

**AN IMPACT ASSESSMENT OF POVERTY REDUCTION STRATEGIES IN
KENYA: CASE STUDY OF KENYA AGRICULTURAL AND SUSTAINABLE
LAND MANAGEMENT PROGRAM (KAPSLM) IN NYANDARUA COUNTY.**

BY

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DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted to any other college, institution or university other than the United States International University in Nairobi for academic credit.

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DEDICATION

This research project is dedicated to my son Ray Kidiga, my parents; siblings Damaris, Alex and Peter; and lastly to all persons committed in implementing and assessing poverty eradication strategies in Kenya.

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This thesis was made possible by the guidance and help I received from several individuals whose assistance and contribution should not go unmentioned.

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Last but not least, I am indebted to my parents for educating me and for their passionate love, unconditional support and continued moral and financial support as I pursued my higher studies. Their love and support gave me faith that helped me overcome the difficulties and pursue my dream passionately.

This study was a success because of all your efforts. May the almighty God bless you abundantly in all your endeavors.

ABSTRACT

The Government of Kenya has been on the move to eradicate poverty in the country. This has been seen through various Poverty eradication strategies and other papers put in place by the government. This study assesses the impact of Kenya Agricultural Productivity and Sustainable Land Management (KAPSLM) as poverty eradication strategy. It focuses on whether it has created and strengthened the self-sufficiency of smallholders' rural farmers. It also focuses on whether the innovative and productive capacity of the smallholder rural farmers has been attained in order to reduce poverty and enhance development. The study adopted both quantitative and qualitative research approach. Nyandarua County was purposively selected being one of the areas covered by KAPSLM. Using a cross-sectional survey research design, the study was conducted on 116 households who were selected using simple random sampling procedure. Rwanyambo, Njambini, Githabai, and Bamboo are the areas that were included in the study, and the sample was selected from these areas using proportionate sampling to ensure representativeness. A pilot study was conducted in Nakuru County to provide the basis for testing the validity of the data collection instrument. The instrument had a reliability coefficient of 0.76. The study revealed that nappier grass planting, digging terraces, fruit and vegetable farming, dairy farming, apiculture, and aquaculture are the main aspect of the projects implemented by farmers. The main benefits that the farmers realized from the project include increased incomes, diversification of farm enterprises, reduced soil erosion, and diversification of food sources, among others. The costs associated with project implementation acted as a major hindrance to the full implementation of the project in the project area. The study concludes that the projects implemented had a significant influence on poverty reduction in Nyandarua County. The study recommends that there is a need for further research to ascertain the best option among the various projects implemented by farmers.

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LIST OF ACRONYMS

COG	Common Interest Groups
GEF	Global Environment Facility
GDP	Gross Domestic Product
GOK	Government of Kenya
IMF	International Monetary Fund
IPRSP	Interim Poverty Reduction Strategy
KAPSLM	Kenya Agricultural Productivity and Sustainable Land Management
KANU	Kenya National Union
MTP	Medium Term Plan
MTEF	Medium Plan Expenditure Framework
NRM	Natural Resource Management
PRSP	Poverty Reduction Strategy Paper
SAPs	Structural Adjustment Programs
SDGs	Sustainable Development Goal
UND	United Nations Development Program
NASEP	National Agricultural Sector Extension Policy

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Poverty eradication is an essential element of overall human well-being and an important milestone towards development. Poverty alleviation is the goal number one of the Sustainable Development Goal (SDGs) and remains the number one cause of issues such as hunger and illness. UNDP (2016) estimates that globally 836 million people still live in extreme poverty in the world and about 1 of 5 persons in developing regions lives on less than \$1.25 per day.

Reducing poverty in many countries especially in Sub-Saharan Africa has been one of the key entry points for donor agencies. Governments, international organizations as well donor agencies spend a lot in this endeavor. While these activities, projects, and programs have been going on for many years, it is hard to point the success of many such projects. This is so because, in spite of the hefty resource allocation, families and communities in developing countries continue to wallow in poverty.

According to Mararia (2010), land degradation in Kenya and Africa as a continent has manifested itself in rapid rates leading to depletion of natural capital. This can be seen through forest degradation, and soil erosion especially in river basins. Therefore the recognition and appreciation of impacts of land management activities on productivity have been instrumental in the design of many projects in the developing world today. According to Barbier (1998), explains that poverty is not the direct cause of environmental degradation .He explains that the inability of rural households to avoid land degradation, the inability to invest in mitigating factors and inability to compete for resources such as high-quality, productive land are the main causes of poverty. Barbier (1998) argues that evidence of declining soil fertility; climate change, degraded soils, population pressure sedimentation and contamination of water downstream are among the causes of poverty in rural areas. Therefore diversity protection, as well as the use of local solutions and indigenous technical knowledge, has been used to offer solutions in the poverty reduction.

The KAPSLM project is one of the many programs by the government of Kenya and international development partners including to eradicate poverty promote land management and enhance the sustainability of development efforts. KAPSLM is part of a long-term program and derived its goals of the Kenya Agricultural Productivity Program. The project had multi-stakeholders participating in the funding such that GEF provided US\$10 million; the GOK provided US\$2.58 million, the beneficiary communities had to contribute an equivalent of US\$400000 while the Bank-Netherlands Water Partnership Program Trust Fund contributed US\$102000. Such enormous of resources should provide lasting and sustainable solutions to the perennial problem of food insecurity, unsustainable land use and help in poverty alleviation among the target communities.

KAPSLM project proponents observed that there were continued soil degradation, declining soil fertility and unsustainable land use in the areas of study. These factors have a negative impact on food production, land productivity as well as the socio-economic status of farmers. Sustainable Land Management practices varied from one place another but included soil and water conservation, integrated soil fertility management and agroforestry. The project proponents envisioned that the project would impact people's livelihood, enhance the state of the environment at the local and global scale while at the same time reduce land degradation and promote biodiversity. It would also offer alternative livelihoods to the people in the catchment areas.

Nyandarua County is one of the micro-catchments found in Kinale-Kikuyu Catchment area. The catchment is located in the Athi River drainage system and encompasses the greater Kiambu and its environments. High population density is one characteristic of the study area. Destruction of water catchment areas, deforestation, massive encroachment on wetlands, depletion of soil fertility as a result of over cultivation overgrazing cultivation on steep slopes, limited soil fertility management practices and high incidences of soil erosion are features that characterize the catchment area. The significance of this catchment area in providing water to nearby towns and cities like Nairobi cannot be overemphasized. However, due to poor land use practices, sedimentation in dams and rivers downstream has increased by 5 to 15 times of the levels in the 1970s. For instance, Mwangi (2013) observes that due to

increased siltation, Sasumua Dam that supplies 20% of the portable water in Nairobi has had significant siltation over the years.

The Kikuyu/Kinale escarpment, which lies within Nyandarua, is a significant breeding ground for some of the rare species of birds in African Savanna. Some of the forests in this catchment area including those in Gatamaiyu, Kambaa, and Bathi, which are found in the south most of the Aberdare ranges, are home to indigenous trees of great significance to the local people. However, Volunteers Africa (2003) argues that most of the tree species are disappearing rapidly due to overexploitation for charcoal and land clearing for agricultural production. Thus the promotion of sustainable land management in the area would contribute significantly to promote the protection of important plant and animal species. Due to the fact that Nyandarua micro-catchment is home to the slopes of Aberdare ranges which is home to the forests that provide a breeding ground for three near-endemic species of butterfly namely *Charaxesnandina*, *Neptiskikuyuensis* and *Neptiskatama* coupled with the various indigenous trees in the forest, the study will purposively select this area.

