FOOD SECURITY AMONG RURAL SMALL HOLDER FARMERS: NATIONAL AGRICULTURE, LIVESTOCK AND EXTENSION PROGRAMME (NALEP) INTERVENTION IN BOBASI, KISII COUNTY

BY

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DECLARATION

This research project paper is my original work and has not been submitted to any other university.

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OMARI BENARD MOSETI Date

This research project paper has been submitted for examination with my approval as University Supervisor.

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PROF.PATRICK ODERA ALILA Date

DEDICATION

This research project is dedicated to the late Dr. Hezron O. Nyangito; my parents; sibling Andrew, Everyln, Kevin, Faith, David and Eunice; and lastly, to all persons sincerely committed to addressing the problem of food insecurity among smallholder rural farmers in Kenya.

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LIST OF ACRONYMS AND ABBREVIATIONS

CBO	Common Based Organization
CBS	Central Bureau of Statistics
CIG	Common Interest Groups
COK	Constitution of Kenya
DFID	Department for International Development
ESP	Extension Service Providers
FADC	Focal Area Development Committees
FAO	Faith Based Organization
FBO	Food and Agriculture Organization
FGD	Focus Group Discussion
GOK	Government of Kenya
IFPRI	International Food Policy Research Institute
KFSSG	Kenya Food Security Steering Group
KII	Key Informant Interview
M & E	Monitoring and Evaluation
MOA	Ministry of Agriculture
MDG	Millennium Development Goals
NAEP	National Agriculture and Extension Policy
NALEP	National Agriculture, Livestock and Extension Programme
PDDA	Pluralistic, Participatory and Demand-Driven Approaches
SRA	Strategy to Revitalize Agriculture
SIDA	Swedish International Development Agency

ABSTRACT

Food security is an essential element of overall human well-being. This study assesses how and the extent to which National Livestock and Extension Programme (NALEP) has created, strengthened and enhanced the innovative and productive capacities of the smallholder rural farmers to attain self-sufficiency levels in food security requirements.The study analyzed the characteristics of small holder rural farmers households; the influence of NALEP interventions on current capacity for food security among the smallholder farmers; and lastly, the strengths and weakness of the NALEP interventions .

The study adopted both quantitative and qualitative research approach. Multi-stage and purposive sampling techniques were used to select the respondents. The study utilized both primary and secondary data; and thematic analysis technique of data analysis.

The study draws four key findings. First, Smallholder rural farmers' households display diverse socio-economic and demographic characteristics. Second, food security differences cut across gender, age, and income sources. Third, the biggest strength of NALEP has been the formation and capacity building of grassroot farmer organizations in form of the Common Interest Groups (CIGs). Through these groups the farmers have been able to survive difficult challenges and increase their individual incomes. The study findings however did not establish any organization that provided capacity support in monitoring and evaluation; and lastly, by involving local farmers in the Focal Area Development Committees (FADC) and educating them in new farming technologies have shown to be another successful strategy.

The study suggests three key recommendations for policy. First, while connections between research and extension are often problematic as their roles can appear to be overlapping,it is recommended that in order to ensure a certain level of relevance in their work, the research service will have to rely on extension workers to screen and field test solutions together with farmers and on the farm. This aspect is particularly relevant in relation to crops that may be suitable for the poorer segments of the farming communities. Second, the study recommends that an attempt should be made to formalize the mandate of the Stakeholder Forum, using the mandate of the Ministries of Agriculture to reinforce the coordination of all entities working in rural development towards a more efficient use of resources in this area; and finally, it is recommended that a comprehensive monitoring and evaluation system is designed and implemented. The M&E system should embrace activities and results related both to production as well as cross-cutting issues related to gender, age and education.

Additionally, the study suggests three recommendations for further research. First, this study was based on household survey data using a small sample, which cannot provide conclusive insight into how households move in and out of food shortages across time. Therefore a longitudinal study using panel sets with a larger sample is more likely to bring out the bigger picture. Second, a study on the sustainability of NALEP as a development intervention be carried out, noting that NALEP is a measurable and time-bound intervention in its last phase under NALEP-SIDA. Third, the study recommends for replication of the studies be carried out in other areas of Kenya where NALEP intervention exist to establish variations in strategies employed, and the outcome of household food security interventions on household food security.

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CHAPTER ONE

1.0 Introduction

This study assesses how and the extent to which National Livestock and Extension Programme (NALEP) has created, strengthened and enhanced the innovative and productive capacities of the smallholder rural farmers to attain self-sufficiency levels in food security requirements. This report is divided into five chapters. Chapter one presents the background to the study, the problem statement, research questions research objectives; and the justification for the study

Chapter two presents literature review, the theory and conceptual framework. Literature review focuses on overview of NALEP; its history and implementation, agricultural extension service on the success of food security projects, and overview of studies on food security. The theoretical framework underpinning the study draws from the social systems theory and the diffusion of innovations theory, the basic needs approach and the sustainable livelihood approach.

Chapter three describes the study site and methodology. The methodology focuses on the research design, the unit of analysis, population and sampling techniques. Additionally, the chapter describes the pilot study, the data sources and collection methods; data processing and analysis; and finally the scope of the study and its limitations.

Chapter four presents the findings of the field research in line with the objectives of the study. Among the issues addressed include basic characteristics of the respondents, household characteristics, agricultural activities and food security status of the households. NALEP interventions on food security and implications for households are also presented. Where appropriate, figures and tables have been used to illustrate the study findings and assist in analysis

Finally, chapter five presents summary of findings, conclusions and recommendations. The recommendations focus on both policy and areas for further research.

1.1 Background to the study

Food security is an essential element of overall human well-being and an important milestone on the path to complete poverty alleviation. Hunger and poverty alleviation which is the goal number one of the Millennium Development Goals (MDGs) remains the number one cause of death. It is estimated that globally 925 million people do not have enough food to eat and about 13 percent of the world population is undernourished (FAO, 2011), due to the economic downturn manifested by food crises, financial crunch and economic recession.

Food is categorised as a basic human right (FAO, 1996; CoK, 2010), yet, food and nutrition insecurity is a daily reality for millions of Kenyans living in both the rural and urban areas (GoK, 2008). Inadequate food consumption has serious implications for health, cognitive ability of children, labour productivity and often results to social ills like crime (Wolf and Ross, 1992).

Food security has remained one of the Kenya's development agenda and for good reason. About a half (46 percent) of Kenya's estimated 40 million people live below the poverty line, and some 10.5 million people live in extreme poverty (CBS, 2008). A recent IFPRI report (IFPRI, 2013) classified the status of hunger in Kenya as 'alarming', indicating that negligible progress was made between 1990 and 2009 in terms of the global hunger index; Kenya's hunger index was 20 in 1990 and 20.2 in 2009.

Food insecurity in Kenya is concentrated in the rural areas. In 2008, 51 percent of the rural Kenyan households were food insecure, compared to 38 percent in urban areas (GoK, 2008). At household level, the combined effects of insufficient domestic food production and increasing food prices have eroded the ability to access adequate food by many people (Gok 2008) This is reflected in a high number and proportion of undernourished people in the country, currently about 33% percent of the population (FAO, 2011). At national level, the problem is reflected in the growing dependence on food imports; Kenya has been getting increasingly dependent on food imports (Nyangito et al., 2004).

Smallholder farmers constitute over half of the 80 percent of the Kenyan poor (GoK, 2007).The Kenya Food Security Steering Group (KFSSG) states that the then Kisii district is one of the districts in Kenya where poverty levels and incidence of food insecurity among households is relatively high. (KFSSG, 2008).

To address the problem of food insecurity in Kenya, the Government of Kenya (GOK) has designed policies and programmes to improve food security in the country through improving agricultural productivity. In 2000, the Government through the Ministry of Agriculture (MOA) came up with an intervention known as *National Livestock and Extension Programme* (NALEP) to address food insecurity. The main purpose of the NALEP was to spearhead the fulfillment of Millennium Development Goal Number One (MDG-1). The goal of the program was to contribute to reduction of poverty, hunger and food insecurity among poor communities in Kenya (MOA, 2006).

The strategies used by NALEP include training and empowerment, community driven agricultural development initiatives (through community participation in project planning and implementation) and agricultural productivity through purchase and utilization of technology/farm inputs.

Despite the implementation of the NALEP from 2000. Food security remains a problem in Kisii County, including many parts of Kenya. This study sought to analyze in detail, the actual food security interventions that were implemented in Kisii, to see how they were carried out, notably how well they were targeted and what outcomes the intervention had on food security in the area. It is in essence an analysis of NALEP contribution towards mobilization and utilization of resources for the improvement of sustainability of livelihoods for the smallholder households in Kisii County.

1.2 Problem Statement

Despite many years of investment in agriculture through the implementation of the policies and the complementary programmes, majority of the small holder farmers in Kenya are still food insecure. Hunger still continues to threaten human survival. Some of key factors that contribute to food shortage include centralized development models (Alila and Omosa 1999), political marginalization of rural areas (Oloo, 2009 and Njeru, 2009), lack of gender mainstreaming in the rural areas (Kinyanjui, 1999). Other factors include inadequate access to productive assets (land and capital), inadequate infrastructure, limited well-functioning markets, high population pressure on land, inadequate access to appropriate technologies by farmers, effects of global trade and slow agricultural reform process (Republic of Kenya, 2007).

It is well recognized that extension service providers can empower smallholder farmers through participatory training and technology innovation (Zaidman, 2000).The issue then becomes how well the interventions interpret and approximate the needs of the small holder rural farmer for food policy objectives to be realized. In its efforts to address the continued decline in agricultural production in the context of global concern and MDG-1, the GOK initiated NALEP.

The strategies employed specifically by NALEP, towards building capacity for food security is of particular interest. The first component is concerned with support to community-driven projects for food security improvement, and focuses on empowerment of communities through capacity building of group members and their facilitators. The second component is the support of community nutrition awareness and school meal programmes that aims at improving health and nutrition status of vulnerable people and school going children. The third component is the support and up-scaling of private sector food security innovations. This involves participation of community-based organizations (CBOs), NGOs, private sector organizations and other independent food security innovations.

This study seeks to find out how the NALEP interventions in food security has created, strengthened and enhanced the innovative and productive capacities of the smallholder rural farmers to attain self-sufficiency levels in food security requirements. Moreover, lessons from NALEP need to be documented and outcomes from NALEP interventions in food security form a basis for policy action leading to improved food self- sufficiency among smallholder rural farmers.

1.3 Research Questions

Broad Research Question

How and to what extent is the NALEP intervention an appropriate instrument of addressing food security?

Specific research questions

1. What are the characteristics of small holder rural farmer's households in Mokwerero?
2. What is the influence of NALEP interventions on current capacity for food security among the smallholder rural farmers in Mokwerero?
3. What are the strengths and weakness of the NALEP interventions in Mokwerero?

1.4 Research Objectives

To examine how and to what extent the NALEP intervention is an appropriate instrument of addressing food security among small holder rural farmers with particular reference to Mokwerero Ward, Kisii County.

Specific Objectives

1. To establish the characteristics of small holder rural farmer's households in Mokwerero;
2. To identify the relationship between NALEP interventions and current capacity for food security among small holder rural farmers; and
3. To analyze the challenges of the NALEP interventions in Mokwerero

1.5 Justification for the study

Apart from consultants' reports, and in-house evaluation reports (GoK, 2005c), there has been virtually no systematic research on the actual outcomes of this intervention (Wanjohi, 2011). Thus, there is a gap in knowledge that development thinkers and practitioners are challenged to fill. This study is an attempt therefore to respond to this apparent shortcoming.

The NALEP intervention is a rural based dynamic model for designing and implementing integrated agricultural projects. It aims to support in a sustainable way, the smallholder rural farmers, their livestock and plant life. This study will generate data and knowledge to hopefully enlighten the ongoing debate over sustainable and livelihood approach to rural development. It is envisaged it will provide insights for future studies and inform projects based on similar intervention strategies.

The study is significant also because it focuses on households as a unit of analysis. Literature on food security argues that in terms of conceptualization, it is important to focus on households in matters related to food security because the livelihoods strategies are determined by the households (Sen, 1981) and (Omosa, 1998).Most of the studies done during NALEP in Kenya on food security including Lemba, (2009) and Olwande, (2012) have focused on Community Interest Groups (CIGs) of farmers as unit of analysis. These studies have addressed food security at the household level.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

This chapter presents review of literature focusing on an overview of NALEP; its brief history and implementation, Agricultural extension service on the success of food security projects, and overview of studies on food security. The chapter further discusses the theoretical framework within which the study is grounded and the conceptual framework.

2.2 Overview on NALEP

The implementation of the National Agriculture and Livestock Extension Programme (NALEP) started in 2000 and was coordinated jointly by the Ministry of Agriculture and the Ministry of Livestock Development of Kenya. The programme sought to enhance social economic development and poverty alleviation through agriculture and livestock development. The programme generally aimed at providing and facilitating pluralistic and efficient extension services for increased production, food security, higher incomes and improved environment. The programme targeted rural populations engaged in agriculture, livestock and fisheries, with a specific focus on smallholder farmers.

The main strategy of implementation of NALEP was to form and promote institutions at the local level. The institutions have been necessary to "sustain programme initiatives and activities and support agricultural sector reforms related to the delivery of agricultural research and extension services and strengthen research extension-farmers linkages" (Mustisya et al, 2010:10). NALEP has also promoted of a multi-sectoral approach towards agriculture and rural development services, as well as collective rural innovations addressing difficult tasks. The last strategy was the monitoring and evaluation of the programmes implementation. (Baiya, 2000).

In 2006, a SIDA report by Cuellar et al. (2006) claimed that 80% of the households' part of the program that formed a producer group – called Common Interest Group (CIG) – stated that the introduction of the programme has offered new opportunities for men, women and youth in agriculture. The study revealed that more than 70% of the farmers interviewed claimed that they now regard agriculture as an enterprise rather than a mean of subsistence. However, the report was mostly aimed at evaluating the implementation of the program rather than the impact on the livelihoods and production of program takers A paper by Richard Githaiga (2007) looked at the impact of CIGs under NALEP. It found that the CIG approach had a significant impact on farmers' access to extension services but no significant impact on farmers' access to agricultural credit and marketing In addition, the study found that CIGs had a significant impact on the agricultural productivity of group members.

