0		
Identifying markets for the new crop	I cannot do it at all	4	11.8	1	7.1	23	53.5	11	22.0	5	17.2
	I can do with some help	17	50.0	3	21.4	8	18.6	28	56.0	4	13.8
	I can do without help	13	38.2	10	71.4	12	27.9	11	22.0	3	10.3

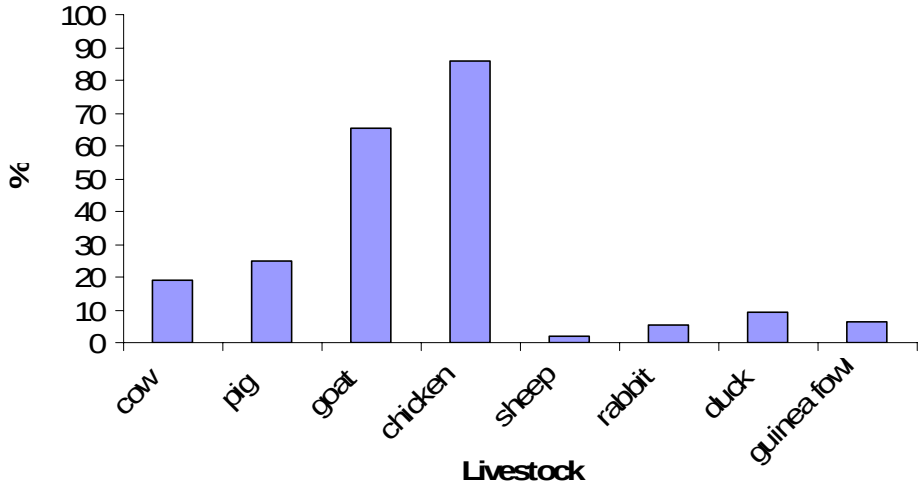

Figure 4-1. Percentage Distribution of Farmers by type of Livestock Owned (n = 170)

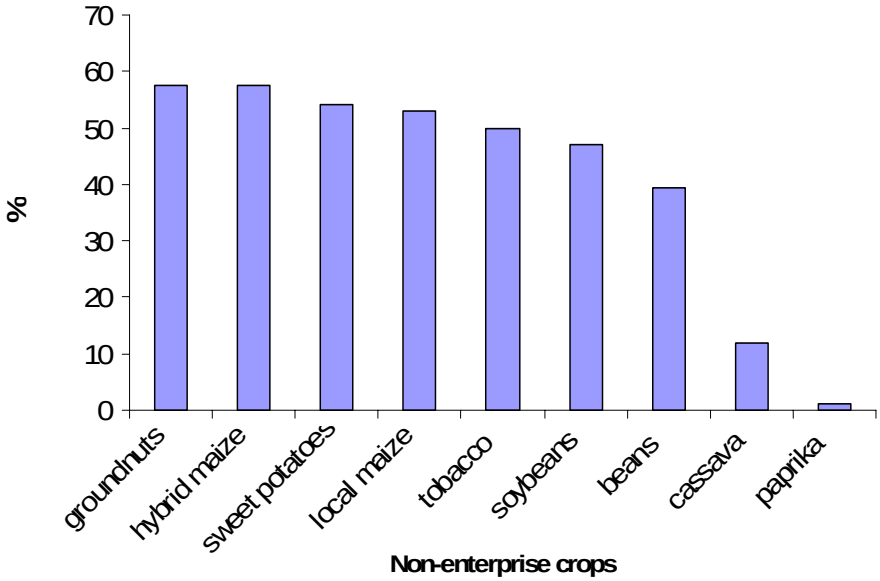

Figure 4-2. Percentage Distribution of Farmers by Non-enterprise Crops they Produced (n = 170)

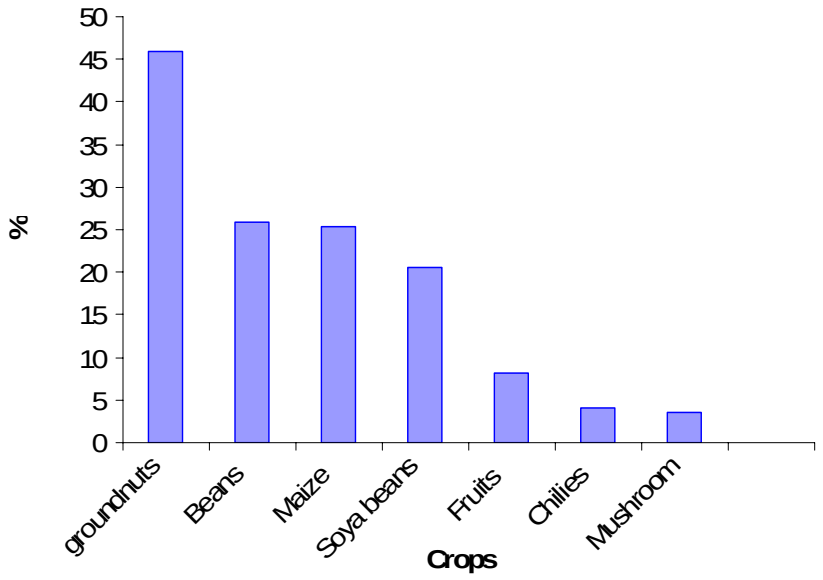

Figure 4-3. Crop Enterprises Implemented by Farmers (n = 170)

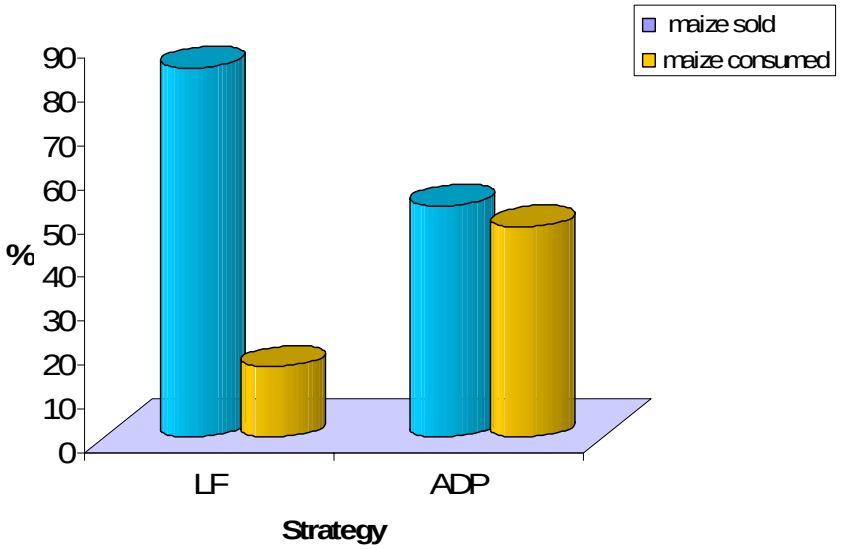

Figure 4-4. Percentage of OPV Maize Sold and Consumed by Farmers (LF, n=18; ADP, n=25)

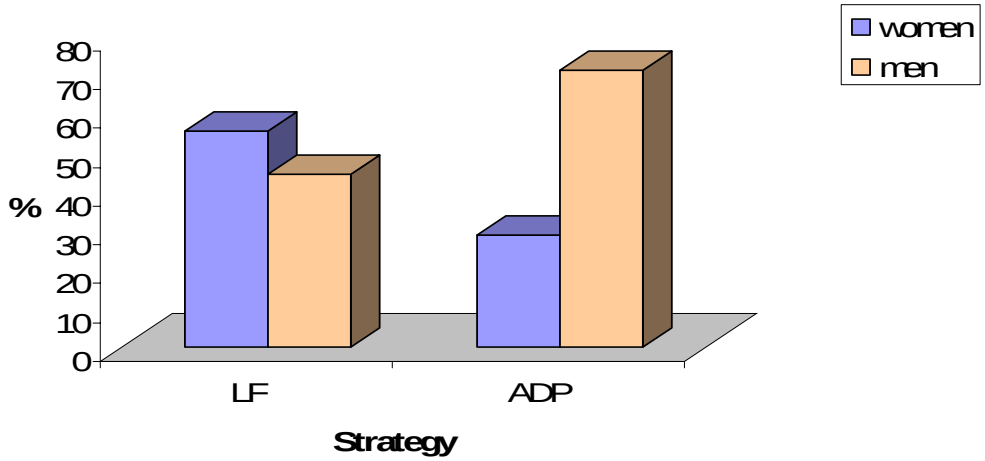

Figure 4-5. Percentage of Total Income Controlled by Women and Men Farmers after Selling OPV Maize (LF, n= 18; ADP, n=25)

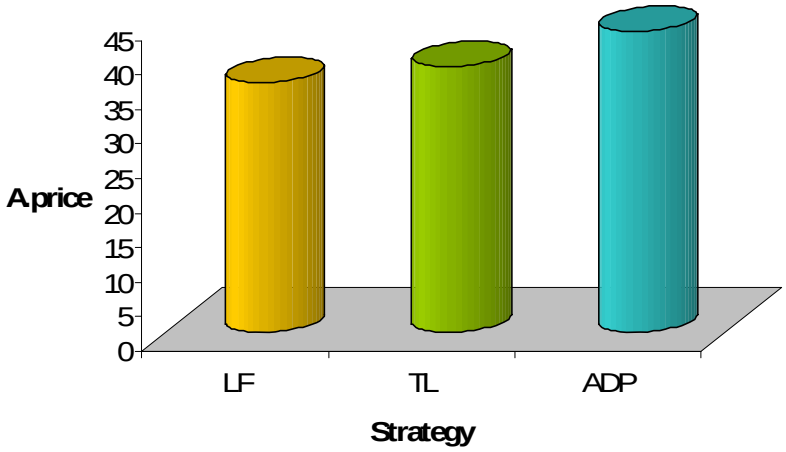

Figure 4-6. Average Price (MK) that Farmers Sold Groundnuts across Strategies (LF, n=18; TL, n=35; ADP, n=25)

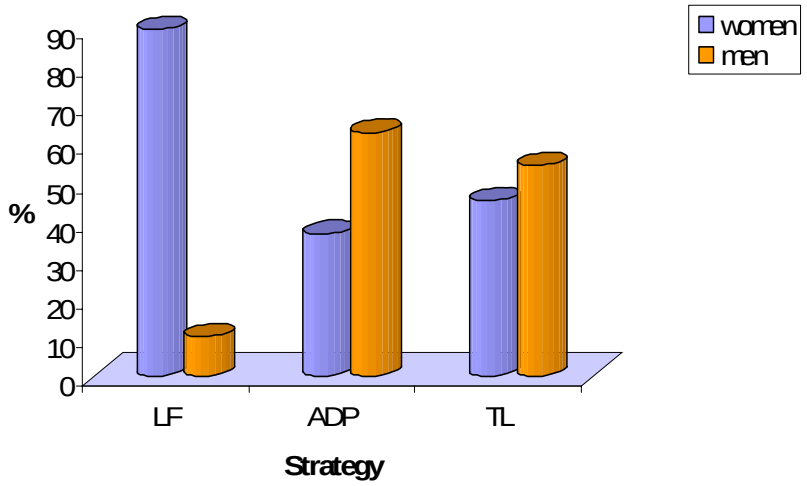

Figure 4-7. Percentage of Total Amount of Income from Groundnuts Controlled by Women and Men farmers (LF, n=18; TL, n=35; ADP, n=25)

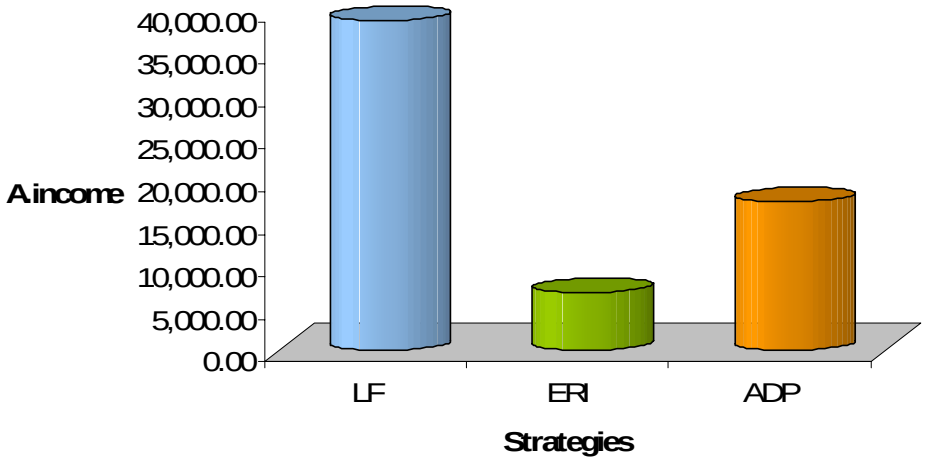

Figure 4-8. Average Total Income (MK) Obtained from Beans (LF, n= 4; ERI, n=18; ADP, n=22)

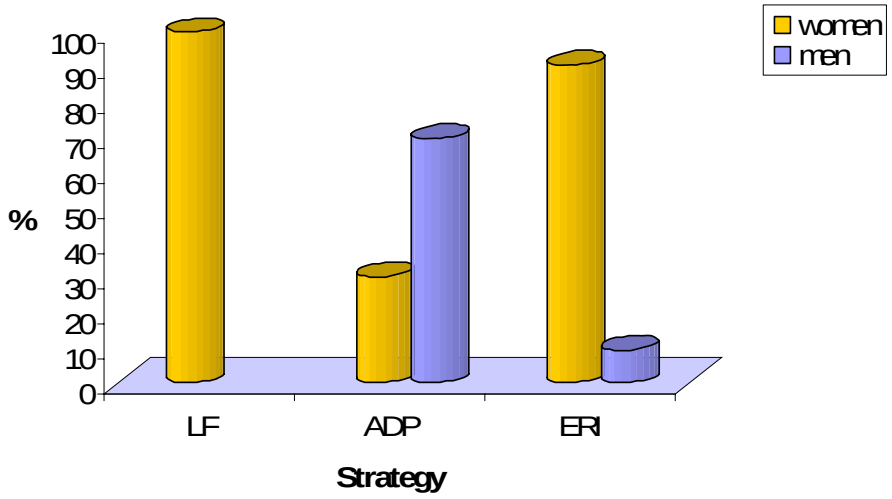

Figure 4-9. Percentage of Total Amount of Income from Beans Controlled by Women and Men (LF, n= 4; ERI, n=18; ADP, n=22)

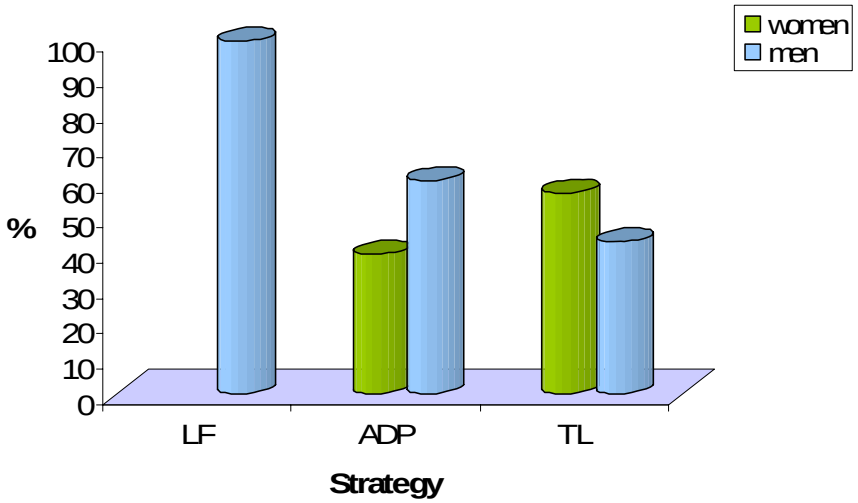

Figure 4-10. Percentage of Total Amount Income from Soybeans Controlled by Men and Women (LF, n=3; TL, n=26; ADP, n=6)

Figure 4-11. Some of the Vegetables Processed by Farmers in Jali Group

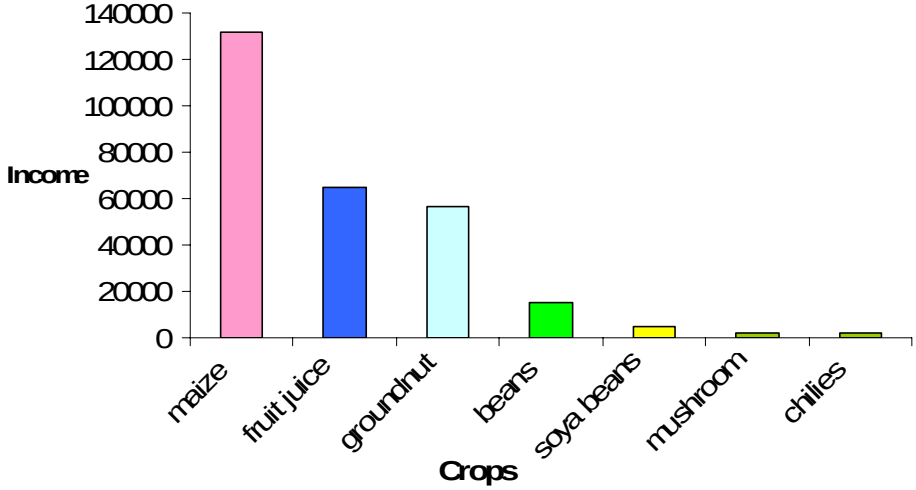

Figure 4-12. Average Total Income (MK) obtained by Farmers by Crops (n = 170)

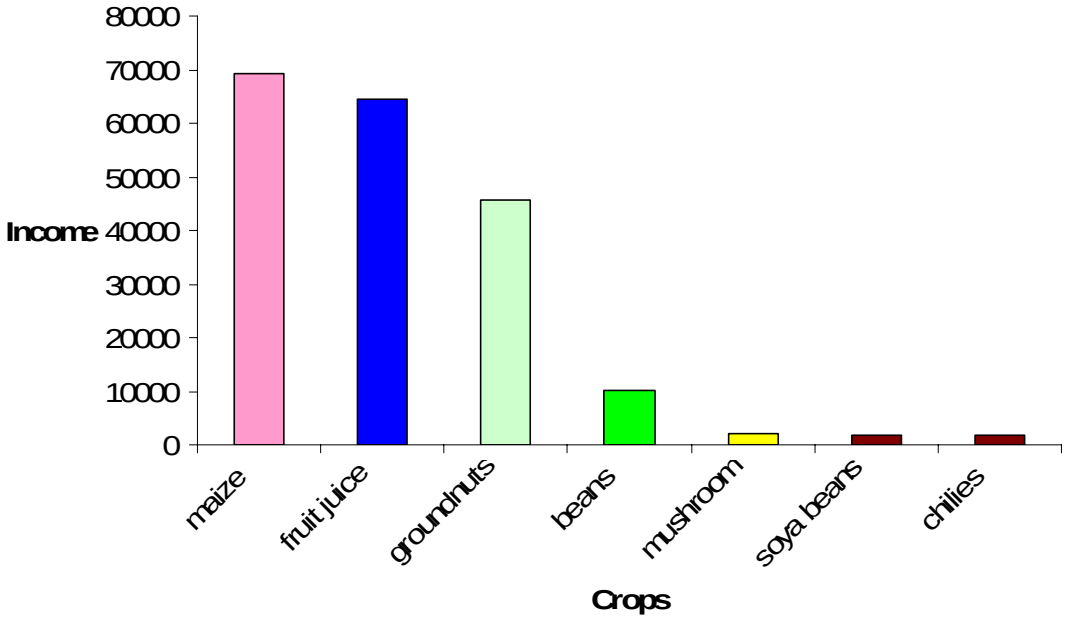

Figure 4-13. Average amount of Income (MK) Controlled by Women across Crops (n = 137)

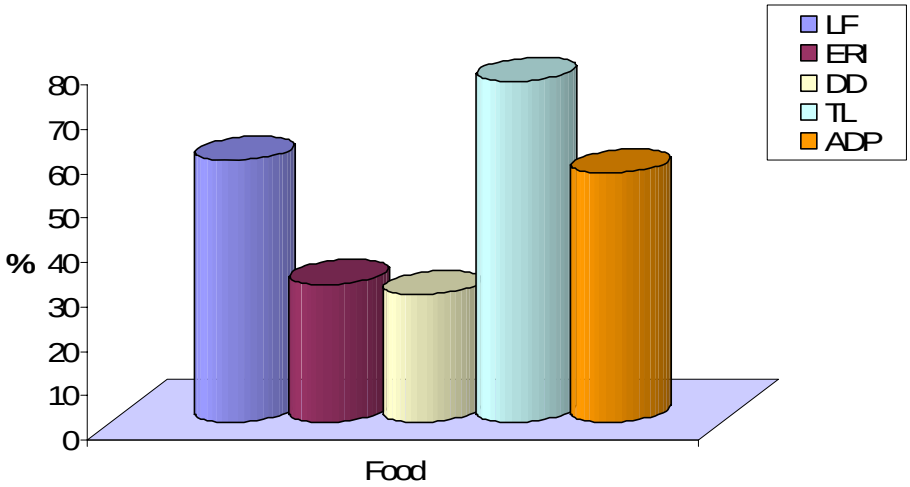

Figure 4-14. Investment in Food by Farmers across Strategies (ERI: n = 29; DD: n = 14; LF: n = 34; TL: n = 43; ADP: n = 50)

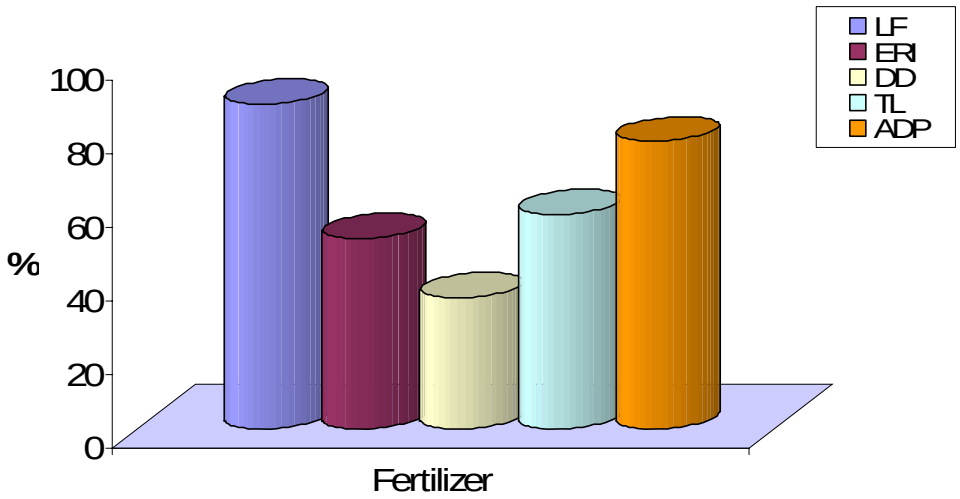

Figure 4-15. Investment in Chemical Fertilizer Farmers across Strategies (ERI: n = 29; DD: n = 14; LF: n = 34; TL: n = 43; ADP: n = 50)