1.2 Statement of the problem

Agriculture forms the backbone of the Kenyan's production sector and employs over 80% of the population either directly or indirectly. It contributes to about 26% of the GDP and forms the mainstay of rural livelihood where the majority of Kenyans reside. The sector has been performing poorly over the last decades, and this has been attributed to various external factors. Such factors include vulnerability to climate shocks, declining prices of agricultural produce in the export market, unfavorable domestic policy framework, among others. The major challenge that Kenya faces is addressing these constraints to tap into the great potential offered by the agricultural sector and achieve national food security, reduce poverty and create employment while maintaining sustainable natural resource base. A lot of resources were spent on the implementation of KAPSLM project in Kenya as one of the approaches to reducing poverty, diversifying sources of livelihoods, promoting natural resource management, reducing soil erosion, enhancing biodiversity and restoring favorable ecosystems for flora and fauna in the specific catchment areas. Various stakeholders took part in the process in different capacities to see to the full implementation of the project. Although the project was terminated in December 2016 the impact it had on poverty

reduction has not been assessed. The only information available by the time this project was being assessed is only at the local authority, e.g., chiefs' office, Although the current study is designed to establish the impact of KAPSLM in Nyandarua County, there is no published information that shows how much the project aided in reducing poverty in the study area. Hence this study is designed to investigate the impacts of KAPSLM project as a tool for poverty reduction in Nyandarua micro-catchment. The study will lay grounds for future scholars who would want to assess the project.

1.3 Objectives of the study

The study was guided by goals, which were divided, into general objectives and specific objectives

1.4 General objective

To assess the impact of poverty reduction strategies used in Kenya with a particular focus on KAPSLM

1.5 Specific objectives

- i. To establish the incidence of the various projects implemented by KAPSLM on poverty alleviation in Nyandarua micro-catchment
- ii. To investigate benefits derived from participating in the KAPSLM project on poverty reduction in Nyandarua micro-catchment
- iii. To assess the impact of the sustainable land management techniques implemented by farmers involved in KAPSLM project on poverty reduction in Nyandarua micro-catchment
- iv. To investigate the effects of costs incurred by farmers involved in KAPSLM project on poverty alleviation in Nyandarua micro-catchment

1.6 Research questions

- i. What are the impacts of the various projects implemented by KAPSLM on poverty reduction in Nyandarua micro-catchment?
- ii. What are the perceived benefits derived from participating in the KAPSLM project on poverty reduction in Nyandarua micro-catchment?

- iii. Which are the impacts of the sustainable land management techniques implemented by farmers participating in KAPSLM project on poverty reduction in Nyandarua micro-catchment?
- iv. What are the effects of costs incurred by farmers participating in KAPSLM project on poverty reduction in Nyandarua micro-catchment?

1.7 Significance of the Study.

According to the GoK (2005c) National Agricultural Sector Extension Policy (NASEP) report, there is need for consultant reports and evaluation reports , and this has been backed up by Wanjohi, (2011) who argues that there exist a gap in knowledge, and the experts and practitioners experience a day-to-day challenges in filling this gap of development. Therefore this study is an attempt to respond to these shortcomings. The study was useful in providing insight into the success of the project in alleviating poverty. The study will also add to the existing literature on the impacts of poverty reduction strategies implemented in Kenya. Besides, the study was useful to further project designs after learning the perceived benefits by the farmers. Upon understanding the sustainable land management structures implemented by farmers, the subsequent follow-up to ensure their sustainability can be recommended.

1.8 Scope of the study

The study was conducted in Nyandarua micro-catchment. It only focused on the farmers that participated in the project from its inception to the end.

1.9 Limitation of the study

The vastness of the area-constrained the data collection .The data was collected during rainy season however early planning and use of motorbikes helped to overcome this challenge. In some cases especially with old respondents, the language barrier hindered data collection the researcher used interpreters wshere needed to mitigate language barrier.

1.10 Operational definition of terms

Adoption: Adoption has been used to refer to the use or non-use of a new technology by a farmer at a given period of time. The definition will be adopted in this study and the technology

Household head: The head of the household is the most responsible or respected member of who makes a key decision in the household on a day-to-day basis and whose authority is honored by all members.

Impact: The term impact refers to having a strong positive or negative effect on something or someone. In this study, the term is used to refer to the strong effects that the KAPSLM program had on the livelihoods of people, which in return translates to poverty reduction.

Poverty: Poverty can be defined as the state of lacking the financial resources that are necessary for a person, a family or a community to enjoy the minimum standard of life as well as the communally acceptable well-being of life. In this study, the concept of poverty will be viewed from the economic perspective of lacking the finances. Thus poverty reduction will be measured by changes in incomes and availability of food for domestic consumption. The increase in revenues will imply that farmers can use the money to alleviate poverty. Similarly, availability of food will mean that farmers can meet one of the basic need namely food.

Smallholder farmers: Smallholder farmers are those farmers that operate less than two hectares of cropland and have low resource base. The farmers rely majorly on rain-fed agriculture and family labor for their agricultural production. They keep a few livestock in their mixed farming agricultural practice.

Diffusion: This is the spread of new ideas or innovation in a particular setting and it's spread depends on how well the people embrace it.

Sustainable land management: The term refers to technologies and practices whose aim is to integrate land, water, environmental resources and biodiversity management to meet the needs of humans while ensuring that the land remains viable to support future generations

Aquaculture: This is the way of life in which the people keep fish as a way of life. In this study, it will be adopted because fish is being adopted as a way of life.

Apiculture: This is a culture where the people keep and rear bees for honey that they both sell and for domestic consumption

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

As defined by Dickson, Macroe and Dickson (2002) poverty is the inability of people to feed themselves to dress properly, and they risk dying as a consequence. They further argue that an empirical data have shown that absolute poverty continues to play a major role in the countries where per capita income is low, and the poverty levels are high. Immediately after independence, the Kenya African National Union (KANU) philosophy and manifesto was pegged on establishing necessary structures for achieving the greatest and fastest economic freedom for Kenya cused in the independence mantra, thus to get the faster economic growth rate and get an equitable distribution of the national income both between different geographical areas of the country and between people and sectors (KANU Manifesto, 1963). Furthermore, the document cut down taxation load for low-income groups and prioritize rural development by standardizing and raising agricultural and non-agricultural infrastructure.

The policies in the manifesto focused much attention on economic growth which in isolation had not achieved much unless it was amended and narrowed down towards economic independence which would practically reduce poverty levels. Although the manifesto noted the importance of the voluntary sector in helping to score intended goals, the document failed to design a strategy to alleviate poverty implications. This clearly indicates that poverty reduction strategies started failing at the point of designing the documents and necessary structures for the implementation of plans (KANU Manifesto, 1963).

Kenya inherited and domesticated an open and policy-oriented economy with a policy environment favorable to the agricultural sector. The Kenyan ruling elites, due to their strong desire for agriculture, designed policies that were favorable to them and also other smallholder and large-scale producers. For close to two decades after independence, a booming agricultural sector was evidenced in the economic improvement, and the environment was characterized by political stability (Anderson & Masters, 2009).