According to internal reports from NALEP there where more than 150 000 individual farmers participating in one of the 7,000 CIGs active in Kenya after Phase I. During the end of Phase I interviews were made with both male and female farmers participating in the CIGs. The results indicated that by being active in CIGs both their families food security and their overall productivity were improved. The internal assessment of NALEP done in 2006 shows that "as many as 80% of the farmers interviewed in the focal areas stated that the introduction of the programme has offered new opportunities for men, women and youth in agriculture" (OPTO, 2006:3). It also indicates that over 70% of the farmers had begun viewing their farming as a business rather than a way of surviving, after being introduced to NALEP. Many of the CIGs have also been encouraged to open their own bank accounts, access loans and make use of the micro finance institutions available. This would also be a step towards changing the overall view of farming from a way of surviving into being a business (Mustisya et al, 2010).

It was reported that a number of CIGs had managed to mobilize and encourage farming entrepreneurs in the rural areas who had realized that the volunteer group formation based on a commercial enterprise could serve as a strong foundation for economic expansion (Republic of Kenya, 2005d). Interviews also showed that a considerable number of CIGs had actively incorporated widows and female-headed households as members. A number of these women tended to act as entrepreneurs, being given considerable opportunities to both improve their economic positions by group membership as well as being provided with opportunities to

influence the work of the group members. NALEP statistics indicate that women comprised 70 per cent of the members of CIGs based on food crops and small livestock production. Members of CIGs identified a considerable increase in women's participation in commercial farm enterprises undertaken previously by men only, particularly in marketing and processing (Republic of Kenya, 2005d).

Government assessment report of NALEP indicated that agricultural production among small holder farmers had not improved due to the absence of the proper institutions arrangements manifested by lack of clarity of who is responsible for specific aspects of initiating and coordinating linkages with other stakeholders. It also did not clarify the roles of various actors in extension service provision (GoK, 2005c).

NALEP, thus, offers an opportunity to analyze the effectiveness of small holder farmer empowerment in agricultural extensions initiatives. The importance of agricultural extension in relation to the fight against food insufficiency has been underscored in the Strategy to Revitalize Agriculture (SRA) (GoK, 2004).

2.3 Agricultural Extension Service on the Success of Food Security Projects

Anderson (2007) defines the terms agricultural extension and advisory services as "the entire set of organizations that support and facilitate people engaged in agricultural production to solve problems and to obtain information, skills and technologies to improve their livelihoods''. Extension services can be organized and delivered in a variety of forms, but their ultimate aim is to increase farmers' productivity and income. According to Birner et al. (2009) and Davis (2009), ''agricultural extension, or agricultural advisory services, support smallholder farmers engaged in agricultural production and facilitate their efforts to solve problems; link to markets and other players in the agricultural value chain; and obtain information, skills, and technologies to improve their livelihoods''. Availability of extension services and frequency of contacts with the extension agents contributes significantly to the extent of farm enterprise diversification (Caroline 2005). Extension helps in transfer of technology to improve productivity, especially for staple food crops. Progress in poverty and hunger reduction crucially depends on the increased productivity and profitability of farmers, which in turn depends on the successful delivery of agricultural extension (Claire J. et al 2011).

Extension proves important as it provides farmers with information related to the following: most appropriate technological options, management of technologies including optimal use of inputs, changing farm system options (mixed farming and diversification, animal husbandry, fisheries), sourcing reputable input suppliers, collective action with other farmers, consumer and market demands for products, quality specifications for produce, time to buy inputs and sell produce, off-farm income-generation options, implications of changing policies (input subsidies, trade liberalization), access to credit and loans, sustainable natural resource management and coping with climate change (Van den Ban 1998). The entire above have a bearing on food security programmes and hence the role of extension service provision as a success factor in project implementation cannot be overemphasized.

Agricultural extension plays a wider role of developing human and social capital, enhancing skills and knowledge for production and processing, facilitating access to markets and trade, organizing farmers and producer groups, and working with farmers toward sustainable natural resource management practices (Swanson 2008). Within this expanded role, the breadth of information that agricultural extension can support through provision and facilitating access and sharing is much larger. In addition, as the agriculture production has become more mechanized and modernized, farmers' access to sources of reliable and relevant information has become increasingly important. Farmers require a diverse range of information to support their farm enterprises. Information is needed not only on best practices and technologies for crop production, which the traditional public-sector extension system provide, but also information about postharvest aspects including processing, marketing, storage, and handling.

Researchers at the global, regional, and national levels continue to generate new information. This information is channelled to farmers through extension services. As agriculture systems become more complex, farmers' access to reliable, timely, and relevant information sources becomes more critical to their competitiveness. Information must be relevant and meaningful to farmers, in addition to being packaged and delivered in a way preferred by them (Diekmann, Loibl, and Batte 2009). The repackaging of the researched information for the farmers uptake is done through extension service provision. Context-specific information has a greater impact on the adoption of technologies and increases farm productivity for marginal and small agricultural landholders and extension services are crucial in playing this role (Sammadar 2006).

Extension services are usually vital in facilitating effective adoption of enterprise diversification (Caroline 2005). Agricultural extension and advisory services play an important role in agricultural development and can contribute to improving the welfare of farmers and other people living in rural areas. According to Anderson and Feder (2003) productivity improvements are only possible when there is a gap between actual and potential productivity. Extension can contribute to the reduction of the productivity differential by increasing the speed of technology transfer and by increasing farmers' knowledge and assisting them in improving farm management practices (Birkhaeuser et al., 1991; Feder et al., 2004b).Additionally, extension services also play an important role in improving the information flow from farmers to scientists (Anderson, 2007; Birkhaeuser et al., 1991).

2.4 Overview on Food Security

Food security is a broad concept that includes issues related to the nature, quality, food access and security of the food supply (Iram and Butt 2004). The 1996 World Food Summit in Rome defined thus food security exist when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO 1996). Hence, there is no single way of measuring food security. Food insecurity has a temporal dimension. It is defined as transitory when a person suffers from a temporary decline in food consumption and as chronic when a person is continuously unable to acquire sufficient food (Chung et al., 1997). During transitory food insecurity a household engages in several strategies but poor households might deplete their productive assets which may lead to chronic food insecurity.

Pinstrup-Andersen (2009) proposes that conditional on making assumptions on income share of household expenditure, and expenditure on other goods and services; and the household behaviors, then the total household income and food prices could be used to estimate the household food security. He further points out that consumption based estimates is an outcome of access to food, household food acquisition and allocation behavior. A food consumption method does not provide a full assessment of the food security because it fails to take into account the vulnerability and sustainability elements of food security.

Most previous studies concentrate on food security measures at the household level. These measures look at the consumption (converted into calories) or expenditure data. Mallick and Rafi (2010), among others, argue that consumption has large seasonal volatility and most of

these studies use single round of survey, thus consumption data may systematically under or over report the true food security.

In rural Pakistan, Khan and Gill (2009) analyzed the determinants of three components of food security i.e. food accessibility, availability, and absorption. Food availability is achieved when sufficient quantities of food are available to all individuals. Khan and Gill explain that access to food is attained when household members have enough resources to acquire food. Food absorption/utilization has health dimension and requires sufficient energy from diet and access to clean water and sanitation. They find that food availability requires the increased production of crops and livestock products. In food accessibility component they found that electrification and adult literacy positively contribute to food accessibility while marginalization of land contributes negatively to food accessibility. For food absorption, they found that child immunization, female literacy, safe drinking water and number of hospitals increase food security.

It has generally been argued that female-headed households are more vulnerable to food insecurity and non-income aspects of poverty. For example, cultural restrictions on women‘s ability to participate fully in food production activities in some of the poorest areas of South Asia have left them particularly vulnerable in times of economic crisis (Kabeer 1990). McLanahan (1985) finds that children in the female-headed households have a lower rate of socio-economic attainment than children in the male-headed households. If female-headed households utilize all available resources including engaging school going children in income generating activities to survive, then they end up with low education level attainment, thus the probability of transmitting poverty and food insecurity to the next generation is higher. Kennedy and Peter (1992) found that the proportion of income controlled by women has a positive influence on household caloric intake.

At the household level, Feleke et al. (2005) and Kidane et al. (2005) probed the household food security in rural households of Ethiopia. The studies link food security and technology adoption (adoption of high yield varieties of maize and fertilizer application). They concluded that technology adoption increase household food security. Other factors analyzed include farm size, livestock ownership, education of head of household, household size and per-capita production of the household. With the exception of household size all the other factors increase food security. A hypothesis that is often raised in the literature is that wealth, assets ownership (e.g. land, livestock) and income is a good predictor of food security (e.g. Iram and Butt 2004; Feleke et al., 2005; Kidane et al., 2005; Babatunde et al., 2008). A

household with resources is expected to withstand shocks in production or prices that create food shortages. Unexpected, in Pakistan, Iram and Butt (2004) who measured food security as per capita calories, found that mother's education reduce likelihood of food security. Babatunde et al. (2008) conducted a gender-based analysis of vulnerability to food insecurity in Nigeria. They found that female headed households were more vulnerable to food insecurity than male headed households. They also found that increase in farm size and crop output reduces vulnerability to food insecurity in male headed households. Mallick and Rafi (2010) found no significance differences in the food security between male headed households and female headed households among the indigenous ethnic groups in Bangladesh. Their finding is in contrast to the conventional view that female headed households are vulnerable.

In the literature, studies have also focused on the levels and causes of the food insecurity problems. In general, food insecurity is linked to high food prices, poverty and low agricultural productivity (Nyangweso et al., 2007; Misselhorn, 2005; GoK 2008; Dávila 2010; Lewin 2011). Dávila found that higher prices for maize affected Mexican household living standard and food security both in urban and rural areas, the poorest net buyers of maize were most affected. In Malawi, Lewin shows that a 25 percent increase in the price of maize flour would increase the likelihood of food insecurity in Northern Malawi by 12 percent, while a similar increase in fertilizer prices would increase food insecurity by 30 percent in the central region. Using dietary diversity among household in a poor Vihiga district in Kenya, Nyangweso et al. found that household income, number of adults, ethnicity, savings behavior and nutritional awareness are critical when addressing the question of food security.

Different interventions have been shown to improve food security situation. For instance, participation in drylands interventions (e.g. Makueni district Agricultural Project, Kenya) such as irrigation have been shown by Lemba (2009) to have significant impacts on household food security, which was attributable to improved access to resources (mainly for production). Similar results were found for irrigation schemes in Malawi (Lewin 2011). In Nepal, Tiwari *et al.* (2010) assessed the effects of Maize varietal intervention to improve productivity and food security. They found that food availability increased as a result of the improved varietal intervention with greater relative benefits to poor farmers compared to rich farmers. Nyangito et al. (2004) identified the economic and trade policy reforms introduced in Kenya. They found that market access for food imports has improved since the reforms, but the capacity to import food has declined, making the country more food insecure.

2.5 Theoretical Framework

This study employed social systems theory, diffusion of innovation theory; basic needs approach and sustainable livelihood approach as its theoretical underpinning. Quoted in Appelbaum (1970) Talcott Parson's conceives the society as a social system in a larger system within which exist other sub-systems that are interrelated and interdependent. This implies that change in any one of the sub-systems triggers change in other sub-systems ultimately effecting change in the whole system. Such changes however take a longer time span to occur (1978).

According to Parsons, every social system is confronted by four functional problems if they are to remain stable and functioning: adaptation, goal attainment, integration and pattern maintenance. He further argues that addressing these challenges entails plurality of individual actors interacting within a defined setting. Dill (1958) in Thompson (1967:27) refers to this setting as the 'Task Environment' which comprises those parts of the environment relevant to goal setting and goal attainment.

The task environment within which an organization operates comprises endogenous and exogenous elements. According to Thompson (1967), endogenous elements are elements involved in organizational action when it conforms to an open system logic that exposes it to environmental influences. Such elements include: constraints which are the fixed conditions the organization must adapt to; contingencies which refers to factors over which the organization has no control; and lastly, variables which entail factors that can be controlled by the organization.

Exogenous elements are considered factors that cause environmental fluctuation that penetrate the organization thus requiring the technical core to alter its activities. As noted by Alila (1978), these factors can either be remote to the organization such as market prices or even closer such as government's /donor aid policies.

The diffusion of innovation is a theory of how, why and at what rate new ideas and technology diffuses through cultures (Rogers, 2003). Everett Rogers in his book, *Diffusion of Innovations*, wrote that "Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1962). Rogers theorized that innovations would spread through society in an S-curve; as the early adopters select the technology first, followed by the majority, until a technology or innovation is common.

According to Rogers, diffusion research centers on the conditions which increase or decrease the likelihood that a new idea, product, or practice will be adopted by members of a given culture (Rogers, 1962). According to Rogers, people's attitude toward a new technology is a key element in its diffusion. Although he acknowledges that more or fewer stages may exist, Rogers highlights that there seem to be five main stages (Rogers, 2003). The five stages are: awareness, interest, evaluation, trial, and adoption. Rogers expounds that in the awareness stage, the individual is exposed to the innovation but lacks complete information about it. At the interest or information stage, the individual becomes interested in the new idea and seeks additional information about it. At the evaluation stage, the individual mentally applies the innovation to his present and anticipated future situation, and then decides whether or not to try it. During the trial stage, the individual makes full use of the innovation. At the adoption stage, the individual decides to continue the full use of the innovation.

The diffusion of innovations theory is relevant to this study, the proponents of the theory have identified some of the factors which influence the adoption of innovations such as economic status, leadership skills and frequent use of media. Some of these variables highlighted by Rogers will be investigated in the study area.