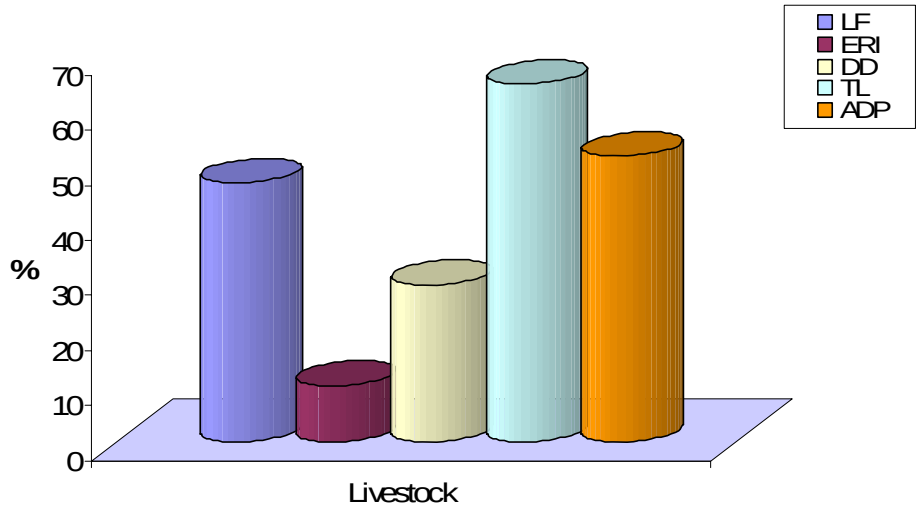

Figure 4-16. Investment in Livestock by Farmers across Strategies (ERI: n = 29; DD: n = 14; LF: n = 34; TL: n = 43; ADP: n = 50)

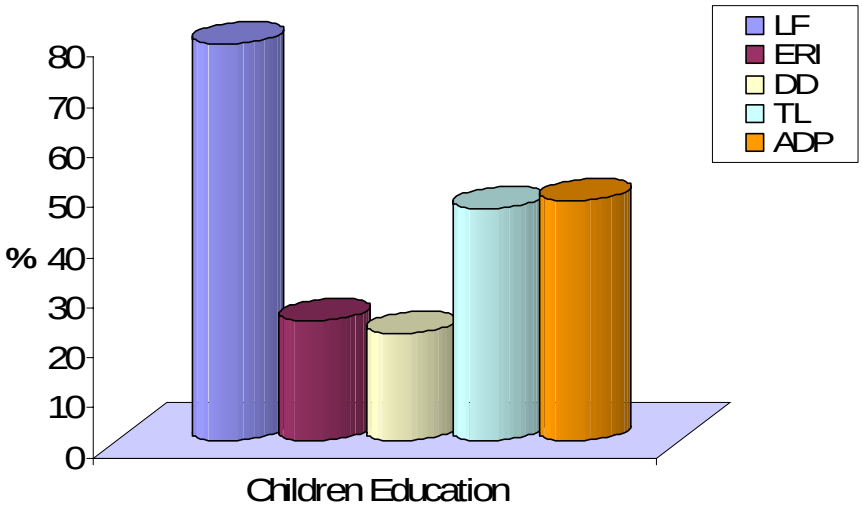

Figure 4-17. Investment in Children Education by Farmers across Strategies (ERI: n = 29; DD: n = 14; LF: n = 34; TL: n = 43; ADP: n = 50)

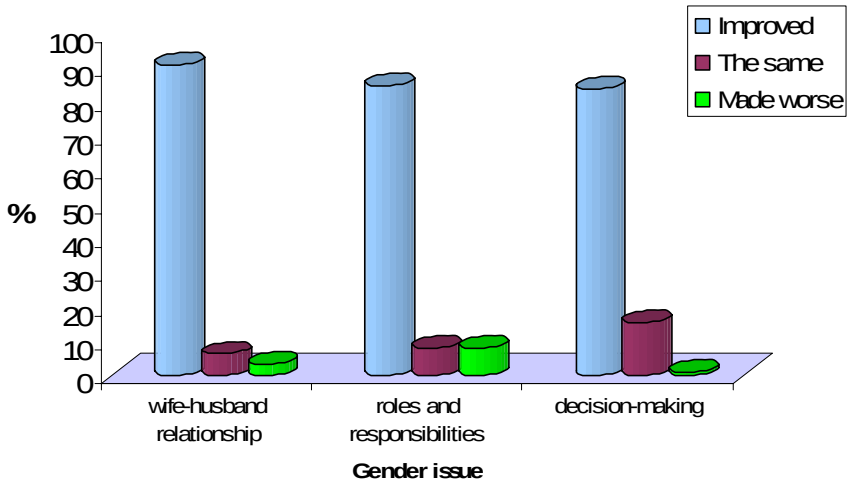

Figure 4-18. Farmers' Response on Changes on Specific Gender Issues: Wife-Husband Relationships, Roles and Responsibilities and Decision-Making among Married Farmers (n = 116)

CHAPTER 5
RESULTS AND DISCUSSION

Trade off on Soil Fertility Management Technologies between Food and Cash Crops

Introduction

This chapter analyzes the trade off on soil fertility management technologies (SFMTs) between food and cash crops. Subsequent sections provide general results on types of SFMTs used by all farmers studied, and by farmers across strategies across crop enterprises. The final sections present farmers' major sources of information on SFMTs and type of support on SFMTs offered to farmers by each strategy. The following variables will guide the discussions on SFMTs that farmers used on different crops, and by strategy.

- Percentage of farmers that used different types of SFMTs
- The most-used SFMTs by both women and men
- Variation in use of SFMTs across different crops (the trade off)

Generally, soil fertility management was an integral component of all strategies for linking farmers to market. Each of the strategies involved farmers in one or a combination of the following SFMTs:

a) Animal manure
b) Compost manure
c) Crop residues
d) Chemical fertilizer
e) Soil erosion control measures such as contour bands, terraces and the use of vertiver grasses
f) Crop rotation
g) Integrated Pest Management (IPM)
h) Agroforestry

Table 5-1 and Figure 5-1 present percentage distribution of farmers by type of soil fertility management technologies used. The results show that the majority of farmers used crop rotation, chemical fertilizer, crop residues, animal manure, erosion control measures and compost manure to improve soil fertility. A few farmers used intercropping with legumes, agroforestry or IPM. Tables 5-2 and 5-3 indicate type of SFMTs used by male and female farmers respectively.

Regardless of farmer's sex, the results further show that crop rotation, chemical fertilizer, animal and compost manure and soil erosion control measures were the most-used SFMTs.

Soil Fertility Management Technologies used by Farmers across Strategies

Table 5-4 reports percentage distribution of farmers by SFMTs used by strategy. The results show that SFMTs used by farmers varied by strategy. Also, crop rotation, chemical fertilizer, crop residues, animal manure, erosion control measures, compost manure and intercropping with legumes were SFMTs used by more than fifty percent of farmers across strategies. Agroforestry technologies and IPM were SFMTs used by less than fifty percent of farmers across strategies.

Figures 5-(2-6) show percentage distribution of farmers by type of SFMTs used across strategies. For chemical fertilizer, Figure 5-2 shows that DD strategy represents the highest percentage of farmers who used chemical fertilizer, followed by LF, ERI, ADP and TL respectively. Figure 5-3 shows that very few LF, ERI, TL and ADP farmers used intercropping with legumes compared to crop rotation. The exception was DD strategy that represents the majority of farmers who used intercropping with legumes. As reported in Figure 5-3, the ERI strategy represents the highest percentage of farmers who used crop rotation.

Figure 5-4 shows percentage distribution of farmers who incorporated crop residues and used animal and compost manure on their farms. Generally, LF represents the lowest percentages of farmers who used all these three technologies. For crop residues, the ADP and DD strategies represent the highest percentages of farmers who used this technology on their farms. The DD strategy represents the highest percentage of farmers who used animal manure while the TL strategy represents the highest percentage of farmers who used compost manure.

Figure 5-5 shows percent distribution of farmers who used soil erosion control measures. The DD strategy represents the highest percentage of farmers who used soil erosion control

measures. As reported in Figure 5-6, generally, less than one third of the farmers across all strategies used IPM and agroforestry technologies. ERI represents the highest percentage of farmers who used IPM technology while the TL strategy represents the highest percentage of farmers who used agroforestry technologies.

Table 5-5 summarizes the most used SFMTs by farmers across strategies. The categorization of the most-to-less used technologies is based on the highest and lowest percentages of farmers' responses indicated in Table 5-4. In Table 5-5, numbers 1-5 represent the most-used technologies and numbers 6-9 represent the less-used technologies. Chemical fertilizer, animal and compost manure, crop rotation and crop residues represent the most-used technologies across strategies. Agroforestry and IPM represent the less-used technologies by farmers across strategies. The following section explains the trade off/decision making on the most-used SFMTs by farmers across different crops.

Variation in use of Soil Fertility Management Technologies across Crops /the Trade off

Table 5-6 presents general results that support the trade off on SFMTs between cash and food crops. In Malawi, farmers produced maize as a major food and income earning crop. Maize flour is used to prepare the traditional staple food (*Nsima*) often taken with soybeans, beans, groundnuts and green vegetables or meat relish if a farmer has enough income to purchase meat relish. Hence, farmers studied produced soybeans, beans, groundnuts and green vegetables as relishes and also sold these crops for income earning. Farmers in Malawi produced tobacco mainly for income earning. They also produced green vegetables, tomatoes and onions--particularly on dambos--for food and income earning.

As reported in Table 5-6, a majority of farmers used SFMTs on maize, tobacco, soybeans, beans, groundnuts and green vegetables. Very few farmers used SFMTs on pigeon peas, cowpeas, Irish potatoes, fruits, mushroom, tomatoes and onions--very few farmers produced

these crops for food and/or income. Moreover, farmers used leguminous crops such as groundnuts, beans, soybeans, cowpeas and pigeon peas in intercropping or crop rotational systems to replenish the soil fertility.

Across strategies, the results show similarities on the trade off for the SFMTs between food and cash crops. For instance, results in Table 5-7 show that the majorities of farmers across all strategies used chemical fertilizer--particularly on maize and tobacco while very few farmers used chemical fertilizer on soybeans, beans, green vegetables, onions, tomatoes and Irish potatoes. As reported in Figure 5-7, ERI, LF and ADP strategies represents the highest percentages of farmers who used crop rotation on maize. In addition, ADP and LF represent the highest percentage of farmers who used crop rotation on tobacco. Through information discussions with farmers, this researcher found that maize or tobacco was often rotated or intercropped with groundnuts, beans, soybeans, pigeon peas and cow peas. Farmers further commented that groundnut was the most used legume in crop rotation and intercropping systems when compared to soybeans, beans and pigeon peas.

Results in Tables 5-8 and 5-9 show that the majority of farmers used animal and compost manure--particularly on maize. The DD, ERI and ADP strategies represent the highest percentage of farmers who used animal manure. The ADP strategy represents the highest percentage of farmers who used animal manure on tobacco. In addition, the ADP strategy represents the highest percentage of farmers who used compost manure on both maize and tobacco. In general, few farmers across strategies used animal and compost manure on green vegetables, soybeans, beans and groundnuts.

In sum, the significance of maize, groundnuts, beans and green vegetables for food and tobacco for income indicates that farmers used SFMTs on crops with high value attached either for food, income or soil fertility management.

Sources of Information on Soil Fertility Management Technologies Used by Farmers

One of the research interests was to bring more understanding to the sources of information on SFMTs that farmers used on different crops. Table 5-10 reports percentage response of farmers on sources of information for SFMTs they used. The majority of farmers mentioned the government extension worker and their strategies as major source of information for the SFMTs they used.

As reported in Table 5-10, LF, ERI and DD farmers responded that the government extension worker (*Alangisye*) was their major source of information on SFMTs while TL and ADP farmers mentioned that TL and ADP strategies were their major sources of information on SFMTs. Farmers mentioned fellow farmers, family members and their own experiences as additional sources of information on SFMTs.

Through informal discussion with farmers, this researcher found that each strategy supported farmers on SFMTs--particularly information on different SFMTs that they could use; training on how farmers could use SFMTs; or providing farmers with fertilizer loans or seed for leguminous crops such as beans, soybeans and groundnuts. Table 5-11 reports type of support offered to farmers by each strategy. Nearly 48% of all farmers responded that strategies for linking farmers to market provided them with information on how to use different SFMTs. Also, farmers mentioned that they received--from their strategies--training on how they could apply chemical fertilizer, animal and compost manure on different crops. In addition, strategies such as LF, DD, TL and ADP provided fertilizer loans to farmers --particularly at the outset of their market enterprises.

Chapter Summary

Farmers used chemical fertilizer, animal and compost manure, crop rotation, intercropping, soil erosion control measures, IPM and agroforestry technologies to improve soil fertility. However, the most-used technologies by farmers were chemical fertilizer, animal and compost manure, crop residues and crop rotation. The less-used technologies were IPM and agroforestry.

The application of different SFMTs by farmers varied by crops and by strategies. Farmers used the different SFMTs mostly on maize and tobacco. Farmers produced maize for food and income earning, and they produced tobacco mainly for income generation. In addition to maize and tobacco, farmers across strategies used SFMTs on green vegetables that were produced for both food and income generation.

DD farmers processed fruits for income earning while LF, ERI, TL and ADP farmers produced either soybeans, beans, groundnuts or a combination of these as market enterprises, although farmers consumed part of each of these crops. In addition, LF and ADP farmers produced maize for income earning, but farmers consumed part of it. Based on the variation in use of SFMTs across crops, this researcher concludes that farmers invested more in SFMTs for major food and cash crops, which were maize and tobacco respectively. Few farmers invested in SFMTs on groundnuts, soybeans and beans because these crops were not only the major legumes that farmers used as relish with *Nsima*, but farmers also used them in crop rotation and intercropping systems.

This study found that the major sources of information on SFMTs used by farmers varied by strategies. However, the government extension workers played an important role in providing information on SFMTs to farmers across all strategies. Farmers mentioned other sources of information on SFMTs, which were the strategies they worked with, fellow farmers, family members and farmers' own experience. Each strategy supported farmers in terms of providing

them with more information on SFMTs and training programs on how farmers could apply SFMTs on different crops. Some of the strategies provided farmers with fertilizer loans particularly at the outset of market enterprises.

Table 5-1. Percentage Distribution of Farmers by Type of Soil Fertility Management Technologies Used

Soil Fertility Management Technologies	*f*	Percent
Crop Rotation	134	78.8
Chemical Fertilizer	132	77.6
Crop Residues	103	60.6
Animal Manure	97	57.1
Soil Erosion Control Measures	96	56.5
Compost Manure	92	54.1
Intercropping with Legumes	51	30.0
Agroforestry	48	28.2
Integrated Pest Management (IPM)	14	8.2

*Percent do not account for 100 percent because respondents had multiple answers

Table 5-2. Percentage Distribution of Male Farmers by Type of Soil Fertility Management Technologies Used (n = 33)

SFMTs	*f*	Percent
Crop Rotation	27	81.8
Chemical Fertilizer	26	78.8
Animal Manure	22	66.7
Crop Residues	20	60.6
Compost Manure	21	63.6
Soil Erosion Control Measures	19	57.6
Agroforestry	16	48.5
Intercropping with Legumes	9	27.3
IPM	2	6.1

*Percent do not account for 100 percent because respondents had multiple answers

Table 5-3. Percentage Distribution of Female Farmers by Type of Soil Fertility Management Technologies Used (n = 137)

SFMTs	*f*	Percent
Crop Rotation	107	78.1
Chemical Fertilizer	106	77.4
Crop Residues	83	60.6
Soil Erosion Control Measures	77	56.2
Animal Manure	75	54.7
Compost Manure	71	51.8
Intercropping with Legumes	42	30.7
Agroforestry	32	23.4
IPM	12	8.8

*Percent do not account for 100 percent because respondents had multiple answers

Table 5-4. Percentage Distribution of Farmers by Soil Fertility Management Technologies Used by Strategy

SFMTs	LF (n = 34)		ERI (n = 29)		DD (n = 14)		TL (n = 43)		ADP (n = 50)		Total	
	f	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
Crop rotation	32	94.1	28	96.6	6	42.9	30	69. 8	38	76.0	134	78.8
Chemical fertilizer	32	94.1	26	89.7	14	100.0	23	53.5	37	74.0	132	77.6
Crop residues	13	38.2	18	62.1	11	78.6	21	48.8	40	80.0	103	60.6
Animal manure	13	38.2	23	79.3	13	92.9	18	41.9	30	60.0	97	57.1
Erosion control measures	23	67.6	15	51.7	10	71.4	15	34.9	33	66.0	96	56.5
Compost manure	13	38.2	14	48.3	8	57.1	27	62.8	30	60.0	92	54.1
Intercropping with legumes	9	26.5	8	27.6	11	78.6	15	34.9	8	16.0	51	30.0
Agroforestry	7	20.6	7	24.1	4	28.6	14	32.6	16	32.0	48	28.2
IPM	1	2.9	10	34.5	1	7.1	1	2.3	1	2.0	14	8.2

Table 5-5. Distribution of Farmers by the Most-Used Soil Fertility Management Technologies by Strategies

Strategy/ Rank	1	2	3	4	5	6	7	8	9
LF (n = 34)	Chemical Fertilizer	Crop Rotation	ECM[5]	Animal Manure, Compost Manure, Crop Residue	Intercropping with Legume	Agroforestry	IPM		
ERI (n = 29)	Crop Rotation	Chemical Fertilizer	Animal Manure	Crop Residue	ECM	Compost Manure	IPM	Intercropping with Legume	Agroforestry
DD (n = 14)	Chemical Fertilizer	Animal Manure	Crop Residue, Intercropping with legume	ECM	Compost Manure	Crop Rotation	Agroforestry	IPM	
TL (n = 43)	Crop Rotation	Compost Manure	Chemical Fertilizer	Crop Residue	Animal Manure	ECM, Intercropping with legume	Agroforestry	IPM	
ADP (n = 50)	Crop Residue	Crop Rotation	Chemical Fertilizer	ECM	Animal Manure Compost Manure	Agroforestry	Intercropping with Legume	IPM	

[5] Erosion Control Measures

Table 5-6. Percentage Distribution of Farmers by Soil Fertility Management Technologies Used on different Crops (N = 170)

NRM Technology	Maize	Tobacco	Soybeans	Beans	Groundnut	Mushroom	Fruits	Pigeon peas	Cowpeas	Irish potatoes	Green vegetables
Fertilizer	77.1	36.5	2.4	2.9						2. 4	2.4
Crop Rotation	71.2	32.4	23.5	21. 2	58.8			. 6			
Animal Manure	52.9	21.2	3.5	1.8	2.4		1.8				6.5
Soil Erosion Control Measures	52.4	22.4	15.3	17.1	33.5		.6	5.3	2.9		2.4
Crop Residues	49. 4	12.9	8.2	13.5	21.2	5.3		3.5			. 6
Compost Manure	46.5	25.3	3.2	1.2	2.4						4.1
Intercropping with Legumes	30.0	.6	10.0	21.0	6.5			4.1	2.4		
Agroforestry	26.5	8.8	5.9		9.4				. 6		
IPM	2.4	1.2		6.5				.6			

Table 5-7. Percentage Distribution of Farmers who Used Chemical Fertilizer on Different Crops across Strategies

Crop	LF (n = 34)		ERI (n = 29)		DD (n = 14)		TL (n = 43)		ADP (n = 50)		Total	
	f	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
Maize	32	94.1	26	89.7	14	100	22	51.2	37	74.0	131	77.1
Tobacco	12	35.3	15	51.7	2	14.3	10	23.3	23	46.0	62	36.5
Beans	1	2.9	3	10.3					1	2.0	5	2.9
Irish potatoes							2	4.6	2	4.0	4	2.4
Green Vegetables	1	2.9	2	6.8					1	2.0	4	2.4
Soybeans	1	2.9	1	3.4			2	4.6			4	2.4
Tomatoes					1	7.1			1	2.0	2	1.2
Onions			1	3.4							1	.6

Table 5-8. Percentage Distribution of Farmers who Used Animal Manure on Different Crops across Strategies

Crop	LF (n = 34)		ERI (n = 29)		DD (n = 14)		TL (n = 43)		ADP (n = 50)		Total	
	f	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
Maize	12	35.3	20	68.9	13	92.5	15	34.8	30	60.0	90	92.8
Tobacco	4	11.7	8	27.5	1	7.1	5	11.6	18	36.0	36	37.1
Green Vegetables	1	2.9	3	10.3	2	14.3	4	9.3	1	2.0	11	11.3
Soybeans					1	7.1	3	6.9	2	4.0	6	6.2
Groundnut							4	9.3			4	4.1
Fruits					3	.2					3	3.1
Beans			2	6.8					1	2.0	3	3.1

Table 5-9. Percentage Distribution of Farmers who Used Compost Manure on Different Crops across Strategies

Crop	LF (n = 34)		ERI (n = 29)		DD (n = 14)		TL (n = 43)		ADP (n = 50)		Total	
	f	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
Maize	12	35.3	13	44.8	7	50	20	46.5	27	54.0	79	84.9
Tobacco	7	20.5	7	24.1			10	23.3	19	38.0	43	46.2
Soybeans							5	11.6	1	2.0	6	6.5
Green Vegetables			1	3.4	2	14.3	3	6.9	1	2.0	6	6.5
Groundnut							3	6.9	1	2.0	4	4.3
Beans	1	2.9							1	2.0	2	2.2

Table 5-10. Percentage Response of Farmers on Sources of Information for Soil Fertility Management Technologies Used

Source of Information	LF (n = 34)		ERI (n = 29)		DD (n = 14)		TL (n = 43)		ADP (n = 50)		Total	
	f	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
Government Extension Worker	25	73.5	29	100.0	10	71.4	17	39.5	29	58.0	110	64.7
The Organization-Strategy	4	11.8	9	31.0	6	42.9	23	53.5	30	60.0	72	42.4
Fellow Farmers	5	14.7	5	17.2	3	21.4	10	23.3	10	20.0	33	19.4
Family members	1	2.9	4	13.8	2	14.3	3	7.0	4	8.0	14	8.2
Farmers own experience	4	11.8	4	13.8			2	4.7			10	5.9

Table 5-11. Percentage Response of Farmers on Support Offered by their Strategies on Sources of Information for Soil Fertility Management Technologies Used

Support Offered	LF (n = 34)		ERI (n = 29)		DD (n = 14)		TL (n = 43)		ADP (n = 50)		Total	
	f	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
Information on SFMTs	12	35.3	24	82.8	4	28.6	14	32.6	27	54.0	81	47.6
Materials for soil fertility management	2	5.9	25	86.2	7	50.0	7	16.3	5	10.0	46	27.1
Training	2	5.9	13	44.8	5	35.7	8	18.6	16	32.0	44	25.9
Input loans	11	32.4			12	85.7	4	9.3	11	22.0	39	22.9