Seasonal Paper number 1 of 1965 formulated by the government was designed against an array of ideological disagreements on the best and effective economic system for the country.

The document was to spell out the system of political, social, and economic programs and plans ingrained in pragmatism and a free-market economy. The role of both public and the private sector in economic development in an expanding economy that provides the necessary needs to the citizens cannot be overlooked (Goldsworthy, 1975).

Subsequent periods were characterized by the government's efforts to fight poverty and spur economic growth by designing and introducing various aimed at poverty alleviation. They included: The Development Plans, Economic Surveys among others. These documents were intended to strengthen the policy on economic development. In the 1970s, the government adopted the Basic Needs Approach to development as seen in the policy documents through the introduction of a number of subsidies in social-service delivery. As a result, the government in 1973 abolished fees in primary education for reasons of widening access to basic education. At the tertiary level, the government introduced a loan scheme to help those qualifying for university education to be able to finance their studies on their own and shift the burden of financing university education to the beneficiaries. The government established Sessional Paper No. 4 in 1981 on National Food Policy, which basically targeted the agricultural sector to raise the level of self-sufficiency in food production. Thus the period following the 1990s marked a period of weak economic policies that eventually led to increase in poverty levels (Oyugi, 1985).

Contrastingly, the second twenty years witnessed economic down turn and lower agricultural output occasioned by corruption fights and other modes of poor governance, but in the recent times, the fortunes seem to be turning around as the economy is struggling to raise its head. From 1965 to 1981 Kenya's real Gross Domestic Product (GDP) per capita increased exponentially at an average rate of 2.5 % per annum while agricultural value added at an annual rate of close to 5 percent. At this point the government's hand in the economic performance increased, marketing boards controlled prices of agricultural goods and trade restriction was through licensing boards. However, this promising beginning was only short-lived as agricultural production and per capita started dwindling circa the 1980s and persisted until 2004. The rural poverty level in 1970 stood at 53 percent as reported by the Kenya Central Bureau of Statistics (Government of Kenya, 2000)

Policy solutions and initiatives in the 1980s focused on liberalizing the agriculture sector in a bid to cut down transaction costs and ensure that producer costs mirrored global scarcity values. But these liberalization efforts suffered many policy changes and were much confused by macroeconomic instability in the 1990s (World Bank, 1998; WTO 2000).

2.2 Growth and Structural Changes since 1955

The strong economic performance of the economy until 1980 was primarily grounded in good agricultural output which has accounted and sustained for the larger share of the employment margin, added value, and exports. This growth in agricultural output between 1966 and 1980 was due to an increase in cropped base and the opening up of the commercial production opportunities for smallholder African farmers. FAO, (2006) noted that between 1960 and 1969 cereals output increased by 69 percent with cropped base expanding by 61 percent.

The first Medium Term Plan (MTP-1) of Kenya's Vision 2030 strategy covered the period between 2008-2012 and had crucial steps and efforts made to spur growth and other sound economic policies under difficult situations. The major achievements of this period were infrastructure improvement and increasing some social indicators like school enrolment rates. Despite not achieving the expected targets the Gross Domestic Product (GDP) growth hit 3.8% yet repeated droughts were imminent, high international commodity prices, the global financial crisis of 2008 and the political uncertainty to the run-up to 2013 general elections (PRSP, 2013).

The second Medium Term Plan (MTP-2) which covered the period between 2013-2017 sought to build on the success of MTP-1 which included macroeconomic stability, the establishment of the 2010 constitution, the growth of the service oriented sector and an increased enrollment and subsequent access to education. In a nutshell, the overall objective of the MTP-2 was to spur economic growth and to reach a double-digit level, create more jobs and reduce the effects of poverty tremendously. The four major impediments that curtail the attainment of the GDP growth target are;

- i. Funding and implementation of the ambitious investment plans which require a sustained domestic revenue mobilization and apt public financial management practices.
- ii. Promoting the quality and efficiency of public spending
- iii. Curtailing the increased in wage bill that could diminish spending in important infrastructure investment and social protection

The laying and rolling out devolution mechanisms that envision increased accountability, better service delivery, and county levels, and boost social cohesion and overall stability (PRSP, 2013). The MTP-2 has poverty reduction as its major objective and identifies job creation and economic growth as the best panacea for pulling people out of poverty. Since 2006 World Bank has estimated an exponential progress in poverty reduction levels, a factor which can be attributed to a sustained economic boom, together with safety nets increments and rural-urban migration. The progress made under the Millennium Development Goals in bringing down child mortality rates, and an almost universal primary school enrollment are well indicated (PRSP, 2013).

The economic pillars identified as potential for facilitating economic growth stands on six major aspects routed from the Kenta vision 2030 while the seventh the Medium Term Plan 2 has identified as crucial to sustaining an economy that can spur growth. These include tourism, agriculture, trade, manufacturing, business services, and financial sector. Oil sector that is the seventh aspect in a new phenomenon has been discovered and its vagaries are already out. The social pillar hinges on sustaining equitable social development in a palatable environment thus they include education, health, environment, urbanization, gender, sports, and vulnerable groups. The political pillar's main purpose as another pillar is to construct a people-centered, result oriented, and accountable political system. This strongly pegs its argument on the devolution and the improvement of governance perspectives and the rule of law.

The Kenya Poverty Reduction Strategy Paper for the period 2001-2004 lays bare the priorities and measures needed for poverty reduction and economic growth and was the product of a wide consultative initiative carried out in close to 70 districts in Kenya. Its twin

objectives of poverty alleviation and economic growth explicitly explain measures necessary for spurring economic performance and priority activities that will be put in place in order to cut down poverty levels in Kenya (PRSP, 2001).

The three-year macro economic plan encompassed particular economic policies geared towards promoting economic growth, and specific measures are noted. Adequate consultations were aimed at incorporating relevancy stakeholders especially the poor and this has an effect in ensuring the strategy reflects a national ownership necessary to support and implement the intended strategies for poverty reduction. The PRSP, (2001) document exploits past reports in the struggle to alleviate poverty especially the Interim Poverty Reduction Strategy Paper (IPRSP) which had noted interim measures and crucial strategies for promoting sustainable, robust economic growth, improving governance, increasing income incentives for the poor together with an improved life quality, and improved equity and overall participation in economic activities and other government-funded initiatives.

The twin objectives of the document realize that economic growth and development alone is not a guarantee for poverty alleviation. Strategies linked sectorial aims and objectives that were in tandem with the goals for spurring economic growth and reduce poverty. The three-year pro-poor and growth Medium Term Expenditure Framework (MTEF) will actualize the priorities identified purposed for the quality of expenditure improvement and the shifting of resources to the poor people's activities and projects. The monitoring and evaluation sector of the program will purpose to see to the effectiveness and efficiency in the apportioning of economic resources to the poor development initiatives (PRSP, 2001).

Furthermore, the PRSP, (2001) document centralizes the long term vision identified in the National Poverty Eradication Program (NPEP) which proffered a fifteen-year term strategy and incorporated the International Development Goals (IDGs) purposing to bring down poverty by half. The main pillars upon which this document stands include giving a voice to the poor through their consultative mode, which has strengthened poverty reduction efforts since their lack of voice, power and effective representation pushes them away from similar strategies.

