

**RELATIONSHIP BETWEEN NJAA MARUFUKU KENYA INTERVENTION AND
FOOD SECURITY IN KAJIADO COUNTY, KENYA**

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**A Thesis Submitted to the Graduate School in Partial Fulfillment of the
Requirements for the Award of the Degree of Master of Science in Agricultural
Extension of Egerton University**



EGERTON UNIVERSITY

SEPTEMBER, 2013

DECLARATION AND RECOMMENDATION

Declaration

This thesis is my original work and it has not been submitted or published for any award of a degree or diploma in this or any other university.

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Recommendation

This thesis has been submitted for examination with our approval as University supervisors.

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DEDICATION

This study is dedicated to my family for their constant encouragement and patience throughout my academic struggle thus realizing my long cherished dream.

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ABSTRACT

The Government of Kenya and other key stakeholders such as the World Bank and NGOs have over the years implemented various interventions in the agriculture sector aiming to curb poverty, hunger and to enhance food security. Despite these interventions, there has been little achievement in enhancing food security and reducing poverty levels, particularly in Arid and Semi-Arid lands (ASALs). The Government through the Ministry of Agriculture came up with a home-grown approach of *Njaa Marufuku Kenya (NMK)* to address food insecurity. NMK is a Kiswahili term which means; Eradicate hunger in Kenya. The goal of the programme is to contribute to reduction of poverty, hunger and food insecurity among poor communities in Kenya, especially those in Kajiado County. Despite the implementation of NMK, the targeted beneficiaries still heavily rely on relief food from the donors and the government agencies. This raises doubt of whether NMK has had any significant effect on food security. The study sought to investigate the relationship between NMK intervention and food security in Kajiado County. A descriptive survey research design was used. The target population consisted of the officials of all the entire 33 grant funded community groups under NMK program and ten key informants from Kajiado County. Stratified random sampling method was used to sample 24 NMK funded groups whose officials were purposively taken for the study. Thus the sample size of the study was 72 respondents. The study also purposively sampled ten key informants from relevant line ministries. Two validated primary data collection instruments were used during the study; a questionnaire and an interview guide. A pilot study was conducted among five NMK funded groups and a Cronbach's Alpha Coefficient reliability of 0.83 was attained. The data were analyzed using descriptive statistics. Chi-square statistical test was applied to test all the hypotheses at $\alpha = 0.05$ significance level. From the study findings, all the three NMK interventions, the NMK farmer training, community agricultural development initiatives and agricultural productivity interventions had a significant relationship with food security in Kajiado County. The study recommends continuous training of the NMK funded groups in the implementation of their respective projects, more enhanced community participation, more enhanced funding and full utilization of the purchased technologies/inputs. Further, similar studies should be conducted in other counties to allow for generalization of the findings.

TABLE OF CONTENTS

DECLARATION AND RECOMMENDATION	ii
COPYRIGHT	iii
DEDICATION	iv
ACKNOWLEDGEMENT.....	v
ABSTRACT.....	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	ix
LIST OF FIGURES.....	x
ABBREVIATIONS AND ACRONYMS.....	xi
CHAPTER ONE	
INTRODUCTION	1
1.1 Background of the Study	1
1.2 Statement of the Problem.....	3
1.3 The Purpose of the Study.....	3
1.4 Objectives of the Study.....	3
1.5 Research Hypotheses	4
1.6 Significance of the Study	4
1.7 Scope of the Study	4
1.8 Limitations of the Study	5
1.9 Definition of Terms.....	6
CHAPTER TWO	
LITERATURE REVIEW	9
2.1 Introduction.....	9
2.2 General overview of food security at the Global Level.....	9
2.3 Factors affecting Food security situation in Kenya	10
2.4 Indicators of Food Security.....	14
2.5 Strategies Adopted by <i>NMK</i> to Enhance Food Security in Kajiado County	15
2.7 Conceptual Framework.....	18

CHAPTER THREE

RESEARCH METHODOLOGY	20
3.1 Introduction.....	20
3.2 Research Design	20
3.3 Location of the Study.....	20
3.4 Target Population.....	21
3.5 Sampling Procedure and Sample Size	21
3.6 Instrumentation	22
3.7 Data Collection Procedure	23
3.8 Data Analysis	24

CHAPTER FOUR

RESULTS AND DISCUSSION	26
4.1 Introduction.....	26
4.2 General Information on the NMK Funded Groups.....	26
4.3 Training.....	29
4.4 Community Driven Agricultural Development Initiatives	34
4.5 Agricultural Productivity Interventions	37
4.6 Hypothesis Testing	42

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS	46
5.1 Summary of the Findings.....	46
5.2 Conclusion	49
5.3 Recommendations.....	50
5.4 Recommendation for Further Study	51
REFERENCES.....	52
APPENDICES.....	54
APPENDIX A: NMK FUNDED GROUP OFFICIALS QUESTIONNAIRE.....	55
APPENDIX B: INTERVIEW GUIDE FOR THE KEY INFORMANTS	60
APPENDIX C: NMK FUNDED GROUPS IN KAJIADO COUNTY	62
APPENDIX D: LETTER OF AUTHORIZATION	64
APPENDIX E: RESEARCH PERMIT.....	65

LIST OF TABLES

Table 1. Sampling frame for the <i>NMK</i> funded group officials	22
Table 2. Statements on Training through <i>NMK</i>	34
Table 3. Statements on the level of community participation in the planning and implementation of the project	36
Table 4. Benefits derived from <i>NMK</i> programme	41
Table 5. Relationship between farmer training and food security	43
Table 6. Relationship between community driven agricultural development initiative and food security	44
Table 7. Relationship between agricultural productivity interventions and food security	44

LIST OF FIGURES

Figure 1. Conceptual framework on the relationship between <i>Njaa Marufuku Kenya</i> intervention and food security in Kajiado County	19
Figure 2. Number of years that the <i>NMK</i> funded groups had been operational	27
Figure 3. Number of years that the key informants had worked in Kajiado County	28
Figure 4. Areas that <i>NMK</i> projects are based.....	28
Figure 5. <i>NMK</i> group members training before implementation of their respective project	30
Figure 6. Relevance of the training to the project being implemented.....	31
Figure 7. Percentage of group members trained	32
Figure 8. Involvement of the group members in their project activities.....	35
Figure 9. Percentage Funds Used to purchase technologies/inputs	38
Figure 10. Proportion of the purchased technologies/inputs utilized by the groups.....	39
Figure 11. Key informants' responses on use of technologies to improve Agricultural productivity	42

ABBREVIATIONS AND ACRONYMS

ASAL	Arid and Semi-Arid Land
DAO	District Agricultural Officer
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GoK	Government of Kenya
KNBS	Kenya National Bureau of Statistics
LIME	Livestock Marketing Enterprise
MDG	Millennium Development Goal
MoA	Ministry of Agriculture
MoLD	Ministry of Livestock Development
NALEP	National Agriculture and Livestock Extension Program
NGOs	Non-Governmental Organizations
NMK	<i>Njaa Marufuku Kenya</i>
PPP	Public Private Partnership
RVP	Rift Valley Province
UNDP	United Nations Development Programmes

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

More than half of the world's population lives below the poverty line and household food security is a big challenge for about 925 million people in the world (FAO, 2010). Food security is a situation when all people at all times have physical, social and economic access to sufficient, safe and nutritious food that meet their dietary needs and food preferences for an active and healthy life (Bird & Busse, 2006). The main aspects of food security include availability, accessibility, utilization and sustainability. Food security in Africa has worsened substantially over the last 30 years, with high population and increasing food demand consistently exceeding modest agricultural production growth UNDP (2006). It is estimated that out of the world's 800 million people that are food insecure, about 180 million (or 23%) live in Sub-Saharan Africa (Manyasa, 2006).

According to Poverty Baseline Report, 53% of the population in Kenya lives below the poverty line and 51% are food poor (Kenya National Bureau of Statistics, 2010). This translates to poor endowments hence poor access to food. The major causes of food insecurity in Kenya are the rapidly growing demand and changes in consumption patterns, competition for agricultural land for other uses, effects of global environmental change, soil degradation, erosion of agricultural biodiversity, water scarcity, inadequate storage and post-harvest technologies, and poor marketing information (Kangethe, 2004; Armah F., Onumah, E., & Yengoh, G. (2010).

Kajiado County is one of the 14 counties within the Rift Valley Province in Kenya. It has an average poverty index of 46.67% (Kajiado District Development Plan, 2008-2012). The area is divided into livelihood zones which include pastoral, agro pastoral, mixed farming and casual/waged labour/business/trade zones. Kajiado County is an ASAL district occasioned by persistent drought with livestock keeping being the predominant economic activity and the main source of livelihood. The arable land is 8% of the total area of Kajiado County.

In 2004, the Government came up with a home grown approach, *Njaa Marufuku Kenya (NMK)*. It is an initiative established under the Ministry of Agriculture whose main purpose is to spearhead the fulfillment of Millennium Development Goal number one (MDG-1). The goal of the program is to contribute to reduction of poverty, hunger and food insecurity among poor communities in Kenya, including those of Kajiado County (Ministry of Agriculture, 2006).

The *NMK* programme has three components. They include support to community-driven food security improvement projects which focuses on empowerment of communities through capacity building of group members and their facilitators. In addition, there is community nutrition awareness support and school meal programmes that aim at improving health and nutrition status of vulnerable people and school going children. The other component is the support and up-scaling of private sector food security innovations. This involves participation of Community Based Organizations (CBOs), Non-Governmental Organizations (NGOs), private sector organizations and other independent food security innovations (Ministry of Agriculture, 2006).

In Kajiado County, support to community-driven food security intervention is the major *NMK* component with a total of 33 community groups funded for either crops or livestock enterprises. In this component, the *NMK* provides grant per group of up to KES 120,000 for crops based projects and up to KES 150,000 for livestock and fisheries based projects, or any other enterprise requiring structural inputs (MoA, 2006). The strategies used by *NMK* in all the three components includes training, community driven agricultural development initiatives (through community participation in project planning and implementation) and agricultural productivity through purchase and utilization of technology and farm inputs. The other projects that have been implemented in Kajiado with regard to food security include water harvesting for crops and livestock production, traditional high value crops project where few identified groups are provided with high yielding planting materials to bulk for the community. In addition, there is a Small Scale Horticulture Development Project (SHDP) through the rehabilitation of two irrigation schemes in Ngururmani in Magadi and Namelok in Magadi (District Agricultural

Officer, 2011). *NMK* covers the entire county and it is therefore, crucial to establish the relationship between *NMK* intervention and food security in Kajiado County.

1.2 Statement of the Problem

One of the ways of enhancing food security in Kenya is the implementation of *NMK* interventions. *NMK* provides grants to community groups for carrying out projects that enhance food security. Despite the implementation of the *NMK* Programme from 2006, food security remains a problem in many parts of Kenya, including Kajiado County. The Kajiado County community members including those of *NMK* funded groups continue to rely heavily on relief food from donor agencies and the Government. This raises the doubt of whether *NMK* has made any significant contribution to food security among the members of the *NMK* funded groups in the County. It is not clear why community groups funded through *NMK* continue to rely on food relief in the County and hence the need for this study.

1.3 The Purpose of the Study

The purpose of this study was to investigate the relationship between *Njaa Marufuku Kenya* intervention and food security in Kajiado County.

1.4 Objectives of the Study

The study was guided by the following specific objectives:

- i. To determine the relationship between farmer training through *NMK* and food security in Kajiado County.
- ii. To determine the relationship between community participation in *NMK* and food security in Kajiado County.
- iii. To assess the relationship between agricultural productivity interventions by *NMK* and food security in Kajiado County.

1.5 Research Hypotheses

- Ho₁**. There is no statistically significant relationship between farmer training through NMK and food security in Kajiado County.
- Ho₂**. There is no statistically significant relationship between community participation in NMK and food security in Kajiado County.
- Ho₃**. There is no statistically significant relationship between agricultural productivity interventions by NMK and food security in Kajiado County.

1.6 Significance of the Study

The study findings and recommendations may be of importance to the agricultural Sector ministries and other key players in the Kenya government in formulation of policies meant to address the issue of food security, hunger and poverty reduction. The study may also fill in the knowledge gap by illuminating the achievements, improvement areas and challenges of *NMK* Component 1 in executing its main role of reducing food insecurity, hunger and poverty among the Kenyan ASALs. The study may further be useful to *NMK* secretariat in making key decisions on changes necessary in the implementation of the *NMK* cash grant activities. This includes whether there is need to increase the grant accorded to groups. Lastly, the findings may be invaluable and useful to researchers and scholars since it may form a basis for further research. The study may form the basis of discussion on the key issues on food insecurity and poverty eradication in Kenya as well as the challenges affecting the very many initiatives by the Government and other stakeholders in enhancing food security.