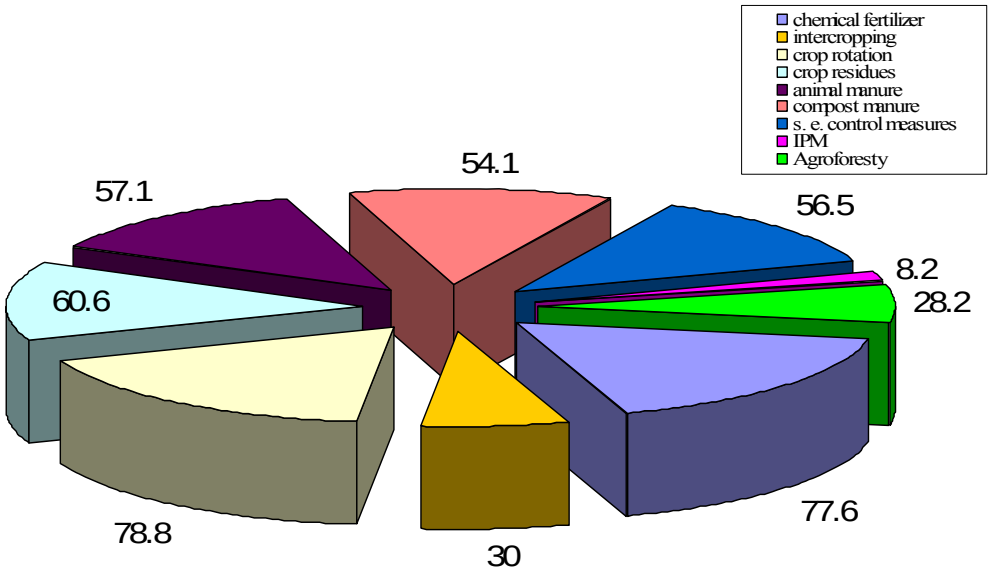

Figure 5-1. Percentage Distribution of Farmers by Type of Soil Fertility Management Technologies Used (n = 170)

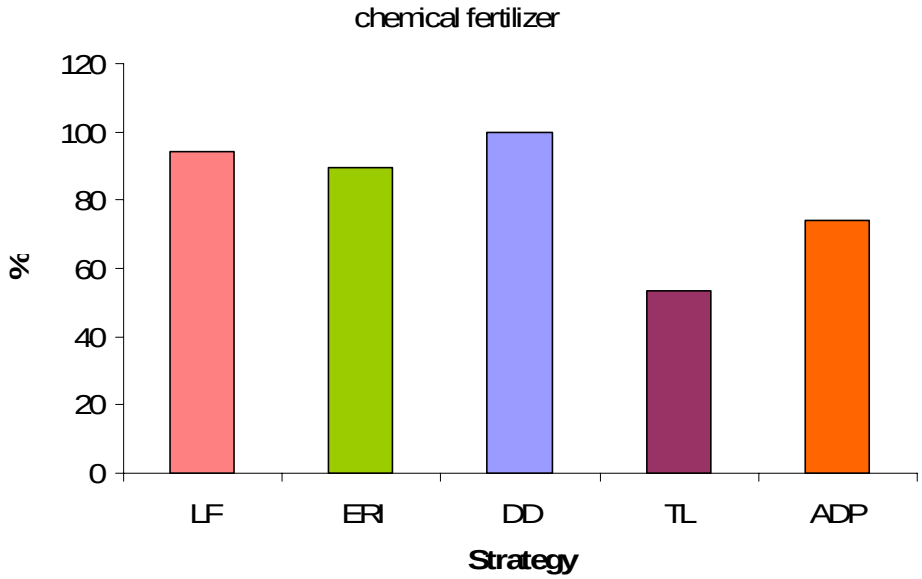

Figure 5-2. Percentage Distribution of Farmers who Used Chemical Fertilizer across Strategies (LF: n = 34, ERI: n = 29, DD: n = 14, TL: n = 43 and ADP: n = 50)

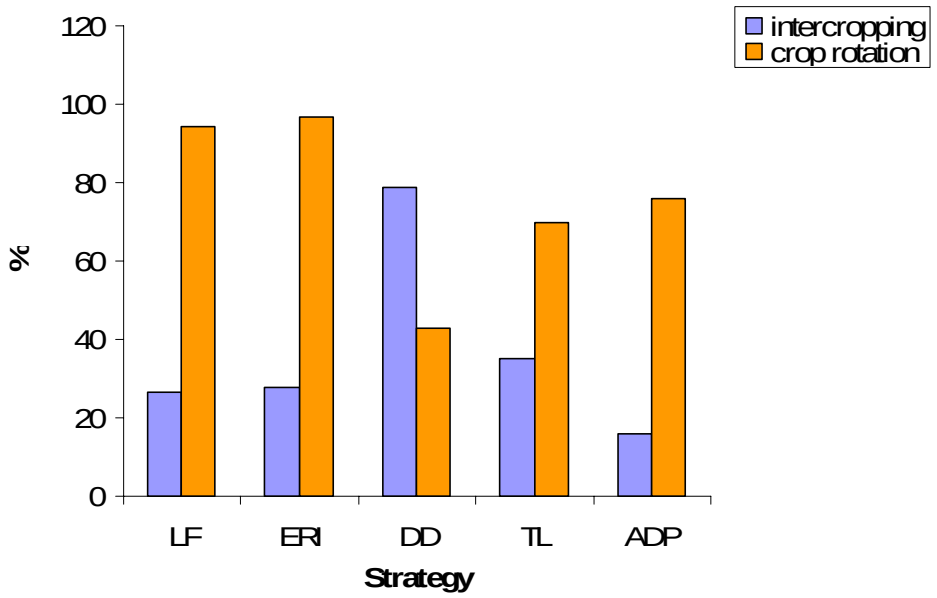

Figure 5-3. Percentage Distribution of Farmers who Used Intercropping with Legumes and Crop Rotation Technologies across Strategies (LF: n = 34, ERI: n = 29, DD: n = 14, TL: n = 43 and ADP: n = 50)

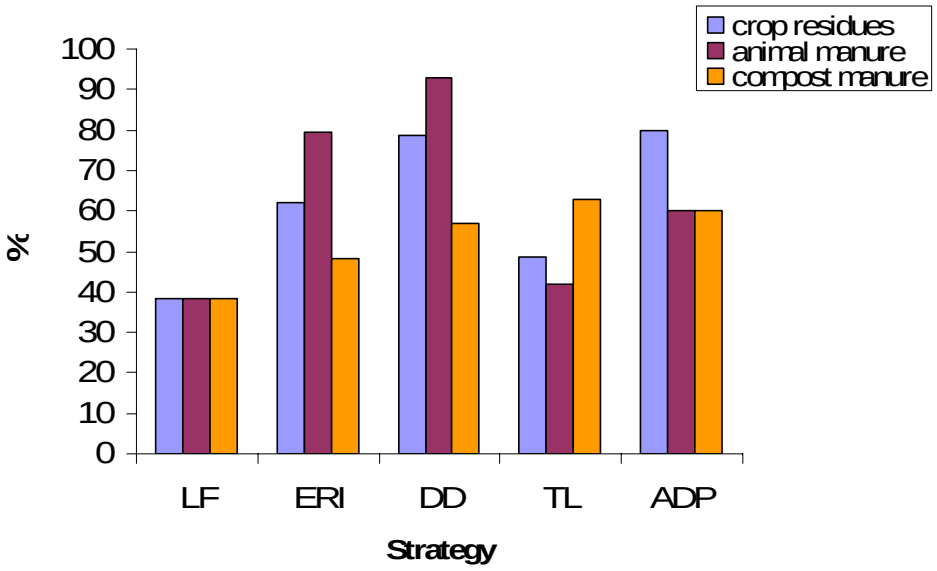

Figure 5-4. Percentage Distribution of Farmers who Used Crop Residues, Animal and Compost Manure Technologies across Strategies (LF: n = 34, ERI: n = 29, DD: n = 14, TL: n = 43 and ADP: n = 50)

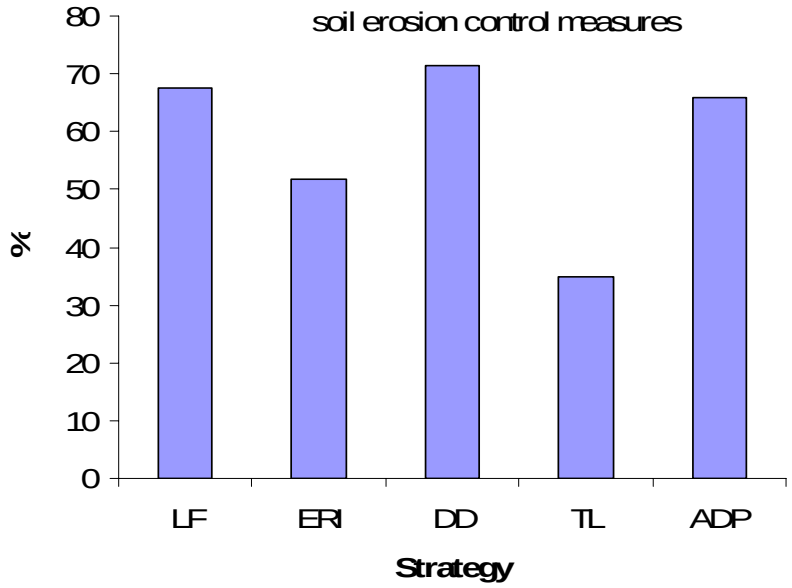

Figure 5-5. Percentage Distribution of Farmers who Used Soil Erosion Control Measures Technologies across Strategies (LF: n = 34, ERI: n = 29, DD: n = 14, TL: n = 43 and ADP: n = 50)

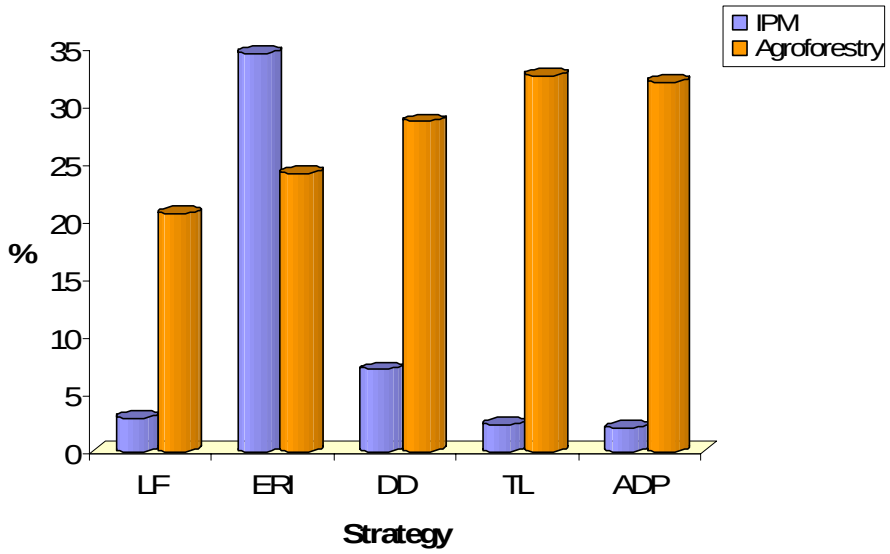

Figure 5-6. Percentage Distribution of Farmers who Used IPM and Agroforestry Technologies across Strategies (LF: n = 34, ERI: n = 29, DD: n = 14, TL: n = 43 and ADP: n = 50)

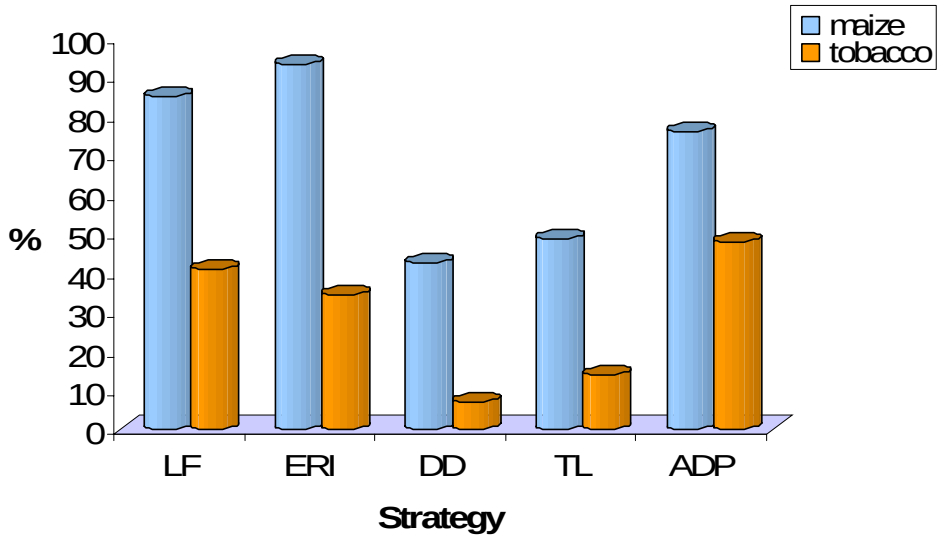

Figure 5-7. Percentage Distribution of Farmers who Used Crop Rotation across Strategies (LF: n = 34, ERI: n = 29, DD: n = 14, TL: n = 43 and ADP: n = 50)

CHAPTER 6
SUMMARY, CONCLUSIONS AND RECOMMENDATIOS

Summary and Conclusions

In chapters four and five the researcher presented detailed findings from the study. This chapter provides a summary of the research findings, conclusions and recommendations by objective.

Summary of Objective One: Identify and analyze strategies used by organizations to link farmers to market using the institutional framework.

This researcher identified 14 organizations with strategies for linking farmers to market. The following is a list of identified organizations, which were compared and analyzed using specific criteria to finally select the five organizational strategies for detailed analysis on the extent to which women participated in the market; the benefits women derived from participating in the market and the trade off on soil fertility management technologies between food and cash crops:

1. International Centre for Tropical Agriculture (CIAT)
2. Initiative for Development and Equity in African Agriculture (IDEAA)
3. International Institute of Tropical Agriculture/ Southern African Root Crops Research Network (IITA/SARRNET)
4. National Smallholder Farmers' Association of Malawi (NASFAM)
5. Association of Smallholder Seed Multiplication Action Group (ASSMAG)
6. Improved Livelihoods through Increased Food Security Development Assistance Program (I-LIFE DAP). This is a consortium including organizations such as Catholic Relief Services (CRS), CARE International/Malawi, the Salvation Army, Africare, Emmanuel International, Save the Children and World Vision.
7. World Vision
8. Catholic Relief Services (CRS)
9. World Agroforestry Centre (ICRAF)

10. Concern World Wide (CWW)

11. Concern Universal (CU)

12. International Crops Institute for the Semi–Arid Tropics (ICRISAT)

13. CARE International

14. Citizen Network for Foreign Affairs (CNFA)/Rural Marketing Development Trust (RUMARK)

This researcher selected five organizations for detailed analysis of overall research objectives 2-4. The following is a list of five selected organizations:

1. International Centre for Tropical Agriculture (CIAT)
2. National Smallholder Farmers' Association of Malawi (NASFAM)
3. Association of Smallholder Seed Multiplication Action Group (ASSMAG)
4. World Vision
5. World Agroforestry Centre (ICRAF)

The strategies of five selected organizations were examined using the institutional framework (IF). The IF analysis was based on such criteria as scale of operation, diversity of enterprises implemented, the extent to which gender was integrated, focus on soil fertility management, community empowerment and level of support offered to farmers. This researcher found that the institutional framework was an important descriptive procedure in analyzing and comparing organizational strategies--particularly for the qualitative information collected from farmers during focus group discussions. As indicated in the following sections, IF provided a more thorough understanding of the strategies for linking farmers to market for specific criteria used.

The geographical area covered and number of farmers reached varied by strategies. The TL, LF and ADP strategies covered a larger geographical area and reached more farmers--particularly women--than did the ERI and DD strategies. Moreover, farmers in each strategy preferred to work in a group in order to meet the volume required by buyers, access potential

markets and other opportunities such as training and inputs, for a stronger negotiation power on better price and to share marketing cost.

The majority of farmers studied produced groundnuts, maize, beans, soybeans, fruit products, chilies and/or mushroom as market enterprises. ADP farmers produced diverse seed crops (maize, groundnuts, soybeans, beans and mushrooms) and also managed improved goats. LF farmers produced maize, groundnuts, soybeans and beans as seed while TL farmers produced soybeans, groundnuts and chilies. ERI and DD farmers managed very limited enterprises. In view of the type of enterprises implemented by farmers, the ADP and TL strategies believed that diversification of enterprises could give farmers more opportunity to improve food security and to obtain surplus for sale.

The ERI, TL, DD and ADP strategies paid more attention to gender issues than did the LF strategy. These strategies had specific people whose role was to sensitize communities they worked with on a variety of gender issues such as equal opportunities and representations, leadership, shared roles, responsibilities and decision making, group work, conflict and conflict resolution, and group and intra-household relationships. LF paid attention only to a limited number of gender issues--which was equal opportunities and representations--but reached and benefited more farmers--particularly women-- than did ERI and DD strategies that paid more attention to gender issues. From these findings, it is clear that paying more attention to gender issues and an explicit integration of gender was not an important consideration for involving the majority of women to participate in the market. Paying attention to gender issues, however, was important to women's empowerment and to ensuring that women equally derived benefits from participating in the market.

Strategies and programs for linking farmers to market offered the necessary support for farmers to establish crops and livestock enterprises. The type of support offered varied across strategies. The ADP and TL strategies had stronger and more sustained market linkages than did the ERI, DD and LF strategies. Moreover, the majority of farmers across LF, ERI, TL and ADP were not confident in identifying markets for their enterprises without support from strategies they worked with. The majority of DD farmers were confident in identifying markets for their products without support from strategies they worked with.

Farmers studied were also characterized in terms of sex, marital status, headship, land ownership, levels of education and ownership of household assets such as radios, bicycles and kitchen items; livestock and hard assets such as automobiles and houses. This researcher found that the majority of farmers studied were better off--in terms of land ownership, education and income--than most rural farmers in Malawi. In particular, LF farmers had more resources (land, income, hard assets and education) and they benefited most from improved income than other farmers studied.

Objective One Conclusions

1. Each organization involved in this research used distinct strategies for linking farmers to markets. In sum, the strategies for linking farmers to market have potential for improving access to markets, income and food security of farmers. Moreover, with the exception of TL who also sold produce to international markets, the strategies focused more on local markets (community, regional and national) than international markets.

2. LF did not emphasize gender issues, yet it reached the majority of farmers--particularly women--than did other strategies that paid more attention to gender issues. Moreover, LF women derived more benefits from the income accrued from different crop enterprises than did women involved in other strategies. Paying attention to gender issues, however, was important to women's empowerment and to ensuring that women equally derived benefits from participating in the market.

3. Farmers across all strategies worked in groups--particularly for marketing activities. By working with groups, strategies for linking farmers to market successfully implemented market interventions with farmers and also improved benefits that farmers--particularly women--derived from participating in the market. Working in groups improved farmers'

access to markets, agricultural inputs, opportunities for training in production, management and marketing of crops and livestock enterprises and other support services such as government extension and agricultural inputs (mostly seed and fertilizer). Groups helped farmers to negotiate better prices and sharing of transportation cost to the designated markets.

4. The majority of farmers studied were better off--in terms of land ownership, education and income--than most rural farmers in Malawi. In particular, LF farmers had more resources (land, income, hard assets and education) and they benefited most from improved income than other farmers studied. These results probably cannot be repeated with the more average and poorer farmers.

Summary of Objective Two: Determine and analyze the extent to which women farmers participate in the market.

This researcher found that the extent to which farmers--particularly women--participated in production activities varied by farmers' group, enterprise and strategy. However, women farmers participated more in production activities than in marketing activities for crops as well as livestock enterprises. For LF and TL farmers, women were involved in all production and processing activities while men were mostly involved in marketing of crops. For ADP farmers, men were more involved in production of maize seed and in the marketing of all seed crops. Women carried out most of the production and processing of all seed crops. The exception was the mushroom group in which women participated more in production and marketing activities. For ERI, both women and men were involved in production and marketing activities.

Women's participation in market activities was limited to local markets particularly when farmers sold individually to vendors compared to when farmers as groups sold to central or designated markets. An informal discussion with women farmers revealed that distance to markets where farmers sold their produce was the most constraining factor to women's participation in the central markets. However, women mentioned other constraining factors to their participation in central markets, which included high transportation cost, lack of marketing skills and household responsibilities.

Generally, farmers who produced and sold maize earned more income than farmers who engaged in other enterprises. LF women controlled more income from maize than ADP women. LF farmers also obtained higher income from groundnuts than TL and ADP farmers. LF women controlled more income from groundnuts followed by women in the ADP and TL strategies respectively. For beans, LF farmers earned more income from beans followed by ADP and ERI farmers. Only LF women controlled income from beans. For the ERI strategy, women controlled more income from beans than men while for the ADP strategy, there was more sharing ownership of income from beans. LF farmers obtained more income from soybeans than ADP and TL farmers. Only TL women controlled income from soybeans than women in the ADP strategy. LF women did not control income from soybeans. Nevertheless, women benefited to a greater extent from income accrued across strategies.

Objective Two Conclusions

5. The extent to which women farmers participated in the production and in marketing of various crops varied across crop enterprises across strategies. In most cases, all household members were involved in production, pesticide application and harvesting activities. However, men performed primary roles in marketing and control of income from crop enterprises. Exceptions to this were the LF, DD and ERI strategies where women controlled most of the income from their enterprises.

6. For the livestock enterprises, this researcher found that all household members in the LF strategy were involved in the management of improved pigs and dairy cows. For ADP, men were more involved than women in the management of livestock. Marketing of livestock was done by men in both the ERI and ADP strategies. Nonetheless, ERI men controlled much more income from livestock than women while in the ADP strategy, men controlled only a slightly higher income from livestock than women.

7. Women's participation in market activities was limited to local markets particularly when farmers sold individually to vendors compared to when farmers as groups sold to central or designated markets.

Summary of Objective Three: Determine what benefits women farmers derive from participating in the market

This study found that income was the major benefit mentioned by the majority of farmers across strategies. However, the average income obtained by farmers varied by crop enterprise as well as by strategy. Farmers who produced maize seed obtained the highest amount of income, followed by farmers who processed fruits, or grew groundnuts, beans, soybeans, mushrooms and chilies. In fact, LF farmers obtained the highest income across all crops when compared to farmers in other strategies. This researcher found that the difference in average income was impacted by the type and quantity of crops that farmers produced and sold and the price in which these crops were sold. Moreover, LF farmers were better endowed than the other farmers, and overall sold more and benefited more than farmers in the other strategies.