Participation and ownership as another pillar encompassed key stakeholders like both the private and the public sectors, the civil society and religious bodies and all involving the poor and marginalized the fulcrum upon which the whole process rotates. Transparency, openness, and accountability that must be embedded in any framework are also part of the strategy. Open and easy access to information and decision making platforms allows all the stakeholders to feel free about any decision or even to voice their concerns freely.

Poverty in Kenya is believed to be caused by a number of factors including low agricultural productivity and poor marketing of agricultural and industrial goods, insecurity, unemployment and low wages, poor governance, lack of education, inequality in terms of accessing economic opportunities among other factors (Nafula, Onsomu, Mwabu, & Muiru, 2005). Attempts to reduce poverty are always thwarted by weak or lack of commitments by governments, donor driven projects that lack ownership and control, the weak resource base for implementing agencies, exclusion of local organizations from policy implementation programs and plans, limited policy directions and lack of transparency and accountability.

For poverty reduction to be seen to be having tangible effects transformation of key sectors like education, agriculture and health is utterly important. Poverty is multidimensional and manifests in various ways and spreads its tentacles to all groups in society and in so doing threatening the very foundation of society. Poverty which is defined as the lack of basic needs of life and opportunities for human development. Poverty in its manifestation causes deprivation, isolation, alienation, insecurity, and despondency (Ayako, 1997).

The upsurge of the Gross Domestic Product (GDP) grew by 6.6 percent per capita income remained steady despite high population growth rate nearly to all sectors. As Lal and Pietrobelli (2000) note, industrialization in Kenya had achieved really recognizable levels by regional standards in 1980s. Life expectancy had risen to appreciative levels and deaths due to hunger were reducing exponentially. The demographics indicators since independence where infant mortality was positioned at 7 deaths per 1000 live births and under 5 mortality rate was at 112 deaths per 1000 live births by close of 1996. Per capita income has been on the rise since mid-1990s due to an increase in population growth rate of close to 2% (Were & Nafula, 2003).

In 1996 Sessional Paper No. 1 of 1986 on Economic Management for Renewed Growth was introduced which came with a new economic management model from an inward looking structure to a more exploratory approach. This came amid poor economic performance that had continued for close to a decade with a worsening poverty environment. Economic shocks triggered by the oil failure saga in 1973 washed away the gains in terms of economic growth that boomed after immediately independence. The document laid the measures to tackle economic stagnation on three main fronts: promoting the private sector, managing high budget deficits, and correcting restrictive foreign trade policies. Economic growth became the major goal to score for the national development policy. The approval of the Structural Adjustment Programmes (SAPs) and the liberalization of the economy only functioned to sink the already poor Kenyans into a new low through increased cost of living.

The Kenya government formulated the National Poverty Eradication Plan in 1999. This document provides a national policy and institutional framework for action against poverty for the period 1999-2015. The policy was aimed to halt the increase in the incidence of poverty through the implementation of well-planned poverty alleviation programs. This approach was initiated following the failure national development plans and programs to combat poverty in the country. The policy was therefore intended to bridge the gap between national development plans and the local needs of the poor.

This policy paper aimed to come up with a charter for social integration setting out pro-poor policies and planning; improve access to essential services by low income households; develop a strategy for broad based economic growth; increase access to education for children of low income groups; eliminate shortfalls in the poor household's access to mother and child health care services; and enhance the assets and income streams of the poor to build and maintain group corporation (Government of Kenya, 1999).

Once put in place, it was assumed that the productive capacities of the households would be improved for sustained economic growth. Through NPEP, the government of Kenya recognizes the need for balanced economic growth and poverty reduction. This could be achieved through facilitation capacities needed at local government levels; support from

national level agencies delivering productive services; and balanced development for rural-urban areas. The Kenya government formulated and produced several policy papers laying out plans ever since independence all geared towards poverty reduction. Most of these plans were under a five-year umbrella apart from a 1994 policy paper that only outlined a three-year framework. Most policy statements in the plans were discarded except the one prioritizing growth in national and per capita income. In a nutshell, the policies are driven by a desire to provide a broadened necessities in education, health and also establishing a market-oriented approach to mobilize necessary resources for economic planning and development together with chasing appropriate fiscal policies for expanded growth and development (Omiti, et al. 2002).

After independence, the Kenya African National Union (KANU) philosophy rotated around achieving or attaining the fastest economic independence for Kenya and to ground an equitable distribution of the national income both between different geographical areas of the country and also among different people. Furthermore, the document aimed at reducing tax load on low- income segments of the society and prioritizes rural development by raising both agricultural and non-agricultural infrastructure (KANU Manifesto, 1963).

Sessional Paper number 1 of 1965 formulated by the national government was a document prepared against a backdrop of ideological differences on how to go about effectively instituting economic policy for the young country. The document set out clearly a system of political, economic, and social progress pegged on pragmatism and free market economy. The important role of the public and the private sectors were outlined (Goldsworthy, 1975) Consequently, the government continued to design and produce policy documents purposed at reducing poverty that included the Development Plans Policy Paper, Economic Surveys among others.

The documents were to strengthen the already existing policy on economic development. In the 1970s the government adopted and domesticated the Basic Needs approach to development as postulated by the various policy documents through the introduction of

various subsidies in social service delivery. This precipitated the abolition of primary school fees in 1973 for the purposes of broadening the scope of basic education.

Relatedly the introduction of a loan scheme at the tertiary level to boost struggling university students to be able to finance their education. This was followed by subsidization of health services in order to level the playing field in terms of access to medical cover. In 1991 the government through Sessional Paper number 4 which was on National Food Policy targeted the agriculture sector by raising self-sufficient levels in food production through this period was characterized by weak economic frameworks which pulled up the levels of poverty.

The District Focus for Rural Development (DFRD) launched in 1983 as a decentralized development planning policy paper was initiated in order to stimulate local participation in development planning and other government funded projects (Oyugi, 1985). The DFRD thesis started shifting the planning and the implementation of policies from the central government to the district in order to trigger local initiatives and to augment government efforts in situation analysis and problem identification, prioritization, resource mobilization, project implementation at local levels and ensure equitable allocation of national resources to different geographical areas. In this sense, more funds were allocated to less developed regions to encourage and support local development projects in order to raise income earnings for the local people thus reducing poverty.

The main vision for the District Focus for Rural Development has improved the national economy and industrial growth. The national government designed the framework, the structures, and conditions on who should sit on the District Development Committees (DDCs) while planning was at the local or district level. Appointees of the government that included the District Commissioners, the Divisional Officers, and the Chiefs became the chairpersons of development committees at various levels.

The intention of DFRD was to make the districts autonomous in preparing their annual development plans before submitting them to the central government for approval. They would then receive allocations based on their needs as highlighted in the development plans

and national priorities. However, the success of the policy was reduced because other stakeholders had little or no powers to influence the formulation of policies or to hold the government officials accountable. This led to non-implementation of policies aimed at stimulating community development position (Omiti, et al. 2000).

2.3 Situating poverty reduction within a development discourse

Citizen participation in development policies and planning processes is the best way to alleviate poverty from the bottom since this ensures the major players are incorporated in their own process of growth and development. Public participation promotes quality and validity of development process and their overall results (Runguma, 2014).