2.5.1 Basic Needs Approach and Rural Livelihoods

The International Conference on Employment in Geneva in 1976 defined 'Basic Needs' as consisting 'first certain minimum requirements of a family, or household for private consumption of adequate food, shelter and clothing as well as certain household equipment and furniture'. Second, essential services provided for and by the community such as safe drinking water, sanitation, public transport and educational facilities.

The idea of participation of the people in making decisions which affect them via genuine community participation was also given a special place in the conference. The basic needs approach to development focuses on the provision of basic services such as food, water, shelter and healthcare. The approach has proved popular with bilateral donor development interventions like NALEP, as well as multilateral donors like UN agencies. However, since the provision of these basic needs depends on budgetary outlays, which in turn are a function of the rate and level of national economic growth, the approach did not overcome the economic biases (Bahemuka et al, 1998). Enormous efforts in the provision of basic needs

were directed to the rural areas where the majority of the world population and the poor live. The Kenyan National Development Plan 1979/83 (GoK, 1979), did state that:

"Given that over 85 percent of the population live in the rural areas and that it is here that the poor are inappropriately located, Kenya opted for a style of development that concentrates on rapid transformation of the rural masses, giving priority to satisfying the needs of large number of rural poor people - The District Focus for Rural Development. This was a strategy designed to improve the economic and social life of specific group of the poor."

According to this approach, the responsibility for control and allocation of development resources was firmly and squarely placed in the hands of central government. It thus assumes that if the state takes a leading and central role in national development, then the benefits are widely and equitably spread. In support of government-led development strategies, the World Bank in its World Development Report of 1993, on "re-invigoration of the state as an agent of development", it has argued that most evaluation studies have shown that project designed and implemented outside formal governmental administrative structures have proved unsustainable and sometimes, destructive (World Bank, 1993). The measures taken must be fully integrated into the administrative, institutional and social structure of the country. However, unsustainable rural development intervention problems have continued to exist. Majority of the poor particularly in Kenya are now living below the poverty line without even the basic public services the approach is meant to cater for. This approach has perpetuated the reliance on external assistance by foreign governments and has proved to be an obstacle to the efforts of unlocking and strengthening people's potential and capacity for sustainable livelihoods.

The Basic Needs Approach is faulted in that it concentrates more on providing material goods and services to deprived groups rather than on enlarging choices and options available to human beings to source for livelihoods. Moreover, welfare approaches view human beings as end product targets and beneficiaries rather than as active agents of change or participants in the development process.

These limitations notwithstanding, the Basic Needs Approach is applicable to this study because it comes closer to capturing the overall orientation of development interventions like NALEP in strengthening food security in Kisii County. This is a financial and technical assistance by the governments of Kenya aimed at meeting the needs of the smallholder rural farmers. In this regard NALEP is engaged in a number of agricultural activities mainly in the

food and nutrition, income generating activities from farming and farmers education. Placing this development intervention in this approach will strengthen our understanding of the strategies NALEP employed in strengthening the rural livelihoods. In this view, the Basic Needs approach endeavours earnestly towards capacity building of the small holder rural farmers to strengthen their livelihoods through ensuring food security.

2.5.2 Sustainable Livelihood Approach

The study also adopts the sustainable livelihood approach by the Department for International Development (DFID) of the British Government as its theoretical framework. An important strength of the livelihoods framework compared to earlier approaches is that it emphasizes people's potential in a holistic way rather than stressing on their problems, constraints and needs. It asserts that livelihoods and institutions that influence and shape livelihoods are dynamic.

The livelihood systems frame (Figure 1) is thus a way of looking and analyzing the system of a household's internal and external factors that affect its socio-economic survival. It looks into livelihood strategies of people in a given vulnerability context (the frame conditions).

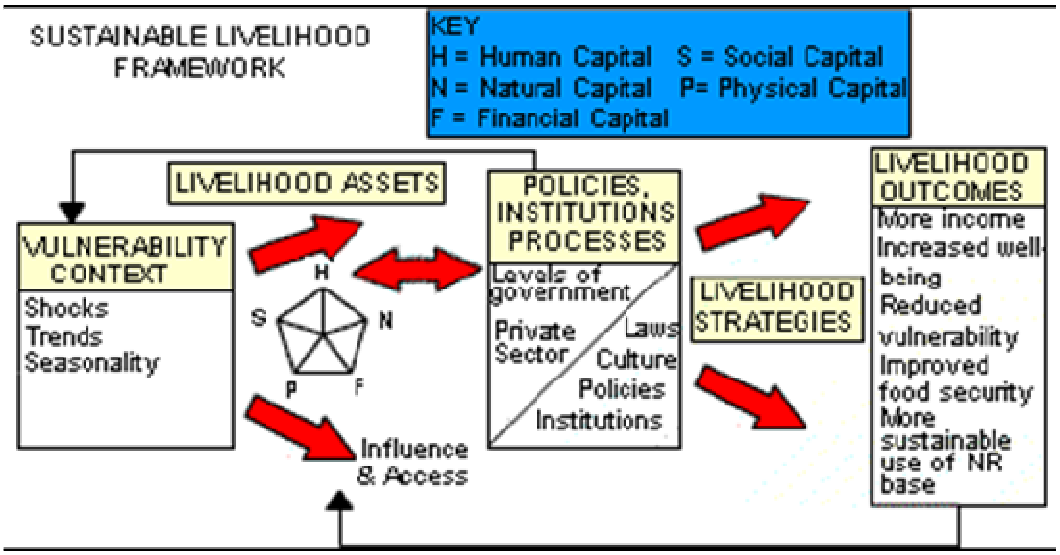


Figure 1: The Livelihood System

Source: DFID, 2004a.

The approach explains that people have access to six forms of capital assets (natural, physical, human, social, political, and financial). These are the resources, which people can make use of and combine in order to carry out livelihood strategies and achieve certain outcomes. These outcomes have positive as well as negative impacts on the livelihood

(feedback loops).

Structures and processes (institutions) are dynamic and are continuously reshaped over time (Scones, 1998). These structures and processes largely determine the effective entitlements (access) to resources and to services, such as markets, inputs. They are part of a social and political negotiation process.

Livelihood strategies will differ with regard to whether people have to deal with gradual trends or sudden shocks: Adaptive strategies denote processes of change which are more or less conscious and deliberate in the way people adjust livelihood strategies to long term changes and challenges (trends). Coping strategies are short-term responses to periodic stress or sudden shocks of both natural and political hazards. Rural livelihoods in the drought prone areas face multiple vulnerabilities caused by environmental hazards, market-related risks and conflict-related uncertainties which enhance the threshold of vulnerability. The concept of vulnerability has been mainly used to describe the livelihood risks in natural disasters (Bohle, 1993; Chambers 1989).

The above framework is relevant to this study which examines a community in search of self-sufficiency levels in the household food requirements. The researcher argues that the farmers have engaged in NALEP intervention as a means of coping with the food shortage and therefore dealing with the shocks in their livelihoods. The researcher intends to investigate how successful the intervention is in coping with the food shortage.

2.6 Conceptual Framework

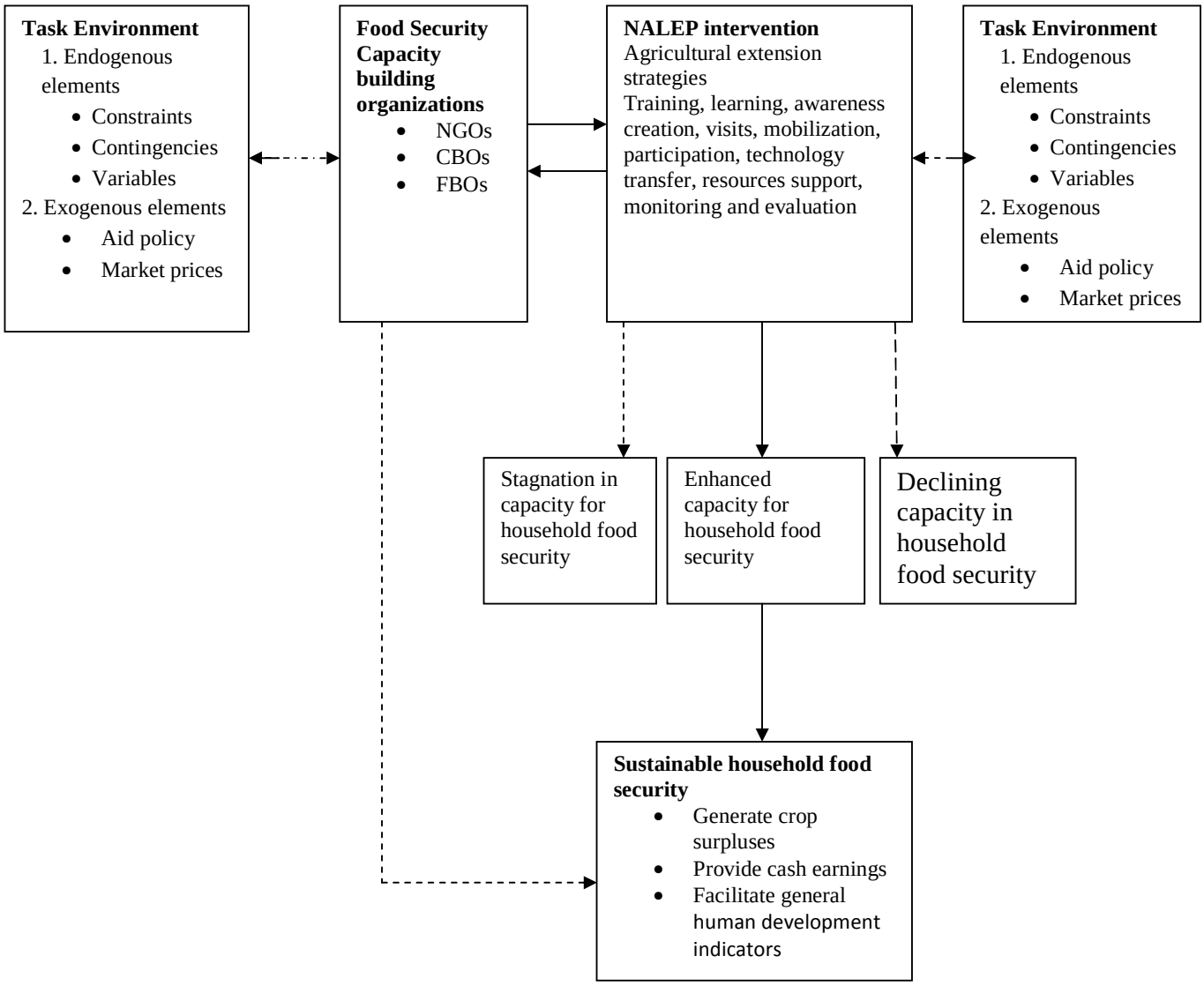
In this study the enhanced food security among smallholder rural farmers is the independent variable operationalized as support meant to improve the capacity of the smallholder rural farmers in Mokwerero. These include: training, resource support (financial and material) exchange visits, on-site support visits, networking, partnership, monitoring and evaluation, awareness creation, participation and technology adoption.

This conceptual framework is based on the assumption that smallholder rural farmers in Mokwerero location receive capacity strengthening support from multiple capacity building initiatives from NALEP. The support is envisaged to enhance the attainment of the overall goal of enhanced capacity for household food security. This study noted that the capacity building takes place at two levels; individual level comprising smallholder rural farmers and at the organizational level, notably the CIGs.

However, the effectiveness of capacity building support depends first, on how the actors cope with the elements in the task environment and second, the structure of interaction institutions create between the capacity building organizations and the NALEP . The endogenous elements in the task environment comprise constraints such as socio-economic and demographic factors; age, income, level of education, number of dependents , engagement in off farm activities, access to credit , membership of farmers associations and leadership roles in the society; contingencies such as political forces and government agricultural policies; and variables such as resources secured by the organization. Exogenous elements on the other hand comprise factors that cause variation in the resources available to the smallholder rural farmers, such as source of NALEP fund; government/donor Aid policies or market dynamics, climatic conditions, access to production assets and endowments, access to credit from financial institution, availability and provision of incentives to professional and ESPs

In light of this argument, the nature of the existing structures of interactions within smallholder rural farmers and between the capacity building organizations and the NALEP intervention in Mokwerero location influences the ability of the smallholder rural farmers to deal with their task environment. Stable and efficient structures of interaction result to success in coping with task environment and therefore improved capacity to household food security. This ultimately leads to sustainable household food security. On the flipside however, unstable and inefficient structures of interaction may cause inability of the NALEP interventions to cope with their task environment thereby resulting to stagnation or decline in capacity to improve household food security.

Figure 2: Conceptual Framework



Source: Author`s own conceptualization

CHAPTER THREE

STUDY SITE AND METHODOLOGY

This chapter presents the study site and methodology. The first section describes Mokwerero ward, which is the research site. This is followed by an overview of the research design in the second section. The third section discusses the unit of analysis, population and sampling techniques. Thereafter, data sources and collection methods is presented in the fourth section. Section five describes data processing and analysis. The last section presents the field challenges.

3.0 Study Site

3.1 Administrative Location Study Site

3.1.1Administrative Location

The study will be conducted in Mokwerero ward, one of the administrative wards of Sameta sub-county, Kisii County. Mokwerero is one of the six wards of Bobasi constituency of the eleven constituencies in Kisii County. The area has been selected because of the researchers' knowledge of the area. Mokwerero ward consists of five sub-locations: Kirwa, Kabosi, Nyamagwa, Kerera and Chirichiro (GoK, 2004). The area has been chosen because it is in one of the covered by NALEP as an umbrella implementation framework for NAEP. The area does not only represent high, medium and low zones, but also diverse agro-ecological conditions. Due to financial constraints it means that a small area can only be covered, hence a choice of a ward.