1.7 Scope of the Study

This study was limited to the contribution of home grown approach; *NMK* in reducing poverty and hunger among Kenyan rural areas. The study was limited to Kajiado County only, which formed the geographical scope of the study. The study focused on *NMK* funded groups while seeking information for the study.

1.8 Assumptions of the study

The study assumed that:

- i. The opinions of the respondents accurately reflect the relationship between *Njaa Marufuku Kenya* intervention and food security in Kajiado County.
- ii. The respondents would be within reach and would not have migrated in search of pastures and water.

1.9 Limitations of the Study

- i. The high expectations from the respondents especially based on the fact that they have an experience with NMK programme might make them expect some additional projects/funding hence giving biased information. To cope with this, the researcher explained to the respondents that the study was for academic purpose.
- ii. The study was further affected by the high level of insecurity in some areas of Kajiado County, which slowed the data collection process. The researcher sought assistance from the local leadership.
- iii. The study was further affected by the poor road network in Kajiado County, which made the area inaccessible and slowed the data collection process. The researcher found assistance from the relevant line ministries for transportation to the sampled NMK funded groups.

1.10 Definition of Terms

Agricultural Productivity Interventions: These are interventions adopted by governments and other development partners meant to increase on-farm productivity and market access, raising smallholder incomes and reducing poverty (GoK, 2005). In this study, agricultural productivity intervention was defined as the *NMK* strategy that mainly focuses on increasing agricultural productivity through purchase of modern technologies/inputs to advance in their area of production.

Community-driven Agricultural Development Initiative: Is an approach that gives control over planning decisions and investment resources for local development projects to community groups (World Bank, 2006). In this study these means community participation whereby the community initiated agricultural development ideas and project implementation progress through meetings are gathered and compiled.

Food Accessibility: Means having sufficient resources to obtain appropriate foods for a nutritious diet. It means that individuals have adequate income or other resources to purchase or barter to obtain levels of appropriate foods needed to maintain consumption of an adequate diet/nutrition level (FAO, 2006). In this study, food accessibility meant the ability of the household to acquire food through purchase from the local markets or through barter trade.

Food Availability: Means that sufficient quantity of food are available on a consistent basis to the household. It mean sufficient quantities of appropriate, necessary types of food from own domestic production, purchase from local market or food aid from donors available to the individuals or are within reasonable proximity to them or are within their reach (FAO, 2006). In this study, food availability meant the physical presence of food from own production or gifts from relatives and friends.

Food Security: This is said to exist when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy lifestyle (FAO, 2006). In this study, a household was considered food-secure when its occupants do not live in hunger or fear of starvation.

Food security Indicators: The indicators are constructed from a set of observations, or measurements, of food security-related conditions, which are classified according to a set of criteria, aggregated, and placed in some program relevant perspective. The indicators are needed to measure improvement in food security status of the participant households as a result of the intervention. In this study, the household food availability and accessibility were the food security indicators.

Household Income: Is the measure of the combined incomes of all people sharing a particular household which include salaries and wages, retirement income, cash transfer. In this study, household income was the money generated from the sale of farm produce.

Household Production: These are activities that are carried out by household unincorporated enterprises that are not involved in market production. In this study, household production is the production from farm for household subsistence use.

Intervention: This is any interference in the affairs of others, especially by one state in the affairs of another. It also refers to efforts provided to improve a situation (Manyasa, 2006). In this study, intervention refers to strategies adopted by NMK to contribute to reduction of poverty, hunger and food insecurity among poor communities in Kenya which includes Agricultural productivity interventions, Community-driven agricultural development initiative and Farmer training.

Njaa Marufuku Kenya (NMK): This is a Kiswahili language term which means; Eradication of hunger in Kenya. The goal of the program is to contribute to reduction of poverty, hunger and food insecurity among poor communities in Kenya. NMK interventions are geared towards increasing agricultural productivity, generation of rural incomes, improving health and nutrition status of poor community members and conservation of the natural resource base.

Poverty: This refers to the state or condition of having little or no money, goods or means of support. According to World Bank, poverty is defined as a person living on less than US\$ 1 per day (UNDP, 2006). In this study poverty refers to lack of resources for the household to produce or purchase enough food for their consumption.

Training: It refers to strengthening the skills, competencies and abilities of people and communities in developing societies so they can overcome the causes of their exclusion and suffering (UNDP, 2006). According to this study training refers to the type of training, the proportion of group members trained and relevance of training to the NMK projects being implemented.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of empirical literature on factors affecting food security in Kenya. It will focus into the concept of food security and later embarks on exploring literature on the strategies adopted by NMK to improve on food security. The chapter also gives the theoretical and conceptual frameworks on which the study is based.

2.2 Overview of Global Food Security Situation

The concept of food security involves both physical and economic access to food to meet people's dietary needs (FAO, 2010). Around a billion people globally do not have adequate food to meet their basic nutritional needs. The vast majority of these, 852 million, live in developing countries, where the prevalence of undernourishment is now estimated at 14.9 percent of the population. The world faces a potentially even greater crisis in food security as the global population is expected to grow from about 6.9 billion (late 2010) to more than 9 billion by mid-century. The FAO has predicted that demand for food will grow by 50% by 2030 and 70% by 2050. A major threat to food security is the rapid decline in agricultural biodiversity, both from population pressure and land clearing, and the low adoption of modern technology in the developing countries (FAO, 2010).

The availability and access to food are affected by population growth, demographic trends, economic development, government policies, income levels, health, nutrition, gender, environmental degradation, natural disasters, refugees, migration, disease, and concentrated resource ownership. The poor attribute their poverty to a number of factors including: unemployment, lack of assets, lack of credit, inaccessible markets, corruption, poor health, illiteracy, insecurity and economic shocks. Poverty is a multi-dimensional phenomenon that goes beyond the lack of incomes (World Bank, 2010).

Achieving food security in its totality continues to be a challenge not only for the developing nations, but also for the developed world. The difference lies in the

magnitude of the problem in terms of its severity and proportion of the population affected. In developed nations the problem is alleviated by providing targeted food security interventions, including food aid in the form of direct food relief, food stamps, or indirectly through subsidized food production. These efforts have significantly reduced food insecurity in these regions. Similar approaches are employed in developing countries but with less success. The discrepancy in the results may be due to insufficient resource base, shorter duration of intervention, or different systems most of which are inherently heterogeneous among other factors (Mwaniki, 2010).

2.3 Factors Affecting Food Security in Kenya

About a half of Kenya's estimated population of 38.6 million people is poor with 7.5 million people living in extreme poverty. Over 10 million people suffer from chronic food insecurity and poor nutrition. In recent years, it is estimated that at any one time, about two million people require food assistance. During periods of drought, heavy rains and/or floods, the number of the needy could double (Government of Kenya, 2005).

Food security is a multi-faceted issue. It is by understanding the factors undermining efforts to thwart food insecurity and their relationship that effective strategies to curb the menace can be realized. Some of the main factors that affect food security include inappropriate land use practices, inadequate institutional capacity and linkages, livestock and livestock product marketing, credit and inputs, agricultural extension and training, and disease and pest control.

2.3.1 Land Use Practices

Farming is dominated by small-holder farmers. As a result of increasing population and land sub-division, the average household agricultural land size in the small-holder sector now stands at 0.9 ha and in some cases, it is as low as 0.2 ha (MoA, 2006). Consequently, an increasing number of rural farmers are either not having adequate land or the land sizes are too small for sustainable use and guaranteed incomes.

Similarly, continued sub-division of agricultural land to small and uneconomical parcels, and inappropriate land tenure has contributed to the low agricultural productivity. The

decrease in the area under cultivation, both rain fed and irrigated, has been facilitated by changes in land tenure policy, both official and customary. The general trend has been towards land privatization, and fragmentation of former communal holdings. Access to land, which is a major primary input, is further limited by inappropriate policies regarding ownership. This is because these policies are implemented without intimately understanding the societal and ecological dynamics that precipitated the condition of shortage in availability of land.

Sub-division of communal grazing lands (group ranches) in Kajiado is in progress. According to Burnsilver and Mwangi (2007), the trend towards subdivision implies dramatic changes in pastoral land use from a system of extensive seasonal movement and intensive, short-duration grazing of successive areas of the pastoral landscape, towards one based on intensive, long-term grazing of private parcels where households have fewer options for mobility and hence overgrazing resulting to land degradation.

2.3.2 Institutional Capacity and Linkages

The key stakeholders in the agricultural sector include interest groups, community development organizations, NGOs and development partners. The performance of most of these institutions has been wanting due to lack of productive resources such as finances and adequate skilled personnel, while coordination of these actors to ensure effective participation in development and service delivery also poses a major challenge (NMK, 2007).

The agricultural cooperatives and farmers' organizations are central to good performance of the agricultural sector, by giving farmers advantages of economics of scale in accessing credit, other inputs and outputs. However, in Kenya, mismanagement has weakened or collapsed most of such institutions through misappropriation of funds and hire of unqualified personnel. In addition lack of capacity by the private sector to take over services after government withdrawal has brought great losses to farmers (MoA, 2006).

In Kajiado county there are four Dairy cooperative societies namely Namanga Dairy Cooperative Society, Kule Dairy Cooperative Society (Kitengela), Maasai Kajiado Women Dairy Cooperative Society, Oololaiser Dairy Coop Society (in Ngong) and one on fresh produce marketing namely Musa Fresh Produce Marketing Cooperative Society which has had managements problems. They are limited to marketing but not issuance of credits or inputs (District Cooperative Officer, 2010).

2.3.3 Market Access and Products Development

Although the marketing system exists in Kenya, the marketing channels are un-streamlined. The un-streamlined marketing channels and the exploitation of farmers by middlemen/exporters have negatively affected livestock farming and livestock product marketing. Kajiado County has not been exceptional. Consequently, there is urgent need to streamline the marketing channels and improve the marketing system. In this regard, development initiatives like *NMK* should support the construction of infrastructure for trade (market yards), sensitize on importance of formation of livestock marketing cooperatives and crops marketing common interests groups and collaborate with other stakeholders who can be encouraged in purchase of machinery and equipment and upgrading of the means of transport. This would boost the streamlining of marketing channels as farmers would have easy access to markets (MoA, 2008).

2.3.4 Credit and Inputs

Lack of access to credit by farmers has been identified as a major constraining factor despite the fact that Kenya has a relatively well developed financial system. Risks associated with farming business, coupled with complicated land laws and tenure systems that limit the use of land as collateral, makes financing of agriculture by the formal banking industry relatively unattractive. On the whole, banks in Kenya still charge very high interest rates despite the large number of credit providers in the country (Wangui, 2005). In Kajiado the financial institutions are Agricultural Finance Corporation, K-Rep bank, and Equity Bank. Most farmers are land tenants and hence unable to access credit due to lack of collateral. The pastoralists too cannot access the credit because the individual title deed has not been issued to many (District Agricultural Officer, 2011).

The major inputs in agriculture are seeds, fertilizer, pesticides and farm machinery. However, the price of inputs, particularly fertilizers has escalated beyond the reach of farmers. This has a negative impact on the overall productivity. There is still untapped potential for increasing the use of improved technology such as seeds and fertilizers (MoA, 2006). In Kajiado County the farming areas includes the high rainfall areas of Loitokitok District on the slopes of Mt Kilimanjaro, slopes of Ngong Hills and Ngurumani irrigation scheme in Magadi Division. Other areas are small pockets dispersed in the rest of the county which includes Meto, Enkorika, Sajiloni, Poka, and Ildarmat, among others (District Agricultural Officer, 2011).

2.3.5 Disease and Pest Control

A number of crop pests and diseases have continued to reduce the potential of farmers' crop yields. Some pests like locusts, army worms and *quelea* birds are controlled by the state through Ministry of Agriculture. Other pests and diseases are controlled on farm by farmers themselves. However, pest and disease control still poses a major challenge to most farmers and especially small and medium scale. This is due to the high costs of pesticides and control equipment. Up to 40 percent post-harvest losses are due to lack of appropriate storage facilities and poor handling services. Some post-harvest disease pathogens like *afflatoxins* have been reported with catastrophic deaths among consumers in some parts of the country (Mwaniki, 2005). The problem is quite significant; especially in the crops growing areas and more severe in the horticultural crops in the irrigation schemes in Loitokitok and Ngurumani. Due to the high cost of acaricides and other animal medications the pastoralists in the county continues to use herbs with little success and hence low returns (District Livestock Production Officer, 2009).