With regard to gender and control of income by women, this research found that women across all strategies have benefited from the control of income across different crop enterprises. Specifically, LF women benefited more from maize, groundnuts and beans while TL women benefited more from soybeans and chilies. ERI women benefited more from beans, DD women benefited more from fruit products and ADP women benefited more from groundnuts and soybeans. Women used the income accrued from different enterprises to build or invest in their asset base, for instance, purchase of household items, children's education, food, seed, fertilizer, livestock, construction of better houses and automobiles.

Farmers who participated in the market also derived other benefits such as improvement in knowledge and skills (capacity development), empowerment (application of knowledge gained) and gender-related benefits (wife-husband relationships, change in roles and responsibilities of women and men, and decision-making at the household level).

Despite the benefits farmers derived from participating in the market, they also faced different challenges in marketing such as lack of timely and sustained markets, low prices and delay in payments after sale. In particular, women were constrained from selling in central markets because of the distance between the local communities, their roles and responsibilities at the household level, and some did not have enough marketing skills for price negotiation.

Objective Three Conclusions

8. Benefits women derived from participating in the market varied by enterprise and by strategy. In terms of income, women benefited to a greater extent in the control of income accrued from different crop enterprises than men. The increase in control of income by women across all strategies may have been supported by cultural values in the central and southern regions where the majority of farmers are more matriarchal. Moreover, the extensive gender training conducted by the ERI, TL, DD and ADP strategies may have contributed to the increase in control of income by women.

9. Women also derived other benefits such as improvement in farmers' knowledge and skills, social networks, self confidence, position/status, wife-husband relationships, decision making and roles and responsibilities at household levels. For some of the women, their work load was also reduced as they used income from different enterprises to hire additional casual laborer to help them with agricultural activities.

10. Farmers involved in different strategies have faced different challenges in marketing; for instance, lack of timely and sustained markets, low prices and delay in payments after sale. In particular, women were constrained in selling to central markets because of the distance between the local communities, their roles and responsibilities at the household level, and some did not have enough marketing skills for price negotiation.

11. Involving farmers in the production and marketing process increased farmers' capacity to produce and manage market enterprises and identify better markets for their produce. The majority of farmers studied commented that they could go outside their communities to identify markets for new, but similar, enterprises only with some help from their strategies. In terms of marketing activities, this researcher concludes that farmers across all strategies were not empowered enough to market crops and livestock on their own.

Objective Four: Analyze the trade off on soil fertility management technologies between food and cash crops.

The management of soil fertility was an integral component of all strategies for linking farmers to markets. Farmers used chemical fertilizer, animal and compost manure, crop rotation, intercropping, soil erosion control measures, IPM and agroforestry technologies to improve soil

fertility. However, the most-used technologies by farmers were chemical fertilizer, animal and compost manure, crop residues and crop rotation. The less-used technologies were IPM and agroforestry. Women used almost all the listed soil fertility management technologies. The application of different SFMTs by farmers varied by crop and by strategy. In fact, farmers used the different SFMTs mostly on maize and tobacco and less on other crops such as green vegetables and onions.

This researcher found that the sources of information on SFMTs used by farmers varied by strategy. However, the government extension workers played an important role in providing information on SFMTs to farmers across all strategies. Farmers also mentioned other sources of information on SFMTs including the strategies they worked with, fellow farmers, family members and farmers' own experience. Strategy for linking farmers to market also supported farmers in terms of providing them with more information on SFMTs and training programs on how farmers could apply SFMTs on different crops. Some of the strategies provided farmers with fertilizer loans particularly at the outset of market enterprises

Objective Four Conclusions

12. The management of soil fertility was an integral component of all strategies for linking farmers to markets. The majority of farmers used crop rotations, chemical fertilizer, crop residues and animal and compost manure to improve soil fertility. A few farmers used intercropping/mixed cropping of maize with a legume, IPM, agroforestry and soil erosion control measures such as contours and ridges and vertiver grass. Women were found to use almost all the listed soil fertility management practices.

13. Sources of information on SFMTs used by farmers varied by strategy. However, the government extension workers played an important role in providing information on SFMTs to farmers across all strategies. Farmers mentioned other sources of information on SFMTs; the strategies they worked with, fellow farmers, family members and farmers' own experience.

Recommendations

1. Strategies for linking farmers to market should take an active role in involving farmers--particularly women--in the whole marketing process. Currently, women's participation in

selling activities is limited to vendors who collect produce from farmers' households. Strategies for linking farmers to market should enhance farmers' capacity to identify and sell to the potential markets (local and central). This will ensure sustainability of market interventions even after the strategies phase out.

2. Although this researcher found that paying more attention to gender issues was not an important consideration for encouraging more women to participate in the market--particularly in the LF strategies--the researcher recommends that gender issues should be specifically tailored to empower women in decision making, improve sharing of roles and responsibilities in agricultural activities and ensure that women equally benefit from participating in the market.

3. Strategies for linking farmers to market that focused on livestock management should consider identifying livestock enterprises that would directly benefit women. For the ERI group that focused on improved pigs, women requested chicken enterprises as they perceived that they could benefit more from chickens in terms of relish and income than from pigs.

4. Strategies for linking farmers to market--particularly, ERI, TL and DD--should encourage farmers to diversify crops as well as livestock enterprises. With regard to challenges in climate that Malawi farmers are continuing to face, limited implementation of enterprises may place farmers at risk in case of losses. Diversification of enterprises would ensure that farmers have a variety of products to sell to meet the diverse needs of consumers.

5. This researcher found a greater participation of women in the management of soil using different technologies. However, strategies for linking farmers to market should emphasize agroforestry, intercropping and IPM because they were used by a very limited number of farmers in general. Specific training should be given to farmers to help them use these technologies. Due to the high cost of chemical fertilizer in Malawi, the use of diverse organic soil fertility management practices such as agroforestry could reduce the cost that farmers have to incur every season to buy chemical fertilizer. There is also a need to strengthen collaboration between strategies--particularly the DD strategy with the other strategies--that could benefit the other strategies in terms of types of soil fertility management practices that the DD strategy had tested and implemented with farmers in Malawi. Currently, such collaboration is still very weak.

Additional Research

This research focused more on women farmers, hence interviewed more women than men who participated in the market strategies. Since only a few men were interviewed, the researcher could not generalize results into specific gender issues. The general characteristics of farmers studied also indicated that strategies for linking farmers to market did not focus on resource-poor farmers. Additional research involving equal numbers of men and women and non-participating

farmers could provide more understanding--particularly of the benefits accrued--between men and women in the participating and non-participating groups. A comprehensive sampling may be required to provide an understanding of the results on diverse categories of farmers. The resources to consumption framework may well be the guide for the additional research--particularly with women--because it contributes to gender equity and building of human capacity through networking and community building efforts.

APPENDIX A
ADDITIONAL TABLES OF RESULTS

Table A-1. Mean Acreage of Land (acres) Owned by Female-and Male-Headed Households (n = 164)

Farmer headship	Strategy	N	Mean	Minimum	Maximum	Range
Female	LF	13	31.019	1.0	224.0	223.0
	ERI	11	4.955	2.0	9.0	7.0
	DD	6	4.917	1.5	9.0	7.5
	TL	7	3.429	1.0	6.0	5.0
	ADP	12	4.250	1.0	7.0	6.0
	Total	49	11.474	1.0	224.0	223.0
Male	LF	18	10.944	2.0	26.0	24.0
	ERI	17	9.515	2.5	24.0	21.5
	DD	8	3.938	1.5	10.0	8.5
	TL	34	8.441	2.0	37.5	35.5
	ADP	38	9.247	2.0	33.0	31.0
	Total	115	8.945	1.5	37.5	36.0
Total	LF	31	19.363	1.0	224.0	223.0
	ERI	28	7.723	2.0	24.0	22.0
	DD	14	4.357	1.5	10.0	8.5
	TL	41	7.585	1.0	37.5	36.5
	ADP	50	8.048	1.0	33.0	32.0
	Total	164	9.700	1.0	224.0	223.0

*Six farmers did not own land

Table A-2. Percent Ownership of Household Asset by Farmers across Strategies (n = 170)

	LF (n = 34)		ERI (n = 29)		DD (n = 14)		TL (n = 43)		ADP (n = 50)	
Asset	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
Bicycle	29	85.3	29	100.0	13	92.9	33	76.7	37	74.0
Foam mattress	29	85.3	14	48.2	10	71.4	19	44.2	23	46.0
Mats	32	94.1	15	51.7	12	85.7	40	93.0	43	86.0
Radio	34	100.0	29	100.0	13	92.9	35	81.4	40	80.0
Chairs	28	82.4	17	58.63.4	12	85.7	30	69.8	28	56.0
Wardrobes	2	5.9							1	2.0
Refrigerator	5	14.7			1	7.1				
Sofa set	12	35.3	1	3.4	5	35.7	1	2.3	4	8.0
Television	14	55.9	1	3.4	3	21.4	3	7.0	1	2.0
Cell phone	3	8.8	1	3.4					2	4.0

Table A-3. Percent Ownership of Hard Asset by Farmers across Strategies (n = 170)

	LF (n = 34)		ERI (n = 29)		DD (n = 14)		TL (n = 43)		ADP (n = 50)	
Asset	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
House-Thatched	9	26.5	9	31.0	6	42.9	27	62.8	23	46.0
Brick House-"*Malata*"	25	73.5			9	64.3	15	34.9	21	42.0
Saloon car	4	11.8								
Truck car	4	11.8			1	7.1				
Motorbike	5	14.7			1	7.1	1	2.3	1	2.0
Ox – cart	5	14.7	5	17.2			3	7.0	6	12.0
Treadle pump	1	2.9							2	6.0

Table A-4. Percent Ownership of Livestock Asset by Farmers (n = 170)

	LF (n = 34)		ERI (n = 29)		DD (n = 14)		TL (n = 43)		ADP (n = 50)	
Livestock	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
Cow	8	23.5	13	44.8	1	7.1	5	11.6	5	10.0
Pigs	4	11.8	8	27.6	6	42.9	8	18.6	16	32.0
Goats	21	61.8	18	62.1	11	78.6	23	53.5	38	76.0
Chicken	31	91.2	24	82.8	14	100.0	32	74.4	45	90.0
Sheep	1	2.9	2	6.9						
Rabbits	3	8.8			1	7.1	3	7.0	2	4.0
Ducks	5	14.7	1	3.4	4	28.6	3		6	12.0
Guinea fowl	3	8.8	2	6.9				7.0	3	6.0

Table A-5. Non-Enterprise Crops Produced by Farmers (n = 170)

Crops	LF (n = 34)		ERI (n = 29)		DD (n = 14)		TL (n = 43)		ADP (n = 50)	
Local Maize	8	23.5	26	89.7	10	71.4	23	53.5	23	46.0
Hybrid Maize	16	47.1	9	31.0	11	78.6	29	67.4	33	66.0
Beans	12	35.3	16	55.2	5	35.7	16	37.2	18	36.0
Groundnuts	9	26.5	27	93.1	9	64.3	20	46.5	33	66.0
Soybeans	14	41.2	23	79.3	4	28.6	4	27.9	12	54.0
Tobacco	17	50.0	15	51.7	2	14.3	21	48.8	30	60.0
Sweet potatoes	18	52.9	10	34.5	9	64.3	22	51.2	33	66.0
Cassava	1	3.0			6	42.9	9	20.9	4	8.0
Paprika	1	2.9							2	2.0

Table A-6. Farmers' Major Reasons to Work in Groups

Reasons	LF (n = 34)	ERI (n = 29)	DD (n = 14)	TL (n = 43)	ADP (n = 50)
Easy training	√	√	√	√	
Easy management of enterprises		√		√	√
Easy experimentation/on-farm		√			
Easy to identify market		√			
Easy to sell (market)	√	√		√	√
Better price	√			√	
Increase income	√	√	√		√
Improve food security	√		√		√
To meet production volume				√	√
To have stronger negotiation power				√	√
To access seed	√			√	√
Improve social relationships			√		√
Easy management of the group		√			√
Promote community development		√			√
Encourage each other		√			√
Conflict resolution		√			√
To share farming knowledge	√			√	√
To access agricultural extension services					√
To get better measurements (weighing scale)				√	
Improve and protect natural resources			√		

√ = yes, Blank = no

Results on Gender-Disaggregated Activities

Linkage through Farmer Associations

Formal discussions were conducted with four groups: Mpingu, Kasiya, Mponela and Ntcheu. Mpingu and Kasiya groups are located in Lilongwe district, Mponela group in Kasungu district and Ntcheu group is located in Ntcheu district (all four groups are in the central region). Table A-7 reports results on gender disaggregated activities of farmers in the four groups.

Mpingu (Seed Marketing Groups) SMAG involved 19 (seven women, 12 men) active members. Farmers produced beans, groundnuts, OPV maize, soybeans and cowpeas. All members of the households were involved in production activities such as land preparation, planting, weeding and fertilizer application for all seed crops while women processed all the seed crops. Women and men applied pesticides on beans and cowpeas. Also, they carried out other

activities such as harvesting, transportation of seed crops from fields to households, grading and packaging of all seed crops for marketing. When farmers sold individually, only men traveled outside the communities to identify best markets for all seed crops. After selling the seed crops, men also controlled income and made decisions on the use of income from sale of all seed crops.

Table A-7. Production and Marketing Activities of LF-Farmers by Gender by Group (n = 34)

Activity	Mpingu	Kasiya	Mponela	Ntcheu
Production	All	All	All	All
Process Seed Crop	Women	Women	Women	All
Pesticide Application	All	All	All	All
Harvesting	All	All	All	All
Transportation of Seed from Field to Households	All	All	Men & Children	All
Grading/Packaging Seed for Market	All	All	All	All
Marketing	Men & MC[6]	Men & MC	Men & MC	Men & MC
Own Income from Sale of Seed	Men	Women	Men	Men
Make Decisions on use of Income from Seed Sale	Men	Men	Men	Men

Kasiya SMAG involved 25 active members (eight women, 17 men). Farmers in Kasiya SMAG produced OPV maize, groundnuts and soybeans. For this particular group, all members of the household were involved in land preparation, planting, weeding and harvesting. They also transported seed crops after harvest to households and involved in grading and packaging for marketing. Processing of all seed crops was mainly done by women. Women and men made decisions on which markets to sell their seed crops. Although a majority of women controlled income from all seed crops, the decision on how to use this income was made by men.

Mponela SMAG involved 46 (21 women, 25 men) active members. Farmers in Mponela SMAG produced beans, groundnuts, OPV maize and soybeans. For this group, all members of the household were involved in land preparation, planting, weeding, harvesting, processing and packaging activities. Men and children (girls and boys) transported all seed crops after harvest to

[6] Market Committee

households. Men and women applied storage pesticides on seed crops and also shared decisions on which markets to sell their seed crops. Nevertheless, men controlled income from all seed crops and they made decisions on how to use income.

Ntcheu SMAG involved 15 (3 women, 12 men) active farmers. Farmers in Ntcheu SMAG produced only OPV maize. The results from focus group discussions (FGDs) indicate that all members in the households were involved in land preparation, planting, weeding, harvesting and transportation of OPV maize after harvest to households. They were also involved in processing, application of storage pesticide and packaging activities. However, men controlled income from maize and also made decisions on the use of income.

The Enabling Rural Innovation (ERI) /CIAT

This researcher visited three farmers' groups in Katundulu, Bokosi and Chinseu communities. Katundulu (*Tiguridzane*) group is located in Lilongwe district while Bokosi (*Gunguruwe*) and Chinseu (*Tikolane*) groups are located in Kasungu district (all are located in the central region). The Katundulu community involved 32 households that focused on management of pigs. However, farmers were also experimenting with potential crop enterprises for food and as feed for pigs. In Bokosi community, there were 32 households that produced beans and ten of these households managed dairy cows. The Chinseu community involved 65 households that engaged in production of beans, but they also identified local goats as potential livestock enterprise.

Starting with beans, the results from focus group discussions indicate that both women and men were involved in the production and marketing of beans. Women were mostly responsible for processing activities and for controlling income from beans. Men, on the other hand, shared with women other activities such as land preparation, planting, weeding, pesticide application, harvesting and transportation of beans after harvest from fields to households. Men were also

involved in packaging, application of storage pesticide and decision making on the use of income from bean sales. When men were asked why women controlled much of the income from beans, one of the men responded:

> ...we prefer our wives to own money from beans because many of us are mobile, and some of us drink too much beer that may lead to inadequate income to women when they need money to sustain household needs.

In the case of livestock management activities, this study found that all household members were involved in the management activities such as feeding and watering (both pigs and dairy cows) and in milking and transportation of milk to buyers (dairy cows only). Men and women consulted each other --particularly for the initial capital -- required to acquire the animals (pigs and dairy cows). Generally, for all groups that worked with ERI, the market committee was responsible for identifying potential markets and selling crops and livestock to identified buyers. However, when collective marketing failed, farmers sold crops and livestock individually at household levels. This researcher found that women controlled income from beans and men controlled income from livestock.

The Area Development Program (ADP)/World Vision

This researcher conducted focus group discussions with four farmers' groups: Chakhonje, Tiamike, Chabvuwu and Nyongweni (Table A-8).

Chakhonje, Tiamike and Chabvuwu are located in Dowa district and Nyongweni is located in Mchinji district (all four groups are in the central region). Chakhonje group involved 33 active members (17 women, 16 men). As reported in Table A-8, farmers in Chakhonje group produced beans, groundnuts, OPV maize and soybeans and also managed livestock enterprises. The results indicate that all members of the household were involved in land preparation, planting, weeding and pesticide application for all seed crops. They were also involved in harvesting OPV maize while women and girls harvested other seed crops--groundnuts, beans and

soybeans. Men and boys transported all seed crops from fields to households. Women and children (girls and boys) processed all seed crops, but, men processed only OPV maize. Men packaged all seed crops for storage and marketing.

Table A-8. Production and Marketing Activities of ADP - Farmers by Gender (n = 50)

Activity/group	Chakhonje	Tiamike	Chabvuwu	Nyongweni
Production	All	All	All	Women & men
Pesticide Application	All	Men	Men	Women & men
Harvesting	Sb, B, and Gt: Women & girls M: All	Sb, B, M, Rice, Gt, Sp & Cp: Women, girls & boys	B: Women Sb: Women and men Gt and M: All	Women & men
Transportation of Seed Crop from Field to Households	Men & male children	Sb, B, M, Rice, Gt, Sp & Cp: Women, girls and boys M: Men	All	Women & men
Process Seed Crop	SB, B, and Gt: Women, girls & boys M: All	Sb, B, M, Rice, Gt, Sp & Cp: Women, girls & boys	Sb, B, Gt & M: Women and girls	Women & men
Packaging	Men	Men	Men	Women & men
Marketing	MC	MC	MC	MC

*All → all household members: Sb → soybeans; B → beans; Gt → groundnuts; M → OPV maize; Sp → sweet potatoes; Cp → cowpeas

Farmers in Chakhonje group also managed improved goats. The results revealed that men were more involved in the livestock management activities than women. Women performed watering and treatment activities while male children fed the goats. Men did a variety of activities--purchasing of animal feed, identification of markets and transportation of animals to the market. They also decided on which markets to sell livestock and controlled income from livestock.

Tiamike group involved 54 active members (20 women, 34 men). Farmers in Tiamike group produced and sold beans, groundnuts, OPV maize, soybeans, sweet potatoes, cowpeas and rice. The majority of farmers in this group however, for a long time have been producing beans, groundnuts and OPV maize. In 2005, a few farmers started producing soybeans, sweet potatoes, cowpeas and rice. The results indicate that all members of the household were involved in land preparation, planting and weeding for all seed crops. Pesticide application was done by men -- when it was necessary and particularly on OPV maize and beans. Women and children harvested and transported all seed crops while men, transported only OPV maize from the field to the households. Men also transported OPV maize seed from the field to the households. Women and children processed all seed crops while men packaged all the seed crops for marketing. Men also controlled income and decided on the use of income after the sale of all seed crops.

There were 25 farmers in Chabvuwu group who produced and sold beans, groundnuts, OPV maize and soybeans and also managed livestock enterprises. For the seed crops, results indicate that all members of the households were involved in land preparation, planting, weeding, harvesting and transportation of these crops from the field to the households. Men applied pesticides on OPV maize and packaged all seed crops for marketing. They also controlled income from seed crops and livestock enterprises.

In the case of livestock, this group shared similar results like the Chakhonje group --where men were found to be more involved in the management of livestock activities than women. Women only carried out watering activities while male children were responsible for feeding the goats. Men performed a variety of activities such as the construction of animal houses, animal

treatment, identification of markets and decision making on which markets to sell the improved goats. Men also controlled income from livestock.

The Nyongweni group involved 32 active members (23 women, 9 men) who mainly produced and sold mushrooms. Mushroom enterprises involved such activities as shed construction, chopping of maize stalks, cleaning of maize stalks, boiling of cleaned maize stalks, sowing (packing) the boiled maize stalks and mushroom seed (spawns) in small plastic bags, covering the packed seed and maize stalks with black plastic for fermentation process, which usually takes about 21 days. Other activities carried out were the removal of black plastic, watering, opening up tubes for mushroom emergence, harvesting, grading, packing mushrooms for sale and selling of mushrooms.

The results on gender-disaggregated activities indicate that women and men were involved in mushroom production activities. For non-married women farmers, other members in the group usually helped them on shed construction and sowing. Otherwise, female-or male-headed households hired additional labor (*Ganyu*) to help them carry out different production activities. Women farmers controlled income from mushroom and also decided on how to use income from mushroom.

The Trader-Led Strategy (TL) for Linking Farmers to Market/NASFAM

This researcher visited and interviewed four farmers' groups (chapters): Kalulu, Matutu, Navikali and Karoga (Table A-9). Kalulu, Matutu and Navikali are located in Mchinji district in the central region. Farmers in these chapters produced and sold groundnuts and soybeans. Karoga chapter is in Balaka district in the southern region. Farmers in Karoga chapter produced and sold chilies.

Kalulu chapter involved 26 active members (14 women, 12 men) who produced and sold groundnuts and soybeans. As reported in Table A-9, men and women were involved in land

preparation, planting, weeding, harvesting and transportation of crops from the field to the households. Women processed groundnuts and soybeans. Men sold groundnuts and soybeans to the identified buyers, they controlled the income obtained made decisions on how to use income from groundnuts and soybeans.

Table A-9. Production and Marketing Activities of TL-Farmers by Gender Group (n = 43)

Activity	Kalulu	Matutu	Navikali	Karoga
Production	Women & Men	All	All	All
Process Seed Crop	Women	All	Women & Girls	Women
Harvesting	Women & Men	All	All	All
Transportation of Seed from Field to Households	All	All	All	Women & Men
Grading/Packaging Seed for Market	All	All	All	Men
Marketing	Men & MC[7]	Men & MC	Men & MC	Men & MC

In the case of Matutu chapter, there were 64 active members who produced and sold groundnuts and soybeans. As reported in Table A-9, all members of the households engaged in production activities. However, women and men made decision on which markets to sell groundnuts and soybeans. Men sold soybeans and groundnuts to different markets, but, women controlled the income and also made decisions on how to use that income.