3.1.2 Topography and Agro-ecological Profile

Kisii County is mainly hilly with several ridges on the eastern part. It is divided into three agro-ecological zones comprising the upper midlands (UM) (75%), lower highlands (LH) (20%) and lower midlands (LM) (5%). Mokwerero is classified as zone three covering areas lying between 1500M and 1800M above the sea level. Most parts have red soils and rich organic matter making 78 percent of the land in Mokwerero arable. The area has a highland equatorial climate and receives an average of over 1500mm of rainfall annually, which highly is reliable. Temperatures stand at a mean annual maximum of 27^{o}C in the lowlands and minimum 16^{o}C .The high and reliable rainfall with the moderate temperature is suitable for growing of many cash and food crops and practice of dairy farming (GoK, 2001b)

3.1.3 Socio-economic and Demographic profile

Farming is the main economic activity undertaken in the Mokwerero ward. Both cash and food crops are grown due to favourable climate. Food crops include maize (the staple crop), beans, millet, sorghum, and sweet potatoes. Cash crops found here are coffee tea pyrethrum sugarcane and horticultural crops; Avocado and passion fruits. Small scale farming is the most important primary production activity (GoK, 2001b).The average land holding in Mokwerero is 1.2 acres and farmers do not have large farms. Most farmers in the area practice both subsistence and cash crop farming (GoK, 2001b). The agricultural sector employs about 85 percent of the labour force. Population distribution in the area is greatly influenced by physical, historical patterns of economic development and policies pertaining to land settlement. In 2009, population density in Kisii district was approximately 647 persons per km^2 and is projected to reach 672 persons per km^2 by 2014(CBS, 2009).

3.2 Research Design

Punch (1998) describes a research design as the overall plan for a research study outlining the strategy, conceptual framework; and subjects and content to be studied. It also outlines data collection instruments and analysis of empirical materials. This study employed an explorative research design. Yin (2003) considers explorative research design as an empirical investigation of a contemporary phenomenon in its natural setting especially where there is no clear boundary between the phenomenon and the context, and where multiple sources of evidence are used. The focus of this study on the extent to which National Livestock and Extension Programme (NALEP) has contributed to innovative and productive capacities of the smallholder rural famers to attain self-sufficiency levels in food requirements necessitated the use of this design.

3.3 Study Population and Sampling

This study utilized both probability and non- probability techniques. Probability sampling involved a survey to cover 100 households' heads from Mokwerero. The unit of analysis for this study is a household and household heads were the respondents. The study population consisted of all household heads from Mokwerero. The sample selection involved a multi-stage sampling procedure based on the 2009 census of enumeration areas in the ward.

First, a total of 14 out of the 41 enumeration areas were selected through maximum variation sampling strategy to purposively select the smallholder rural farmers' households. The strategy entailed purposive and non- random selection of a set of respondents (in this case, the smallholder rural farmers) that exhibit maximal differences on the variables of interest (Mugenda, 2008). Berg (2009) describes purposive sampling as a technique that allows the investigator to use their special knowledge about some group to select respondents that represent the population under study. This study specifically targeted the smallholder rural farmers under the NALEP intervention. Thereafter, a sampling frame was developed by listing all the households in each of the 14 selected enumeration areas with the help of the village elders (Table 3.1).

Table 3.1: Enumeration areas sampled for this study

No	**Name of Enumeration Area**	**Sub-location**	**Number of households**
1	Nyamagwa I	Nyamagwa	52
2	Inani and Gesere	Kerera	66
3	Esamba	Chirichiro	69
4	Mokomoni	Kabosi	73
5	Omosocho I and II	Kirwa	81
6	Ibeno II	Kirwa	81
7	Kenyenya, Engoto and Ebate	Kirwa	95
8	Nyankororo	Kerera	98
9	Egetare	Kabosi	102
10	Nyanturago	Chirichiro	114
11	Omwobo and Omoyo	Kabosi	115
12	Nyanturago	Kabosi	125
13	Riangari and Gucha	Nyamagwa	127
14	Kerera I and II	Kerera	155
	Total number of households		**1362**

Second, the study sample of 100 households was allocated to the 14 enumeration areas proportionate to the total number of households in each enumeration area, however, more households were picked from Kerera I and II Nyamecheo and Ebate,and Kenyenya, Engoto and Ebate. This is because the areas represent different agro-ecological zones. Mokwerero is classified as zone three covering areas lying between 1500M and 1800M above the sea level and represents high population density. (Table 3.2).

Table 3.2: Enumeration areas and sample allocation

No	Enumeration Area	Sub-location (households)
1	Mokomoni	5
2	Nyankororo	8
3	Egetare	8
4	Esamba	6
5	Inani and Gesere	5
6	Kerera I and II	13
7	Nyamagwa I	5
8	Nyanturago	9
9	Omosocho I and II	6
10	Kenyenya, Engoto and Ebate	3
11	Omwobo and Omoyo	4
12	Riangari and Gucha	9
13	Ibeno I	7
14	Nyamecheo and Ebate	12
	Total (sample size)	**100**

Non-probability sampling was used to select respondents for focus group discussion, key interviews, and case histories through a purposive process. As discussed, Berg (2009) describes purposive sampling as a technique that allows the investigator to use their special knowledge about some groups to select individuals or cases that represents a population. In selecting focus groups, a discussion was held with ward agricultural and extension officer to identify all the farmer groups in the ward, from which some were selected. These groups were helpful to the study since they are involved in the farming activities in the ward and this helped the researcher to come up with a diverse demographic profile in the ward. The

agricultural officer, cooperatives, civil society organizations (community based organizations and non- governmental organizations) helped to identify key informants i.e persons with experience and knowledge of NALEP agricultural activities from the following categories among smallholder rural farmers.

3.4 Data Sources and Collection Methods

Field data collection began on 13th July, 2014 and was completed on 8th August, 2014.When farmers were experiencing short rains and were preparing land for the planting besides harvesting. The rains affected the researcher's activities in many ways. The study collected both primary and secondary data.

3.4.1 Secondary Data

Secondary data was obtained from published books and journals, on-line data bases and resources, government reports and records from the agricultural office for Mokwerero ward. Unpublished data sources such as assessment reports, theses, policy briefs and discussion papers were also be reviewed. The desk review of all these materials continued on the entire period of this research; involved an extensive analysis of issues relating to food insecurity alleviation strategy through policies and programmes in Kenya, and the extent to which they have involved the small holder farmer. The records of NALEP implementation were also analysed. This was important in documenting and analyzing the approaches taken in ensuring the attainment of food security among the small holder farmers .From the chief's office, demographic records of the ward, village and village maps of the ward were obtained. This data was critical in complementing primary data and providing the study background.

3.4.2 Primary Data

Primary data collection involved quantitative and qualitative methods. Creswell (2009) argues both quantitative and qualitative research approach is preferred when a complex an detailed understanding of an issue is required and which can only be established by talking within their context the nature of research questions in this study justified the use of these methods in data collection as it seek to obtain detailed information from both the smallholder rural farmers and other stakeholders helpful in addressing the research objectives.

Quantitative data was gathered by means of a survey questionnaire administered to the selected household heads on a face –to- face basis. The data collected included issues on demographic characteristics of farmers such as sex, education level and age; access to assets and endowments such as land holding in acreages, land utilization ,number of crops grown and livestock kept by individual farmers; membership of farmers to groups; type of projects the groups or individual farmers are engaged in; distance from ESPs offices to farmers' homes; if the farmers attended any training during the last five years; if the farmers are aware of the PDDA mode of extension; if the farmers participated in agricultural activities ;if the farmers received services from the GoK-funded or SIDA-funded ESPs; if farmers received credit from financial institutions for group activities.

Qualitative data collection involved in-depth interviews with purposively selected key informants, focus groups, and case histories of chronically food insecure households. Focus group discussions were used to gather detailed information from the following categories. (a group of farmers, 8-10):- youths, women, people living with disabilities, religious leader , political leader, the elderly. Kothari (2004) argues that such a discussion enables the investigator to understand what a specific set of populace feel about a particular issue and Bryman (2008) argues that a range of 8 to 10 discussants is appropriate as it is easy to manage and sustain an effective discussion. The researcher conducted three focus groups discussion. An interview guide was used to probe and follow-up in more depth a significant item raised by the participant. This helped to generate more information about the socio-economic and demographic characteristics of the farmers, how agricultural interventions bear on rural household food security and factors that constrain the small holder farmer in achieving household food security.

Key informant interviews were conducted. The researcher used a focused interview technique to obtain information from the key informants. According to Yin (2003), the technique entails an open ended interview with a respondent for about an hour in which the discussion assumes a conversational manner but follows a certain set of questions. The respondents' explanation was recorded against corresponding questions in note pads designed in a two column word table interspersed with rows. This helped the researcher to focus on the information relevant to the study. These interviews served to gather data on actors in NALEP agricultural activities, socio-economic characteristics of small holder farmers who participate in NALEP agricultural activities and methods used to mobilise small holder farmers during NALEP

planning. An interview guide was used to probe and follow-up in more depth a significant item raised by the participant. This generated in-depth knowledge NALEP process in ensuring food security at the household level in the ward.

3.4.3 Data Analysis

The study adopted both quantitative and qualitative methods to analyse data.Data gathered through the survey was coded, processed and entered into a Statistical Package for Social Sciences (SPSS) data editor to create a database. The analysis involved generating frequency distribution, and cross-tabulations to explore how small holder farmers are empowered, mobilised and participate to achieving food security. Thematic analysis technique was used to analyze data from focus group discussion and key informants. Thematic analysis is a model of narrative analysis in which is more on what was said than how it was said (Bryman, 2004). This will be guided by La Pelle (2004) approach to qualitative data analysis using Microsoft word. On how small holder farmers are empowered, mobilised and how they participate in agricultural activities so as to achieve food security.

3.5 Scope of the study

This research focus is on smallholder farmers in rural areas. However, the research focus is on the beneficiaries of NALEP. Such focus delimits the research to certain characteristics. The intervention chooses households to join the project in the assumptions that they are food insecure. The programme aims at helping food insecure households to gain self-sufficiency levels in food security requirements. The bulk of the respondents therefore are smallholder farmers in a rural ward.

Geographically, this study focuses on Mokwerero ward of Kisii County; although there are a lot of similarities among Kenya's rural localities, there are many differences in terms of economic activities, climatic conditions that favour agriculture. However, the agricultural practices are similar in some ways but also different in many ways with practices in other parts of rural Kenya. Therefore, while the findings of this study are pointers to what might be happening in other parts of rural Kenya, the findings cannot be generalized for all the rural areas in Kenya

3.6 Limitations of the Study

The roads were muddy and the rivers impassable once it rained thus grounding the researcher on a number of occasions. To deal with such challenges the researcher had to collect much data as possible on dry days. Accessing farmers during land preparation season was also a challenge. A number of respondents had to be interviewed in farms because they were in farms. Despite the mentioned challenges, with the help of NALEP field officers the researcher made prior arrangements and thus accessed the respondents at the appointed days. The farmers also hold regular meetings and it was easier for the researcher to join them in their meetings and carry out interview or schedule for interviews.

CHAPTER FOUR
STUDY FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents the findings of the field research in line with the objectives of the study. Among the issues addressed include basic characteristics of the respondents, household characteristics, agricultural activities and food security status of the households. Effects of NALEP interventions on food security and implications for households are also presented. Where appropriate, figures and tables has been used to illustrate the study findings and assist in analysis

4.2 Basic Characteristics of the Respondents

The household heads were the target respondents which, given the patrilineal nature of the Abagusii, were deemed the male heads of the households. However, where the male head was absent the spouse was interviewed and where both the male head and the spouse were absent, the eldest member of the household was interviewed. The characteristics of the respondents that were investigated include their sex, age, position in the household and marital status. It is vital to study these attributes of the household head (respondent) because they have significant influence on the decision of the agricultural activities a household will engage in, thus leading to attainment of food (in) security.

4.2.1 Sex

As shown in Table 4.1, out of the hundred respondents interviewed, 78 percent were female while 22 percent were male. Notably, male heads of the household after realizing the study was about household food security, they directed the researcher to their respective spouses. This shows that female respondents were almost four times more than male respondents. It is evident therefore that farming among smallholder farmers is practiced by both sexes but women participate more in agriculture. The findings that rural women in Mokwerero involved in agricultural production are more than men are consistent with those in Lasterria-Cornhiel (2011). Indeed, Alila and Atieno (2006) and Lasterria-Cornhiel (2011) observe further that more than half of the labour force in agriculture, particularly in rural Africa and Asia consist of women. The study results are also consistent with research findings by Mwanyumba (2010) conducted in Taita district, Wundanyi location. It was found that most of the farm workers (66%) were women aged between 35 and 60 years, closely followed by women of advanced age group. Some old men over 60 years also assisted in the farming equally.

Table 4.1: Distribution of Respondents by Sex

Gender	Frequency	Percentage
Male	22	22
Female	78	78
Total	**100**	**100**

Source: Field data, 2014

Further, analysis of the extent of respondents' involvement in NALEP implementation by gender was undertaken and the findings are indicated in Table 4.2.

Table 4.2: Involvement in NALEP Implementation by Gender

Extent of involvement		**Gender**		
		Male	Female	Total
Largely involved	Count	10	20	30
	%of Total	10%	20%	30%
Moderately involved	Count	19	40	59
	%of Total	19%	40%	59%
Not largely involved	Count	1	10	11
	%of Total	1%	10%	11%
Total	**Count**	**30**	**70**	**100**
	%of Total	**30%**	**70%**	**100.0%**

Source: Field data, 2014

Table 4.2 shows that 40% of female gender and 19% of male gender were involved in NALEP activities to a moderate extent, while 20% of female gender and 10 % of male gender were largely involved in the NALEP implementation. Only 10% female and1% male gender were not largely involved in the programme activities. From the results analysis, it is an indication that female gender is more receptive to the implementation of community food-based programmes compared to male gender. Majority of the respondents largely involved in programme implementation were female, confirming that gender had influence on NALEP implementation. A Key Informant from the Agricultural Department explained:

In our NALEP work especially the one that target food security women participate more since they are the custodians of food stores and utilization. This makes them closely involved in our activities to ensure that family has enough food.