2.3.6 Agricultural Extension

The agricultural sector extension service plays a vital role in sharing of knowledge, technologies, agricultural information and also linking the farmer to other actors in the economy. Kenya's agricultural extension, training and information system has its own challenges, which include the need for a regulatory system to coordinate the players. Coordination and regulation are required to promote professionalism, and reduce

unnecessary competition. It further helps to reduce dissemination of conflicting extension messages to clients, duplication of efforts and wastage of resources. The high farmer extension staff ratio is the other challenge facing provision of extension services to the farmers which currently stands at 1:1200 (MoA, 2008). In the Kajiado County, effort for coordination of all the extension service providers has been by the Ministries of Agriculture and MoLP through NALEP though with a lot of challenges. The staff farmer ratio stands at 1:1400, which makes the coverage a big challenge (DAO, 2011).

Through NMK, the Kajiado the NMK funded groups are assisted with extension service through a facilitator from the line ministries. The extension services are given to the farmers based on their request.

2.4 Indicators of Food Security

Food security is multi-dimensional having interrelationships with vulnerability indicators; it cannot be captured by any single or specific indicator. Food security may be defined as access by all people at all times to sufficient food for a healthy and productive life. This definitional framework implies the four major elements that constitute food security. These are availability, adequacy, accessibility and sustainability of the access. Availability connotes the physical presence of food in large amounts. It is the availability of sufficient quantities of food of appropriate qualities, supplied through domestic production or imports (including food aid). Accessibility suggests sufficient purchasing power or ability to acquire quality food at all times while utilization demands sufficient quantity and quality of food intake. The elements of availability, accessibility, utilization and sustainability in a larger context embrace the supply, demand and adequacy of food at all times. The interactions and combinations of these dimensions represent food security together (Mwaniki, 2006). This study will primarily focus on food availability and accessibility. They are deemed the key indicators of household food security in Kenya.

2.5 Strategies Adopted by NMK to Enhance Food Security in Kajiado County

Effective action against hunger and poverty has been impeded by a lack of political support to tackle the problem and, consequently, to provide the required resources. However, following the adoption of the Millennium Declaration, the formulation of the Millennium Development Goals (MDGs) and their reaffirmation at the Monterrey Summit in 2002, there are now encouraging signs of a strengthening of resolve to fight poverty and hunger (MoA, 2006).

2.5.1 Agricultural Productivity Interventions

Through the *NMK* initiative, the main areas of intervention has been to focus on increasing agricultural productivity which includes enabling group members to purchase modern technology to advance in their area of production, purchase of new hybrid varieties both in animal and crop production. The various groups in the country have accrued many benefits some of which include increase in yield for either crops or animal products and increase in volume or production area under animal or crop production. In addition, the groups generate income from the sale of products they specialize in (MoA, 2006).

2.5.2 Community Driven Agricultural Development Initiative

Njaa Marufuku Kenya (NMK) supports community driven agricultural development initiatives targeting the extremely poor and vulnerable groups in the communities. Interventions are geared towards increased agricultural productivity, food utilization, agro-processing and value-addition, health and nutrition improvement, water harvesting and conservation of the natural resource base to ensure sustainability of the current production systems (MoA, 2008). The overall objective of the programme is to contribute to reduction of poverty, hunger and food insecurity among poor and vulnerable communities in Kenya by 2015. The strategic objectives include: to enhance community driven food security initiatives through support to resource poor and vulnerable communities; to improve the health and nutrition status of vulnerable groups (pregnant and lactating mothers, children under five and school-going children); to promote participation of private sector in innovative food security and livelihoods initiatives; to

strengthen management and coordination of *NMK* programme through strengthening organizational structures, linkages and collaboration with stakeholders (MoA, 2006).

The groups are allowed to decide the sector to base their projects. The group specifically engage in either crop or animals production. Animal farming include steer fattening, dairy goats rearing, poultry farming, goat production. Those that are involved in crop production engage in activities like Tissue Culture Banana farming, mango, fruits and vegetables cultivation, tree nursery and fodder conservation among others. Bee keeping is also a major economic activity engaged in by a number of the *NMK* funded groups (MoA, 2006).

Through *NMK* funding the area residents can look into small industries that process food crops for value addition and/or enhancing shelf life through preservation techniques. They can also venture into production of small scale processing machinery; contract processing facilities; and market facilitation. Specific activities may include the production of items with enhanced shelf life that would allow for marketing in distant markets. These products may range from dairy products such as butter, cheese and ghee, to pre-processed and packaged cut vegetables such as carrots and shelled garden peas for the urban population; to dried fruits and vegetables. *NMK* helps the targeted beneficiaries to make products, such as starch and vegetable oils. To achieve this, there is need for collaboration amongst the all the stakeholders (Kimani, 2006).

2.5.3 Farmer Training

Continuous learning and continuous improvement are important management tools that increase efficiency of long-term sustainability of Public Private Partnership (PPP). In this regard, *NMK* adopted a systems approach in which the whole PPP is seen as a system comprising various actors who all need to work efficiently to ensure the eventual efficiency of the PPP. The system inculcates continuous learning and improvement. This has made the farmers to remain up to date in the technology applications they use (MoA, 2006).

The ultimate threshold of helping the needy is in their empowerment to fully own the interventions championed by external actors like in the case of *NMK*. To actualize beneficiaries' training, *NMK* adopted four strategies. The strategies included; clear definition and identification of the real target beneficiaries and capacity building through training and exposure to latest research technologies through effective research-extension-farmer-private sector liaison arrangements. It also included; devolution of resources from public offices to be managed directly by the beneficiaries and participatory monitoring and evaluation (M & E) systems involving the members of the beneficiaries through delegated decision-making (GoK, 2005).

2.6 Theoretical Framework

The study adopts the theory of modernization. According to Bradshaw, York W. & Michael W. (1996), modernization theory is a theory of change. It not only stresses the process of change, but also the response to that change. It looks at internal dynamics referring to social and cultural structure and the adaptation of new technologies. The modernization theorists argue that the poverty and backwardness of the third world is the failure of these societies to kindle sparks of creativity. On the other hand, the developed countries are based on research and development motivated by the goal of efficiency. They are driven by the search for profit and wealth, as people take risks to do things in a new and better way in the hope of improving their lot. The modern world is committed to growth and improvement (Bradshaw *et al* 1996).

Economic development of an underdeveloped people by themselves is not compatible with the maintenance of their traditional customs. A break with the latter is a prerequisite to economic progress. Thus *NMK* is modeled against this theory as it seeks to drive the beneficiaries to break from traditional practices that hinder food production and adopt modern technology to enhance their household food security.

The study is also based on participatory program planning model. Participatory program planning model is a planning paradigm that emphasizes involving the entire community in the strategic and management processes of planning or, community-level planning processes, urban or rural. It is often considered as part of community development

(Lefevre *et al* , 2000). With regard to rural development, participation includes people's involvement in decision making process, implementing programs, sharing in the benefits of development programs, and their involvement in efforts to evaluate such programs. *NMK* borrows heavily from this model as it is a community driven agricultural development initiative. The extension staff takes advisory role.

2.7 Conceptual Framework

The dependent variable in this study was food security which was measured by determining the *NMK* funded groups' self-perceived level of household food availability and accessibility. Household food availability was measured by checking the increase in production (area under production and yield). Household food accessibility was measured by looking at the improved income generated (money generated from sale of farm produce). Food security aggregate score/index was measured by calculating the average of the amount of income a household got from the sale of farm produce and the value of farm produce consumed by the household.

This self-perceived household food availability and accessibility is influenced by several factors (agricultural productivity interventions, training and community driven agricultural development initiatives) that constituted the independent variables. Agricultural productivity interventions were measured by assessing whether the technologies/inputs were purchased, and the proportion of funds that were used to purchase the technologies/inputs and the extent to which the technologies/inputs were utilised. On the other hand, community driven agricultural development initiatives was measured by determining the level of community participation in the implementation of the project. Training was measured by determining whether trainings were conducted and their relevance to the community.

The intervening variables, which according to Kothari (2004) are independent variables that are not related to the purpose of the study but can have an effect on the dependent variable. In this study the intervening variables included gender, infrastructure and marketing channels and government policies. The intervening variables were controlled through randomization to ensure that they did not influence the dependent variable.

Independent variables

Intervening variables

Dependent variables

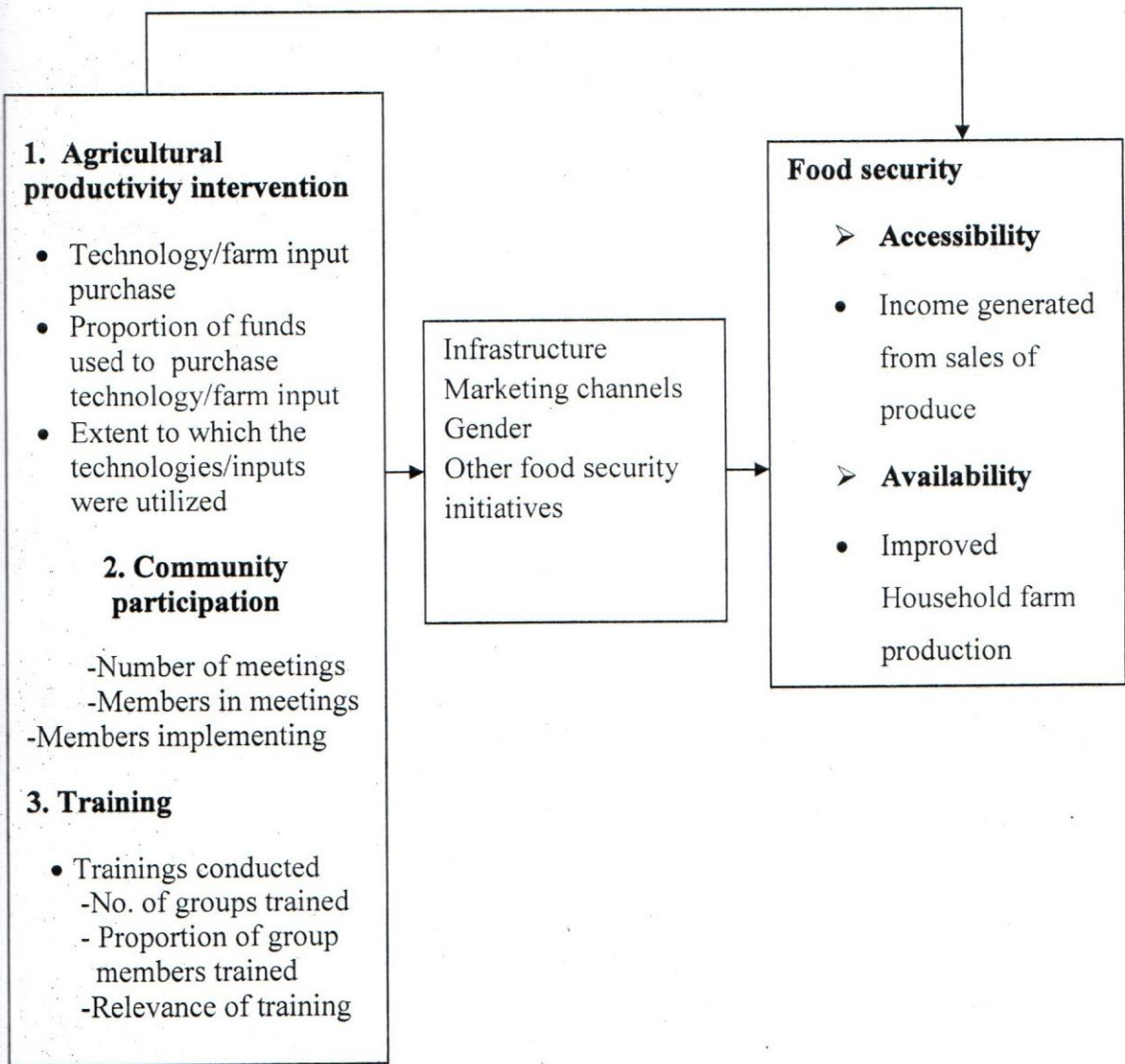


Figure 1. Conceptual framework on the relationship between Njaa Marufuku Kenya intervention and food security in Kajiado County

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter presents the research design, location of the study, target population, sample size, sampling procedure and techniques. A research instrument and validation of research instrument is also explained in this chapter. Data collection procedure, processing, analysis and presentation are also elaborated in this chapter.