Indeed participation molds better-informed citizens is a fact we cannot deny. The minute changes in character that become explicit through the participation of those concerned makes gross differences in terms of helping alleviate poverty. Many who have witnessed first-hand the democratic governance pragmatism can attest to the fact that participatory democracy is an all-inclusive system that engenders inclusiveness. Equally, those who have watched from the fence how other people have actively been involved in other's activities portend that surely it's a better method (Mansuri, 1995).

Poverty reduction is one of the objectives of current global developments tasked with finding solutions to poverty problems as a developmental impediment that assails many citizens and governments. Development as a concept transcends economic, social, political, gender, cultural, religious, and environmental issues. Development is always conceptualized in terms of modernization theory that encompasses urbanization, industrialization, and technological advancement. According to UNDP's human development, report, development is an umbrella term for socioeconomic and cultural paradigms of health, education, and economic position (UNDP, 1997).

Development is a multi-dimensional concept that involving changes and shifts in (social) structures, (popular) attitudes, and (national) institutions, improvement of economic growth, equality reduction and eradication of poverty. The aims of development are to increase the availability of distribution of basic goods, pulling up living conditions and broadening the scope of economic and other social choices (Tadaro, 1992).

Many developing countries domesticated centralized planning since the Second World War as the desired mode of achieving development objectives (Booth, 1995; Gready & Ensor, 2005). Many conceptualized this perspective as the best in terms of providing institutional and organized pathways for overcoming impediments thus high economic growth rates in the 1950s through 1970s for many nations. The state theory here comes in handy in dissecting the view that the politics and economy are two sides of the same coin in that a developmental state is needed for development to take off by occupying the driver's seat in a given state (Tadaro & Smith, 2006).

A slow down in terms of economic growth was witnessed in many countries in the South in the 1970s due to several reasons including the crippled plans and their implementation, insufficient and reliable data for planning, unanticipated economic shocks both internal and external, institutional inadequacy in the planning process, and lack of political will and commitment from leaders and other decision makers (Tadaro & Smith, 2006).

State-led development paradigm in the 1980s shoved aside on numerous occasions for its failure to promote economic growth in Africa, Latin America and South Asia which consequently occasioned the birth of liberal free-market economy in 1980s clouded in the popular Washington Consensus (Engberg-Pederson, 2002). This neoliberal economic approach crusaded for a divorce of the state from the economy. The pricing framework that resulted from the laws of supply and demand had to decide resource allocation, production, distribution, and the fight against poverty (Tadaro & Smith, 2006).

The Washington Consensus which had a backing from the United States and Britain and also held in high esteem by World Bank and International Monetary Fund economists ruminated around ten key principles for economists to foster growth. They include fiscal discipline which vouches for redirection of expenses accrued on health, education and infrastructure, tax reform including expansion of tax base and reducing marginal tax rates, universal and competitive exchange rates, secure property rights, deregulation, trade liberalization, privatization removal of barriers to foreign direct investment, and financial liberalization (Ake, 1994, poverty (Tadaro & Smith, 2006).

Poverty just like development is a concept is a multidimensional and quite tedious concept to tackle efficiently from a single prism. Many people conceive poverty as a pronounced deprivation of well-being in which the poverty-stricken lack access to basic needs like food, shelter, clothing, healthcare and experience levels of powerlessness tied to low self-esteem (Chambers, 1997).

Webster and Engberg-pederson (2002) perceive poverty as a form of vulnerability, isolation, and humiliation and argues that what is defined as poverty may actually be experiences of marginalization which are always overlooked when considering only income and consumption. But poverty encompasses such issues like economic, socio-political, psychological and environmental paradigms (World Bank, 2004).

2.4 Goals and approaches to poverty reduction

The frustrations of the Washington Consensus' economic reforms triggered an increased interest in poverty reduction strategies which eventually led to the molding of frameworks like the Millennium Development Goals (MGDs) and Poverty Reduction Strategy Papers (PRSPs) together with other anti-poverty approaches duly funded by governments, donors, and non-state actors. These perspectives were driven by the fact that poverty had become increasingly painful and solutions beyond the scope of those affected were needed (Webster &Engberg-Pederson, 2002).

The mutation of poverty to an alarming rate led to the inception of commitments. Policies, programs with a national and international scope have been designed, conducted and finally implemented. They include the Millennium Development Goals (MDGs) under the UN umbrella adopted and domesticated in 2001, the Poverty Reduction Strategy Paper (PRSP) aid path in 2000 by the Word Bank (WB) and the International Monetary Fund (IMF), Debt relief campaigns in 2000 and the preparation of national poverty eradication plans like Kenya's 15-year (1999-2015) Poverty Eradication Plan.

The adoption and domestication of MDGs framework was a turn-around for poverty eradication that coalesced the fight into a collective global venture that framed poverty as an unacceptable menace (Hulme, 2010). The first MDG focused on eradication of extreme

poverty as well as hunger while the first MDG objective was to reduce by half the number of people affected by poverty between 1990 and 2015.

In Kenya, the fight against poverty has been on the country's agenda since independence and was followed by the government's dedication for tackle disease, poverty, and ignorance (GoK, 1965). From then onwards the plans to fought poverty has been in close to all post-colonial development plans, seasonal papers, presidential commissions, task forces, and economic policy documents (Nafula, et al., Mutua and Oyugi, 2007).

Improved performance in social and economic aspects, for example, health and education were a positive move especially in the first two to three decades after independence Kirangi & Manda, 2002. Nevertheless, education attainment and health improvements revealed a decrease in 1990s requiring an immediate creation of the Poverty Reduction Strategy Papers together with a 15-year National Poverty Eradication Plan, 1999-2015. Poverty became one of the agendas for the international community mediating the post-election dispute after the 2007 elections.

They, therefore, agree that relative poverty is measured in comparison with a given society. This is further explained by Monchuk (2013) example in Kenya ; there is a big difference among different income groups in terms of access to basic services and human capital outcomes. Mortality rates for infants and children younger than 5 years of age among those in the poorest two deciles are 50 percent higher than rates for those in the richest two deciles. For the purpose of this study. This paper shall focus the Kenya Agricultural Productivity and Sustainable Land Management Program in Nyandarua County.

The Kenya Agricultural Productivity and Sustainable Land Management Program is part of the continued commitment by the national government as well as other stakeholders to alleviating poverty in Kenya. The programs also aimed at accelerating domestic growth while at the same time paying attention to the negative effects of unsustainable land management.

2.5 The contextual operation of the project on a global scale

The KAPSLM project had its emphasis going to sustainable land management. Since biological systems and sustainable land management fall at the epicenter of ecosystems, the project was intended to have both local and global impacts directly and indirectly. The International Panel on Climate Change (2010) noted that conversion of degraded cropland into valuable agroforestry land is one of the property management systems with the highest potential to sequester carbon. Many scholars and climate change specialist assert that carbon sequestration that emanates from proper land use is one of the key avenues to deal with climate change. Additionally, better farming methods and reforestation have the potential to reduce soil erosion, as well as sediment loads on rivers which have cumulative advantages on the water quality, riverine and marine ecosystems as well as international waterways (Intergovernmental Panel on Climate Change, 2014). Global benefits that would emanate from the project would also be helpful to Kenya in meeting her global obligations in meeting international environmental needs as stipulated in international pacts and treaties to which she is a signatory. Some of the agreements and treaties include; the United Nations Convention to Combat Desertification of 1997; the Convention on Biological Diversity, of 1992; Contracting Party to the Ramsar Convention on Wetlands 1990 and United Nations Framework Convention on Climate Change, ratified in 1994. Being a member state in many of international treaties, Kenya has had many geared towards staying true to the spirit of the conventions. It is line with staying with these that the government of Kenya decided to implement KAPSLM project as one of the numerous efforts to provide local and global government of Kenya solutions to the ménage of environmental degradation and sustainable land management.