For Navikali chapter, 16 active members (eight women, eight men) were involved in production and marketing of groundnuts and soybeans. The results in Table A-9 show that all members of the households were involved in land preparation, planting, weeding and harvesting activities. They were also involved in transporting and packaging activities. Women and girls processed groundnuts and soybeans. Men sold the crops to the market, controlled the income obtained and also made decisions on how they could use that income at household levels.

[7] Market Committee

There were 27 farmers (eight women, 19 men) who engaged in production and marketing of chilies. The nursery management activities were done by men. All members of the households engaged in land preparation. Men and women were involved in transplanting, watering, weeding and transportation of crops from the fields to the households. Women processed the chilies while men packaged chilies, identified markets for chilies and also sold chilies to the identified markets. Although men controlled income from chilies, both women and men shared decisions on how to use income from chilies.

The Demand-Driven (DD) Strategy/ICRAF

The DD strategic project on domestication and commercialization of indigenous fruits and products focused only on women farmers. However, men were also involved in other DD projects' activities, for example, the soil fertility management (conservation) projects. This researcher visited two women groups (Magomero that involved five members and Chitukuko that involved 10 members) in the southern region. In both groups, women were responsible for all processing and marketing activities. Women farmers in Chitukuko group decided to keep their income in a bank-joint account until they obtain enough capital to expand their business. Women farmers in the Magomero group commented that they controlled income and made most of the decisions on the use of income from fruit products.

Table A-10 presents percent distribution of farmers by different markets they sold OPV maize. Generally for LF, the marketing officer was responsible for identifying markets and also for selling OPV maize to identified buyers. After markets were identified, farmers collected OPV maize to the central points (normally located in each village) to be picked up by the marketing officer.

The results indicate that 83.3% of LF farmers sold OPV maize to LF strategy while 16.7% of LF farmers sold OPV maize to individual vendors--who normally purchased at the farmers'

houses. On the other hand, about 76 % of ADP farmers sold OPV maize to Kafulu association. Kafulu association is an association consisting of different farmers' groups in Dowa district. ADP strategy implemented different agricultural activities with several of these associations at national levels. Usually, ADP farmers sold OPV maize to vendors, but for 2005 marketing season, none of the ADP farmers interviewed sold OPV maize to any vendors.

Although the majority of LF farmers mentioned that they sold OPV maize to LF strategy, this study, noted that LF farmers did not know to which markets LF strategy sold their OPV maize. An informal discussion with the LF's key informants revealed that there were different markets to which LF strategy sold OPV maize, some of which were the Association for Promotion of Sustainable Agriculture in Malawi (APSAM), Malawi Government, PANAR, Chinese Teaching Mission, CADECOME-Balaka, CARE-Malawi, Concern Universal, Participatory Rural Development Organization (PRDO), World Vision, OXFARM, SeedCo and Chitedze Research Station. LF farmers also sold little amounts of OPV maize to vendors. This study found that through LF strategy, farmers accessed a potential market niche which was not only sundry, but involved other organizations that focused on community development activities in rural areas. Hence, OPV maize produced by LF farmers also served as seed for many other farmers collaborating with other organizations.

As indicated in Table A-10, about 76% of ADP farmers sold OPV maize through Kafulu Farmers' Association while a small percentage (4.0%) of ADP farmers responded that they did not know to which markets Kafulu association sold their OPV maize. But, from the focus group discussions (FGDs), this researcher learned that majorities of ADP farmers did not know to which markets Kafulu association sold OPV maize. It was through informal discussions with ADP's key informants that this researcher identified some of the markets to which Kafulu

association sold OPV maize. Some of these markets included Adventist Relief Agency (ADRA), World Vision and European Union (EU). ADP strategy was mentioned as one of the buyers because sometimes ADP purchased OPV maize produced by farmers to re-distribute the seed to other farmers in the same and/or new areas of interventions.

Table A-10. Percent Distribution of Farmers by Different Markets they Sold OPV Maize (n = 43)

Markets	LF (n = 18)		ADP (n = 25)	
	f	Percent	*f*	Percent
Vendors	3	16.7		
LF	15	83.3		
ADP			4	16.0
Kafulu association			19	76.0
Did not sell			1	4.0
Did not know			1	4.0

Table A-11 indicates percentage of farmers by who transported OPV maize to the markets. The results show that LF strategy and the ADP farmers' marketing committee were more involved in transporting OPV maize to the markets. When ADP purchased OPV maize from farmers, they also became responsible for transporting it to the markets or to any other intended users. Table A-12 shows percent distribution of farmers by markets to which they sold groundnuts. Within LF, 55.6% of farmers sold groundnuts to vendors, 38.9% to LF and 5.5% to World Vision. Potential buyers for groundnuts produced by LF farmers included Liwonde CADECOME, Malawi Government, APIP, CARE, World Vision, Concern Universal and other NGOs, all of whom were focusing on agricultural production with rural communities. TL-farmers sold groundnuts to TL strategy and none of them sold groundnuts to any vendors. For ADP, 56.0% of farmers sold groundnuts through Kafulu association, 32.0% sold groundnuts to ADP and 4.0% sold to vendors.

Table A-11. Percent Distribution of Farmers by who Transported OPV Maize to the Market (n = 43)

Strategy	women		men		wife and husband		strategy		market committee	
	f	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
LF (n = 18)	2	11.1	6	33.3			10	55.5		
ADP (n = 25)			5	20.0	2	8.0	4	16.0	13	52.0

Table A-12. Percent Distribution of Farmers by Markets to which they Sold Groundnuts (n = 78)

Strategy	vendors		LF		TL		ADP		Kafulu Association		Did not sell	
	f	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
LF (n = 18)	10	55.6	7	38.9			1	5.5				
TL (n = 35)						100.0						
ADP (n = 25)	1	4.0					8	32.0	14	56.0	2	8.0

Table A-13. Percent Response by Who Sold Groundnuts to the Market by Sex (n = 78)

Sex	Organization	Women	Husband	Wife and husband	Organization /Strategy	Market Committee
Male	LF (n = 18)	33.3	33.3		33.3	
	TL (n = 35)		90.0	10.0		
	ADP (n = 25)	25.0			25.0	50.0
Female	LF (n = 18)	28.6	14.3	21.4	35.7	
	TL (n = 35)	70.0	25.0	5.0		
	ADP (n = 25)	21.1	5.3	5.3	26.3	42.1

LF, TL and ADP farmers collected their crops to centralized centers where farmers stored crops temporarily before they transported it to actual buyers. For TL and ADP strategies, these collection centers were also actual selling points. Table A-14 shows percent response by who transported groundnuts to the market centers. Across LF, TL and ADP strategies, women's responses show that they were also involved in transporting groundnuts to the market centers. As reported in Table A-14, responses by LF female responses indicate that they about twice the percentage of men who sold groundnuts to vendors. Women were also involved in transporting groundnuts to the market centers.

Table A-14. Percent Response by Who Transported Groundnuts to the Market Centers by Sex (n = 78)

Sex	Strategy	wife	husband	wife and husband	organization	market committee
Male	LF (n = 18)		100.0			
	TL (n = 35)		100.0			
	ADP (n = 25)	25.0	50.0			25.0
Female	LF (n = 18)	14.3			85.7	
	TL (n = 35)	52.6	26.3	10.5	10.5	
	ADP (n = 25)	16.7	16.7	16.7	11.1	38.9

Table A-15 shows percent response by markets to which farmers sold beans. The results indicate that LF farmers sold beans to LF strategy who, in turn, sold beans to a private company known as Rab processors and to the Lutheran Church. In the case of ERI, 61.5% of farmers sold beans to vendors, 23.1% sold beans to the grain bank (initiated and supported by Plan Malawi), and 15.4% sold beans to Jenda, which is one of the trading centers in Kasungu district. ADP farmers sold beans to ADP strategy and through Kafulu farmer association.

As reported in Table A-15, for ERI, in which the majority of farmers sold to vendors, 30.8% of women and 7.7% of men responded that they sold beans to vendors. The farmers' market committee only sold beans to organized markets such as Jenda trading center and to the

grain bank. For ADP, 56.5% of farmers show that the market committee sold beans to different markets.

Table A-15. Percent Response by Different Markets to Which Farmers Sold Beans (n = 44)

Strategy	Vendors	ADP	Kafulu Association	Plan Malawi - Grain Bank	LF	JENDA Trading Center
LF (n = 4)					100.0	
ERI (n = 18)	61.5			23.1		15.4
ADP (n = 22)		43.5	56.5			

Table A-16. Percent Response by Who Sold Beans to the Market (n = 44)

Strategy	Women	Men	wife and husband	organization	market committee
LF (n = 4)				100.0	
ERI (n = 18)	30.8	7.7	7.7		53.8
ADP (n = 22)	8.7	13.0	8.7	13.0	56.5

Table A-17. Percent Response by Who Transported Beans to the Market (n = 44)

Strategy	Women	Men	wife and husband	organization	market committee
LF (n = 4)				100.0	
ERI (n = 18)					100.0
ADP (n = 22)	8.7	21.7	17.4	4.3	47.8

Table A-18 presents percent response by markets to which farmers sold soybeans. The results show that 66.7% and 96.0 % of LF and TL farmers respectively sold soybeans through their strategies. For ADP farmers, 50.0% sold through Kafulu association, and 33.3% sold soybeans to ADP. LF and TL farmers also sold soybeans to vendors. As reported in the Table A-18, when LF farmers sold to vendors, women became more involved, but when farmers sold to other markets, LF was more involved. For TL, the results indicate an equal percentage of women and men who sold soybeans to TL. For ADP, the market committee was more responsible in selling soybeans to different markets. As reported in Table A-19, women--

particularly those working with LF and TL--were also involved in transporting soybeans to the markets centers.

Table A-18. Percent Response by Markets to which Farmers Sold Soybeans (n = 35)

Strategy	Vendors	LF	TL	ADP	Kafulu Association	Did not sell
LF (n = 3)	33.3	66.7				
TL (n = 26)	4.0		96.0			
ADP (n = 6)				33.3	50.0	16.7

Table A-19. Percent Response by Who Sold Soybeans to the Market Centers (n = 35)

Strategy	Women	Men	Wife and Husband	Organization/ Strategy	Market Committee
LF (n = 3)	33.3			66.7	.
TL (n = 26)	48.0	48.0	4.0		
ADP (n = 6)				40.0	60.0

Table A-20. Percent Response to Who Transported Soybeans to the Market (n =35)

Strategy	Wife	Husband	Wife and Husband	Organization /Strategy	Market Committee
LF (n = 3)	33.3	33.3		33.3	
TL (n = 26)	48.0	44.0	4.0	4.0	
ADP (n = 6)			20.0	20.0	60.0

Table A-21. Percent Response on Ownership of Income from Different Crops by Women and Men Farmers

Crop	Response category	LF		ADP		ERI		TL		DD	
		f	Percent	*f*	Percent	*f*	Percent	*f*	Percent	*f*	Percent
Maize	Women	8	53.3	5	20.8						
	Men	6	40.0	15	62.5						
	Wife and husband	1	6.7	4	16.7						
Groundnuts	Women	10	58.8	14	50.0			11	46.7		
	Men	6	35.3	10	27.3			6	33.3		
	Women and Men	1	5.9	6	22.7			5	20.0		
Beans	Women	3	100.0	7	30.4	11	78.6				
	Men			9	39.2	3	21.4				
	Women and Men			7	30.4						
Soybeans	Women			2	40.0			11	45.8		
	Men			2	40.0			10	41.7		
	Women and Men			1	20.0			3	12.5		

Table A-22. Chiseu Farmers' perceived benefits from participating in the ERI project

Perceived benefits by farmers in Chiseu	Perceived benefits by farmers in Chiseu
1. Agro-enterprise ▪ Potential enterprises in place- bean and local goat enterprises. 2. Farming Systems ▪ Beans are now grown in the area ▪ More land for bean production ▪ Opportunities for more cropping systems e.g. crop rotations ▪ Crop diversification – beans were not grown at all. Farmers used to depend on Maize only. Now they also consider Irish potatoes as a potential crop 3. Social capital ▪ Social relations among people has improved and increased by working together in groups ▪ Knowledge sharing has increased through these social relations ▪ People are meeting more often now than used to be ▪ Working in groups has helped farmers reap benefits they got from bean multiplication enterprise ▪ Number of visitors has increased – and this is an opportunity for farmers to exchange ideas with visitors and also to build social relations with them. 4. Gender relations ▪ Women and men have started working together ▪ Women confidence has increased ▪ Women freedom to buy what they need has increased 5. Capacity development ▪ Knowledge in farming has increased ▪ Capacity to analyze costs-benefits in farming not only for bean production, has increased ▪ Women confidence has increased. They can now talk even in front of their in laws ▪ Increase in farmers independence mind—the river code has helped farmers to become independent ▪ Farmers are able to put into use the knowledge learned from bean enterprise to other agricultural enterprises. e.g cost-benefit analysis of their individual enterprises, or consider focusing on crops that they can sell ▪ General public speaking particularly among women farmers has improved and increased ▪ Farmers' capacity to do market research has increased. ▪ The ITK knowledge has increased and trickled to members in the community particularly on the traditional pest management practices ▪ Farmers are able to open bank accounts from bean sales	6. Nutrition, health and hygiene ▪ Beans serve as major relish food which was difficult to have. Bean relish is in forms of leaves and grains. Leaves also dried for relish next season. Farmers utilize both green and dry beans. ▪ Farmers and children look healthy. Though it might be difficult to document impact of beans on farmers' health, beans have nutritional value to farmers particularly women and children ▪ Some farmers are able to take tea every morning now as result of increased income from bean sales ▪ Some farmers are now able to feed their children more frequent than it used to be ▪ Dress code particularly among women has improved significantly ▪ Some farmers are now able to use soaps and body glycerin than the grease they used to apply on their skin. Skin outlook among farmers is much better ▪ Some farmers have built beautiful toilets ▪ Used money from bean sales to buy food such as maize, chicken and pigeon peas ▪ Using money from bean sales women are able to go at the maize milling than pound maize ▪ Some farmers are able to go to hospitals as a result of increase in income from bean sales 7. Increase in amount and levels of income ▪ Amount of income has increased as a result of bean enterprise. One farmer has received on average about 6,400MK as a result of bean sales ▪ Marrying additional wives as a sign of wealth and status—though there was a strong discussion on the fact that men get married to more wives to increase labor, or if the first wife is lazy ▪ Some farmers were able to contribute their share of 6,000MK for goat enterprise ▪ Some farmers have built goat kolas and beautiful toilets from increased in income from bean sales ▪ Some farmers have opened up their first bank accounts from bean enterprises ▪ Purchases of assets has increased, for instance farmers bought camera, bicycles, cloths, cooking pots and plates ▪ Levels of income by farmers have increase. Opening up of grocery stores for income earning ▪ Purchasing of maize for family food ▪ Purchasing of fertilizer, a better indicator for farmers' investment in NRM after they have increased their income from bean enterprises 8. Community services ▪ Grocery stores have increased access to household services among farmers particularly women More interventions that are facilitated by different actors: Plan, CIAT, Malawi government

Table A-23. How farmers in Bokosi perceived to have benefited from participating in the ERI project

Farmers perceived benefits	Farmers perceived benefits
1. Cropping systems and cropping patterns ▪ Beans are now grown in the village. More beans are grown in the area ▪ Change in cropping systems – crop rotations ▪ Farmers have opened up new land for bean production, in addition to tobacco production ▪ Increased access and availability of bean seed varieties within the community and to the neighboring communities 2. Food, nutrition and health ▪ Increased availability of relish. Relish is no longer a problem because beans are now grown in the village. Farmers have a variety from which to choose e.g. use green beans, grains, fresh and dry leaves as relish ▪ Availability and accessibility of milk from farmers having diary cow. The price of milk ranges between 7MK per 300ml – 30MK per Liter. Farmers used to get little milk from local cows, which was even not enough and unavailable when needed by for instance sick children ▪ Healthy skin observed among children ▪ Availability of other food items such as breads – children were observed to be eating bread ▪ Increase in number of farmers taking breakfasts with milk 3. Increased income from both bean and milk sales ▪ More farmers purchasing maize for food and confectioneries such as bread ▪ Asset building. Increase in purchase of household items such as mattress, purchase of bicycles –by a woman, construction of brick houses with iron roofs and establishment of grocery stores ▪ Increased number of women who now go to the milling machine instead of pounding maize for Nsima ▪ Farmers purchasing animal drugs 4. Increased in physical assets and wealth ▪ Farming knowledge (crop and livestock) has improved ▪ Dairy cows are viewed as major farmers' assets ▪ Purchase of household items like mattress ▪ Building of modern houses with red bricks and iron roofing ▪ Increase in marriages among young men. 2 men got married after they sold their beans. In this village a man would not be able to marry if he does not have money. And if he failed to pay the dowry a wife could be taken back to her home, or a man could even get jailed 5. Increased access to services in the community ▪ Increase in grocery stores after bean sales has allowed farmers particularly women and children to buy household items within the village using less time which took them more time before. There are now three grocery stores as a result of bean sales ▪ Veterinary and extension services have increased	6. Social capital ▪ Social relation and sharing knowledge within the community and between farmers in Bokosi and neighboring communities have increased particularly during the field days. ▪ Farmers are now able to work in groups ▪ Social relations have increased beyond Bokosi section. Farmers from Bokosi are able to train other farmers in neighboring communities ▪ Increase in social relations with visitors even from outside Malawi, which enables exchange of knowledge, for instance the suggestion provided by research scientists from Uganda collaborating partners on how to collect and use urine-liquid manure something that farmers in Bokosi were not aware of. These types of social relationships are also viewed as symbols of community status. 7. Capacity development ▪ Different training programs have increased farmers' knowledge on bean production and in the management of diary cows. Farmers were of the opinion that these training opportunities used not to be there before ▪ Gender training has increased women confidence in public speaking, ▪ Gender training has also increased women's capacity to negotiate with their husband, something which was not used before. A woman was to kneel down about 3-5M to request her husband about what she needed. ▪ Using knowledge from market research, farmers have become more aware of the costs-benefit analysis that they use in analyzing different potential enterprises ▪ Farmers in Bokosi are now training farmers in neighboring communities in bean production ▪ Farmers are now able to keep records particularly with the dairy enterprise ▪ Increase in knowledge on how to conduct market research, crops and livestock management practices diseases and pest control on beans. 8. Increased gender awareness and gender equity ▪ Men perceive that gender is working in the community ▪ Increase in decision making among women particularly on how to use money from milk sales. Generally, men distribute the milk to customers and collect the money and discuss with their wives on how to use the money ▪ Increase in women bargaining power in the household. ▪ Increase in sharing of roles and responsibilities among men and women in both beans and dairy cow enterprises. However, women commented that they are still providing most of the labor required in the dairy cow enterprise. Men now help women fetching water from dambos ▪ Gender training has improved male-female caring relationships. For instance, men giving their wives money to go to milling machine to grind maize. 9. Increase in employment opportunities Dairy cow enterprise has open up employment for people who had no job before. Some farmers do piece work for instance in cutting the silage, animal feed to get cash to sustain their lives

APPENDIX B
BENEFITS FARMERS DERIVED FROM PARTICIPATING IN STRATEGIES FOR LINKING FARMERS TO THE MARKET

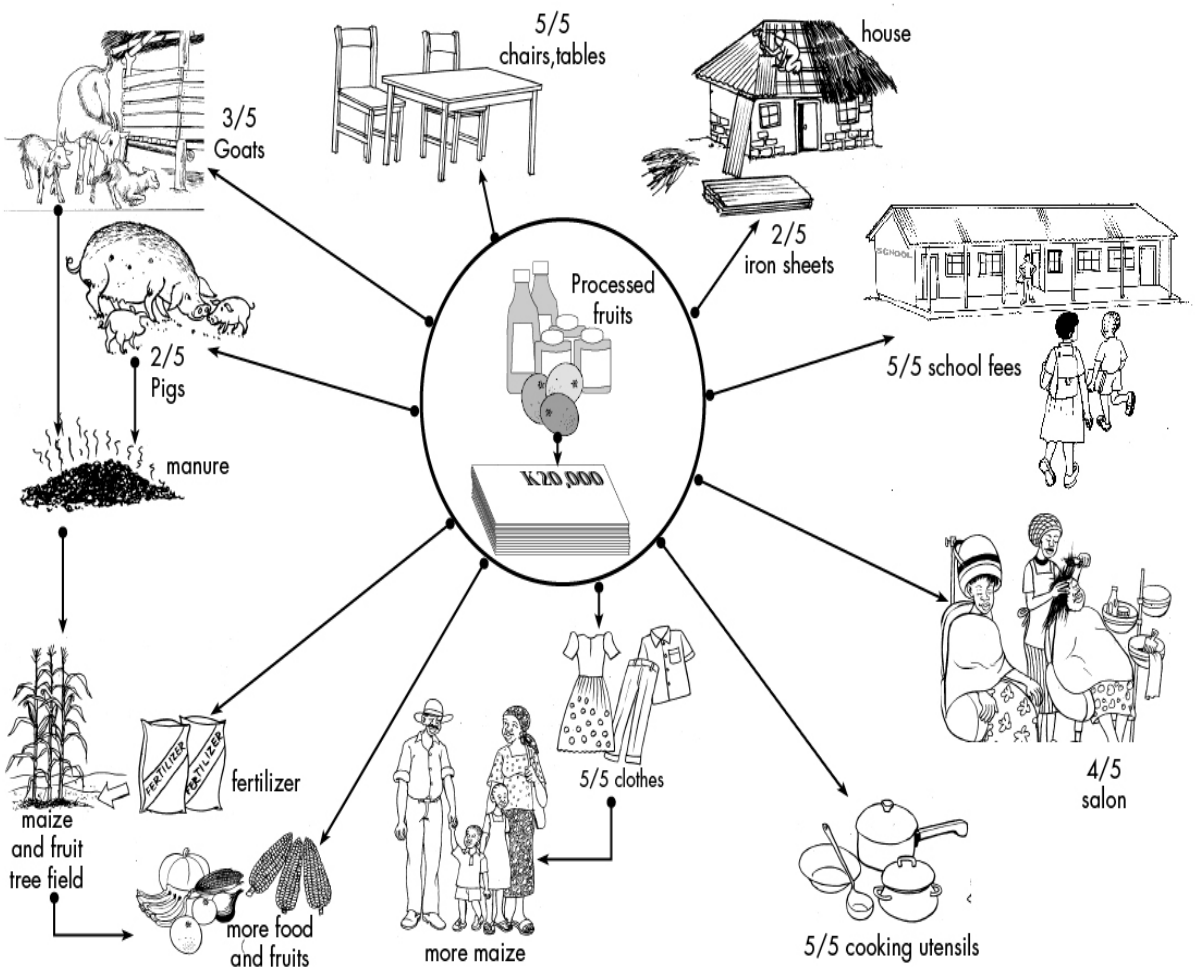

Figure B-1. Benefits derived by DD-Magomero farmers (n = 5)