3.2 Research Design

The study used a descriptive research design. Mugenda and Mugenda, (2008) state that the descriptive design is a method, which enables the researcher to summarize and organize data in an effective and meaningful way. The design was deemed suitable since it helped to describe the state of affairs as they exist without manipulation of variables (Kothari, 2004).

3.3 Location of the Study

Kajiado County is situated in the Rift Valley Province of Kenya. It borders Narok and Kiambu Counties to the West Nairobi and Machakos Counties to the North, Makueni and Taita Taveta Counties to the East and Tanzania to the South. It has five administrative districts namely Kajiado Central, Kajiado North, Loitokitok, Isinya and Mashuru. The Population is 767,338 persons with 103,190 farm families and occupies an area of 21,902km square. The County has six livelihood zones namely; pastoral, agro-pastoral, mixed cropping (maize, beans, tomatoes), formal employment (casual waged labour and business), mixed farming and leasing/pastoral. The single most important livelihood in the County is pastoral farming which is practiced by about 39 percent of the population engaging in it. The county experiences bimodal rainfall pattern with average annual rainfall of 400mm around Lake Amboseli and Magadi, and 1,250mm on the slopes of Mt. Kilimanjaro and Ngong hills (Drought Management Officer, 2011).

Kajiado County was selected for the study as it experiences persistent drought where most of the land is non-arable (92%), while only 8% supports farming. NMK is being implemented in this county with the aim of enhancing agricultural activities to eradicate the high level of poverty, hunger and food insecurity (Kajiado District Development Plan, 2008-2012). In addition, in Kajiado County there are already existing NMK funded groups which have been functional for several years who would give credible information on the relationship between NMK intervention and food security.

3.4 Target Population

According to Kothari (2004), a population is a well-defined set of people, services, elements, events, group of things or households that are being investigated. Mugenda and Mugenda (2008), explain that the target population should have some observable characteristics, to which the researcher intends to generalize the results of the study. This definition assumes that the population is not homogeneous. The population of the study was the NMK funded groups in Kajiado County. Currently, there are 33 grant funded community groups under NMK programme. The target population of this study was the officials of NMK funded groups in Kajiado County. Each of the NMK funded group have three officials namely; the chairperson, secretary and the treasurer. The study also sought information from ten key informants from the relevant government line ministries.

3.5 Sampling Procedure and Sample Size

Stratified random sampling procedure was used to select the sample. This was because the technique produces estimates of overall population parameters with great precision (Shuttleworth, 2009). The researcher grouped the population into three strata, which included; animal production, crop farming; and bee keeping. From the population of 33 NMK funded groups, the researcher used simple random sampling to proportionately select 24 NMK funded groups, which was 72.7 percent of the population. From each of the 24 NMK funded groups, three officials participated in the study. This gave the study a sample size of 72 respondents. This is in conformity with Mugenda and Mugenda (2008) who postulated that at least 10 percent of the accessible target population is appropriate

for statistical reporting. It is also in conformity with Krejcie, Robert, Morgan, Daryle (1970) table of determining the sample size from a given population.

The ten key informants were selected using purposive sampling technique. In this method, the researcher purposively targets a group of people believed to be reliable for the study (Denscombe, 2008). The key informants were sampled from the relevant line ministries which included the MoA, MoLD and Ministry of Cooperative Development.

Table 1

Sampling Frame for the NMK Funded Group Officials (targeted n=72 i.e. 3 Officials per Group for 24 Groups)

Stratum	Target population (groups)	Sample size(groups)	Percentage
Crop production	10	7	72.7
Bee keeping	6	4	72.7
Animal production	17	13	72.7
Total	33	24	72.7

3.6 Instrumentation

Two primary data collection instruments were used during the study; a questionnaire and an interview guide. The reason for choosing questionnaire and interview guide as the data collection instruments was primarily due to their practicability, applicability to the research problem and the size of the population. Both are also cost effective (Denscombe, 2008). A self-administered questionnaire with both open and closed ended questions were developed and administered to obtain information from the 72 respondents. On the other hand the interview guide was used to obtain data from the key informants. The key informants were drawn from the relevant government line ministries officers in the county. The questionnaire had two major sections. The first part sought background information of the respondents while the other part had questions based on the study questions. The questionnaire had both open and closed ended questions. The structured questions were used in an effort to conserve time and money as well as to facilitate in

easier analysis as they are in immediate usable form; while the unstructured questions were used to encourage the respondent to give an in-depth and felt response without feeling held back in revealing of any information.

3.6.1 Validity

Validity indicates the degree to which an instrument measures what it is supposed to measure; the accuracy, soundness and effectiveness with which an instrument measures what it is intended to measure (Kothari, 2004) or the degree to which results obtained from the analysis of the data actually represent the phenomena under study (Mugenda & Mugenda, 2008). The research instrument was availed to the lecturers in the Department of Agricultural Education and Extension at Egerton University, and peers who established its content and construct validity to ensure that the items were adequately representative of the subject area to be studied.

3.6.2 Reliability

Reliability is a measure of the degree to which a research instrument yields consistent results after repeated trials (Nsubuga, 2000). The researcher carried out a pilot study among 5 NMK funded groups in the County where 15 group officials participated. The pilot study was conducted among the groups that would not participate in the main study. The reliability of the instrument was estimated using Cronbach's Alpha Coefficient which is a measure of internal coefficient. A reliability coefficient of 0.83 was achieved; an indication that there was consistency among the items in measuring the concept of interest (Frankell & Wallen, 2000; Mugenda & Mugenda, 2008). The instrument was therefore accepted since the reliability coefficient was more than 0.70, but the suggestions made by the respondents on words and phrases that were not clear were incorporated in the final instrument.

3.7 Data Collection Procedure

Data was collected through a self-administered questionnaire for the group officials and an interview guide for the key informants. The researcher obtained approval from Egerton University Graduate School and a permit from the National Council for Science and Technology to conduct the study. The researcher explained the purpose of the study

and offered guidance to the respondents on the way to fill in the questionnaire before administering the questionnaire. For those respondents with difficulties in reading and filling in, the researcher interviewed and filled in the information in the questionnaire for them.

3.8 Data Analysis

Data analysis is the whole process which starts immediately after data collection and ends at the point of interpretation and processing data (Kothari, 2004). The statistical package for social sciences (SPSS) was used; whereby frequencies, percentages, mean and standard deviations, generated from the various data categories were computed and shown in different graphs, tables and figures. The data on each of the three objectives on the *NMK* interventions (training, agricultural productivity interventions and community driven agricultural development initiative) were tested using chi-square and interpreted at $\alpha = 0.05$ significance level. Chi-square (χ^2) is the statistical test used to determine if categorical data shows dependency or if the two classifications are independent (Kothari, 2004).

Table 2**Summary of Data Analysis**

Hypothesis	Independent Variable	Dependent Variable	Statistical Test
Ho ₁ . There is no statistically significant relationship between agricultural productivity interventions by <i>NMK</i> and food security in Kajiado County.	Agricultural productivity interventions (Farm inputs)	Food Security	Chi-square
Ho ₂ . There is no statistically significant relationship between community participation by <i>NMK</i> and food security in Kajiado County.	Community participation	Food Security	Chi-square
Ho ₃ . There is no statistically significant relationship between training by <i>NMK</i> and food security in Kajiado County.	Training	Food Security	Chi-square

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results that were obtained on the relationship between *Njaa Marufuku Kenya* intervention and food security in Kajiado County. The chapter is based on the following objectives: to identify the relationship between farmer training, community driven agricultural development initiatives and agricultural productivity interventions by NMK and food security in Kajiado County.

The research was conducted on a sample of 72 NMK funded groups officials. However, out of the issued questionnaires, only 70 were returned duly filled making a response rate of 97.2 percent. This percentage was adequate for statistical reporting. Mugenda and Mugenda (2008) recommended a response rate of 50% and above as for data analysis. The chapter gives the results on the general information of the NMK funded groups. It also gives the results of the study based on each objective.

4.2 Overview of NMK Funded Groups

The study sought to establish the information on the NMK funded groups, duration of operations, the projects area of specialization and the kind of project that the NMK funded groups engaged in. This point at the respondents' suitability in answering the questions related to the relationship between *Njaa Marufuku Kenya* intervention and food security in Kajiado County.

4.2.1 Years NMK funded groups have been in operation

The respondents were asked to indicate the length of time that their NMK funded groups had been operational. The study findings are illustrated in Figure 2. The findings indicated that majority (71.4%) of the NMK funded groups had been operational for 1-5 years. The findings indicate that majority of the NMK funded groups had been operating for periods long enough to be conversant with the relationship between *Njaa Marufuku Kenya* intervention and food security in Kajiado County. The majority of the NMK funded groups had operated for more than a year and therefore they had utilized the yearly grants from NMK and could articulate the benefits of NMK.

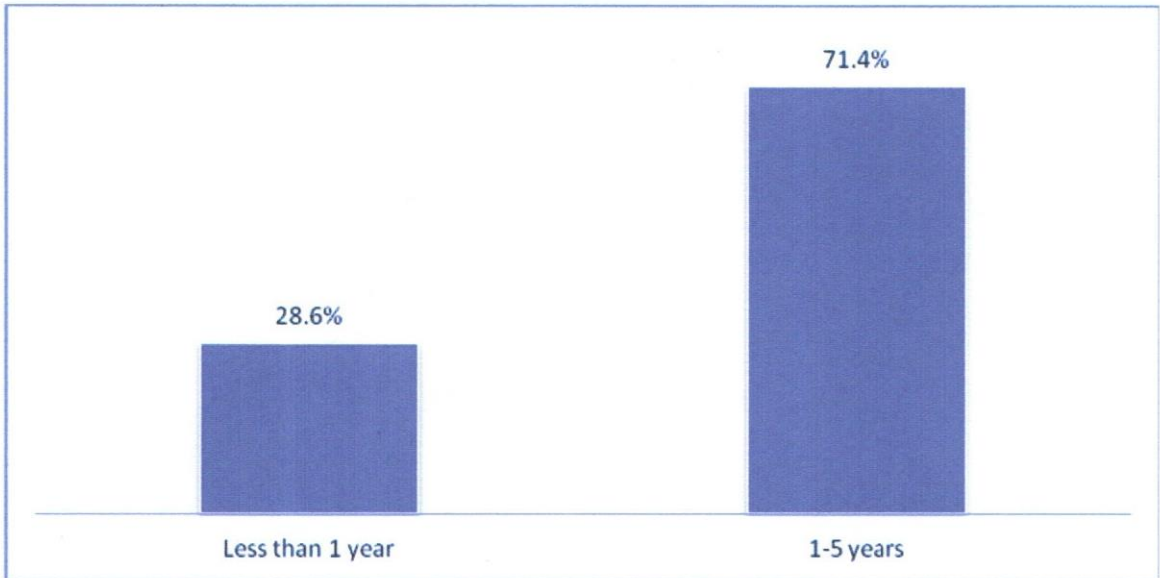


Figure 2. Number of years that the NMK funded groups had been operational (n=70)

4.2.2 Years key informants worked in Kajiado County

The study sought to establish the reliability of the information given by the key informants by inquiring on the number of years that the key informants had worked in Kajiado County. The results were as indicated in Figure 3. Majority of the key informants (50%) had worked in Kajiado County for 10 – 20 years, 40% for over 20 years while a small proportion (10%) of the respondents had worked in the County for less than 10 years. This depicts that the majority of the key informants gave accurate and reliable information on the relationship between *NMK* and food security owing to their many years of experience while working in Kajiado County.