4.2.2Age

There was a variation in terms of age of the respondents. There was a variation in terms of age of the respondents. The youngest respondent was 18 years while the oldest was 84 years. The mean age of the respondents was 51 years. As shown in Table 4.3, 10 percent of the respondents fell within the age bracket of 21-30 years, 18 percent were aged between 31-40 years. Another 18 percent were aged between 41-50 years, while 18 percent were aged between 51-60 years.16 percent comprised age category 61-70 years, while 12 percent were in the age category 71-80 years and 2 percent of the respondents over 80 years and above. The study results agree with Kipserem (2011) findings in Keiyo district, the average age of farmers in the study area was above 45 years. He drew the conclusion that youth tend to shun projects that are agriculture-related and those of low monetary profits.

Table 4.3 Distribution of Respondents by Age

Age group (years)	**Frequency**	**Percentage**
10-20	6	6.0
21-30	10	10.0
31-40	18	18.0
41-50	18	18.0
51-60	18	18.0
61-70	16	16.0
71-80	12	12.0
80 above	2	2.0
Total	**100**	**100**

Source: Field data, 2014

4.2.3 Marital Status

As shown in Table 4.4, a half (50percent) of the respondents were married while 6 percent were single. A further 44 percent said that they were widowed. Unlike those who come from married families, household members of single parents experience food shortages due to reduced collective income earning capacity of the household. One of the key informants stated that food insecurity cases in Mokwerero were higher in single-parent households owing to inability to raise food costs, especially when the parent lacked stable source of income. This was because many single parents generally had higher responsibility of providing the family with basic needs. A respondent affirmed:

Kemeri kerakonye tikeiyo nande tibwate mogaka(there is no cash crop that can generate income and my husband is not there to help me in any way).Some children sleep at the neighbours house due to inadequate room. Even clothes are a big problem. I sell labor to earn income such that, itaragenda ekonda nabo tokwete(When I am unable to sell labour, we have nothing to eat).

Probing more, it was established that all single-parent households were headed by females owing to death of husbands, divorce or separation. Table 4.4 summarizes the findings of the marital status of the respondents.

Table 4.4: Marital Status of the Respondents

Marital Status	Frequency	Percent
Single	6	6.0
Married	50	50.0
Widowed	44	44.0
Total	**100**	**100**

Source: Field data, 2014

4.3 Household Characteristics

This study was to determine the characteristics of households among smallholder rural farmers in Mokwerero. Household characteristics are the basic attributes that make up a family unit in terms of behaviour and role performance, and also identify one household from the other

4.3.1HouseholdSize

The number of people living in a household varied from one household to the other. The largest household had 12 members while the smallest had 4 members. The mean household size was found to be 7 members. As shown in Table 4.5, 22% percent of the respondents had eight children under the age of eighteen years, 20% had six children, 10% had ten children .4% had twelve children, while 16% had four children, 10% had two children, and 18% did not have children. These findings show that the sampled households had fairly few members which could be attributed to the increased migration from rural Mokwerero to urban centers due to population pressure and decreased agricultural production arising from depleted land sizes Kisii. (Nyangito *et al.*, 2012). It was also evident the ravages of HIV-AIDS in the Mokwerero sub-location has left many orphans under the care of the elderly without financial and social support.

Table 4.5: Distribution of Respondents by Number of Children

Number of children	**Frequency**	**Percentage**
4	18	18.0
2	10	10.0
4	16	16.0
6	20	20.0
8	22	22.0
10	10	10.0
12	4	4.0
Total	**100**	**100.0**

Source: field data, 2014.

A Chi-square (x^2) test of significance was conducted to find out the association between household food security and household size. The null hypothesis was that household size does not affect household food security. At significance level (p) of 0.05, the Chi-square value was found to be 6.773 with a significance level of 0.034 and a degree of freedom (df) of 2 (see Table 4.6). Mugenda (1999) informs that for a relationship between variables to be significant, the calculated significance value must be equal to or smaller than the alpha value; meaning that there are only 5 chances (or less) out of 100 that the relationship between the variables is out of chance or error. The calculated significance value is less than the selected alpha value of 0.05 hence the null hypothesis was rejected. The study concluded that there was a significant relation between household food security and household size. For example, from the research findings, 42% of the respondents' households could not afford three meals a day (breakfast, lunch, and supper), while 58% were able to afford three meals a day. (see Table 4.4).

Therefore, households with fewer members were likely to access three meals a day than those with more members, a result which has also been found by Lemba *et al.* (2009) in Kenya.

Table 4.6 Access to three meals a day by household size

	Household Size(Number of people)			
Household Access	4 and below	5-9	10 and above	Total
Yes	6	10	4	20
No	20	40	20	80
Total	26	50	24	100

X^2 =6.77,p=0.034,df=2

Source: field data, 2014.

One possible explanation for this finding is that large household size overstretches scarce household resources hence decreasing income available to meet food expenses. Indeed, a respondent from one of the households with more than 10 members and had no access to three meals a day argued that buying food stuff was tough because they also had to meet the other needs, clothing and education expenses, of all the household members.

4.3.2 Education

From the study findings, Table 4.7, 26% of the sampled respondents did not have any formal education. 62% of the respondents had primary education, and 12% attained secondary schooling level while none of the respondent had university education. From the study findings on Spouse's level of education, 10% did not attain any formal education, 52% had primary schooling, while 18% had secondary education and 2% had college education. This finding is consistent with the findings by Reuben (2005) noted that education levels of households in Niger Delta in Nigeria were quite low, especially among the youth and women who were engaged in agricultural farming but with constant field demonstration, the government supported food interventions were successfully implemented. Further probing had one key informant remarking:

Whereas our farmers are deemed to have low level of education, we have seen them take up new technologies, commercial inputs and certified seeds and application of modern methods of farming their indigenous knowledge has been of great use in storage of produce

Table 4.7: Distribution by Level of Education of Household Head

Level of education	**Frequency**	**Percentage**
No formal schooling	26	26.0
Primary	62	62.0
Secondary	12	12.0
University	0	0.0
Total	**100**	**100.0**

Source: Field data, 2014

4.3.3 Household Income Level

Households were asked to estimate their monthly total income. As stated in Table 4.8, respondents reported deriving incomes from various sources, but the majority indicated they derive their incomes from farming (99%).Other sources of income were off farm business (23%), remittance (11%), wages (9%), salary (7%), and pension (1%). From the study findings, the minimum income was Kshs. 100, while the maximum income was Kshs 23,000 - with a range of Kshs 22,900 and a standard deviation of Kshs.2, 755. The mean monthly income was Kshs 1,657. Furthermore, most households earned Kshs. 300 monthly while the median income was Kshs. 800.These findings are in tandem with past studies showing that

majority of the poor in Kenya live in rural areas and comprise people earning a monthly income less than Kshs. 1,562 (Kenya, 2007).

For the purposes of this paper, income has been categorized into three levels (Table 4.8 below). Over three quarters of the respondents earned 1500 or less while the percentage of respondents who earned Kshs.3000 or more was the lowest (9%).In rural areas it is possible for people to survive without cash given people consume and are sustained by what they produce in their farms

Table 4.8 Levels of Monthly Total Income

Income (Kshs.)	Frequency	Percentage
< = 1500	78	78
1501-3000	13	13
> 3000	8	9
Total	100	100

Source: Field data, 2014

Household income varied across the five sub-location covered by this study. A cross tabulation of income and the sub-locations covered illustrated in Table 4.9,shows that over 70% of respondents from each of the five sub-locations earned 1,500 or less. In contrast, Kabosi sub-location had a higher percentage of respondents who earned Kshs 3000 than those who earned between Kshs 1501and 3000.In Chirichiro sub-location about 90 percent of respondents earned Kshs.1,500 or less plus there was no respondent who earned more than Kshs 3,000.

Table 4.9: Cross tabulation of income and sub locations covered by the study

Income (kshs)	**Sub-locations**				
	Kabosi	Kerera	Kirwa	Nyamagwa	Chirichiro
<= 1500	74.4	75.0	71.4	80.0	90.9
1501-3000	9.3	13.9	25.0	10.0	9.1
>3000	16.3	11.1	3.6	10.0	0.0
Total	100.0	100.0	100.0	100.0	100.0

Source: Field Data 2014

Table 4.9 implies that although income earned in the five sub-locations varied, most respondents earned low incomes. This means that most respondents in each of the sub-location were likely to experience food insecurity. It also means that the socio-economic and demographic characteristics of respondents would vary across the five sub-locations covered by the study, which would be reflected in different food (in) security indicators. Participants in the focus group discussions also expressed similar views on income variation. This was illustrated by a discussant in the FGD who said, *"Income variation is very high and the community engages in different activities in the ward some of which do not fetch money like here in Chirichiro, we don't have a variety cash crops to sell neither a we employed to get income, my son we are a poor lot….."*

4.3.4 Household Crises

The study established that ill health and inadequate food were the two most common crises that faced 65 percent and 61 percent of respondents, respectively. As illustrated in Table 4.10, 17 percent households experienced school fees problems, 13 percent lost property, 10 percent lost a family member, and 5 percent experienced household conflicts while 3 percent experienced police harassment. As it was explained in the FGD, by the time households harvest their produce, they often have too many debts. They sell their produce to repay cash debts and lack of cash translates into lack of capacity to deal with emergencies and basic household needs like affording medical care when someone is sick. Medical or health needs are basic human needs. They are major expenditure item in households.

Table 4.10: Household crises

Household crisis	Frequency	Percentage
Ill health	97	64.7
Inadequate food	92	61.3
Loss of property	19	12.7
Death of family member(s)	15	10
Lack of school fees	8	5.3
Family conflicts	8	5.3
Police arrests or harassment	4	2.7

Source: Field data, 2014

In response, to crises, most respondents (75%) resorted to sale of household goods. There are the who resorted to borrowing from relatives or friends (42%), sale of labour (29%), and charity (10%).Moreover, (20%) made use of household income, a small percentage of 4 percent only borrowed from banks or financial institutions.

The respondents reported various levels of effectiveness of strategies employed to cope with household crises. Some respondents (8%) said that the strategies were effective to a greater extent. Others said the strategies were effective to a great extent (18%), to some extent (22%), to a less extent (33%), (19%) and to a lesser extent (Table 4.11).

Table 4.11: Effectiveness of crises coping strategies

Effective of strategies	**Frequency**	**Percentage**
To a greater extent	8	8.0
To a great extent	18	18.0
To some extent	22	22.0
To a less extent	33	33.0
To a lesser extent	19	19.0
Total	**100**	**100.0**

Source: Field data, 2014

Further analysis was done by cross tabulating income and effectiveness of strategies of coping with crises (Table 4.12). This analysis shows that over 96 percent of respondents who earned Kshs 1,500 or less coped with crises to a lesser extent. It also shows that only respondents who earned more than Kshs 3,000 coped with crises,some to a great extent and others to a greater extent. In addition, only a quarter of respondents who earned Kshs 1,500 or less coped with crises to a lesser extent.

Table 4.12: Cross tabulation of income and effectiveness of coping strategies

Income (Kshs)	**Effectiveness of Strategies of coping with crises**				
	To a greater extent	To a great extent	To some extent	To a less extent	To a lesser extent
< = 1500	25.0	61.5	80.6	89.4	96.4
1501-3000	25.0	11.5	19.4	10.6	3.6
> 3000	50.0	26.9	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0

Source: Field data, 2014

Table 4.12, relates effectiveness of strategies employed to cope with crises to income. This means that respondents who earned higher income were more likely to employ strategies that would effectively cope with crises. Participants in the FGD reported similar views:

High poverty level has worsened the situation more so for families most of who earn very little income from casual jobs which hardly give them enough to cope with vulnerabilities.

4.3.5 Groups and Associations

The survey found that over half of the respondents belonged to a group or association. Many belonged to one group, although a few belonged to two or three groups. Further, of the six different groups or associations listed for the study, merry go rounds, self-help projects and welfare associations were the most common (Table 4.13).According to Muyanga and Jane (2006), farmer groups make extension services more accessible to smallholder farmers by providing economies of scale in service delivery and as a mechanism for producers to express their desire for services.

Barua (2002) argues that groups are more effective if the members are mobilized in the same village as this allows them to share the same cultural values, local knowledge and experiences on regular basis.

Findings on the membership further revealed that the group and association employed both open and closed membership policy. The study established that the rationale was to retain members who were committed to the objectives and goals of the group and association. One respondent said:

We have no opening for more members. Most members started with the group and one joins the group and is recruited as a member through the ranks.

Table 4.13: Type of group or association

Type of group or association	Frequency	Percentage
Merry go round	42	28.0
Self - help project	35	23.3
Welfare associations	12	8.0
Professional associations	8	5.3
Farmers' cooperative	4	2.7
Political group	3	2.0

Source: Field data, 2014

The study further analysed the relationship between income and membership in community groups (Table4.14). This analysis illustrates that a higher percentage of respondents who earned Kshs. 1,500 or less had membership in Welfare associations than those who earned more than Kshs. 1,500. It also shows that a higher percentage of the respondents who did not belong to a group earned Kshs. 1,500. This finding confirmed Kanyinga et al. (2007) findings that Self-Help community groups mainly relied on own contributions from members.

Table 4.14: Cross tabulation of income and membership in groups

Income (Kshs)	**Membership in groups**	
	Yes	No
< = 1500	69.6	85.9
1501-3000	15.2	11.3
> 3000	15.2	2.8
Total	100.0	100.0

Source: Field data, 2014

This means that respondents who earn lower income are more likely not to belong to a group or association. Thus, smallholder farmers are more likely to be among those who did not belong to a group or association. A respondent interviewed confirmed this finding when she said, "*Nchera ende teiyo,etokorusi ebituma nyomba twaoni gose ogende ekonda,onde taiyo oragokonye'*(Other than selling part of the maize harvest or selling labour, there is no any other option as no one can offer help as I do not belong to any community group or association.)