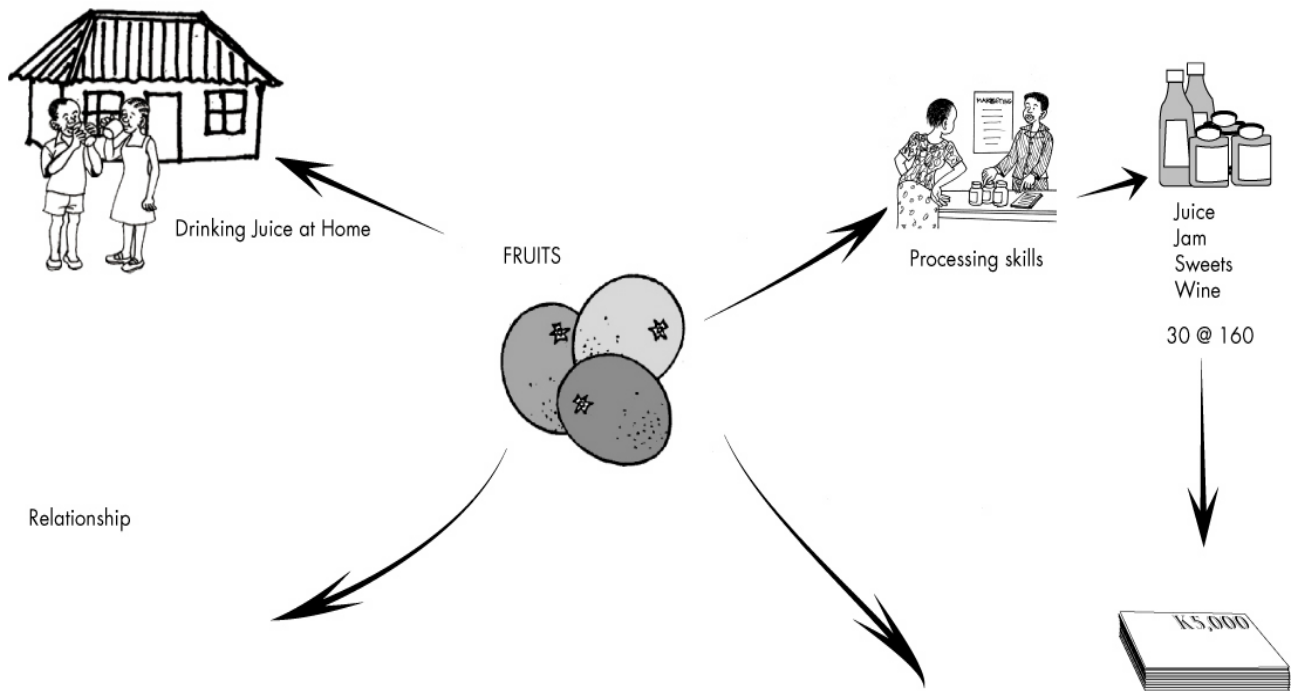

Figure B-2. Benefits derived by DD-Chitukuko farmers (n = 10)

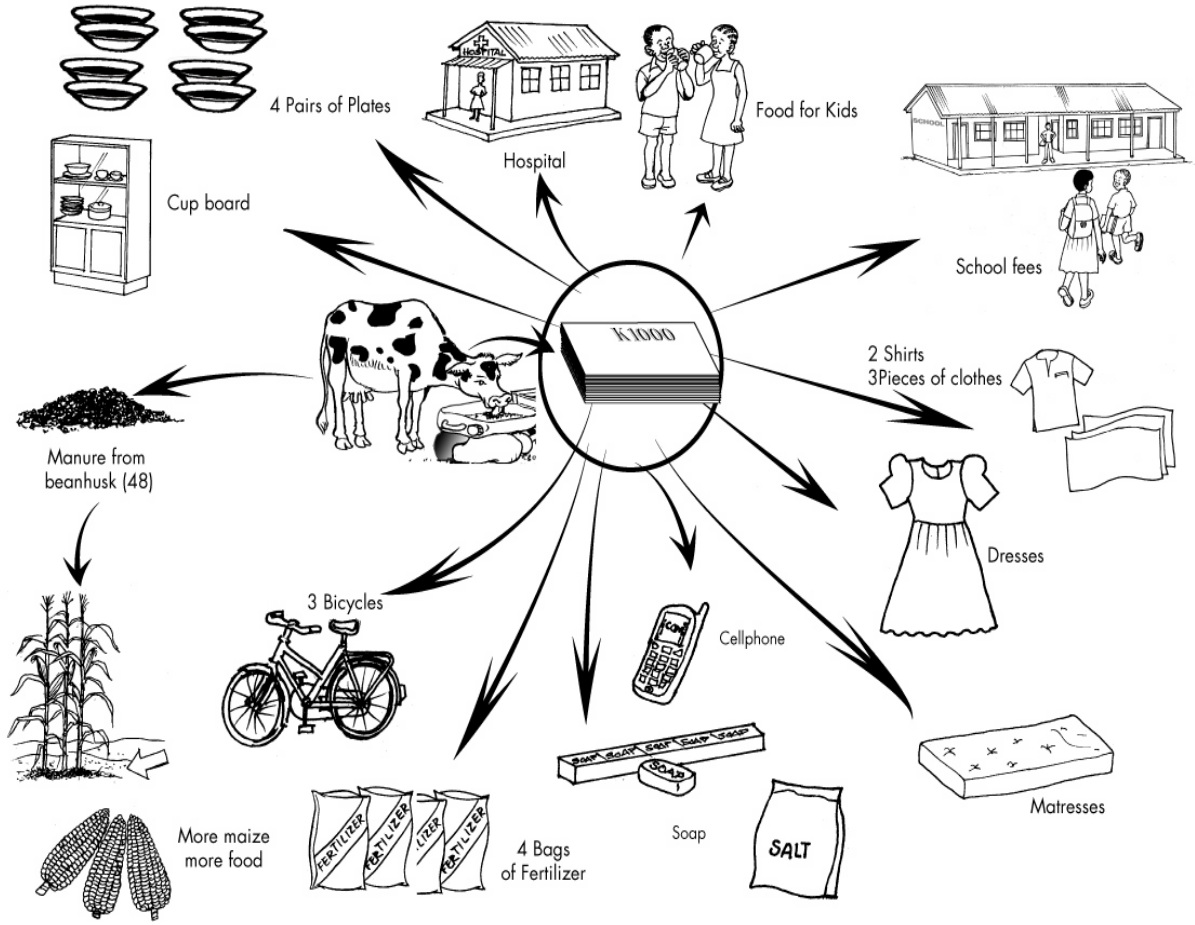

Figure B-3. Benefits derived by ERI farmers who managed dairy cow

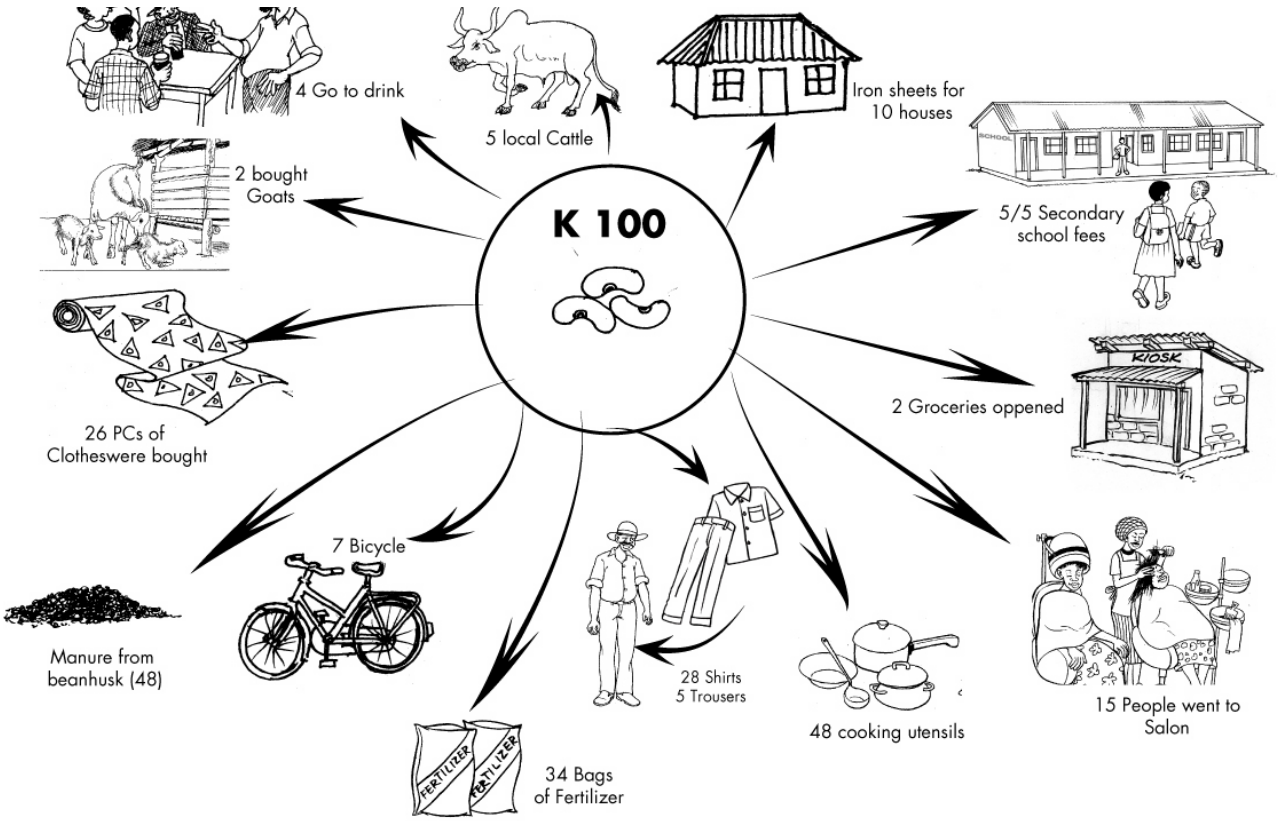

Figure B-4. Benefits derived by ERI farmers who produced beans

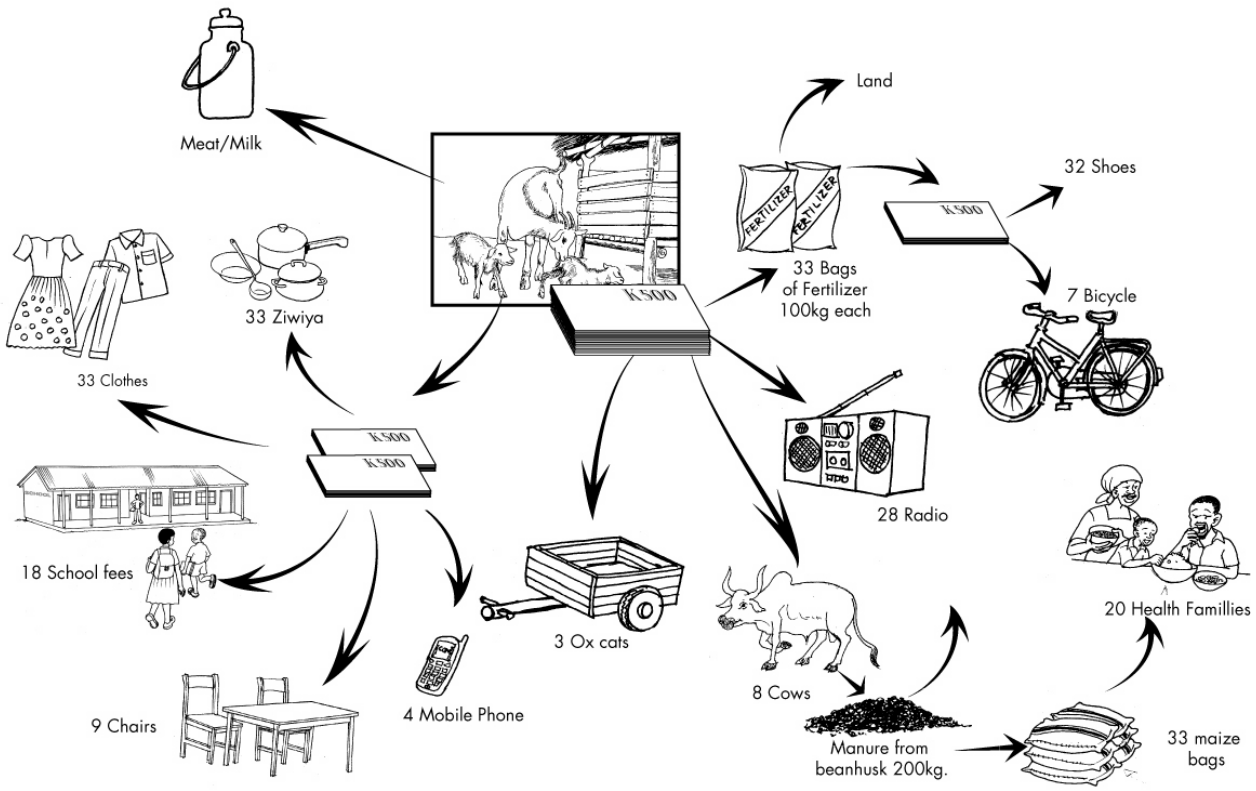

Figure B-5. Benefits derived by ADP Chakhonje male farmers who managed improved goats

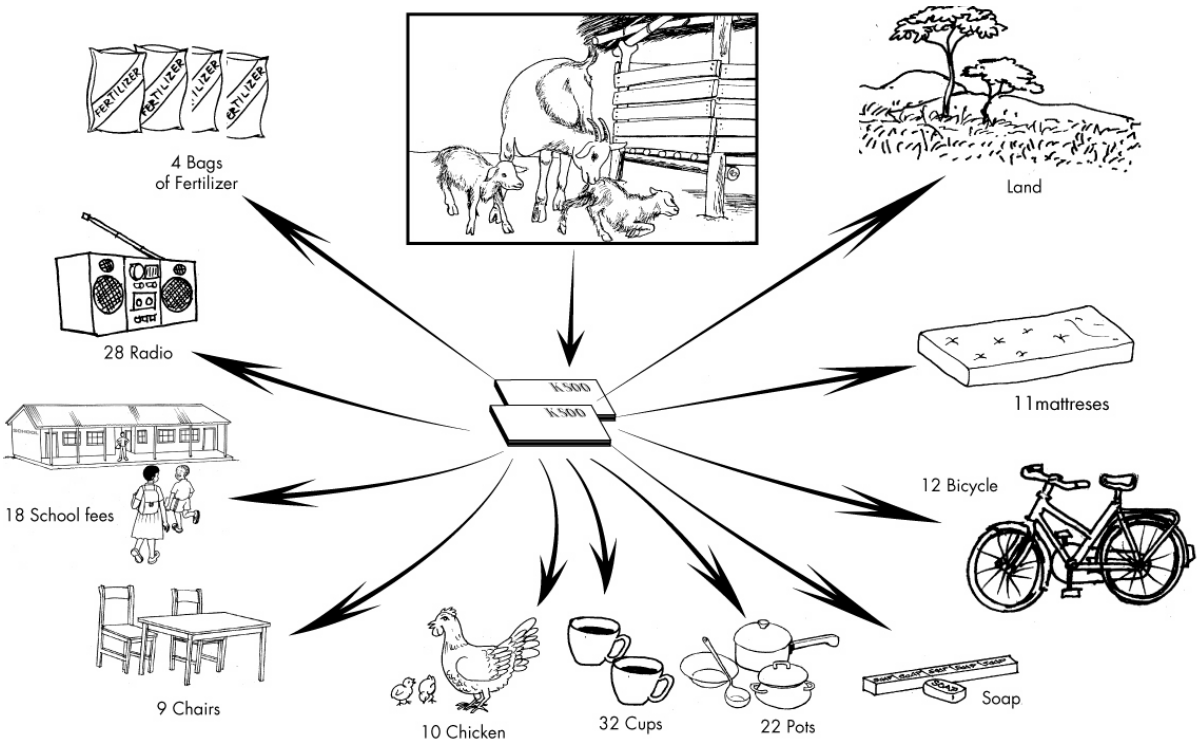

Figure B-6. Benefits derived by ADP Chakhonje female farmers who managed improved goats

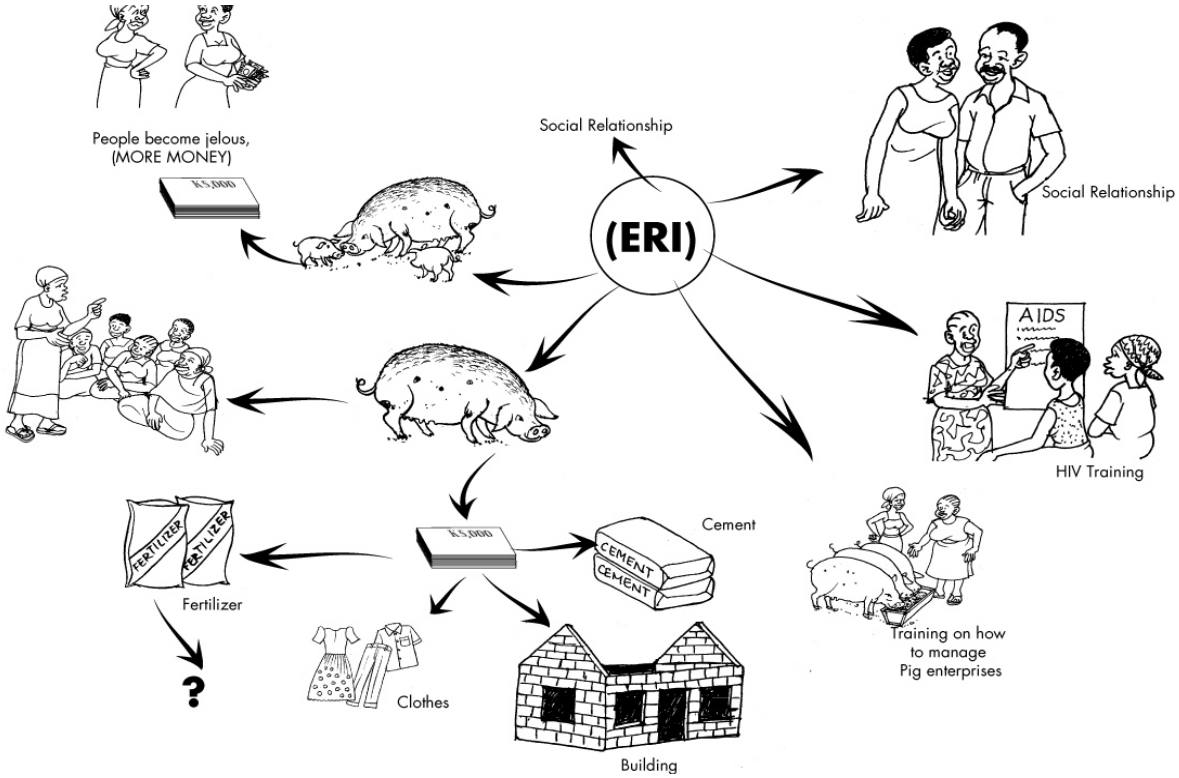

Figure B-7. Benefits derived by ERI male farmers who managed pigs

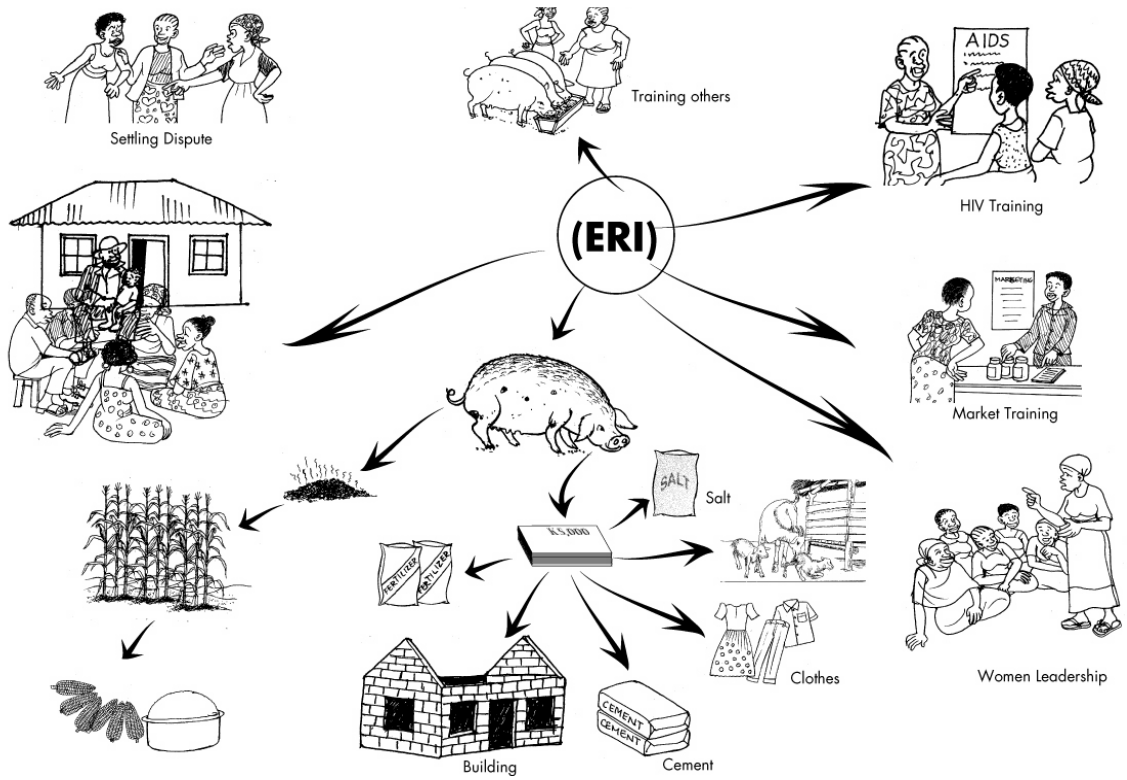

Figure B-8. Benefits derived by ERI female farmers who managed pigs

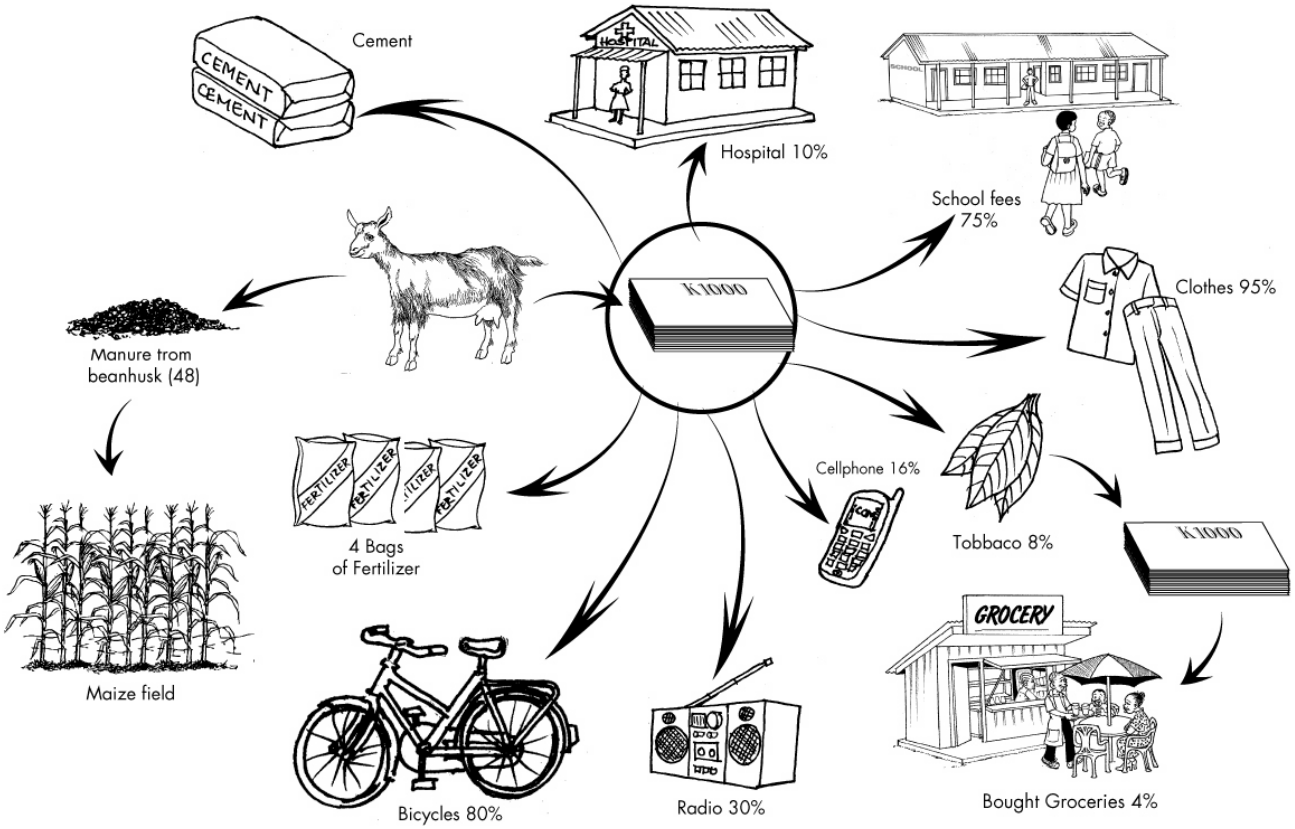

Figure B-9. Benefits derived by ADP Chabvuwu male farmers who managed improved goats