2.6 Contextualization of the project in local scale

In the entire project area, the majority of the rivers are annuals and only flow during the rainy season. As a result of poor land management in these areas, it emerges that majority of the rivers carry their load to the low-lying areas thereby causing a potential threat to the marine ecosystems. As a result, there has been decline in fish problem, total or partial loss of biodiversity which has led to the ultimate loss of incomes for the rural poor in the areas of project implementation (Milne, Paustian, Easter, et al. 2010).

Policy formulation has been underway in Kenya since 2004 because at it was, Kenya did not have a clearly codified or well defined National Land Policy since independence. Since 2004, the country embarked on efforts to formulate a national land policy using a highly consultative process whose aim was to come up with a plan that would guide the country towards sustainable land management as well as its fair use. In October 2006, the country the first policy draft and a process to finalize the plan is still underway. According to the policy, all land in Kenya has a designation of whether it is public, private or communal. The policy offers protection to customary land rights. The KAPSLM project was aimed at supporting activities that will help the government in the definition of policies that promote and address sustainable land management while promoting the participation of communities in land management.

2.7 Integrated livestock and crop production

Sustainable promotion of crop and livestock production depends almost entirely on water conservation and adequate soil management efforts combined with the thoughtful use of inorganic and organic fertilizers (Herrero, Thornton, Notenbaert, et al. 2010). In any ecological zone, there is evidence of wealthy research on inorganic fertilizers, livestock and crop species that are suited to particular ecological zones. Nonetheless, the recommendation and investigation efforts together with promotion have not been commensurate with uptake and widespread adoption. KAPSLM project was designed with a view to promoting community-based approaches to encourage widespread adoption of the recommendations. This project aimed to enhance farmers' participation in the uptake of livestock production combined with crop production which has been shown to improve household incomes and reduce expenditure on labor through improved technologies. The project thus aimed at one, improving livestock feeds and breeds and two promoting efforts to increase vegetative cover through agroforestry and supplying the fast-growing tree seedlings to nursery operators on cost recovery basis. Such an effort would not only increase vegetable cover to protect soil degradation, but it would also increase animal fodder for increased output from livestock. Besides, it would also act as a source of income to farmers as they reduce their benefits on fodder and farm labor.

2.8 Fish culture

Fisheries activities are the main sources of livelihoods for people that live along the shores of many rivers. Fish caught is either consumed directly as food by the local communities, or in some cases, it is processed and exported to European markets (Bharucha, & Pretty, 2010). To this end, fish provides an alternative to proteins for individuals and source of revenue. With aspects, such degradation of water bodies, excess fishing and industrial pollution, invasion of fish breeding ground and eutrophication among other factors, the total number of fish caught has been on a steady decline globally. Subsequently, local fish prices have gone through the roof, which has direct impacts on the livelihoods of people who depend on them for survival. Besides, the lack of fish supply to act as raw material for industries has seen many processing plants shut down and subsequently leading to loss of employment for families. The KAPSLM project aimed at reversing the trend using three main approaches: firstly, encouraging and providing technology for fish farming that will reduce on fishing in lakes, stabilize fish prices, and offer alternative livelihoods to the communities living in the catchment area. Secondly, improving the ecosystems in the catchment area, which would in return reduce water pollution thereby, improving the environment for fish breeding. Finally, the project would provide alternative sources of proteins and subsequently reduce the pressure on demand for red meat.

While all these activities might have been undertaken in the project area, it is worth assessing if the intended aims of the project were achieved. In the Nyandarua micro-catchment, several technologies regarding the implementation of light of the fish farming aspect were undertaken. They included improving the river environment for fish to breed and provision of and stocking of fish ponds (Milne, Paustian, Easter, et al. 2010). This study will assess if indeed this approach helped the farmers in achieving improved food security and thus reduce poverty through increased fish output. This being one of the project impacts that would be hard to measure directly, the perceptions of the farmers on the role of the project in enhancing fish supply in their locality both at the household's level and at the community level or national level was assessed.

2.9 Water resource management

The natural endowment of fresh water for Kenya stands at 645cm³ per capita. This value is way below the global recommendation of 1000cm³ per capita (Giordano & Shah, T.2014) Based on this result, Kenya is classified as a water scarce country. Increased domestic consumption, higher demand for irrigation water, reduction in surface water as well as changing climatic patterns have led to overexploitation of the already scarce natural resource. As a result, the majority of the existing water supply and sanitation facilities were shown to be overexploited, dilapidated and seriously inadequate in many parts of the catchments under study. To this effect, there was a need to rehabilitate the existing ones and provide a new approach to management by investing sufficient resources in the maintenance of water wells and natural springs. In recognition of the facts stated, the government came up with strategies to foster catchment-based water management and integrated water management resource management. This is line with the government meeting its constitutional requirement and basic need of access to water by people.

To achieve this, the KAPSLM project devised interventions that were not limited to the following: promotion of water harvesting techniques on farms to reduce reliance on river resources and reduce river pollution; taking measures to increase the total forest cover either by agroforestry or rapid a forestation of Gazette areas; taking action to develop and promote efficient conveyance and water saving technology; encourage community-based organizations and NGOs to construct small dams upstream to stabilize river flows and conserve runoff and also provide opportunities for aquaculture and irrigation. Besides, the project implemented activities that would help reduce the over-reliance on rain-fed agriculture. Kiringai and Gautam (2007) documented that Kenya's rural population rely almost entirely on rain-fed agriculture for their livelihoods. However, with dramatic changes in climatic patterns, unreliable rainfall, and frequent droughts, agricultural production has become a straight game of chance. This call for water saving technologies that will enhance more careful framing. However in spite of the implementation of the project to its terminal end, little is known about the actual impact that the project had on the farmers in light of how they conserve their water for both domestic consumption and probably irrigation.

2.10 Theoretical Framework

The study employed the theory of diffusion developed by Everett Rogers.

2.10.1 Diffusion of innovations theory

The diffusion of innovation is a theory of how, why and at what rate new ideas and technology diffuse through cultures (Rogers, 2003). Everett Rogers in his book, *Diffusion of Innovations*, wrote that "Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system." Rogers theorized that innovations would spread through society in an S-curve; as the early adopters select the technology first, followed by the majority until a technology or innovation is common. According to Rogers, diffusion research centers on the conditions, which increase or decrease the likelihood that a new idea, product, or practice was adopted by members of a given culture (Rogers, 1962). According to Rogers, people's attitude toward a new technology is a key element in its diffusion. Although he acknowledges that more or fewer stages may exist, Rogers highlights that there seem to be five main stages (Rogers, 2003). The five stages are awareness, interest, evaluation, trial, and adoption. Rogers expounds that in the awareness stage, the individual is exposed to the innovation but lacks complete information about it. At the interest or information stage, the individual becomes interested in the new idea and seeks additional information about it. At the evaluation stage, the individual mentally applies the innovation to his present and anticipated future situation and then decides whether or not to try it. During the trial stage, the individual makes full use of the innovation. At the adoption stage, the individual decides to continue the full use of the innovation.