The 47 percent respondents who did not belong to any group or association gave different reasons. Many of them (54%) said that they could not afford the registration fee or they could not make the regular contributions required. Of the remaining, 20 percent attributed it to discouragement due to collapse of a previous group, 10 percent said that they wanted to avoid conflicts that arise in such groups, 6 percent said that there were no groups that would meet their interests, 6 percent were busy with their personal projects while 4 percent could not join any group due to illness (Table 4.15).

Table 4.15: Reasons for not belonging to a community group or association

Reason for not belonging to a group	**Frequency**	**Percentage**
Cannot afford registration fee and regular payment made	38	54.3
Discouraged due to collapse of a previous group	14	20.0
To avoid conflicts that may arise in such groups	7	10.0
Available groups cannot adequately meet their interests	4	5.7
Busy with personal projects	4	5.7
Due to terminal illness	3	4.3
Total	**70**	**100.0**

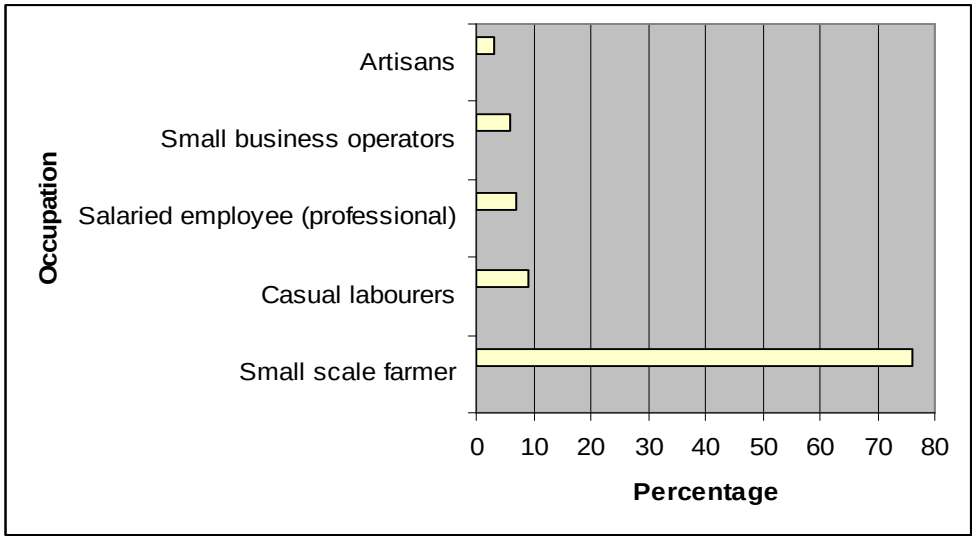
Source: Field data, 2014

4.4 Economic Activities

4.4.1 Main Occupation

This study found that a majority of the respondents (76%) were small-scale farmers. Others were casual labourers (9%), salaried employees/professionals (7%), small business operators (6%) while three percent were artisans (Figure 4.1).

Figure 4.1: Main occupation



Source: Field data, 2014.

A further analysis of the relationship between income and occupation is illustrated in Table 4.16 This analysis shows that a higher percentage of small-scale farmers earned Kshs 1,500 or less compared to those who earned higher income. Similarly, a higher percentage of casual labourers earned Kshs 1,500 or less compared to those who earned between Kshs 1,501 and 3,000 and none of them earned more than Kshs 3,000. Further, a higher percentage of artisans earned Kshs 1,500 or less than those who earned between Kshs 1,501 and 3,000 while no artisan earned more than Kshs 3,000. For small business operators, a higher percentage earned between Kshs 1,501 and 3,000 than those who earned Kshs 1,500 or less although none of them earned more than Kshs 3,000. On the other hand, a higher percentage of salaried employees earned more than Kshs 3,000 than those who earned between Kshs 1,501 and 3,000 while none of them earned Kshs 1,500 or less:

Table 4.16: Cross tabulation between income and main occupation

Income (Kshs	Main Occupation				
	Small scale farmers	Casual labourers	Artisans	Small business	Salaried employee
<=1500	86.8	76.9	75.0	44.4	0.0
1501-3000	8.8	23.1	25.0	55.6	10.0
>3000	4.4	0.0	0.0	0.0	90.0
Total	100.0	100.0	100.0	100.0	100.0

Source: Field Data 2014

From this analysis, It can be interpreted that most of the community members of low or no stable sources of income are more likely not to be involved in implementation of community projects due to lack of extra savings to help maintain project activities in and off seasons.
One respondent interviewed illustrated the challenge. She said:
I have heard of NALEP but does not know its operation, this is because 'inkokora ekonda boire goise inde isiko aiga intari gotara imanye amangana'(I sell labour or I am at home much of the time participating in this projects is difficult).'Twensi na abanyasae tore korende nabo tochaire,monto taagokorigereria esengech tari rikiri'(Though we all belong to God ,we are despised and no one can help you since we are not employed.''
On the other hand, community members with extra reliable salaries may not be directly involved in community food-based projects since they can assess and afford food without being directly involved in the implementation process.
A key informant remarked:
We have a problem of enlisting farmers who are employed into NALEP specifically in matters of food security, they dismiss this by saying that they don't experience food insecurity.

4.4.2 Land Ownership and Size

All respondents interviewed own land although the sizes vary. The mean size of land owned was 2.6 acres and a standard deviation of 1 .8. The land size owned ranged from 0.25 acres to 10.0 acres and most respondents had two acres-of land. Table 4.17 shows that 44 percent of the respondents own 2 acres or less while 24 percent own land that is more than 4 acres.

/Table 4.17: Total size of land (acres)

Land (acres)	Frequency	Percentage
< = 2.0	44	44.0
2.1-4.0	32	32.0
>4.0	24	24.0
Total	**100**	**100.0**

Source: Field data, 2014

The study analysed the relationship between income and the size of land owned (Table 4.18).This analysis shows that half of the respondents who earned Kshs 1,500 or less owned less than two acres of land. Further, a higher percentage of respondents who earned more than Kshs 3,000 owned land that was 4 acres or more compared to those who earned lower income. In addition, a higher percentage of respondents who earned more than Kshs3,000 owned land of between 2.1 and 4 acres followed by those who owned more than 4 acres of land while fewer owned less than two acres of land. The study findings established that although 56 % of farmers own two or more acres of land, less than a quarter of them (20%) farm them. One possible reason is that this group spends much of its time selling labour and leases land to meet monetary needs of the family. This was mentioned by 3/8 Key Informants interviewed. This revelation confirmed findings postulated in literature (Okinda, 2007). One of the respondents said:

Much of my land is on lease. I grow maize and have 200 tea bushes on the rest. I sell the tea in the open market (soko huru) or part of my maize harvest to generate income. I mainly sell labour to generate income.

Table 4.18: Cross tabulation of income and total size of land

Total size of land (acres)	Income (kshs)		
	< = 1500	1501-3000	> 3000
< = 2.0	50.9	25.0	14.3
2.1-4.0	31.0	25.0	50.0
> 4.0	18.1	50.0	35.7
Total	**100.0**	**100.0**	**100.0**

Source: Field data, 2014

Further investigation indicated that 80% of the respondents confirmed that the land they occupied was not very adequate for the implementation of the NALEP project activities, 20% revealed that the land size they occupied was adequate just for the NALEP agricultural activities they were undertaking like dairy farming. The responses of the respondents on land adequacy were analyzed in Table 4.19 below. One Key Informant observed,

"...due to increased population pressure and the ancestral attachment over land by the community it has made it impossible to curb sub-division due inheritance so as to help farmers engage in commercial farming."

A respondent also remarked:

That agricultural productivity had been affected by scarcity of productive land since much of the available land had been fragmented into small segments which could only support beans and maize crops to serve the season.

Table 4.19: Adequacy of Land Accessible to the Respondents

	Frequency	**Percentage**
Just Adequate	20	20%
Not Adequate	80	80%
TOTAL	**100**	**100.0**

Source: Field data, 2014

4.4.2 Maize Harvest

All respondents interviewed grew maize. However, as illustrated in table 4.20 below, most respondents (56%) harvested less than two sacks. The rest harvested two to four sacks (31%). Only few respondents harvested more than four sacks of maize.

Table 4.20: Amount of maize harvested (sacks)

Maize (sacks)	**Frequency**	**Percentage**
< = 2.0	56	56.0
2.1-4.0	31	31.0
> 4.0	13	13.0
Total	**100**	**100.0**

Source: Field data, 2014

Only 30 percent of the respondents harvested food sufficient for household needs. The rest bought additional food, relied on neighbours/relatives or stayed without food for periods ranging between one and five months. Further analysis of income and harvest of food sufficient for household needs is shown in Table 4.21. This Table illustrates that few respondents who earned Kshs 1,500 or less harvested sufficient food than those who did not. However, more respondents who earned more than Kshs, 1,500 harvested food sufficient for household needs than those who did not.

Table 4.21: Cross tabulation of harvest of sufficient food and income

Do you harvest food that is sufficient household needs?	**Income (kshs)**		
	< = 1500	1501-3000	> 3000
Yes	18.0	70.0	79.0
No	82.0	30.0	21.0
Total	**100.0**	**100.0**	**100.0**

Source: Field data, 2014

4.4.2 Surplus in Households Benefiting from NALEP

This study found out that 55% realized a surplus out of agricultural production, whereas 45% did not derive a surplus. The findings established further that majority of the respondents that had surplus production attributed this various factors as shown in *Box 1* below. This finding was in conformity with kabeer (1990).

Box 1: Factors Attributed for Surplus Production

- Use of fertilizers and certified seeds,
- Recommended crop spacing,
- Timely weeding and reliable rainfalls.

Source: Field data, 2014

The participants also gave explanations as to why many people still experienced hunger despite enjoying bumper harvests. A participant said:

I do not know what happens after food is harvested even after I have learnt and planned that I am not going to use food in a particular way. I just find myself using food in that way. As a household we just find ourselves eating more and tending towards buying things like fish and

*meat and other things we do not normally use. Food is cooked more often; we sell our harvest to buy other things to only end up buying maize again when prices are high. if we used our food properly we could not engage in 'ogotonda'.(*Buying food from the market).
The general consensus among participants in different FGDs was that consumption trends change once people harvest their produce.

A key informant observed," *The modal annual surplus is negative indicating that majority of the households do not make an annual surplus but require to supplement their crop yield if they are to sustain themselves. This is indicative of the fact that reliance on farm activities only may not be sustainable due to high recurrent expenditure budgets in the households''*

4.4.3 Cash Crops

The survey found that bananas and tea are the most commonly grown cash crops by 94 percent and 82 percent of the respondents, respectively. Sugarcane is the third most common cash crop grown by slightly over 30 percent of the respondents. In addition, 31 percent of the respondents grew coffee, 7 percent grew tomatoes while one percent of the respondents grew pyrethrum (Table 4.22 below).

Table 4.22: Cash crops grown by respondents

Cash crop grown	Frequency	Percentage
Bananas	141	94.0
Tea	123	82.0
Sugarcane	47	31.3
Coffee	46	30.7
Tomatoes	10	6.7
Pyrethrum	2	1.3

Source: Field data, 2014[1]

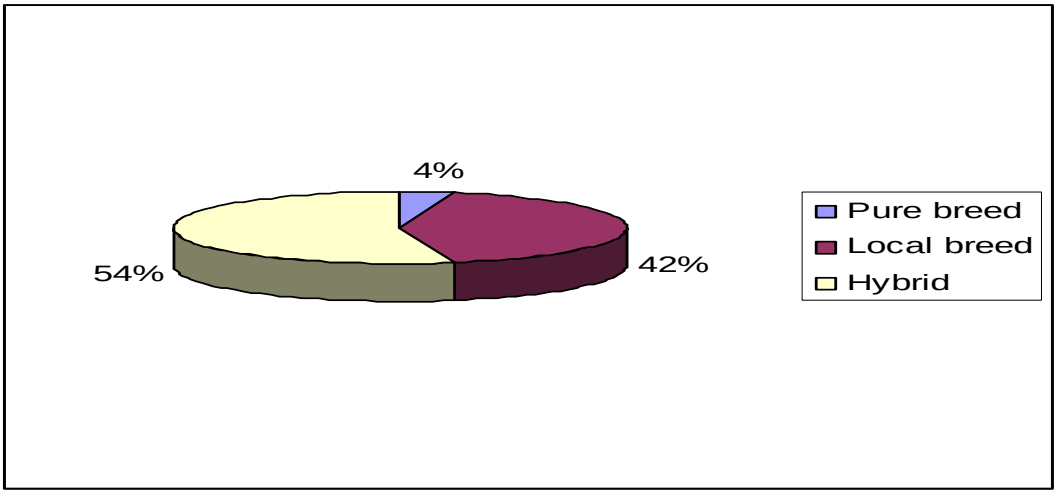
Planting other of crops is a livelihood diversification measures that ensures variety in terms of food supply but also food security. Additionally, once the food base is widened surplus at the household level become a possibility. A key informant said:
Farmers plant different types of crops particularly to ensure food security and livelihood sustainability through diversification.

[1] The percentage is more than 100 because this is a multi response question

4.4.4 Livestock

A majority of respondents (77%) keep cattle. The number of cattle owned ranged from one to ten with a mean of about two and a standard deviation of about one: In terms of the breed of cattle reared, slightly over half of the respondents reared hybrid cattle, A small proportion of the respondents (4%) reared pure breeds (Figure 4.2).

Figure 4.2: Breed of cattle



Source: Field data, 2014

Further analysis of the relationship between income and cattle breed (Table 4.23) shows that a higher percentage of respondents who earned Kshs 1,500 or less reared local breeds compared to those who reared hybrid or pure cattle breeds. Further, a higher percentage of respondents who earned between Kshs 1,501 and Kshs 3,000 reared hybrid cattle than those who reared local breeds. In addition, a higher percentage of respondents who earned more than Kshs 3,000 reared pure breeds compared to those who reared hybrid cattle while none of them reared a local breed of cattle.