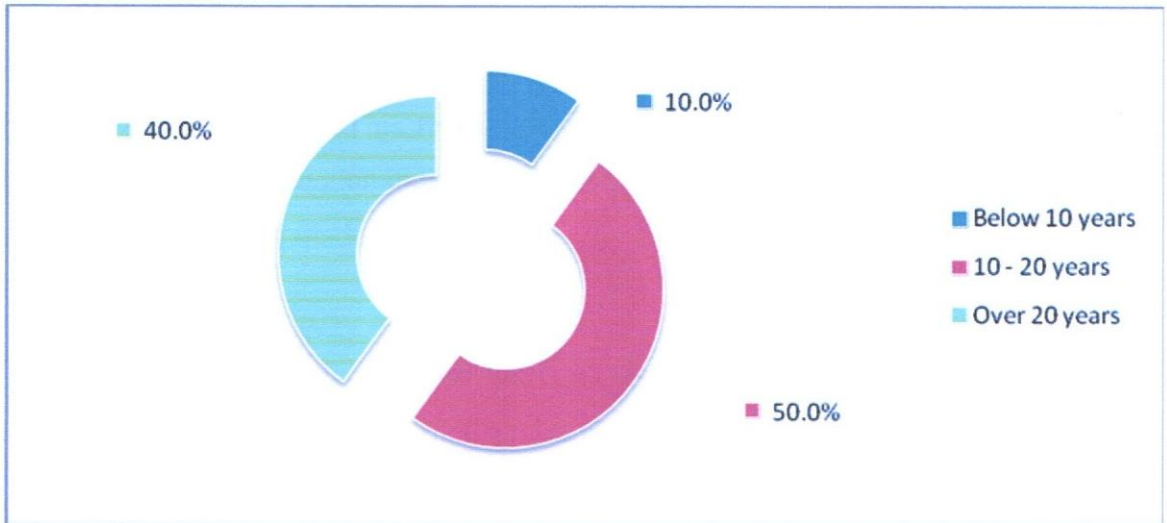


Figure 3. Number of years that the key informants had worked in Kajiado County (10 informants)

4.2.3 Areas that NMK Projects are Based

In order to understand the NMK funded groups' project nature, the respondents were asked to indicate the areas in agriculture that the group based their project. Figure 4 indicates an analysis of NMK funded groups' project nature.

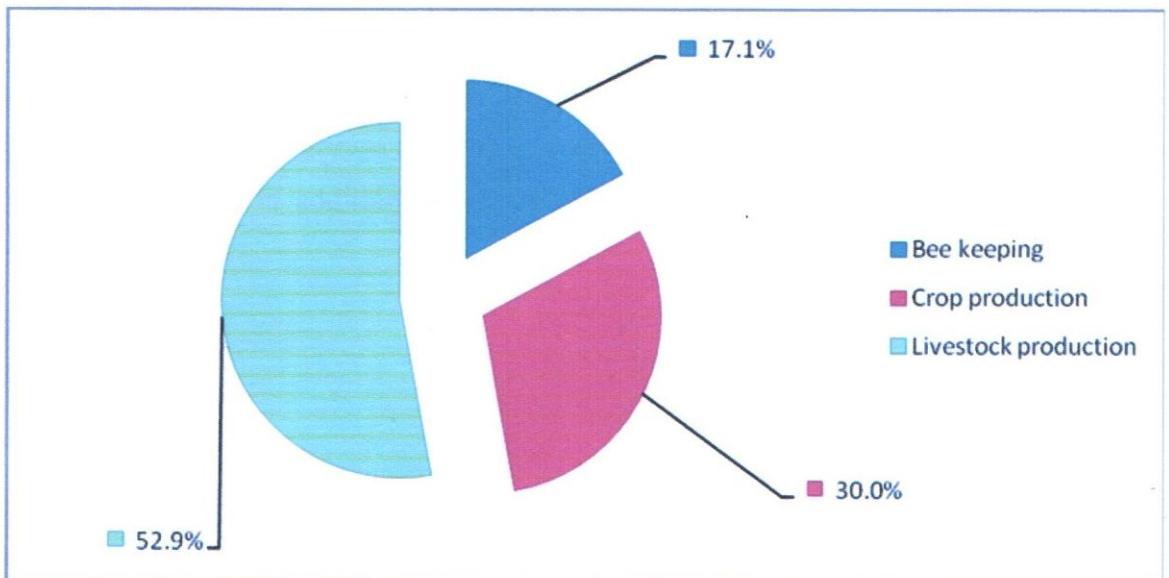


Figure 4. Areas that NMK projects are based (n=70)

According to Figure 4, 52.9% of the respondents indicated that their group projects were based in livestock production, 30% were based in crop production while 17.1% were involved in bee keeping. This reveals that majority of the NMK funded groups were based in livestock production indicating that NMK grants had helped them to improve on livestock farming in Kajiado County.

4.3 Training

The first objective was to establish the relationship between farmer training and food security in Kajiado County. The findings are presented in the following subsections.

4.3.1 NMK Group training

The respondents were asked whether the group members were trained before implementation of their respective projects. Figure 5 illustrates the findings. The majority (71.4%) of the respondents agreed that the group members were trained before implementation of their respective project. All the key informants interviewed agreed that NMK group members are trained as they implement their project. The findings therefore indicate that training enhances food security as the skills the members were equipped with, helped them in executing their respective projects. According to NMK (2007), most of the poor communities are entrapped in a poverty cycle; no amount of training, awareness and outreach efforts will help them until they are given some initial capital to empower them and help break the poverty cycle. However, to be assisted meaningfully, the poor need to be in groups who are able to articulate their needs and common interest activities/projects. In addition, they require continuous learning and adoption of new technologies.

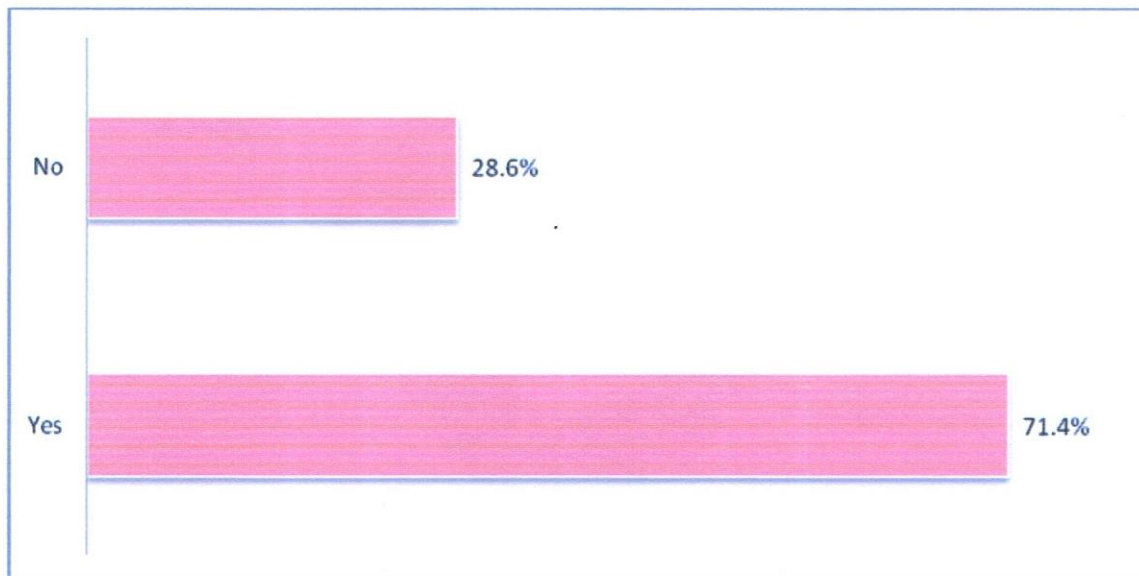


Figure 5. NMK group members training before implementation of their respective project (n=70)

4.3.2 Relevance of the Training to the Project Implemented

The respondents were asked to indicate whether the training they received was relevant to the project being implemented. The findings are indicated in Figure 6. The respondents reported that the training offered to NMK funded groups was relevant to the respective project they are implementing as indicated by 74.3% of the respondents. This finding implied that the relevance of the training offered to NMK funded groups is an important consideration when seeking to eradicate food insecurity using NMK intervention. According to MoA, (2006) the capacity building through training and exposure to latest technologies through NMK has made the farmers to remain up to date in the technology applications they use.



Figure 6. Relevance of the training to the project implemented (n=70)

4.3.3 Proportion of group members trained

The NMK officials were asked to give the proportion of group members that were trained in their respective NMK funded groups. From the study findings in Figure 7, most of the respondents (42.9%) agreed that 25-50% members of their respective NMK funded groups received training, 27.1% indicated that less than 25% of the group members were trained while, 15.7% of the respondent posited that 51-75% of the group members received training. The findings illustrates that the training that the members of NMK funded groups received was insufficient as only small proportion of the members received training regarding the projects they were involved in.

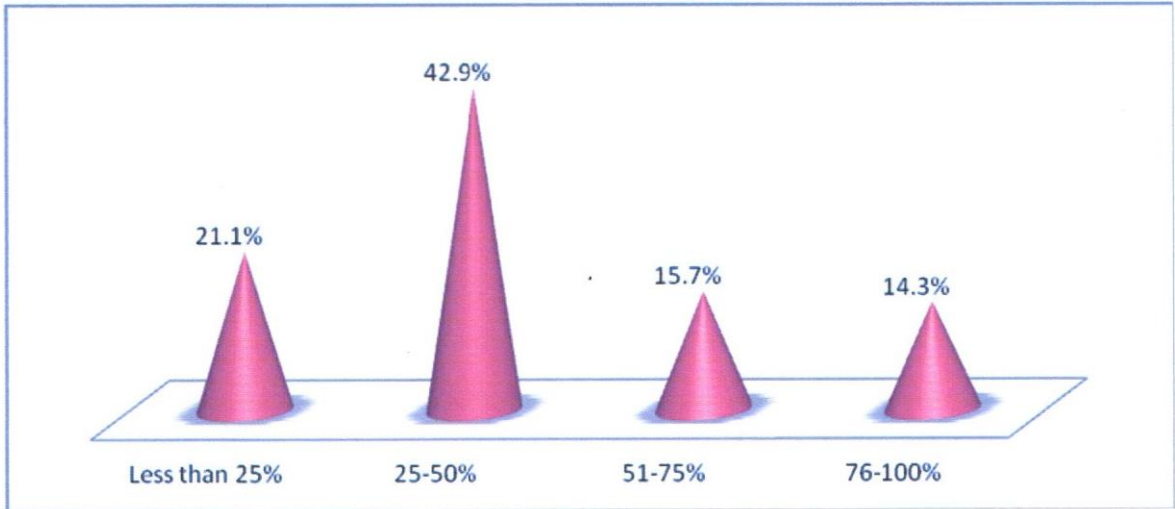


Figure 7. Percentage of group members trained (n=70)

4.3.4 Type of Training Provided for NMK Groups

From the interview with the key informants, the research established that NMK funded groups were trained in crop and animal husbandry for both indigenous and modern animals and crops, agribusiness and marketing of products, bee keeping, irrigation and poultry. In addition, the key informants agreed that NMK funded groups spent between 20-30% of the total funds granted on capacity building. The findings are corroborated by a survey by GOK, (2005) which established that the NMK funded projects include small-scale irrigation, production of high value and drought tolerant crops, animal production, agricultural produce value addition and marketing, water harvesting and environmental conservation, bee keeping, and HIV/AIDs management projects (GOK, 2005). The findings also support earlier findings that the groups are allowed to decide the sector to base their projects. The group specifically engage in either crop or animals production. Animal farming include steer fattening, dairy goats rearing, poultry farming, goat production. Those that are involved in crop production engage in activities like Tissue Culture Banana farming, mango, fruits and vegetables cultivation, tree nursery and fodder conservation among others. A number of NMK funded groups engaged in bee keeping as a major economic activity (NMK, 2007).

4.3.5 Relationship of Training and Food Security

In order to further assess the relationship between training and food security of NMK, the respondents were requested to indicate their level of agreement on the extent to which a number of relevant statements on training are reflected in the implementation of NMK projects. The responses were rated on a five point Likert scale where: 1 - Strongly Disagree 2 - Disagree 3 - Neutral 4- Agree and 5- Strongly Agree. The mean and standard deviations were generated from SPSS and are as illustrated in Table 2. The statements with mean close to 1 were rated as strongly disagree, 2 disagree, 3 neutral, 4 agree and 5 strongly agree. From the study findings, the majority of the respondents agreed that through *NMK* they had received training on how to reduce poverty (capacity building) (M=4.39); local residents were empowered to fully exploit the available resources (M=4.26); they had been empowered to fully own the projects to eradicate poverty and increase food security (M=4.12) and that devolution of resources from public offices to be managed directly by the beneficiaries (M=4.13) respectively.

The findings are in support of the fact that the ultimate threshold of helping the needy is in their empowerment to fully own the interventions championed by external actors like in the case of NMK. To actualize beneficiaries' empowerment, NMK adopted four strategies: Clear definition and identification of the real target beneficiaries, capacity building through training and exposure to latest research technologies through effective research-extension-farmer-private sector liaison arrangements, devolution of resources from public offices to be managed directly by the beneficiaries and participatory M and E systems involving the members of the beneficiaries and delegated decision-making (GOK, 2005).