The diffusion of innovations theory is relevant to this study, the proponents of the theory have identified some of the factors which influence the adoption of innovations such as economic status, leadership skills and frequent use of media.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This section provides details of the procedures that was used in conducting the study. It describes the research design, study area, population of study, sampling procedure and sample size, instrumentation, data collection procedure and the way the collected data was analyzed.

3.2 Research design

The study is a case study and used a cross-sectional research design. This design allows researchers to gather data from a large sample, and to get respondents' opinions and feelings on issues relevant to the study (Kothari, 2008). In addition, it is cost effective since it collects data at one point in time.

3.3 Study Area

Nyandarua County is one of the micro-catchments found in Kinale-Kikuyu Catchment area. The catchment is located in the Tana-Athi drainage system and encompasses the greater Kiambu and its environments. High population density is one characteristic of the study area. The area covered a total of 3061 households, and these were sampled in the survey. The area was chosen because it was one among many areas covered by KAPSLM as an umbrella implementation framework for the project. The area does represent not only high, medium and low zones but also diverse agroecological conditions. Due to financial constraints, it meant that a small area could only be covered, hence a choice of the Nyandarua catchment area.

3.3.1 Topography and Agro-ecological Profile

The county has a cool climate with an average annual rainfall of approximately 1425mm per year and a mean temperature of about 18°C. Night temperatures range between 14°C and 18°C. The average slope of the land varies between 14% and 22% (Ministry of Agriculture, 2014). Soils are mainly clay loams with average pH of between 5.0 and 6.5. These features make this country to be vulnerable to soil degradation and erosion.

3.3.2 Socioeconomic and Demographic profile

The main agricultural activities in this area are crop and animal farming. Various crops are grown which include Irish potatoes, maize, vegetables such as cabbages and kales, and fruits such as plums and pears. However, Irish potato farming is the primary agricultural activity for farmers and forms the backbone of the agricultural sector in this area. The area has a total population of 21, 891 of which 11,009 are males, and 10,882 are females. The dairy sector also is a crucial source of incomes for the farmers in Nyandarua County (Abong et al. 2009). The county has four micro-catchments namely Rwanyambo, Githabai, Bamboo, and Njambini. Their populations are 1187, 982, 681 and 811 households respectively (KNBS, 2010). All these micro-catchments were included in this study. The project targeted 1152 farmers in the area and they were sampled in the study.

3.4 Sample and sampling procedure

The sampling unit was all households who participated in the KAPSLM project in Nyandarua County. The information on sampling frame was obtained at the County agricultural office based in Kinale. The study used a sample of 116 households determined using the formula suggested by Gatotoh, Omulema & Nassiuma, (2011). The formula is stated as;

$$n = NC^2 / C^2 + (N - 1)e^2 .$$

Where n is the sample size,

N is the population size,

C is the coefficient of variation e is the standard error

Nassiuma (2000) asserts that the coefficient of variation should be $\leq 30\%$ while the standard error should lie between 2 and 5%. In this study, C was set at 22% while the standard error was set at 3%. These values are arbitrarily taken by the researcher. Thus,

$$n = 3061(0.22^2) / 0.02^2 + (3061 - 1)0.02^2$$

$$= 116.4$$

$$\sim 116$$

Nyandarua County has 4 micro-catchments namely, Githabai, Bamboo, and Njambini all of which were included in the study. Proportionate sampling was used to determine the number of households from the different locations to be used in the study (Table 3.1, below).

Table 3.1 Summary Table for Proportionate Sampling

Micro-catchment	Population (households) (n)	Proportion(p) (n/N)	Number to be sampled (n/N)x 116
Rwanyambo	1187	0.20	23
Githabai	982	0.32	37
Bamboo	681	0.22	26
Nyambini	811	0.26	30
Totals (N)	3061	1	116

Adopted from Kenya National Bureau of Statistics (2009)

3.5 Data sources and instruments

Both primary and secondary data were collected in the study.

3.5.1 Primary data

Primary data for this study was collected using household interviews. The interview guides were preferred because the population comprised of illiterate and semi-literate persons who could not complete questionnaires. This type of a study required probing for crucial information from respondents, something promised by interviews as a method of data collection. Furthermore, the language of the interview can be adapted to suit the interviewee which reduces misinterpretation of questions (Kothari, 2008). The instrument contained both close-ended and open-ended questions. Close-ended questions provided a basis for quantifying the data obtained while the open-ended ones provided useful information that was used in explaining observation in the study.

3.5.2 Secondary data

Secondary data were obtained from published books and journals, online data and resources, government reports and records from the agricultural office of Nyandarua County. Unpublished data sources such as assessment reports, theses, policy briefs and discussion papers were also be reviewed. The desk review of all these materials continued during the entire period of this research; involved an extensive analysis of issues relating to poverty reduction and alleviation strategies through policies and programs in Kenya and the extent to which they have involved the small holder farmer. The records of KAPSLM implementation were also analyzed. This was important in documenting and analyzing the approaches taken in the assessment of the projects implemented by KAPSL Min poverty reduction. From the chief's office, provide the researcher with the demographic records of the area, village and village maps of the catchment area. This data was critical in complementing primary data and providing the study background. The data was also useful in understanding other projects that have been implemented in other areas and assessing their impacts on farmers.

3.5.3 Validity

Validity implies that the same results would have been collected every time over repeated tests/ observations. Experts who measured and determined whether the items or indicators accurately depicted the concepts of interest verified on the instrument's content validity and face validity.

3.5.4 Reliability

Reliability of a research instrument is its ability to yield consistent results or data after repeated trials (Kothari, 2008). The research instrument was pilot tested using thirty farmers randomly selected from Nakuru County which was part of the project. Nakuru and Nyandarua counties both have similar climatic conditions, and the farmers in both countries were involved in the project. The results of the pilot test will be used for testing reliability of the instrument. Mugenda and Mugenda, (2008) recommends that a reliability coefficient of greater than or equal to 0.7 is acceptable.

3.6 Data collection procedure

With the recommendation of the graduate school, a permit was acquired from the relevant authorities. The county director of agriculture together with various chiefs' and sub-chiefs'

offices in the various locations was contacted so as to be informed of researcher's presence and to provide the sampling frame. A face-to-face interview was conducted to collect data from individual farmers. Interviews offer the researcher a chance of obtaining personal information from the client efficiently, controlling missing returns and thus reducing cases of non-response and quickly adopting the language of the interview to the education level of the interviewee (Kothari, 2008). In addition, interviews facilitate the collection of supplementary information about individual attributes as well as the environment, which are vital in results interpretation.

3.7 Data analysis

The data collected from the field was coded and then entered into the Scientific Package for Social Scientists (SPSS) computer program. Descriptive statistics including means, frequencies, mode, and percentages was used to in data analysis. The results were presented in charts, graphs, and tables. These tools are precise and portray the information in an accurate manner that can be comprehended by anyone.