Table 4.23: Cross tabulation of breed of cattle and income

Breed of cattle	**Income (kshs)**		
	< = 1500	1501-3000	> 3000
Local breed	56.0	11.1	0.0
Hybrid	40.5	88.9	85.7
Pure breed	3.6	0.0	14.3
Total	**100.0**	**100.0**	**100.0**

Source: Field data, 2014

This analysis shows that smallholder farmers who earn low income are more likely to rear a local breed. Findings from interviews with Key Informants, and participants in FGDs revealed households with a hybrid breed sold milk and earned more income which they used to buy food stuff.

4.5 Engagement In Agricultural Activities in the Nalep Intervention

This section seeks to establish the agricultural activities the smallholder rural farmers undertake, the challenges and opportunities and the outcomes of NALEP as a development intervention.

4.5.1 Knowledge and Awareness the NALEP

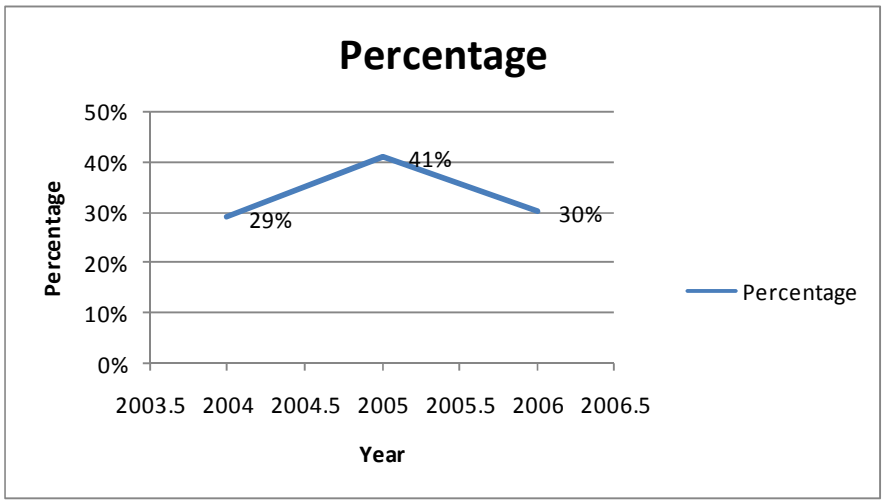
The study sought to establish smallholder rural farmers' knowledge about NALEP itself, NALEP committees and membership, awareness of when the programme was established, the source and purpose of the NALEP. All these are important for the study because they influence smallholder farmers understanding of development projects essential in their mobilization.

All respondents interviewed reported to have heard or known of the NALEP although the duration of such knowledge varied. Over 40 percent of the respondents said that they heard about the NALEP in 2005 while 30 percent heard of it in 2006. Figure 4.3 illustrates that the number of respondents who knew about the NALEP increased considerably between 2004 and 2005. The decrease in 2006 is probably because most respondents (70%) had either heard about. the programme or known its operations. Study findings established several factors responsible for the increased awareness of NALEP between 2004 and 2005 as outlined in *Box 2*.

Box 2: Factors Responsible for the Increased Awareness

- Enhanced sensitization and awareness on NALEP
- Inclusion of more stakeholders in NALEP
- Participation of local community members
- Improved reporting of NALEP activities

Figure 4.3: Year of knowledge of the NALEP



Source: Field data, 2014

The study further analysed the relationship between income and the year when respondents heard of or knew about the NALEP (Table 4.24). This analysis shows that over half of the respondents who earned more than Kshs 1,501 heard of NALEP in 2004. Further, the percentage of respondents who earned K.shs 1,500 or less and had heard about the NALEP increased between 2004 and 2005. In addition, over 70 percent of the respondents who earned more than Kshs 3,000 heard of the NALEP by 2004 while the remaining heard of it in 2005.

Table 4.24: Cross tabulation of year of knowledge of the NALEP and income

Year heard or knew	Income (Kshs)		
	< = 1500	1501-3000	> 3000
2004	19.0	60.0	71.4
2005	45.7	20.0	28.6
2006	35.3	20.0	0.0
Total	**100.0**	**100.0**	**100.0**

Source: Field data, 2014

This means that more respondents who earned higher income knew about the NALEP earlier than those who earned lower income did. This may be interpreted to mean that respondents who earned higher income were more likely to be mobilized due to their knowledge or awareness of the NALEP. A recurring response across all respondents is captured as;-

I obtain income by selling labour 'nigo imenyerete ekonda'(ekes out a living by selling labour).Although I have had about NALEP,I do not know its operations or any project funded nearby.I do not know when public meetings are held because most of the time I go to sell labour.I detest going to public places as they associate me with my poverty and my poor parents.In addition, 'teekonyarekana imbe na abanto abanene,chinguru bwate nechike'(I cannot face rich people due to capability deprivation).I am not interested in government initiatives because 'Serikali tetomanyeti,obokonyi titori konyora'(the government does not know us or offer any help.)

Responding to a question on the source of the NALEP, most respondents (73%) indicated that it originated from the government. Of the remaining, 15 percent did not know the source of the programme while 12 percent considered it a foreign donation (Table 4.25 below).

Table 4.25: Source of the NALEP

Source of the NALEP fund	**Frequency**	**Percentage**
The government	73	73.0
Don't know	15	15.0
Foreign donation	12	12.0
Total	**100**	**100.0**

Source: Field data, 2014

A further analysis of the relationship between the use of extension services and smallholder farmers' knowledge of the source of the NALEP (Table 4.26). This analysis illustrates that a higher percentage of respondents, 84% who knew the source of the NALEP as the government use extension services. It further shows that only 19 % respondents who did not know the actual source of the NALEP use extension services. On the other hand, 15% of the respondents who knew the source of the NALEP as the foreign donation made use of extension services.

Table 4.26: Cross tabulation of source of the NALEP and Use of Extension Services

Source of the NALEP	**Use of Extension Services**		
	YES	NO	TOTAL
The government	84	16	100.0
Don't know	19	81	100.0
Foreign donation	15	75	100.0
Total	**100.0**	**100.0**	**100.0**

Source: Field data, 2014

This implies knowledge of the source of NALEP influences use of extension services. Hence, respondents are more likely to be mobilised due to their knowledge of the actual source of the NALEP. This is because when people know the programme's source as the government, they are more likely to find more information about it or be interested in its operations thereby enhancing their chances of mobilisation. A respondent said that,'' *Agricultural meetings are many a times called by the chief or assistant chief who make sure many people attend''*

Half of the respondents interviewed said that the NALEP is aimed at funding community development projects aimed at increasing agricultural production. As illustrated in Table 4.27 below, 31 percent of the respondents said that the NALEP is aimed at helping the smallholder farmer realize food security while 18 percent did not know the purpose of the NALEP.

Table 4.27: Purpose of the NALEP

Purpose of the NALEP	**Frequency**	**Percentage**
To fund community projects to increase agricultural production	52	52.0
To help the smallholder farmer realize food security	31	31.0
Don't know	18	18.0
Total	**100**	**100.0**

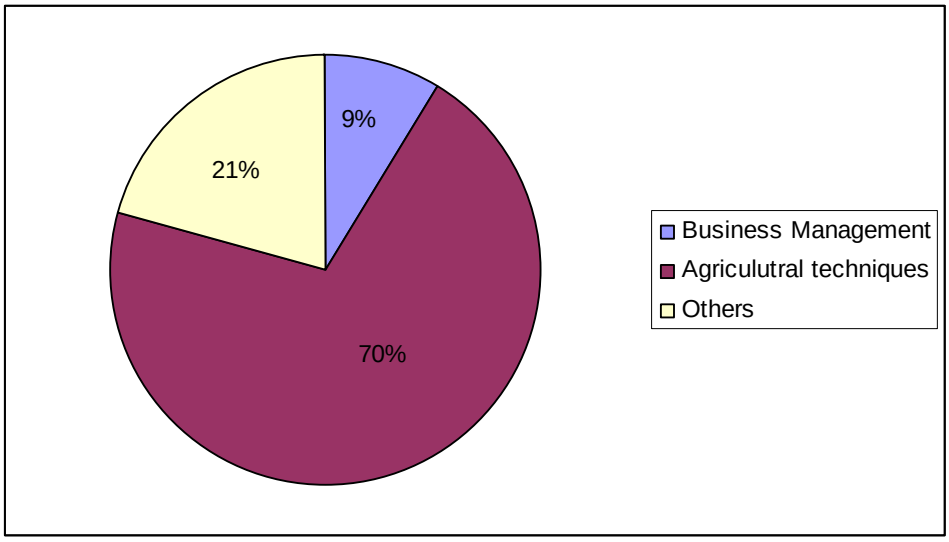
Source: Field data, 2014

4.5.2 Capacity Building Strategies and outcomes

Capacity Building on NALEP Implementation

Study findings established that smallholder farmers in Mokwerero ward received capacity support in various aspects. This finding supported literature in Phiri et al. (2001) and IHA (2002) on the typology of capacity building. 70% of the respondents reported having undergone training in agricultural production techniques, while 9% underwent business management trainings and 21% reported undergoing training in other areas of the NALEP including post- harvest handling and storage, compost making soil and water conservation, cereal banking among others.

Figure 4.4: The Scope of Household Head undergoing Training in NALEP



Source: Field data, 2014.

The study findings however did not establish any capacity support in monitoring and evaluation. Monitoring and Evaluation (M & E) provides the management with information to address project implementation issues and assess progress and fulfilment of objectives. This support would help small holder farmer groups improve documentation of success indicators in achieving food security. Findings revealed that the concept was vague to most small holder rural farmers with most associating it with auditing of financial accounts.. A respondent from one of the farmers groups confirmed the revelation. He said, *"...we feel there is need for more capacity development in monitoring and evaluation because it's still not well understood by most members."*

This discussion revealed that the training opportunities targeted key NALEP programmatic areas. This supported findings in IHA (2002). However, the executive members of the farmers groups attended most training opportunities.. A respondent confirmed the observation:

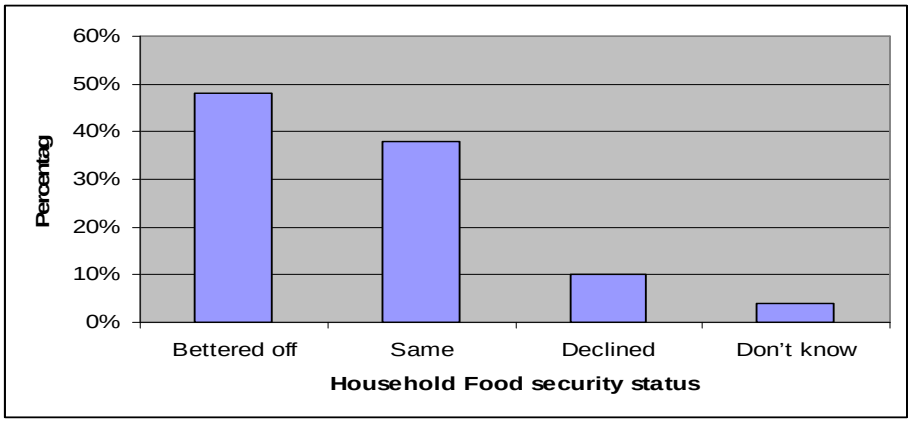
> *I represent the organization in most of the trainings as their leader and pass the information to them.*

The findings further established that in officials were specifically targeted for second level training. The advantage of this approach is that it equips the leadership with the necessary knowledge and skills. On the flipside however, this approach may deny capacity development opportunities to non-executive members.

4.5.3 Outcomes of Capacity Building on Household Food Security Assessment

The study sought a self- assessment and evaluation of household food security of the respondent before the programme and post intervention period. The study yielded the following-results 48% considered their household food security as having better off, 38% considered their household food security to have remained the same, 10% considered their household to have experienced a decline in food security, while 4% were unable to evaluate their household food security status.

Figure 4.5 Household food security Status after NALEP Intervention



Study findings revealed several manifestations of improvement in household food security as a result of capacity building as outlined in *Box 3*. A respondent remarked, *"Personally, I have been able to train others especially on advantages of using certified seeds."*

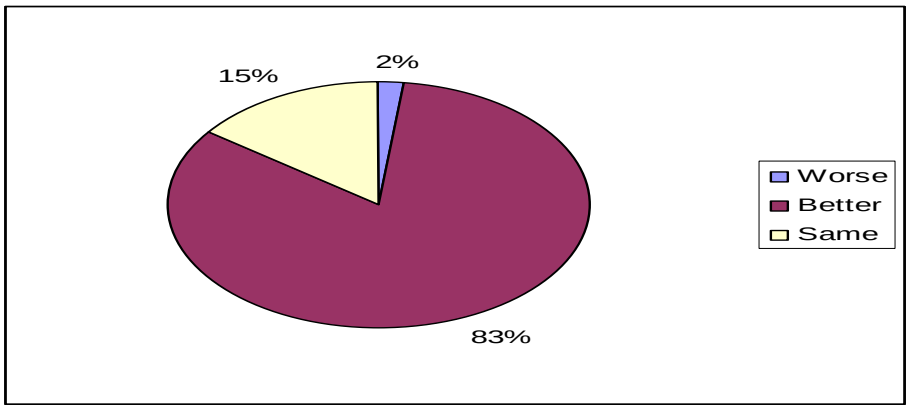
Box 3: Outcome of capacity support on household food security

- Generate crop surpluses
- Meet calorific requirements
- Provide cash earnings
- Facilitate general human development indicators
- Ability to provide own training to other farmers

4.5.4 Perception of Change in Food Security and NALEP Intervention

In an evaluation of change in the outcome of food security and NALEP intervention for the past five years, study findings established that out of the respondents interviewed, (83%) indicated it was better, (15%) indicated it had remained the same while only respondent (2%) observed that the situation had worsened. This is illustrated in *Figure 4.6.*

Figure 4.6: Perception of Change in Food Security and NALEP Intervention



Respondents interviewed reported three main themes as manifest of the change as outlined in *Box 4*. The first was significant reduction in incidences of food shortages. This was a common strand across most respondents, an observation that was confirmed by participants in the focus group discussions. Findings established improvement in adopting new technologies, commercialized inputs and increased access to extension officers. This was unlike earlier years when most of small holder farmers used local implements and inputs. One key informant interviewed confirmed thus:

We have seen increased uptake of new technologies and inputs such as the use modern storage facilities to avoid wastage and commercialized fertilizers besides increased services sought for extension

Box 4: Manifestations of Change in Food Security and NALEP Intervention

- Reduction in incidences of food shortages
- Improved access to extension opportunities
- Improved adoption of new technologies

CHAPTER FIVE
SUMMARY OF FINDINGS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of study findings, conclusions and recommendations. The first section presents summary of findings based on the three key research objectives. The second section presents conclusions drawn from the study findings. Lastly, the chapter concludes with presentation of recommendations for policy and areas for further research.