Table 3***Statements on Training through NMK (n=70)***

Training through NMK	Mean	Std Dev
Through <i>NMK</i> we have received training on how to reduce poverty (capacity building)	4.39	0.88
Local residents are empowered to fully exploit the available resources	4.26	0.88
Devolution of resources from public offices to be managed directly by the beneficiaries	4.12	0.15
We have been empowered to fully own the projects to eradicate poverty and increase food security	4.13	0.79

4.4 Community Driven Agricultural Development Initiatives

The second objective of the study was to establish the relationship between community-driven agricultural development initiatives and food security in Kajiado County. The findings were as follows:

4.4.1 Involvement of NMK group members in their projects formulation

The respondents were asked whether the group members were involved in deciding the kind of activity on which to base projects. Figure 8 illustrates the findings. From the findings, the majority of the respondents (62.9%) agreed that group members were involved in deciding the kind of activity to base projects. This finding depicts that there was community participation in the implementation of NMK. The findings are in line with MOA (2006), which indicates that groups are allowed to decide the sector to base their projects where some group specifically engage in either crop or animals production.

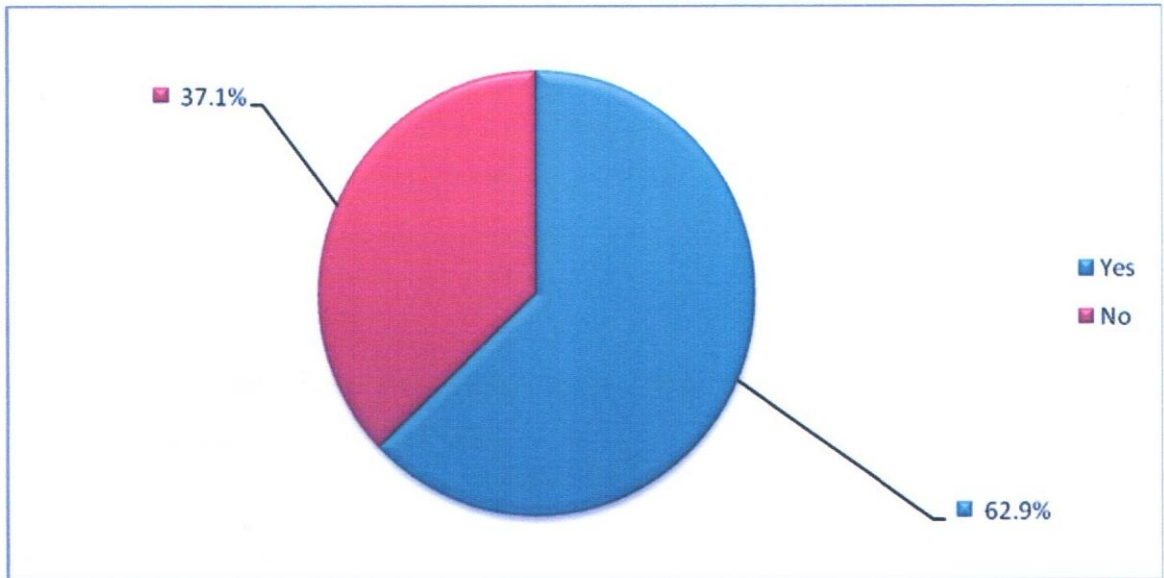


Figure 8. Involvement of NMK group members in their projects activities (n=70)

4.4.2 Community participation

In order to further assess the relationship between community-driven agricultural development initiatives and food security, the respondents were requested to indicate their level of agreement on the extent to which a number of relevant statements on community participation are reflected at the implementation of their NMK funded projects. The responses were rated on a five point Likert scale where: 1 - Strongly Disagree; 2 - Disagree; 3 - Neutral; 4- Agree; and 5- Strongly Agree. The mean and standard deviations were calculated from SPSS and are as illustrated in Table 3. From the findings, the majority of the respondents agreed that there are regular meetings for the group members to give their input about the project progress and improvement (M=4.23) and that the group members were involved in decision making in the running of their project (M=4.15). However, the respondents disagreed to the statements that they involved the group members in the formulation of project proposals (M=2.23) and that the benefits are shared equitably among the members of the group (M=1.23). The study findings imply the community participated in the implementation of NMK funded projects to eradicate food insecurity. The member attending regular meetings about the project progress and improvement and being involved in decision making in the running

of the project would enhance project ownership by the group members. It would also make the project sustainable as group members play their role in project implementation in various phases as they also give their ideas on ways to improve the projects. The findings are in line with Kimani, (2006) who established that for the success of farmers' projects, there is need for collaboration amongst all stakeholders.

Table 4

Statements on the Level of Community Participation in the Planning and Implementation of the Project (n=70)

	Mean	Std Dev
The benefits are shared equitably among the members of the group	1.23	0.12
There are regular meetings for the group members to give their input about the project progress and improvement.	4.23	0.71
We involve the group members in decision making in the running of the project.	4.15	0.97
We involved the group members in the formulation of project proposals.	2.23	0.12

4.4.3 Benefits of NMK programme initiatives to the area residents

The researcher inquired from the key informants on whether NMK programme initiatives have benefited the area residents. According to the findings, all the key informants (100%) unanimously indicated that NMK programme have benefited the NMK group members in Kajiado County through all the three NMK interventions. This illustrates that NMK intervention had a positive contribution to food security in Kajiado County. The benefits derived from the NMK by the Kajiado County residents were training on animal breed upgrading especially dairy goats farming, increased household income and increased unity through teamwork spirit in the NMK groups enhancing opportunity for upcoming of other projects. They also indicated that there is cohesion in self-help groups and accountability and that the county residents got training on diversification of IGAs. The findings support the MoA (2008) that the NMK interventions are geared towards

increased agricultural productivity, food utilization, agro-processing and value-addition, health and nutrition improvement, water harvesting and conservation of the natural resource base to ensure sustainability of the current production systems.

4.4.4 Ways in Which Kajiado County residents benefited from NMK projects

The key informants were further interviewed on ways that the Kajiado County residents have benefited from involvement in NMK projects. From the interviews, the study identified that the County residents were trained on animal upgrading especially dairy goats rearing, they increased household income and that there was increased community unity enhancing opportunity for upcoming of other projects. They also indicated that there is cohesion in self-help groups and accountability and that the County residents got training on diversification of IGAs.

4.4.5 Ways of community involvement in the implementation of NMK interventions

The researcher also interviewed key informants on ways in which the involvement of community in the implementation of NMK interventions had been useful in the overall implementation of the project. From the interview findings, involvement of community in the implementation of NMK has enabled the community to own up the NMK initiatives enhancing the success rate and sustainability of the NMK initiative. The local community gives their ideas in form of proposal that are funded thus enhancing success rate of group project. In addition, NMK funded groups are linked to financial institution enhancing their access to credit.

4.5 Agricultural productivity interventions through NMK

The third objective of the study was to establish the relationship between agricultural productivity interventions and food security in Kajiado County. The following is a presentation of the study findings.

4.5.1 Purchase of the technologies and inputs

The respondents were asked to indicate whether the groups purchased the technologies/inputs required for the implementation of the project. From the study findings in Figure 9, majority (92.86%) of the respondents indicated that the NMK

funded groups purchased the technologies/inputs required for the implementation of the project. Only 7.14% never purchased the technologies/inputs required for the implementation of the project. The study finding reveals the great importance of NMK cash grants to the respective groups to enable them purchase technologies/inputs required for the implementation of the project.

Percentage of funds used to buy the technologies/inputs

The respondents were further asked to indicate proportion of the total funds granted that they used to purchase the technologies/inputs. Figure 10 shows the study findings. From the findings, the majority of the respondents (57.1%) indicated that they utilized 51-75% of the funds to purchase the technologies/inputs, 20% said that they utilized less than 25% of the funds granted while 12.9% of the respondents indicated that they utilized 76-100% of the funds to purchase the technologies/inputs. The study finding reveals that the highest proportion of the NMK cash grants was used by the NMK groups to purchase the technologies/inputs.

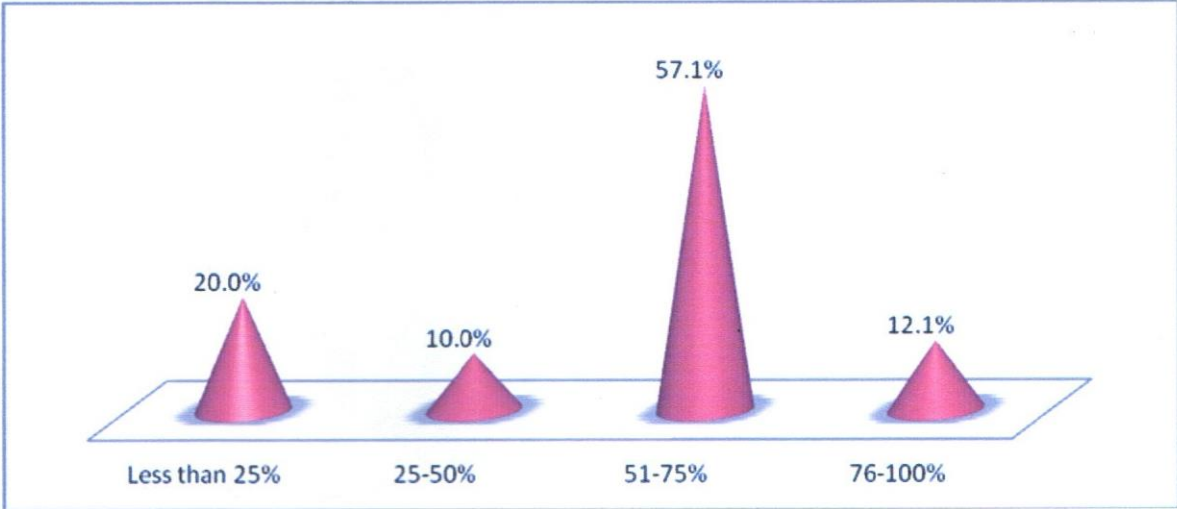


Figure 9. Percentage funds used to purchase technologies/inputs (n=70)

4.5.3 Proportion of purchased technologies/inputs utilized by groups

The study sought to establish the proportion of the purchased technologies/inputs that was utilized by the groups. The study findings are illustrated in Figure 11. The study

findings show that the purchased technologies/inputs were utilized to moderate extent as indicated by most of the respondents (42.1%), 28.9% of the respondents posited that they utilized the purchased technologies/inputs to great extent while 21.05% of the NMK funded groups utilized the purchased technologies/inputs to a low extent. The study findings imply that the NMK funded groups are not fully utilizing the purchased technologies/inputs which hinder them from accruing the maximum benefits from adoption of the new technologies. The findings further support the fact that through the NMK initiative, the main areas of intervention has been to focus on increasing agricultural productivity which includes enabling group members to purchase modern technology to advance in their area of production, purchase of new hybrid varieties both in animal and crop production. The various groups in the country have accrued many benefits some of which include increase in yield for either crops or animal products and increase in volume or production area under animal or crop production. In addition, the groups generate income from the sale of products they specialize in (NMK, 2007).