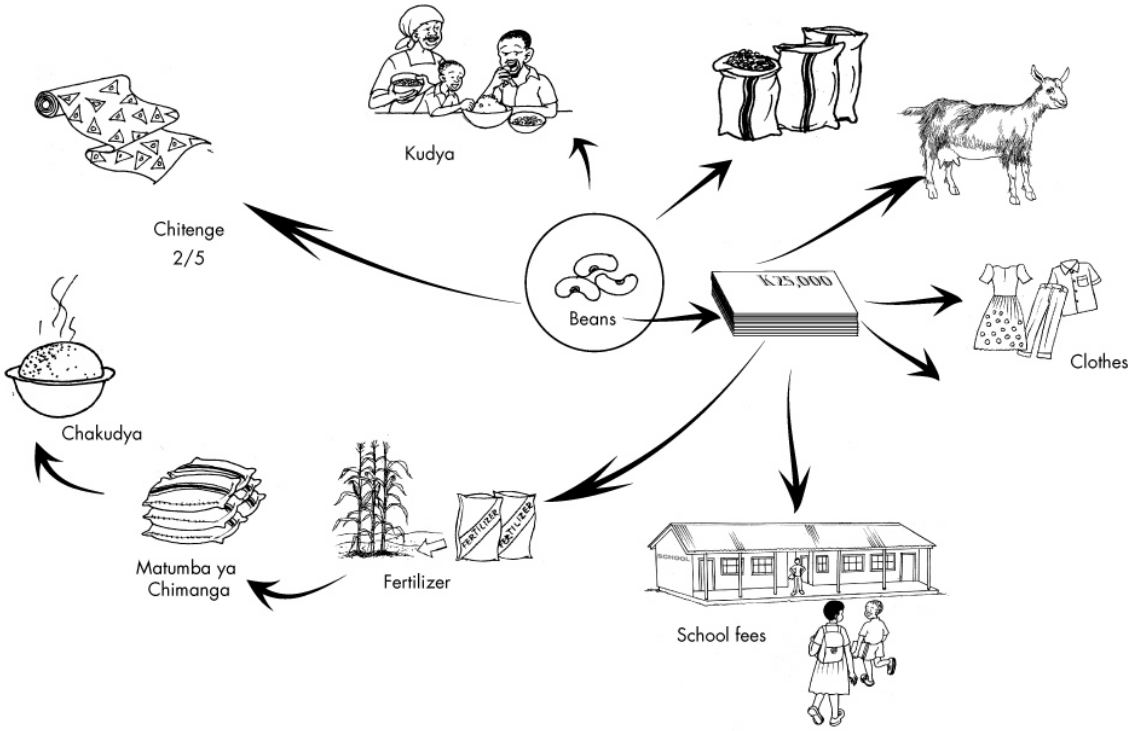

Figure B-10. Benefits ADP women farmers derived from beans

APPENDIX C
INSTRUMENTS USED

Instrument for Key Informants

A. General information
Name of the contact person:
Name of the organization:
B. Specific questions
1. How long have you been working with this organization?
2. How long has this organization been working with farmers in Malawi?
3. What activities/interventions are being carried out by the organization?
4. In which areas / Districts are you operating?
5. At what levels are you operating?

Strategies for linking farmers to the market
6. Is your organization linking farmers to the markets?
7. How is your organization linking farmers to the markets?
8. What types of agroenterprises are farmers involved with in this organization?
9. What type of support do you provide farmers participating in different agroenterprises
10. Are women farmers involved in these different types of agroenterprises?
11. How many women farmers/women groups are involved in each intervention?
12. How are women involved in different agroenterprises/interventions?
13. Where/how are farmers selling products from different agroenterprises?
14. Who determines the selling price of the products produced by farmers?

Partnership with other organizations
15. Who are your collaborating partners in the process of linking farmers to the market?
16. How do you involve these partners in the process of linking farmers to the market?

Natural Resource Management
17. Is the organization involving farmers in any type of NRM?
18. If yes, what type of NRM does the organization focus?
19. How is this organization involving farmers in different types of NRM?

Is there any thing that you would like to share with me that would contribute to the analysis of strategies for linking farmers to the market?

Thanks for your time and cooperation

Instrument for Informal Discussions with Farmers

A) Basic information

1. Name of the farmer/group:
2. Number of farmers attending: Female_____, Male_____
3. Name of the organization:
4. Name of the village/section:
5. Name of the District:

B) General information on Agricultural activities

6. What types of livestock and crops do you grow for cash?

Type of livestock Type of crops

7. Where do you current sell your crops/livestock?

Where do you sell crops Where do you sell livestock

8. What problems do you face in marketing these crops and/or livestock?

Marketing problems for crops Marketing problems for livestock

D) Information on specific activities with organization(s) that link farmers to the market

9. What other organizations are you working with in Marketing crops and /or livestock?

Name of the organization	How long have you been working with the organization?	What market interventions are you involved with this organization	Who decided on the type of market interventions that you are implementing?	How are these organizations linking you to the market?

10. Are you marketing crops /livestock individually or in groups?
11. If marketing in groups, how marketing of crops/livestock is being conducted? Number of women in groups_____. Number of men in groups_____.
12. What services do you get from the organization to support marketing of crops and livestock?
13. How successful are you from the market linkages, knowledge and skills and other services provided by the organization?
14. Are there any specific interventions by the organization on women to ensure that women are participating in the project activities? (if yes, specify them)
15. What benefits do you derive from participating in activities under this organization?

Instrument for Focus Group Discussions

General Information

Name of the Group/Association: _____
Type of group: _____1= women only, 2 = mixed
If mixed: Number of women: _____Number of men _____
Organization: _____1= CIAT, 2=ASSMAG, 3=NASFAM, 4=ICRAF, 5=World Vision
Region: _____1=Northern, 2=Central, 3=Southern
District: _____
Village: _____
Interviewer:_____ Date: _____

SECTION 1: Group Characteristics

1. Is your group registered or not? 1 = registered 0 = not registered _____
2. If it is a registered group, when was it registered? _____
3. Which year was the group formed? _____
4. What were the reasons for forming the group?
   - Easy training on the production of enterprise ……1
   - Easy management of the enterprise ……. …….2
   - Easy marketing ……..……3
   - Meet the production volume ……..4
   - Negotiation for better prices ……..5
   - Inputs procurement (SPECIFY INPUTS BELOW)
     - Seed ……..6
     - Fertilizer ……7
     - Pesticide ……8
   - Easy management of the smaller group ……....9
   - Shorten distance for travel to meeting with larger groups …10
   - Other reasons (SPECIFY) ……11
5. What activities are you involved in as a group?
   - Production and management of crop enterprise ……..…..1
   - Management of livestock enterprise ……..2
   - Experimentation of food security crops …….3
   - Experimentation on soil fertility management options ……..…….4
   - Experimentation on integrated pest management using botanicals…….5
   - Other activities (SPECIFY) …….6

6. Which committees do you have that members can work together? What are the roles of these committees?

Committee	Tick appropriate	Role of committee
Main committee		
Production committee		
Market research committee		
Participatory monitoring and evaluation committee		
Discipline committee		
Executive committee		
Other categories (SPECIFY)		

7. How does each member participate in activities that the group is involved in?
    a. _____
    b. _____
    c. _____
    d. _____
    e. _____
8. How many times a month do you meet as a group? _____
9. What was the number of farmers (men and women) in the group initially? _____
10. How many active members (women and men) are there in the group now?
    Number of active women: _____
    Number of active men: _____
11. How many farmers dropped from the group? _____
12. Why did they drop from the group?
    Did not have time to participate…….....1
    Moved to another village …….2
    Lack of markets – not profitable …….……3
    Project fund ended – lack of fund to continue with the group activities ….....4
    Did not produce enough to compete with other farmers …….5
    Lack of land to grow the crop ……..6
    Did not make profit ……..7
    Poor prices ……...8
    Expulsion –did not adhere to rules and regulations ……9
    Other reasons (SPECIFY) .....

SECTION 2: Specific information on crop enterprises

13. Which crop enterprises do you have?

Beans ……. ……..1
Pigeon peas ……..2
Groundnut ……3
Maize ……4
Soybeans ……..5
Sweet potatoes …….....6
Paprika ……7
Chilies ……..8
Fruits (SPECIFY) ……....9
Others (SPECIFY)
_____

14. Why did your group select these crop enterprises?

Reason	Crop E 1	Crop E 2	Crop E 3	Crop E 4	Crop E 5
Food security					
Nutrition					
Income generation					
Experimentation					
Soil fertility					
Require less fertilizer					
Others (SPECIFY)					

15. Are there crop enterprises that are for women only? 1 = yes, 0 = no

16. If yes, why are these "considered women only" enterprises?

a. _____
b. _____
c. _____
d. _____
e. _____

17. What did you contribute as a group to establish crop enterprises?

a. Labor
b. Seed
c. Land
d. Capital
e. Other (SPECIFY) _____

18. What did the organization contribute to support the group to establish crop enterprises?

Planting material/seed (SPECIFY CROPS) …….....1
Capital to buy seed (SPECIFY CROPS) ……....2
Training skills (SPECIFY BELOW)
Crop production ……..3
Management of enterprise ……..4
How to identify markets ……5
How to negotiate with buyers ……6
How to make contract ……....7
How to keep records ……..8
How to do cost and benefit analysis ……9
Grading ……...10
Gender (SPECIFY training components)
Shared roles and responsibilities ……....11
Household decision making ……12
Household relationships ……..13
Leadership ……..14
Conflict resolutions ……15
Provision of market information ……16
Linkage to buyers (SPECIFY BUYERS……..17
HIV/AIDS training ……..18
Linkage to other organizations……..19
Other contributions/support (SPECIFY) .....

19. Which crop enterprises are you producing and managing individually? Which crop enterprises are you producing and managing collectively in a group?

Level	Crop E 1	Crop E 2	Crop E 3	Crop E 4	Crop E 5
Individually					
Collectively in a group					

20. If producing in a group, who is providing land for crop enterprise? Who is preparing the land for planting? Who is planting the crop? Who is weeding? Who is harvesting the crop? Who is storing the crop?

Enterprise	Who provides land	Who prepares land	Who plants the crop	Who is weeding	Who harvests	Who stores the crop
1.						
2.						
3.						

21. Are you selling products from crop enterprises individually or collectively in a group?

1 = individually, 2 = collectively in a group

22. If selling in a group, when did you start selling together as a group?

Enterprise	Year started selling together
1.	
2.	
3.	
4.	
5	

23. What were the reasons to start selling in a group?
    To obtain the volume required by buyers ……1
    To obtain better price from buyers ……...2
    Contractual agreement become easier in group ……3
    More bargaining /negotiation power …….4
    Sharing marketing cost (SPECIFY) ……..5
    Others (SPECIFY) _____

24. Which markets have you sold products from crop enterprises as a group for last season? Which markets have you sold products the first season you started producing crop enterprise? What quantity (volume) have you sold? Who go to these markets to sell crop enterprises?

Enterprise: …….

Season	Markets sold	Quantity sold (kg)	Number of times sold	Who sold
2005 First season (SPECIFY Year)				

25. Are you as a group facing any problems in selling products from crop enterprises?
    1 = yes, 0 = no

26. If yes, which problems do you face as a group in selling products from enterprises?
    Inadequate knowledge on how to identify markets ……1
    Lack of knowledge on how to identify markets …….2
    Lack of reliable markets to sell products ……3
    Low price of products …….4
    Theft while transporting produce to markets ……..5
    Corruption by buyers ……..6
    Manipulation of weighing scale by buyers ……7
    Others (SPECIFY) .....

27. What can be done to remove problems and encourage marketing activities by the group?
    a. _____
    b. _____
    c. _____
    d. _____
    e. _____

Livestock enterprise

28. Does the group have any livestock enterprise? 1 = yes, 0 = no

If yes ANSWER questions 29-45. If no, SKIP to question 45

29. Which livestock enterprise do you have?
    - Pigs ……1
    - Diary cow ……..2
    - Local goats ……3
    - Others (SPECIFY) _____

30. Why did you choose to manage livestock enterprise?
    - Income earning ……1
    - Food security …….2
    - Asset building ……3
    - Manure ……4
    - Skill development ……..5
    - Others (SPECIFY) _____

31. What did you contribute as a group to establish livestock enterprise?
    a. Animal housing
    b. Labor for managing the enterprise

    Others (SPECIFY)

    c. _____
    d. _____
    e. _____
    f. _____

32. What did the organization contribute to support the group to establish livestock enterprise?
    - Training in the management of enterprise (SPECIFY) ……....1
    - Construction of animal house…….2
    - Animal feed ……3
    - Capital for animal vaccines ……4
    - Capital for regular animal feed …….….5
    - The animal …….6
    - Paraffin ……..7
    - Charcoal ……8
    - Feeding trash …….9
    - Vaccines ……..10
    - Market information …….11
    - Linkage to buyers ……12
    - Training in marketing (SPECIFY)
    - How to identify markets …….13
    - How to negotiate with buyers …….14
    - How to make contract …….15
    - How to keep records ……16
    - How to do cost and benefit analysis ……17
    - Linkage to other organizations (SPECIFY) …….18
    - Others (SPECIFY) _____

33. How many livestock did you start with? _____
34. How many households did they receive livestock initially? _____
35. How many livestock are there in the group now? _____
36. How many households have they received livestock now? _____
37. Are you selling livestock individually or collectively in a group?
    1 = individually, 2 = collectively in a group
38. If selling in a group, which year did you start selling together as a group?

Livestock enterprise	Year started selling together
1.	
2.	

39. What were the reasons to start selling livestock in a group?
    To obtain the number of livestock required by buyers …….1
    To obtain better price from buyers ……2
    Contractual agreement become easier in group ……3
    More bargaining /negotiation power ……4
    Help orphans from HIV/AIDS ……..5
    Others (SPECIFY) ……6
40. Which markets have you sold livestock as a group for last season? Which markets have you sold livestock first season? How many livestock have you sold to these markets?

Livestock enterprise: …….

Season	Markets sold	Number of livestock sold
2005		
Last season		
(SPECIFY)		

41. Which problems have you faced in the management of livestock enterprise?

Lack of feed …….……1
Lack of knowledge on feed formulation …….....2
Diseases …….……3
Animal deaths – while small …….4
Animal deaths– adult ……5
Poor quality feed ……...6
Untimely delivery of resources e.g. Vitamins, paraffin, charcoal by the organization.7
Others (SPECIFY) .....

42. Are you as a group facing any problems in selling livestock?
    1 = yes, 0 = no
43. If yes, which problems do you face as a group in selling livestock?

Inadequate knowledge on how to identify markets ……1
Lack of knowledge on how to identify markets ……..2
Lack of reliable markets to sell products …….3
Low price of products ……..4
High competition …….5
Others (SPECIFY) .....

44. What can be done to remove problems and encourage marketing activities by the group?
   a. Ensure quality
   Others (SPECIFY)
   b. _____

SEPARATE THE GROUP INTO TWO SUB-GROUPS: MEN AND WOMEN ONLY GROUPS FOR GENDER – DIFFERENTIATED CALENDARS AND BENEFITS THAT FARMERS HAVE DERIVED FROM THE ENTERPRISES

Indicate type of sub- group: _____
1 = women only; 0 = men only

If farmers are involved in crop enterprise only ask part (a), if are involved in livestock enterprise only ask part (b), if are involved in both crop and livestock enterprises ask parts (a and b)

SECTION 4: Gender dynamics: Gender-labor differentiated calendar on crop enterprises
45. Who does the following activities in the crop enterprises?
Codes:
1 = Wife only
2 = Husband only
3 = Wife and husband
4 = Male child
5 = Female child
6 = Wife and female child
7 = Husband and male child
8 = All household members
9 = Outside labor

Activity/Task	Who does it				
	Crop E 1	Crop E 2	Crop E 3	Crop E 4	Crop E 5
Selection of crop enterprise					
Land preparation					
Planting					
Weeding					
Fertilizer application					
Pesticide application					
Harvesting					
Transporting after harvesting					
Processing (winnowing, etc.)					
Packaging					
Storage pest application					
Going to town to identify markets					
Decision on which markets to sell					
Going to markets to sell					
Keeping the money after sales					
Decision on the use of money					

Gender dynamics: Gender-labor differentiated calendar on livestock enterprises

46. Who does the following activities in the livestock enterprises?

Codes:

1 = Wife only
2 = Husband only
3 = Wife and husband
4 = Male child
5 = Female child
6 = Wife and female child
7 = Husband and male child
8 = All household members
9 = Outside labor

Activity/Task	Who does what	
	Livestock E 1	Livestock E 2
Construction of the animal house		
Purchase of Livestock		
Purchase of feed		
Feeding		
Watering		
Treatment		
Transporting to market		
Going to town to identify markets		
Decision on which markets to sell		
Going to markets to sell		
Keeping the money after sales		
Decision on the use of money		
Other tasks (SPECIFY)		

SECTION 5: Benefits/Impact diagrams to be drawn by farmers

47. What direct and indirect benefits have you as a group derived from crop/livestock enterprises? What are the negative and positive affect of these benefits to the group members?

ZIKOMO KWAMBIRI

Instrument for Household Interviews

General Information

Name of the Organization: _____
1= CIAT, 2=ASSMAG, 3=NASFAM, 4=ICRAF, 5=World Vision
Name of Farmer's Group: _____
Region: _____1=Northern, 2=Central, 3=Southern
District: _____
Village: _____

Interviewer: _____ Date: _____

SECTION 1: Farmer characteristics

1. Farmer's Name: _____
2. Farmer's Sex: _____ 1 = female, 0 = male
3. Household member who is the group member: _____1 = wife, 2 = husband, 3 = both
4. How many years have you been a member? _____
5. What were the reasons for you to join the group?
   a) Easy management of enterprises
   b) Easy marketing
   c) To obtain better prices
   d) To strengthen social relations with other members in the group

   Other reasons (SPECIFY) _____

SECTION 2: CHARACTERIZING THE ENTERPRISE

Crop enterprise

6. Which crop enterprises do you have?
   Beans ……. ……..1
   Pigeon peas ……..2
   Groundnut ……3
   Maize ……4
   Soybeans ……..5
   Sweet potatoes ……....6
   Paprika ……7
   Chilies ……..8
   Fruits (SPECIFY) ……....9
   Others (SPECIFY) _____

Production, growth and marketing of crop enterprises for last five seasons (2001-2005)

7. How much did you plant? How much did you harvest? How much total did you sell? What was the price per unit sold? What was the total income obtained? How much did the husband keep? How much did the wife keep?

Crop Enterprise: ……Year started producing: ……

Seasons	How much planted		Amount harvested, sold and consumed			Price per unit sold	Total income obtained	Amount of money kept by husband	Amount of money kept by wife
	Area (acre)	Quantity of seed used (kg)	How much harvested (kg)	Total quantity sold (kg)	Total quantity consumed (kg)				
2005									
2004									
2003									
2002									
2001									

8. To which markets do you sell your crop products? How do you go to these markets? Who transports crop products to these markets? Who actual sells crop products to buyers in these markets? What is the distance from the village where you live to the markets?

Crop Enterprise: …….

Season	Which markets did you sell	Price to the market sold	How did you go to the markets	Who carried/ transported products to markets 1 = husband 2 = wife 3 = wife and husband 4 = organization (SPECIFY ……) 5 = Did not transport-collected from the house 6 = Others (SPECIFY ……)	Who Sold 1 = husband 2 = wife 3 = wife and husband 4 = organization (SPECIFY ……) 5 = Others (SPECIFY ……)	Distance to the market
2005						
2004						
2003						
2002						
2001						

9. Did you sell your produce individually or in collectively in a group?
   1=Individually, 2=Collectively

Other crops produced by farmers

10. Which other major crops do you grow?
    1 = yes, 0 = no;
    Purposes of growing them:
    1 = Food only
    2 = Sell only
    3 = both food and sale
    4 = hire labor

	Do you grow?	For what purpose do you grow the crop?
Local maize		
Hybrid maize		
Sweet potato		
Beans		
Groundnuts		
Pigeon pea		
Soybeans		
Tobacco		
Other crops (SPECIFY)		

11. What are your sources of income in the household? Prioritize/Rank them

	Source	Rank
a)	_____	……
b)	_____	……

Investment in soil fertility management technologies (SFMTs) (trade-off) on crop enterprises

12. Do you use SFMTs in any of your crop enterprises? 1 = yes, 0 = no
13. If yes, when did you start using SFMTs on your crop enterprises? Which SFMTs do you use? On which crops do you use SFMTs?