5.2 Summary of Findings

This study mainly sought to examine how and the extent to which National Livestock and Extension Programme (NALEP) has created, strengthened and enhanced the innovative and productive capacities of the smallholder rural farmers to attain self-sufficiency levels in food security requirements. This was guided by three key study objectives. The first objective sought to the household characteristics of small holder rural farmers in Mokwerero.

The study established that smallholder rural farmers' households displayed diverse socio-economic and demographic characteristics making it difficult to disaggregate them along a single trajectory. Considerable heterogeneity exists among the Smallholder rural farmers. Likewise, it was established that the Smallholder rural farmers are quite diverse in the problems they face in attaining food security and possible solutions to their problems. Understanding the needs of such different groups is central to the success of rural development strategies and programmes including NALEP.

The study found out that food security differences cut across gender, age, and income sources. In the households, children and women, widows, orphans, the elderly and long term sick were more likely to suffer food shortages than other groups. The study also established that the food insecure households likely to be among those earning very low incomes and have limited assets. They are likely to own small parcels of land and realize food harvests insufficient to meet household basic food requirements.

The study established that the biggest strength of NALEP has been the formation and capacity building of grassroot farmer organizations in form of the Common Interest Groups (CIGs). Through these groups the farmers have been able to survive difficult challenges and

increase their individual incomes. It can often be difficult for individual small farmers to access credits and technological innovations are often too expensive investments for lone farmers. Through CIGs the farmers make use of “economics of scale” when uniting their investments in production and this have led to increased financial incomes for the individual households this has in-turn led to enhanced capacity for household food security. The study findings however did not establish any organization that provided capacity support in monitoring and evaluation. Monitoring and Evaluation (M & E) provides the information to address project implementation issues and assess progress and fulfilment of objectives.

The study revealed that by involving local farmers in the Focal Area Development Committees (FADC) and educating them in new farming technologies have shown to be another successful strategy. These local farmers have been working as heads of new community development projects as well as demonstrators of new technologies in their focal areas. When the leaders in the communities have proved that new technologies have increased their production and income the other farmers in the communities have been willing to test the new technologies.

5.3 Recommendations

This study made several recommendations for policy and areas for further research.

5.3.1 Research-Extension Linkages

Connections between research and extension are often problematic as their roles can appear to be overlapping. Most farmers are not in a position to petition researchers at the KARI regional centres, or other research institutions, with requests to address specific problems. Farmers rely on the extension service to relay their problems to the researcher. While it can be good for researchers to experience on-farm conditions first hand, in order to ensure a certain level of relevance in their work, the research service will have to rely on extension workers to screen and field test solutions together with farmers and on the farm. This aspect is particularly relevant in relation to crops that may be suitable for the poorer segments of the farming communities.

5.3.2 Stakeholder Collaboration

NALEP has proved itself to be an innovative and resourceful mobiliser of farmers, but there are potentially serious conflicts between the NALEP approach and that of other donor-funded activities. Building up sectoral coordination and harmonization mechanisms is a slow and cumbersome process, even though some progress in the agricultural sector is being made in Kenya. An attempt should be made to formalize the mandate of the Stakeholder Forum, using the mandate of the Ministries of Agriculture to reinforce the coordination of all entities working in rural development towards a more efficient use of resources in this area.

5.3.3 Monitoring and Evaluation

There are a number of lessons to be learned about various aspects of NALEP which may not reach an outside audience because of the lack of systematic information. One important opportunity that has not been followed up on is the updating of the detailed baseline information gathered when the original Focal Areas were identified. In addition to general information about the Focal Area, individual farm plans were drawn up on a massive scale which could have served as a baseline for detailed studies on impact.

It is recommended that a comprehensive monitoring and evaluation system is designed and implemented. The M&E system should embrace activities and results related both to production as well as cross-cutting issues related to gender, age and education.

5.4 Recommendations for Further Research

This study was based on household survey data using a small sample, which cannot provide conclusive insight into how households move in and out of food shortages across time. Therefore a longitudinal study using panel sets with a larger sample is more likely to bring out the bigger picture. In addition, since there is no good panel data set on food security in Kenya, such a study would greatly contribute to this by capturing food security dynamics and may be useful in generating information on why some households move into food shortages, remain food insecure, and yet others move out of food shortages and factors that account for such changes.

There is also need for a study on the sustainability of NALEP as a development intervention. NALEP is a measurable and time-bound intervention in its last phase under NALEP-SIDA. It is recommended that an internal discussion is initiated by NALEP as to the consequences of a gradual phase-out of external resources and its potential influence on future effectiveness and efficiency of the various approaches supported by NALEP.

Finally given that NALEP interventions cover; *environmental; health and nutrition; infrastructure, energy and communication; and education and training* and that this study focused specifically on agricultural (crop and livestock) production, for household food security other studies should be conducted on the other NALEP intervention areas and their possible impacts on food security as well.

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APPENDICES

Appendix I: Household Questionnaire

Hello, my name is Moseti, a student researcher from the Institute for Development Studies (IDS), University of Nairobi. I am conducting an academic study on: **Food Security among smallholder rural farmers: National Livestock and Extension Programme (NALEP) Intervention in Bobasi, Kisii County** as a fulfillment of the requirements for an award of degree Master of Arts in Development Studies. Your participation in this study is voluntary and all the information provided shall remain confidential and used for purposes of this research only.

NO.	QUESTION	RESPONSE	CODE
SECTION ONE: SOCIO-ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS			
1.	Gender of the respondent	1. Male 2. Female	
2.	Age of respondent		
3.	Marital status	1. Single 2. Married 3. Divorced/separated 4. 4. Other, specify……	
4.	Total household members		
5.	Religion/denomination	1. Protestant 2. Catholic 3. Seventh Day Adventist 4. Other, specify ……..	
6.	Highest level of education attained	1. None 2. Primary 3. Secondary and vocational 4. College and University 5. Other, specify ……	
7.	What is your main occupation?	1. Small scale farmer 2. Salaried employee/professional 3. Casual worker 4. Small business operator 5. Other, specify ……	
8.	Is there any other activity you do for a living? Explain		
9	Do you own land?	1. Yes 2. No	

10.	What is the size of these pieces of land(s) (acres)?	a)Inheritance b)Lease/rental c)Purchase d)Other, Specify	
11	Do you grow any of the following cash crops?	1. Yes	If no = 13
	a. Coffee		
	b. Tea		
	c. Pyrethrum		
	d. Sugarcane		
	e. Tomatoes		
	f. Bananas		
12.	If so, what's the value of each cash crop (acres)?		
	a. Coffee		
	b. Tea		
	c. Pyrethrum		
	d. Sugarcane		
	e. Bananas		
	f. Other, specify …….		

13	Do you grow any of the following food crops? a. Maize (sacks) b. Beans (sacks) c. Sorghum (sacks) d. Other (specify)	1. Yes 2. No	
	d. Total		
12.	What value of the following crops did you harvest last season?		
	a. Maize (sacks)		
	b. Beans (sacks)		
	c. Sorghum (sacks)		
16	On average, how much do you spend(monthly) on		
	d. Other (specify)		
13.	Is the amount of food you harvest sufficient to your household needs?	1. Yes 2. No	
	A. Education for household members		
14.	Explain		
15.	What is your monthly income from the following sources (Kshs.)?		
	a. Farming		
	b. Remittances		
	c. Off farm business/Employment		

	B. Health/Medication for household members		
Household Livestock			
17.	Number of cattle		
18.	Breed of cattle	1. Local breed	
		2. Hybrid	
		3. Pure breed	
29.	Number of goats		
20.	Number of Chicken		
21.	Number of sheep		
22.	**Household Shocks**		
23.	Has your household experienced any shock over the last one year?	1. Yes **2.** No	
24.	If yes which one(s)? a)Food shortage		
	b)Loss of property	1. Yes 2. No	
	c)Drought	1. Yes 2. No	
	d)Ill health	1. Yes 2. No	
25.	What measures did you take to cope with the shock(s)	a. Sale of household livestock b. Sale of crops c. Sale of labour d. Borrowing from banks/financial institutions e. Borrowing from friends/neighbours f. Depended on charity **g.** Depended on Household income/earning	
26	To what extent were the strategies employed to cope with shocks effective?	1.Greater extent 2.Great extent 3.Some extent 4.Less extent 5.Lesser extent	

27	When you fall ill, where do you usually seek treatment?	1.Goverment hospital or health care 2.Missionhospital 3.Privatehospital or clinic 4. Traditional practitioner or herbalist	
28	Do you know /are aware of NALEP?	1.YES 2.NO Explain	
29	Please identify for me any new agricultural projects being implemented in the community during the past five years?		
	Did your household engage in farming activities before (the NALEP) intervention	1. YES 2. NO	
	If No, explain		
30 31			

32	How did you learn about the projects?	1. Through member of location development committee	
		2. Other community members	
		3. Chief's Baraza	
		4. Seen notices/posters/newspapers	
		5. Members of project committee	
	Do you use commercialized inputs of fertilizers and certified seeds?	1.YES 2.NO	
		6. Others, specify	

If No, what have you been using?	1.Nothing
	2.Compost manure
	3.Animal manure
	4.Others,specify
What influenced your decision to use commercialized inputs?	1.Neighbours
	2.Agricultural extension officer
	3.NALEP officer
	4.Other,specify
Where do you get them?	1.Purchase
	2.Given by neighbours
	3.Given by NGOs
	4.Other sources
Comment on appropriateness of the use of the fertilizer and certified seeds on the quantity of your harvest?	

Do you have surplus for sale?	1.YES 2.NO
If YES, what do you attribute this surplus to?	1.Fertlizer use
	2.Crop spacing
	3.Certified seeds
	4.Weather

		5.Other,specify	
38	Have you undergone any form of training since the project inception (2000)?	1. Yes 2. No	
39	If yes, which one(s)?	1.Business management	
		2.Agricutural techniques	
		3.Others,specify	
40	Do you belong to any community group?	1. Yes 2. No	
41			
42	List the of groups		
43	If no, explain why		
44	Have you ever been involved in any of the following NALEP project activities?		
	a. Attended project identification n meetings	1. Yes 2. No.	
	b. Attended project selection meetings	1. Yes 2. No	
	c. Contributed ideas during NALEP meetings	1. Yes 2. No	

Appendix II: Interview Schedule for Focus Group Discussion

Hello, my name is Moseti, a student researcher from the Institute for Development Studies (IDS), University of Nairobi. I am conducting an academic study on: **Food Security among smallholder rural farmers: National Livestock and Extension Programme (NALEP) Intervention in Bobasi,Kisii County** as a fulfillment of the requirements for an award of degree Master of Arts in Development Studies. Your participation in this study is voluntary and all the information provided shall remain confidential and used for purposes of this research only.

1. Please comment on the general agricultural situation in this area.
2. What are the socio-economic and demographic characteristics of the :-
    i. Households
    ii. Food insecure households
3. In your view/opinion what are the causes of food shortage in your household?
4. In your view what can be done to address the problem of food shortage?
5. What is your perception of food security/situation of your household before and after the NALEP, and NALEP interventions?
6. a) How has smallholder rural farmers' participation in NALEP projects taken place?
   b) What factors constrain smallholder rural farmers' participation in project planning and implementation?
7. In your view are the NALEP interventions adequate to address:-
    i. Sustainable agriculture
    ii. food security

Conclusion

Is there anything else I have not asked you that you think is important to share concerning food security in this community?

Closing

Thank you all for spending time with us today, for sharing your opinions and experiences with us. Your participation in this discussion is helping us better understand your knowledge, experiences and practices about food security in this community. We have learnt a lot from our discussion today and have enjoyed spending time with you.

Thank you so much!!!!!!

Appendix III: Interview Schedule for Key informants

Hello, my name is Moseti, a student researcher from the Institute for Development Studies (IDS), University of Nairobi. I am conducting an academic study on: **Food Security among smallholder rural farmers: National Livestock and Extension Programme (NALEP) Intervention in Bobasi, Kisii County** as a fulfillment of the requirements for an award of degree Master of Arts in Development Studies. Your participation in this study is voluntary and all the information provided shall remain confidential and used for purposes of this research only.

1. What is the overall agricultural situation in this area; Probe on
(Issues of distribution, Income, Market availability and Market prices)
2. What are the NALEP interventions in agriculture and are they sustainable in addressing food security?
3. What are the major changes observed in agriculture and food security in particular, since the project(s) implementation under NALEP
4. Who are the main actors in agricultural/food security interventions? And what roles do they play?
5. What challenges /constraints have you encountered in the implementation of the NALEP interventions in agriculture and food security in particular?

Conclusion (5 minutes)

Is there anything else I have not asked you that you think is important to share concerning food security in this community?

Closing (2 minutes)

Thank you all for spending time with us today, for sharing your opinions and experiences with us. Your participation in this discussion is helping us better understand your knowledge, experiences and practices about food security in this community. We have learnt a lot from our discussion today and have enjoyed spending time with you.

Thank you so much !!!!!