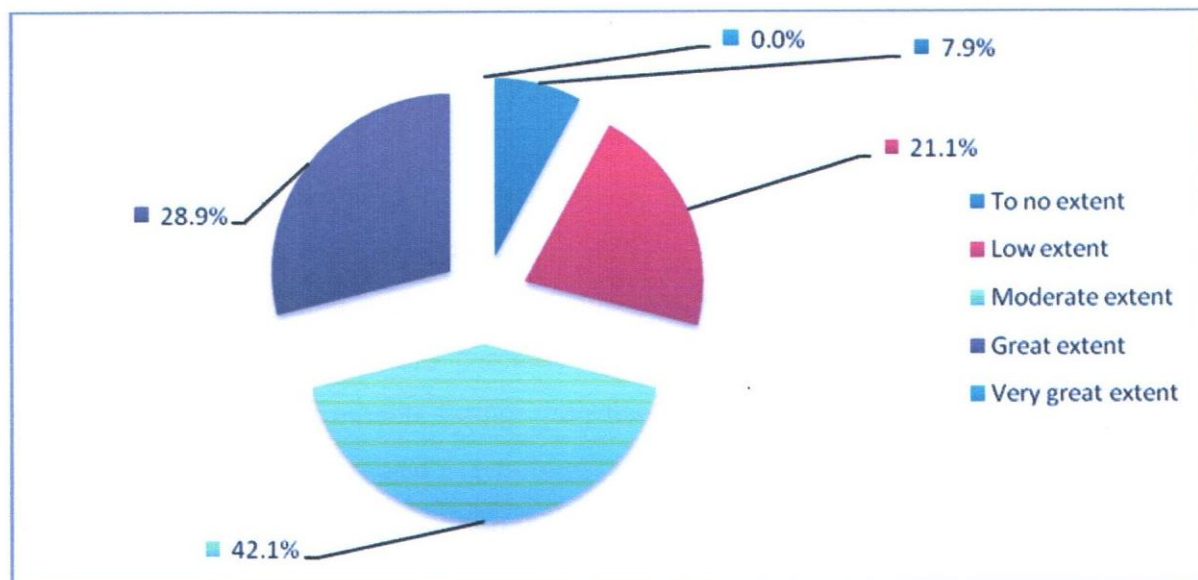


Figure 10. Proportion of purchased technologies/inputs utilized by groups (n=70)

4.5.4 Benefits Derived from NMK Programme

The respondents were requested to indicate their level of agreement on the interventions to improve agricultural productivity and the benefits derived from NMK programme. The responses were rated on a five point Likert scale where: 1- Strongly Disagree 2 - Disagree 3 - Neutral 4- Agree and 5- Strongly Agree. The mean and standard deviations were generated from SPSS and are as illustrated in Table 5. According to the findings, majority of the respondents agreed that groups use new breeds (hybrid breeds) (M=4.39) and purchase of new technology (M=4.09). However majority of the respondents disagreed that from the NMK programme, they derived value addition of the products produced (M=2.43).

On the benefits derived from NMK programme, the majority of the respondents agreed that through NMK there is increase in yield of crops produce (M=4.23), income generated from crops (M=4.03), increase in yield of Livestock produce (M=4.03) and increased area under crop production (M=3.87). However, majority of the respondents expressed moderate view on the statement that the NMK has helped the groups with increased number of livestock (M=3.06) and income generated from sale of Livestock and Livestock produce (M=3.00).

From the interview with the key informants on the kind of technologies/farm inputs purchased to improve on agricultural productivity, they highlighted that NMK funded groups purchase planting materials, pesticides, fertilizers. In addition, they purchase machinery, livestock drugs and purchase improved breeds for both milk and meat production. The key informants further indicated that NMK funded groups utilized 50-80% of the total amount granted to purchase the technologies and inputs. These research findings corroborate with MoA (2006) that, agricultural productivity interventions enable group members to purchase modern technology to advance in their area of production, purchase of new hybrid varieties both in animal and crop production (MoA, 2006).

Table 4***Benefits Derived from NMK Programme (n=70)***

i) Interventions to improve agricultural productivity	Mean	Std Dev
Purchase of new technology	4.09	0.52
Use of new breeds (hybrid breeds)	4.39	0.50
Value addition of the products produced	2.43	0.12
ii) Result of intervention		
Increase in yield of crops produce	4.23	0.93
Increased area under crop production	3.87	0.30
Income generated from crops	4.03	0.21
Increase in yield of Livestock produce	4.03	0.86
Increased number of livestock	3.06	0.20
Income generated from sale of Livestock and Livestock produce	3.00	0.54

4.5.5 Key informants responses on use of technologies to improve Agricultural productivity

The study sought to find out whether the use of technologies in *NMK* projects assisted in improving agricultural productivity. From Figure12, majority of the key informants (80%) attested that the use of technologies in *NMK* projects assisted in improving Agricultural productivity. Only 20% of the respondents indicated that the use of technologies in *NMK* projects never assisted in improving Agricultural productivity.

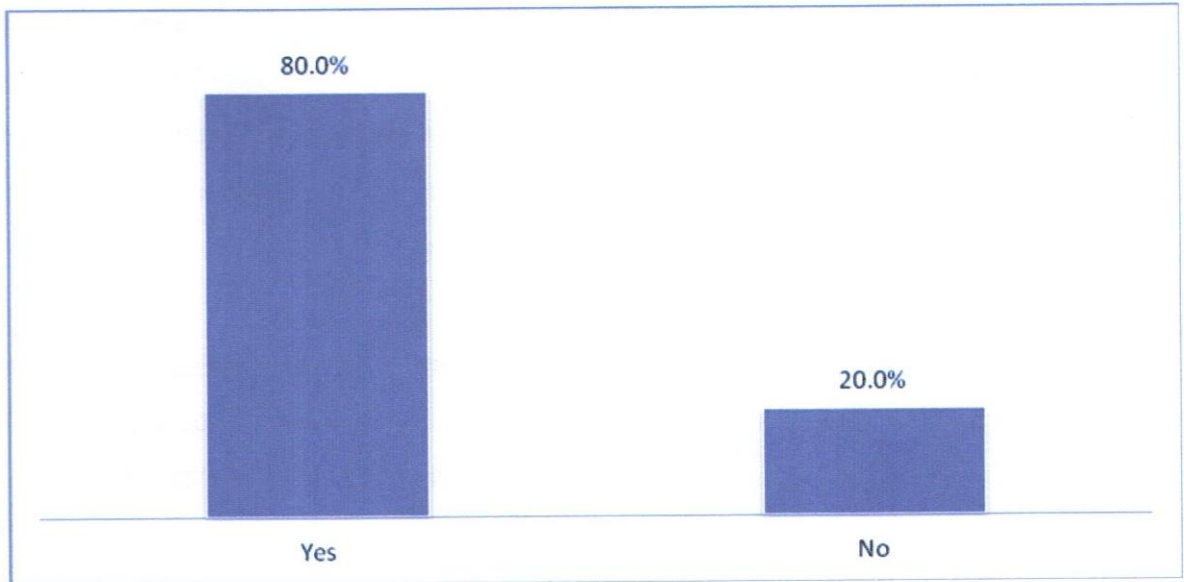


Figure 11. Key informants' responses on use of technologies to improve Agricultural productivity

4.5.6 Ways that NMK contributed to reduction of poverty, hunger and food insecurity

The study required the key informants to state the ways that NMK programme has contributed to reduction of poverty, hunger and food insecurity. From the interview with the key informants the research established that NMK has increased farmers' yields for both subsistence and commercial purposes. The NMK had also increased household income and through the cash grants to NMK groups helped them expand their projects and diversify to other IGAs. According to MoA, (2006) the various groups in the county have accrued many benefits some of which include increase in yield for either crops or animal products and increase in volume or production area under animal or crop production. In addition, the groups generate income from the sale of products they specialize in (MoA, 2006).

4.6 Hypotheses Testing

The study utilized Chi-square test in testing the null hypothesis used in the study. Chi-square is a statistical test commonly used to compare observed data with data we would

expect to obtain according to a specific hypothesis. The chi-square test is always testing the null hypothesis, which states that there is no statistically significant difference between the expected and observed result. Testing of the null hypotheses in this study was based on the fact that if the calculated Chi-square associated p value is greater than $\alpha = 0.05$ confidence level ($p > 0.05$), then we accepted the hypothesis.

4.6.1 Relationship between farmer training and food security

H_{01} . There is no statistically significant relationship between farmer training by the NMK and food security in Kajiado County.

Table 5

Relationship between Farmer Training and Food Security

Chi-Square Tests			
	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	38.322	9	.001
N of Valid Cases	70		

Table 6 shows that the chi-square value is 38.322 with an associated p of 0.001. Since p is less than $\alpha = 0.05$ significance level ($p < 0.05$), the null hypothesis is rejected and therefore farmer training has significant relationship with food security in Kajiado County.

4.6.2 Relationship between community driven agricultural development initiative and food security

The analysis also explored the relationship between community driven agricultural development initiative and food security.

H_{02} . There is no statistically significant relationship between community driven agricultural development initiative and food security in Kajiado County.

Table 6***Relationship between Community Driven Agricultural Development Initiative and Food Security***

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.883	6	.001
N of Valid Cases	70		

Table 7, indicates that the chi-square value is 23.883 with an associated p of 0.001. Since p is less than $\alpha = 0.05$ significance level ($p < 0.05$), the null hypothesis is rejected and therefore community driven agricultural development initiative has significant relationship with food security in Kajiado County.

4.6.3. Relationship between agricultural productivity interventions and food security in Kajiado County

The analysis further looked at the relationship between agricultural productivity interventions and food security. The following illustrates the statistical relationship between them.

H₀₃. There is no statistically significant relationship between agricultural productivity interventions and food security in Kajiado County.

Table 7***Relationship between Agricultural Productivity Interventions and Food Security***

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.883	6	.001
N of Valid Cases	70		

Table 8 shows that the chi-square value is 23.883 with an associated p of 0.01. Since p is less than $\alpha = 0.05$ significance level ($p < 0.05$), the null hypothesis is rejected and therefore agricultural productivity interventions has significant relationship with food security in Kajiado County.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of study, conclusions and recommendations of the study in line with the objectives that were to analyze the relationship between training, community driven agricultural development initiatives and agricultural productivity interventions and food security in Kajiado County.

5.1 Summary of the Study

Despite the implementation of the NMK Programme from 2006, food security remains a problem in many parts of Kenya, including Kajiado County. The Kajiado County community members including those of NMK funded groups continue to rely heavily on relief food from donor agencies and the Government. This raises the doubt of whether NMK has had any significant relationship on food security among the members of the NMK funded groups in the County. The study sought to identify the relationship between farmer training, community driven agricultural development initiatives and agricultural productivity interventions by NMK and food security in Kajiado County.

The study used a descriptive survey research design. The target population consisted of three officials per group for the entire 33 grant funded community groups under *NMK* program and ten key informants from Kajiado County. Stratified random sampling method was used to sample 24 NMK funded groups whose officials were purposively taken for the study. Thus the sample size of the study was 72 respondents. The study also purposively sampled ten key informants from relevant line ministries. Two validated primary data collection instruments were used during the study; a questionnaire and an interview guide. A pilot study was conducted among five NMK funded groups and a Cronbach's Alpha Coefficient reliability of 0.83 was attained. The data were analyzed using descriptive statistics. Chi-square statistical test was applied to test all the hypotheses at $\alpha = 0.05$ significance level.

The study established that there is statistically significant relationship between farmer training by the *NMK* and food security in Kajiado County. It further established that majority of the *NMK* funded group members were trained before implementation of their respective project. In addition, the training offered to the groups was relevant to the respective project they were implementing. The *NMK* funded groups were trained in crop and animal husbandry for both indigenous and hybrid animals and crops, production of drought resistant crops and animals, business training and marketing of products, bee keeping, livestock upgrading, irrigation and poultry among others. In addition, the research established that *NMK* funded groups spent between 20-30% of the total funds granted on capacity building. However the research revealed that 25-50% members of *NMK* funded group received training. Thus training influence food security as the groups are imparted with skills and knowledge necessary for success of their projects. The small proportion of members trained however reduces the benefits of training to the *NMK* funded group as majority of the members involved in the implementation of the project lacked the know how to implement their respective projects efficiently. While assessing the relationship between training and food security, the study established that through *NMK* the members of *NMK* groups received training on how to reduce poverty; the local residents were empowered to fully exploit the available resources; *NMK* funded groups had been empowered to fully own the projects to eradicate poverty and increase food security

The study established that community-driven agricultural development initiatives by *NMK* have a relationship with food security in Kajiado County. There was community participation in the implementation of *NMK* as the majority of the respondents indicated that *NMK* funded group members were involved in deciding the kind of food security activity to base projects. While assessing the extent of community participation in the implementation of *NMK* the research revealed that there were regular meetings for the *NMK* group members to give their input about the project progress and improvement and that *NMK* group members were involved in decision making in the running of the project. The study findings imply the significance of community participation in the implementation of *NMK* funded projects to eradicate food insecurity.

The research established that majority of the respondents were involved in decision making in the running of the NMK funded projects. The study further established that NMK programme initiatives have benefited the Kajiado County residents thus contributing positively to food security in Kajiado County. The study identified that the County residents were trained on animal upgrading especially dairy goats rearing. Through NMK, the members had increased their household income. They also had gained skills on diversification of income generating activities (IGAs).

On the ways that the involvement of community in the implementation of NMK interventions had been useful in the overall implementation of the project, the researcher established that the involvement enabled the community to own up the NMK initiatives enhancing the success rate and sustainability of the NMK initiatives. In addition, NMK funded groups were linked to other financial institution enhancing their access to credit.