Soil fertility measure/season	Do you use? 1=yes 0=no	When did you start using	On which crops do you use
Chemical fertilizer			
Intercropping with legumes			
Crop rotation			
Incorporate crop residues			
Animal manure			
Compost manure			
Soil erosion control measures e.g. grass strips, terraces, contour bands, vertiver grass etc.			
Integrated Pest Management e.g. use of botanicals			
Plant agroforestry trees			
Others (SPECIFY)			

14. Who helped you the most to obtain information on SFMTs that you use?
    Fellow farmers within the group …….1
    Fellow farmers within the village ……2
    Farmers from the neighboring villages ……3
    The organization (SPECIFY)…….....4
    Others (SPECIFY) _____
15. Who helped you the most to obtain materials (SPECIFY…….) for soil fertility management?
    Fellow farmers within the group …….1
    Fellow farmers within the village ……2
    Farmers from the neighboring villages ……...3
    The organization (SPECIFY)...…….....4
    Others (SPECIFY) _____
16. Which support does the organization provide on the use of SFMTs?
    None ……0
    Information on SFMTs ……1
    Material for soil fertility management (SPECIFY) …….2
    Training on how make and apply animal manure ……..3
    Training on how to make and apply compost manure ……4
    Training on how to apply chemical fertilizer …….5
    Linkage to organizations that provide input loans …….6
    Others (SPECIFY) _____

17. Do you face any problems in using SFMTs? 1 = yes, 0 = no.
    If yes, which problems do you face in using SFMTs?
    Transport ……1
    Access to technologies/materials ……...2
    High cost …….3
    Lack of knowledge on how to use SFMTs …….4
    Labor intensive (SPECIFY SFMT) ……5
    Others (SPECIFY) _____
18. What can be done to remove these problems and encourage you to use SFMTs?
    a) _____
    b) _____
    c) _____
    d) _____
    e) _____

Livestock enterprise

19. Do you have any livestock enterprise?
    1 = yes, 0 = no

If yes ANSWER questions 20 - 25. If no SKIP to question 26

20. Which livestock enterprise do you have?
    Pigs ……1
    Diary cow ……..2
    Local goats ……3
    Dairy goat ……..4
    Broiler chicken …..5
    Others (SPECIFY) _____

Production and growth of livestock enterprise

21. When did you start managing livestock enterprise? How many livestock did you start with? How many livestock do you have now? Did you loose any livestock? If yes, how many did you loose them? What were the reasons for their loss?
    Livestock enterprise: …….

When did you start	How many did you start with	How many do you have now	Have you lost any livestock 1=yes 0=no	How many did you loose	What were the reasons for their loss
					1. Diseases 2. Poor management 3. Lack of enough feed 4. 5. 6. 7.

Marketing of livestock enterprise for the last five seasons (2001-2005)

22. How many livestock did you sell? What was the unit price for each livestock you sold? What was the total income you obtained from livestock sales? How much did the husband keep? How much did the wife keep?

Livestock Enterprise: ……

season	Number of livestock sold	Price per livestock	Total income	Amount of money kept by husband	Amount of money kept by wife
2005					
2004					
2003					
2002					
2001					

23. Which markets did you sell your livestock? What was the distance from your village to the markets? How did you go to these markets? Who transported livestock to the markets? Who actually sold livestock to buyers at these markets?

Livestock enterprise: ……

Season	Markets sold	Price to each market sold	Distance from the village	How did you go to the markets	Who transported livestock to markets 1 = husband 2 = wife 3 = wife and husband 4 = organization (SPECIFY ……) 5 = Did not transport-collected from the house 6 = Others (SPECIFY ……)	Who Sold 1 = husband 2 = wife 3 = wife and husband 4 = organization (SPECIFY ……) 5 = Others (SPECIFY ……)
2005						
2004						
2003						
2002						
2001						

24. Did you sell your livestock/products individually or in collectively in a group?
    Individually ……..1
    Collectively ……..2
25. Have you faced any problems in the management of livestock enterprise? 1 = yes, 0 = no.
    If yes, which problems have you faced in the management of livestock production?
    Lack of animal feed ……..1
    Inadequate skills in feed formulation ….2
    Animal deaths ……3
    Lack of markets for livestock ……..5
    High cost of livestock vaccines ……..6
    High cost of artificial insemination …….7
    Others (SPECIFY) _____

SECTION 3: Advantages and Disadvantages of selling crops and or livestock enterprises individually or collectively in a group

26. What do you see as advantages and disadvantages of selling crops and or livestock enterprises individually or collectively?

Marketing strategy	Advantages	Disadvantages
Individual	1. Easy to control money	1. You do a lot of work alone
	2. You become more responsible	2. You sell at low prices
	3.	3. Difficult to get transport
	4.	4.
	5.	5.
Collective	1. Higher prices	1. Income becomes inaccessible when you need it
	2. Easy to meet buyers' demand/volume	2. Lazy members discourages fellow members
	3. Share marketing costs	3. Top leaders can use money without members permission
	4. Skills development / enhancement	4.

SECTION 4: Factors that are facilitating or constraining farmers' participation in the market

27. Who is involved in the following marketing activities?

Activity	Who is involved 1 = husband 2 = wife 3 = others (SPECIFY)			
	Enterprise1	Enterprise2	Enterprise3	Enterprise4
Making decision to get involved in the enterprise				
Processing				
Grading				
Packaging				
Market committee				
Going to markets outside the community to sell products from enterprise				
Going to markets within the village to sell products from enterprise				
Negotiating with buyers for better prices of the products from enterprise				
Making contract				
Making decision on amount of crop produce to sell				
Making decision on the number of livestock to sell				
Other marketing activities (SPECIFY				

28. Are there any problems constraining you to go to markets outside the community to sell products from enterprises? 1 = yes 0 = no

If yes, which problems constrain you to go to markets outside the community to sell products from enterprise?

Distance to markets ……..1
Household responsibilities ……2
Not allowed by their husbands …….3
Women are not allowed by culture ……..4
Lack of marketing skills …….5
Lack of confidence …….....6
Lack of selling ID ……7
Other problems (SPECIFY) _____

29. What is the organization doing to remove problems or encourage you to go to markets outside their community to sell products from enterprises?
    a. Gender training
    b. Encourage women leadership
    Other (SPECIFY)
    c. _____
    d. _____
    e. _____
    f. _____
    g. _____

SECTION 4: Benefits from farmers' participation in the marketing activities

30. Who decides on the use of money after sales of products from enterprise that your household is involved in?

Enterprise Who decides on the use of money after sales of products from enterprise you are involved in?

	Husband	wife	others (SPECIFY)
Enterprise 1			
Enterprise 2			
Enterprise 3			
Enterprise 4			

31. How did you use the money you obtained from sales of the enterprises your involved in?

How the money was used	Tick appropriate	Indicate how much purchased where appropriate	Who bought? 1=husband 2 =wife 3= wife and husband
Purchased food for the household			
Purchased seed			
Purchased fertilizer			
Purchased livestock (SPECIFY)			
Built new structure for livestock			
Purchased livestock feed			
Paid school fees for the children			
Purchased mattress			
Purchased bicycle			
Purchased kitchen utensils (plates, cups, pots)			
Purchased iron roofs			
Constructed new house			
Opened a grocery store			
Purchased cloths (chitenge, shirts)			
Purchased TV			
Other uses (SPECIFY)			

32. How your participation in the marketing activities has changed the following?

Change	Improved		Made worse		Stayed the same	
	1= yes 0=no	Why	1= yes 0=no	Why	1= yes 0=no	Why
Self-confidence						
Position / status in the community						
Social networks and social relationships						
Knowledge/skills-capacity development						
Workload for women						
Roles and responsibilities between husband and wife						
Husband-wife relations						
Decision making capacity within the household						
Other changes (SPECIFY						

SECTION 5: Farmers' Empowerment

Crop enterprise

33. Suppose you hear from your neighbor that there is a new crop enterprise called *'velvet beans'* in Zomba district that farmers are making a lot of money out of it. Which of the following can you do on your own without support from the organization?

Statement	I can do it without help	I can do it with some help	I cannot do it at all
I can produce and manage the new crop			
I can test different ways to produce and manage the new crop			
I can ask the organization to come and train us on the production and management of the new crop			
I can go outside the village to identify the best markets for the new crop			
I can go to markets outside the village to sell the new crop on my own			
I can negotiate with buyers on a good price for new crop			
I can make contract with buyers			
I can keep all records for production and marketing of the new crop			

Livestock enterprise

34. Suppose you hear from your neighbor that there is a new livestock enterprise called '*diary goat'* in Karonga district and farmers are making a lot of money out of it. Which of the following are you confident to do on your own?

Statement	I can do it without help	I can do it with some help	I cannot do it at all
I can produce and manage the new livestock			
I can ask the organization to come and train us on the production and management of the livestock			
I can go outside the village to identify the best markets for the new livestock			
I can go to markets outside the village to sell the new livestock on my own			
I can negotiate with buyers on a good price for new livestock			
I can make contract with buyers			
I can keep all records for production and marketing of the new livestock			

SECTION 6: How to increase benefits to women from enterprise that you are involved in?

35. In your opinion, are women benefiting from the enterprise that you are involved in?
    1 = yes
    0 = no

36. How are women benefiting from the enterprise that you are involved in?
    a) _____
    b) _____
    c) _____
    d) _____
    e) _____

37. How could the organization (SPECIFY…….) increase benefits to women from the enterprise that you are involved in?
    a) _____
    b) _____
    c) _____
    d) _____
    e) _____

SECTION 7: HOUSEHOLD ASSETS

38. What is the educational level of you and your spouses?

	Educational level
Man	_____
Woman	_____

Codes for educational level:

No formal education …….0

Primary education (Standard 1-4) ……..1

Primary education (Standard 5-8) ……..2

Secondary education ……3

Tertiary education ……4

Other (SPECIFY) ……..

39. How many children do you have? _____, how many boys? _____, how many girls? ____

40. How many school age girls and boys in this household attend school? How many children are not attending school? What is the reason for not attending school?

Attend school	School age not attending school	Reason for not attending
Girls: _____	_____	_____
Boys: _____	_____	_____

41. Which of the following assets do you have? 1 = yes, 0 = no

Assets	Owns? (1 = yes, 0 = no)	Number
Bicycle		
Foam mattress		
Mats		
Radio		
Chair		
Brick house		
House with iron roofing		
House with more two rooms		
Other assets (SPECIFY)		

42. Do you own any livestock? 1 = yes, 0 = no.

If yes, which animals do you own? How many animals of each type do you own?

Livestock	Owns? (1 = yes, 0 = no)	Number of improved	Number of local
Cows			
Cattle			
Pigs			
Donkeys			
Goats			
Sheep			
Chickens			
Ducks			
Rabbits			
Others (SPECIFY)			

43. How much land (acres) does the household own? _____

44. Type of household: Does your spouse lives with you (married)?____ 1 = yes, 0 = no

45. If not married, specify type of household: _____

Male headed, never married ……1
Male headed, separated ……...2
Male headed, divorced ……....3
Male headed, widower ……4
Female headed, absentee husband …….....5
Female headed, never married……6
Female headed, separated ……..…7
Female headed, divorced ……..8
Female headed, widow …….9

APPENDIX D
RESEARCH METHODOLOGY FRAMEWORK

Table D-1. The Research Methodology Framework

Objectives	What information do we need to know	Variables	Data collection Methods	Analysis
1. To identify and compare strategies used by organizations to link farmers to markets. Research Question: Which strategies explicitly integrate gender?	1. Which organizations are linking farmers to markets? 2. Which strategies are being applied to link farmers to market 3. At what level are they working? 4. How is each strategy linking farmers to markets?	▪ Community led (ERI) ▪ Trader led ▪ Other methods ▪ Areas of operation ▪ Level – group vs. associations ▪ Number of groups ▪ Number of women ▪ Enterprises ▪ Training skills, ▪ Organize groups/work with existing groups, ▪ Inputs/support ▪ Market information; ▪ Training in business skills, Negotiation & financial management ▪ Access to credit ▪ Production aspects	Interviews with Key informants in each organization using a checklist of Questions Interviews with Key informants in each organization ▪ Interviews with Key informants in each organization ▪ Household survey ▪ Focus group discussion ▪ Participant observation ▪ Literature reviews	Institutional Framework for comparison →to compare strategies for linking farmers to markets: ▪ Integration of gender ▪ Level and area of operation ▪ Strategies/models for linking farmers to markets ▪ Types of enterprise ▪ Support mechanisms

Table D-1: Continued

Objectives	What information do we need to know	Variables	Data collection Methods	Analysis
1.To identify and compare strategies used by organizations to link farmers to markets. Research Question: Which strategies explicitly integrate gender?	5. How is each strategy explicitly integrate gender	▪ Type of groups they work with, ▪ Type and level of gender training programs/gender components, ▪ Specific activities for women ▪ A gender policy to support women farmers' participation in the market? ▪ Elements of each organizational strategy for increased women farmers' participation in the market	▪ Interviews with Key informants in each organization ▪ Household survey ▪ Focus group discussion ▪ Participant observation ▪ Literature reviews	
	6. What type of enterprises that each strategy is focusing on?	▪ Types of enterprises (high value / cereals/ livestock/ others ▪ Volumes/quantities produced and sold ▪ Perishable vs. non-perishable	▪ Interviews with Key informants in each organization ▪ Household survey ▪ Focus group discussion	
	7. How does each strategy involve groups/ work with groups?	▪ Group formation/working with already existing groups, ▪ Criteria for selecting farmers' groups to work with, ▪ Group representation, , ▪ Facilitation, ▪ Training, ▪ Support mechanisms	▪ Interviews with Key informants in each organization Focus group discussion	

Table D-1: Continued

Objectives	What information do we need to know	Variables	Data collection Methods	Analysis
2. To determine and analyze the extent to which women farmers participate in the market Research questions: a) To what extent are women participating in the market?	▪ At what level are women farmers participating in the market? ▪ What market opportunities are available to women farmers? ▪ How are women involved in the production and marketing of crops and livestock enterprises? ▪ For main enterprise identified what are gender implications of the enterprises to women livelihoods/welfare?	▪ Number of women farmers ▪ Level- individual/group/associations ▪ Type of markets where women farmers sell ▪ Distance to the market / access to market / transportation/ ▪ Price in the markets ▪ Marketing strategy ▪ Types of Agroenterprises(high value / cereals/ livestock/ others ▪ Type of products produced and marketed ▪ Volume sold ▪ Who sells? ▪ Who owns income	▪ Key informants ▪ Group discussion ▪ Household survey ▪ Seasonal and activity calendars ▪ Focus group discussion ▪ Household survey	Institutional Framework to compare extent to which women farmers participate in the market by enterprise by strategy, and Descriptive statistics: ▪ Level of participation ▪ Access to central markets ▪ Marketing strategy

Table D-1: Continued---

Objectives	What information do we need to know	Variables	Data collection Methods	Analysis
2. To determine and analyze the extent to which women farmers participate in the market Research questions:	Which household factors are facilitating /constraining women's participation in the market?	▪ Access to income/ Income sharing ▪ Reduced labor ▪ Shared roles and responsibilities ▪ Decision making abilities-over resources, benefits and income	▪ Seasonal-activity calendars/diagramming ▪ Focus group discussions ▪ Household interviews	
b) Which household, community and institutional factors are facilitating and/or constraining women's participation in market	Which community factors are constraining /facilitating women's participation in the market?	▪ Women's roles and responsibilities ▪ Decision-making, ▪ Distance to the markets ▪ Education/training, ▪ Freedom to sell to the markets outside the village	▪ Informal discussions ▪ Focus group discussions ▪ Household interviews	
	Which institutional factor is constraining /facilitating women's participation in the market?	▪ Gender relations /culture/norms, ▪ Community leadership ▪ Location of the market, ▪ Level of social capital/ organization ▪ Networking ▪ Promoting group vs. individual marketing ▪ Strategy used: Is it sustainable and empowering? ▪ Support mechanisms ▪ Training: Is it adequate for marketing activities by women? ▪ Promoting group vs. individual marketing	▪ Focus group discussion ▪ Informal discussions	

Table D-1: Continued

Objectives	What information do we need to know	Variables	Data collection Methods	Analysis
2. To determine and analyze the extent to which women farmers participate in the market Research questions: c) What are other opportunities for different agro enterprises that women farmers can get involved in?	What are other opportunities for income generation that more women farmers can get involved in?	▪ Social networks/networking ▪ Access to credit ▪ Freedom to go outside the community ▪ Implementation of women-preferred enterprises ▪ Diversification of income earning activities (including non-farm activities) ▪	▪ Focus group discussion ▪ Informal discussions ▪ Panel data for specific case studies	
3. To determine what benefit women farmers derive from participating in the market Research question: What are women benefiting from participating in the market?	What are the benefits from women's participation in the market?	▪ Household income ▪ Family wellbeing (food, income, health and education) ▪ Income ownership ▪ Decision-making ▪ Self-confidence ▪ Position / status in household, group, and community, ▪ Social relationships/networks ▪ Roles and responsibilities ▪ Women work load ▪ Application of knowledge and skills	▪ Benefit diagrams ▪ Household interviews	Institutional Framework to compare benefits by enterprise by strategy, and Descriptive statistics

Table D-1: Continued ---

Objectives	What information do we need to know	Variables	Data collection Methods	Analysis
4. To analyze the trade off on soil fertility management technologies between food and cash crops Research questions: What is trade-offs on soil fertility management technologies between food and cash crops?	▪ What soil fertility management technologies are used by farmers? (Which technologies are mostly used by women? ▪ Which soil fertility management technologies are mostly used by women? ▪ To which crops farmers are mostly using soil fertility management technologies?	▪ Type of soil fertility management technologies used by farmers/women ▪ Number and percentage of women ▪ Number and percentage of farmers Income	▪ Focus group discussion ▪ Household survey ▪ Key informants ▪ Focus group discussion ▪ Household interviews ▪ Household survey	▪ Institutional Framework to compare trade-offs between food and cash crops by crop by strategy and Descriptive statistics

APPENDIX E
THE INFORMED CONSENT

Protocol Title: Linking Women Farmers in the Market: Discourse on Community Empowerment and Gender Equity in Malawi

Please read this consent document carefully before you decide to participate in this study.

Purpose of the research study:
The purpose of this study is to determine the degree to which women farmers participate in the market in five organizations: International Center for Tropical Agriculture (CIAT), The World Agroforestry Center (ICRAF), National Smallholder Farmers' Association of Malawi (NASFAM), Association of Smallholder Seed Multiplication Action Group (ASSMAG) and World Vision.

What you will be asked to do in the study:
Following a normal African greeting you will be asked to volunteer to answer questions for this study. The questions would focus on different types of crops and livestock activities that you perform in your daily life. These activities relate to the type of crops you grow, type of livestock that you manage and marketing of crop and livestock products. Specifically, the study's interest is to understand the benefits you get from working with CIAT, ICRAF, World Vision, ASSMAG and NASFAM.

Time required: 1 hour

Risks and Benefits:
Your answers and suggestions are very important to organizations working with you and would help improve the performances of these organizations through development and delivery of appropriate technologies to many farmers in the Region including yourself. We therefore anticipate that you will benefit directly by participating in this study. There are no risks to you for participating in this study.
Compensation:
There would be no payment for your participation in this research.
Confidentiality:
Your identity will be kept confidential to the extent provided by law. Your information will be assigned a code number. The list connecting your name to this number will be kept in a locked file in my faculty supervisor's office. When the study is completed and the data have been analyzed, the list will be destroyed. Your name will not be used in any report.
Voluntary participation:
Your participation in this study is completely voluntary. There is no penalty for not participating.

Right to withdraw from the study:
You have the right to withdraw from the study at anytime without consequence.
Contact information for any questions about the study:

1. Kibiby Jabir Mtenga (Ph. D Candidate)
   Department of Agricultural Education and Communication,
   University of Florida, 310 Rolfs Hall. P.O. Box 110540. Gainesville, Florida. 32611.
   Telephone numbers: 1-352-392-0502/ 265-1-707-387/396
   E-mail: Kibiby@yahoo.com
2. Supervisor Name and contact information
   Dr. Ladewig Howard
   Department of Agricultural Education and Communication
   University of Florida,
   411 Rolfs Hall, P.O. Box 110540
   Gainesville, Florida. 32611
   E-mail: hladewig@mail.ifas.ufl.edu
   hladewig@verizon.net

Whom to contact about your rights as a research participant in the study:
UFIRB Office, Box 112250, University of Florida, Gainesville, FL 32611-2250. Telephone: 1-352-392-0433.

Agreement:
I have read the procedure described above. I voluntarily agree to participate in the procedure and I have received a copy of this description.

Participant: _____ Date: _____

Principal Investigator: _____ Date: _____

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BIOGRAPHICAL SKETCH

Kibiby Jabir Mtenga was born February 3, 1969, in Morogoro Region, Tanzania. Ms. Mtenga was raised in Morogoro Municipality where she attended her primary, ordinary and high level secondary school education. She graduated from Kilakala Girls' High School in 1991. While attending Kilakala girls' high school, Ms. Mtenga was very active in sports activities and she ranked number one in all classes.

Her late parents were farmers from whom she learned different farming methods. Her farming background motivated her to pursue an agricultural degree at Sokoine University of Agriculture. Ms Mtenga received her Bachelor of Science degree program in agriculture general from Sokoine University of Agriculture in Morogoro, Tanzania in 1997. As part of this degree program, she investigated the potential and experiences of the extension workers' knowledge on maize in the Southern Highlands of Tanzania, under the supervision of Professor Amon Mattee.

Ms Mtenga received her Master of Science in agricultural education and extension from Sokoine University of Agriculture in Morogoro, Tanzania in 1999. As part of her degree program, she investigated the potential and limitation of community seed supply systems, under the supervision of Professor Amon Mattee and Dr. Flavianus Magayane.

Following her successful completion of Master of Science degree program, Ms Mtenga was appointed to a faculty position at Sokoine University of Agriculture in the Department of Agricultural Education and Extension. Ms Mtenga taught undergraduate students in areas of agricultural administration and management, agricultural extension and adult education. In addition to her teaching responsibilities, Ms Mtenga also supervised students' research and conducted outreach research and extension project activities in line with the national agricultural policy objectives and in collaboration with national and international scientists. Ms Mtenga also

worked as an independent research consultant with several international organizations including GTZ, ICRISAT and CIAT/SABRN.

Participating in agricultural activities at the family and professional level at Sokoine University of Agriculture inspired her to advance her knowledge and skills in international agricultural extension to better help the majority of farmers in Tanzania and in the world. In 2002, Ms Mtenga began her Ph.D. program in the Department of Agricultural Education and Communication at the University of Florida, specializing in international extension with minors in gender and international development, and farming systems research and extension. While pursuing her PhD, Ms Mtenga was a graduate research assistant in her department, under the supervision of Drs. Howard, Ladewig, Edward Osborne, Nick Place and Marta Hartmann. Ms Mtenga assisted in various research and extension activities and also in designing an *e*-course on managing agricultural innovation.

Ms Mtenga has two children, Opulukwa (Jr), born in April of 2002, and Vanessa, born in January of 2004.