The researcher established that majority of the NMK funded groups purchased the technologies/inputs required for the implementation of the project. Therefore, the NMK cash grants enabled the groups to purchase the technologies/inputs required which are expensive and they could not afford without NMK funds. The majority of the NMK funded groups spent the highest proportion (51-75%) of the NMK grants on purchasing of the technologies/inputs which proves that it was the most important aspect in the implementation of the respective group projects. However, there was a gap in the utilization of the purchased technologies/inputs as the purchased technologies/inputs were utilized to a moderate extent by most of NMK funded groups.

The study established that the NMK funded groups' derived benefits related to agricultural productivity from NMK Programme. Majority of the respondents agreed that the groups were able to purchase new breeds (hybrid breeds) and to purchase of new technology. On the results of NMK interventions to improve agricultural productivity, majority of the respondents agreed that through NMK there is increase in yield of crops produce, income generated from crops, increase in yield of livestock produce and increased area under crop production. With regard to the kind of technologies/farm inputs purchased to improve agricultural productivity, the researcher found out that the NMK

funded groups purchased planting materials, pesticides and fertilizers. In addition, they purchased machinery, livestock drugs and animal breeds for both milk and meat production.

5.3 Conclusions

The following are the conclusions of the study:

- i. Training has a positive relationship with food security in Kajiado County. The training offered to the NMK funded groups was relevant to the respective project. The NMK funded groups were trained in crop and animal production, entrepreneurship, bee keeping, and poultry farming. The training helped them to reduce poverty; empowered them to fully exploit the available resources; and to fully own the projects to eradicate poverty and increase food security.
- ii. Community participation had a positive relationship with food security in Kajiado County. There was community participation in the implementation of NMK projects. The NMK group members were involved in decision making in the running of their project. Regular meetings for the NMK group members to give their input about the project progress and improvement areas were held. The community participation in the implementation of NMK interventions enhanced the project ownership by the community and improved on the success rate of the project. In addition, NMK funded groups were linked to other financial institution to access to credit.
- iii. Agricultural productivity intervention through NMK has a positive relationship with food security in Kajiado County. The majority of the NMK funded groups purchased the technologies/inputs required for the implementation of the project. The majority of the NMK funded groups spent the highest proportion of the NMK cash grants on purchasing of the technologies/inputs. However, the purchased technologies/inputs were utilized to a moderate extent by most of NMK funded groups.

- iv. NMK funded groups' derived benefits related to agricultural productivity from NMK Programme. The benefits include the purchasing of new breeds (hybrid breeds) and purchase of new technology. The NMK interventions have improved agricultural productivity through increased crops yield, income generation from sale of crops produced, increase in yield of livestock produce and increased area under crop production.
- v. The benefits accrued through the NMK intervention are insufficient to make the granted community group members food secure. The NMK cash grants were inadequate to ensure the projects sustainability. In addition, only a small number of NMK group members received training. The low community participation in the implementation of NMK projects reduced the projects' ownership, sustainability and success rate. The NMK funded groups spent the highest proportion of the NMK cash grants in purchasing of the technologies/inputs which they were utilized to a moderate extent. The failure to fully utilize the purchased technologies/inputs reduced the success rate of the NMK interventions towards reduction of food insecurity in Kajiado County.

5.4 Recommendations

In view of the conclusions, the following recommendations are made;

- i. As the study established low NMK group members' turnout in training, it is recommended that the NMK implementing line ministries should embark on continuous training of all the NMK funded groups' members in Kajiado County.
- ii. The NMK implementing line ministries should seek to increase community participation of NMK groups in the implementation of NMK projects through intensive community mobilization.
- iii. The NMK funded groups leadership should seek to fully utilize the purchased technologies/inputs.

- iv. The Government through NMK should increase cash grants awarded to the NMK groups.

5.5 Recommendation for Further Study

Since this study dwelt on the relationship between *Njaa Marufuku Kenya* intervention and food security in Kajiado County; the study recommends that;

Similar studies should be done in other counties in Kenya where *NMK* is being implemented for comparison purposes and to allow for generalization of findings on the relationship between *Njaa Marufuku Kenya* intervention and food security in Kenya. Results could help in up-scaling of private sector food security innovations component of *NMK*.

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APPENDIX A

NMK FUNDED GROUP OFFICIALS QUESTIONNAIRE

Introduction

I am a final year student at the Egerton University undertaking a Master of Science degree in agricultural extension. I am currently undertaking a research on **THE RELATIONSHIP BETWEEN NJAA MARUFUKU KENYA INTERVENTION AND FOOD SECURITY IN KAJIADO COUNTY**. I would be grateful if you could spare some time from your busy schedule and complete this questionnaire for me.

Instructions: *(Please read the instructions given and answer the questions as appropriately as possible)*. It is advisable that you read carefully and correctly fill in each section as provided.

Section A: Background Information

1. For how many years have your *NMK* funded group been operational?

- a) less than 1 year [] b) 1 – 5 years [] c) Over 5 years

2. What area of agriculture does the group engage in?

- a) Bee keeping [] b) Livestock production [] c) Agricultural production []

Others (specify)

3. What kind of project does your group engage in?

Small-scale irrigation	
Production of high value crops	
Production of drought tolerant crops	
Animal production	
Agricultural produce value addition and marketing	
Water harvesting and environmental conservation	
Bee keeping	

Section C. Community Driven Agricultural Initiatives

8. Were your group members involved to decide the kind of project to base your projects?

a) Yes [] b) No []

i. Community Participation

9. Please rate the following statements on the level of community participation in the planning and implementation of the project. Use a scale of 1-5, where 1- no extent, 2-low extent, 3-moderate extent, 4-great extent, 5-very great extent

	1	2	3	4	5
The benefits are shared equitably among the members of the group					
There are regular meetings for the group members to give their input about the project progress and improvement.					
We involve the group members in decision making in the running of the project.					
We involved the group members in the formulation of project proposals.					

10. The following are some of the benefits that are derived from NMK programme, to what extent have you benefited from each? Use a scale where 1- To a very low extent, 2- To a low extent, 3- To a moderate extent, 4- To a great and 5-To a very great extent

Section D Agricultural Productivity Interventions through NMK

11. Did you purchase the technologies/inputs required for the implementation of the project?

Yes []

No []

12. What proportion of the total funds granted was used to purchase the technologies/inputs?

Less than 25% 25-50% 51-75% 76-100%

13. What extent were the purchased technologies/inputs utilized?

- a) To no extent [] b) Low extent [] c) Moderate extent []
 d) Great extent [] e) Very great extent []

14. The following are some of the benefits that are derived from *NMK* programme, to what extent have you benefited from each? Use a scale where 1- To a very low extent, 2- To a low extent, 3- To a moderate extent, 4- To a great extent and 5-To a very great extent

	1	2	3	4	5
Agricultural productivity interventions through <i>NMK</i>					
i) Interventions to improve agricultural productivity					
Purchase of new technology					
Use of new breeds (hybrid breeds)					
Value addition of the products produced					
ii) Result of intervention					
Increase in yield of crops produce					
Increased area under crop production					
Income generated from crops					
Increase in yield of Livestock produce					
Increased number of livestock					
Income generated from sale of Livestock and Livestock produce					

15. What main area of concern would you like addressed in the relationship between *NMK* intervention and food security in Kajiado County?

.....
.....

16. What recommendations would you make regarding the relationship between *NMK* intervention and food security in Kajiado county?

.....
.....

THANK YOU FOR YOUR TIME AND PARTICIPATION

APPENDIX B

INTERVIEW GUIDE FOR THE KEY INFORMANTS

Introduction

I am a final year student at the Egerton University undertaking a Master of Science in Agricultural extension. I am currently undertaking a research on **THE RELATIONSHIP BETWEEN NMK INTERVENTION AND FOOD SECURITY IN KAJIADO COUNTY**. I would be grateful if you could spare some time from your busy schedule and complete the enclosed questionnaire.

Instructions: *(Please read the instructions given and answer the questions as appropriately as possible)*. It is advisable that you answer each section as provided.

Section A: Background Information

1. Which organization do you work for?

.....

2. For how many years have you worked in Kajiado County?

a) Below 10 years []

b) 10 – 20 years []

c) Over 20 years

Section B: Training

3. Are the members of the designated NMK groups usually trained as they implement their projects?

If yes, what kind of training are they trained in?

4. What proportion of the grant funded to the groups goes for capacity building?

Section B Community Driven Agricultural Initiatives

5. Which NMK programme initiatives does the community engage in?

.....

6. Have NMK programme initiatives benefited the area residents?

a) Yes []

b) No []

7. In which ways have the area residents benefited in?
-
8. How has the involvement of community in the implementation of NMK interventions been useful in the overall implementation of the project?
-
9. How are the NMK funded group members involved in decision making for their projects?

Section D Agricultural productivity interventions through NMK

10. What kind of technologies/farm inputs do the NMK groups purchase to improve on Agricultural productivity?
-
11. What proportion of NMK cash grants funded to each group is used for the purchase of the technologies?
-
12. Has the use of technologies in *NMK* projects assisted in improving Agricultural productivity?
- a) Yes [] b) No []
13. If yes, has the *NMK* programme contributed to reduction of poverty, hunger and food insecurity among poor and vulnerable people in Kajiado County?

.....

Explain.....

.....

.....

14. What recommendations would you make regarding the relationship between NMK intervention and food security in Kajiado county?

THANK YOU FOR YOUR TIME AND PARTICIPATION

APPENDIX C

NMK FUNDED GROUPS IN KAJIADO COUNTY

NAME OF GROUP	PROJECT
1. Induati	Mango growing
2. Oloshaiki	Bee keeping
3. Kajiado Tumaini SHG	Poultry
4. Ilmejooli SHG	DTCs seed bulking
5. Enyonyor ilmeshuki	Steer fattening
6. Elangata WUAs	Goat production
7. Abigael Women Group	Dairy Goats Keeping
8. Olkeri Women Group	Poultry Keeping
9. Kangawa Central Women Group	Commercial Tree Nursery
10. Nasaru Women Group	Oil Crops and Vegetable Production
11. Kamarora Women Group	Dairy Goats Keeping
12. Umoja Women Group	Bee-Keeping
13. Enkamai	Dairy goat production
14. Tumaini women group	Dairy goat production
15. Airstrip women group	Dairy goat production
16. Naseremi	Bee keeping

17. Enkogorigiriani	Tissue culture banana
18. Induati	Mango growing
19. Oloshaiki	Bee keeping
20. Umoja WG	Bee keeping
21. Jampik-Reto YG	Steer fattening
22. Olkeri CBO	Poultry
23. Abigail WG	Dairy goats
24. Kajiado Tumaini SHG	Poultry
25. Osupuko	Fruits & Vegetables
26. Enyonyor ilmeshuki	Steer fattening
27. Nareto-Ekule WG	Dairy goats
28. Empiron Environmental SHG	Tree nursery
29. Inkitoip WG	Goat rearing
30. En-Kukuon WG	Fodder conservation
31. Matanya Umoja SHG	Tree nursery
32. Maseko Green Belt Movement SHG	Poultry
33. Naretisho Ngatu	Bee keeping

APPENDIX D

REPUBLIC OF KENYA



NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

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P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Reference: NCST/RCD/14/012/1129

Date: 22nd August 2012

Kamoni Njoroge
Egerton University
P.O.Box 536-20115
Egerton.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Influence of Njaa Marufuku Kenya intervention on food security in Kajiado County*," I am pleased to inform you that you have been authorized to undertake research in **Kajiado County** for a period ending **30th September, 2012**.

You are advised to report to **the District Commissioners and the District Education Officers, Kajiado County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


DR. M. K. RUGUTT, PhD, HSC.
DEPUTY COUNCIL SECRETARY

Copy to:

The District Commissioners
The District Education Officers
Kajiado County.

LETTER OF AUTHORIZATION

APPENDIX E
RESEARCH PERMIT

PAGE 2

THIS IS TO CERTIFY THAT:

Prof./Dr./Mr./Mrs./Miss/Institution

Kamoni Njoroge

of (Address) Egerton University

P.O.Box 536-20115, Egerton.

has been permitted to conduct research in

Location

District

Kajiado

County

**on the topic: Influence of Njaa Marufuku Kenya
intervention on food security in Kajiado
County.**

for a period ending: 30th September, 2012.

PAGE 3

Research Permit No. NCST/RCD/14/012/112

Date of issue 22nd August, 2012

Fee received

KSH. 1,000



**Applicant's
Signature**

**Secretary
National Council for
Science & Technology**

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