3.8 Expected output

The study was expected to show the impact of the KAPSLM project on poverty reduction in the study area. Similarly, the study was to point out the potential flaws that may have occurred that may have led to project failure or success in poverty reduction.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Introduction

This chapter provides the findings of the study. The chapter is divided into major sections as guided by the study objectives. Section one offers the general demographic characteristics of the farmers and the households that were interviewed. The demographic characteristics are age, education level, family sizes, marital status and gender. Section two relates to study objective one that is about impact of the KAPSLM on poverty reduction in the study area. The third section is based on the study objective three which relates to benefits that the farmers realized from the project. The fourth section relates to the third objective, which focuses on the costs that the farmers incurred in the project implementation process, which may have influenced the implementation of the project by the farmers. At the end of each section, a discussion of each objective and how it is related to other studies is provided.

4.2 Household demographic characteristics

The demographic characteristics of the respondents that were studied in this study are age of the household head, household size, gender of the household head, level of education, and marital status. The results are as shown in Table 1.

4.2.1 Sex

The study interviewed 116 households. The total number of males interviewed was 66, which represented 56.9%, and the total number of female respondent was 50, which represented 43.1%.

4.2.2 Age

The distribution by age shows that 21 respondents were aged below 20 years, 27 household heads were aged between 20 and 30 years, 37 were aged between 30 and 40 years while 31 were aged between 41 and 50 years. Youth in farming (2011) explains that the youth tend to shun away from agriculture due to several reasons. Some of this reasons could be due to Agriculture being a profession of intense labor, agricultural loans are always siphoned by politicians hence lack of funds and in Africa parents always encourage their children to study and get themselves white collar jobs. It was also observed that KAPSLM had integrated a

project for the youth, Youth for KAPSLM (Y4KAPSLM). It targeted the youth mainly, and this helps to account for the large number of youths in the project area.

4.2.3 Education

The level of education of the farmers reveals that at least almost all the farmers had some form of formal education. 62 of them which represented 53.4% of the study sample had completed primary education, 47 of them which accounted for 40.5% had attained secondary level education while only one farmer did not have any form of formal education. The literacy level was observed at 84.4% and is evident that the farmers who were involved in the program were educated. This further implies that their high level of literacy could have influenced the high uptake of the program.

4.2.4 Family

The study shows that about 46.6% of the respondents had between 2 and 4 family members while the rest had families larger than that. These results reveal that many of the families in the study area are relatively small. In line with the marital status of the farmers, 33 were single while 71 were married which represented 28.4% and 61.2% respectively. The population had 11 household heads that were widowed representing 9.5%. Only 1 farmer was divorced. This shows a strong value on family unity where people dwell together unless they are separated by death. Ninety-two percent of the respondents were married while the rest were not. The relatively high number of respondents having small family sizes could be explained by the fact that families are continuously reducing in sizes over the recent years. As observed by Brass (2015), people are moving from large family sizes of the early to mid-twentieth century to small sizes as witnessed in the 21st century. The reducing land sizes and high economic demands could help explain the trends. More so, many of the respondents were youths who are raising their young families and thus it is expected that the families will be small and may or may not expand in future. This implies that majority of the respondents in the study area had acquired basic literacy.

Table 4.1 Demographic Characteristics of the Respondent (N=116)

	Category	Frequency	Percent
Gender of the respondent	Male	66	56.9
	Female	50	43.1
Age of the farmer	Below 20 years	21	18.1
	20-30 years	27	23.3
	31-40 years	37	31.9
	41-50 years	31	26.7
	Above 50 years	0	0
Family size	1-4 members	44	46.6
	5-9 members	72	53.7
Highest level of education attained	Primary	62	53.2
	Secondary	47	40.5
	Tertiary	6	5.2
	None at all	1	0.9
Marital status of the farmer	Single	33	28.4
	Married	71	61.2
	Widowed	11	9.5
	Divorced	1	0.9

4.3 Projects implemented

I sought to find out the projects were executed by the various respondents. The results are shown in table 2.

Table 4.2: KAPSLM project implemented by farmers (n=116)

Component	Frequency	Percentage
Terraces	13	11.2
Nappier grass	18	15.5
Fruits and vegetables	35	30.2
Aquaculture	9	7.8
Apiculture	16	13.8
Dairy farming	25	21.6
Total	116	100.0

The study revealed that 35 (30.2%) of the farmers were involved in the fruits and vegetables component of the project. The other part of the project that took a larger share of the farmers was the dairy-farming component, which had 25 farmers representing 21.6% of the total households sampled. Those practicing apiculture (bee keeping) and aquaculture (fish farming) were 16 and 9 representing 13.8 and 7.8 respectively. The project had all these components and farmers implemented what they thought was good for them.

Ligthelem and Wilsensch (1993) argue that widespread of poverty causes environmental degradation and this normally results in a threat in economic development. It is in this aspect that the terraces were introduced and aimed at controlling soil erosion especially in the steep slopes of Aberdare Ranges, which are prone to heavy rains. The terraces were either Fanya

juu terraces or Fanya chini terraces. In some cases, especially in very steep slopes, cut-off drains would come in handy for areas, which are highly water logged.

The terraces would be dug depending other direction of the flow of the gradient to limit the movement of water across the soil surface thus controlling soil erosion. The project also provided farmers with nipier grass by the name Kakamega 1 to act as a fodder crop for livestock and also control soil erosion. Another component of the project was fruits and vegetables which were meant to diversify the crops that the farmers relied on for their livelihoods. The vegetables in question include indigenous vegetables as well as new varieties. Since the area is mainly known for milk production, the project also targeted dairy farmers. The dairy industry was to be improved by the provision of fodder crops such as tree lucern and calliandra. The farmers would also receive training on the same form specialist as well as dairy breed improvement. Farmers also implemented these projects to different extent depending on the land sizes and interest.

The study showed that the uptake of fish farming was rather limited. The main reason for this is that fish farming is still not wide spread in the study area. The cultural variation here may explain why. The Agikuyu who are not traditionally fish eaters predominantly inhabits the area. However, with advances in community integration and information sharing, they are continuously getting into fish farming and consumption due to the nutritional awareness created over the recent past. Besides, the practices require a steady supply of water in fish ponds as well as the land where to keep the fish.

With reducing land sizes, competing alternatives and the opportunity cost, farmers tend to shy away from fish farming. As observed by Rogers (2010) the farmers will always consider the farm enterprises with the highest returns within the shortest time possible. For small-scale farmers like those in the study area, fruits and vegetables combined with dairy become an easier choice. Fruits and vegetables take a short time to mature (not more than four months), and this acts as a motivating factor for farmers who wish to increase their incomes rapidly. The main fruits that the project promoted were tree tomatoes and Pepino Mello. Tree

tomatoes are in high demand in the local markets and can be harvested continuously for many years.

The fruits provided a ready source of nutritional vitamins for the family, and thus the farmers easily adopted them. The pepinomello were a major source of income as they had a ready market and grew continuously. That is, they do not have a harvesting season. The harvesting is continuous. Thus, they helped to increase family incomes. Moreover, the crop did not require a lot of land for implementation. Given the small sizes of land, the fruits and vegetables become a more attractive technology for adoption by the farmers.

According to Rogers (2010), projects are adopted differently by farmers depending on their conformity with the value system and the ease with which they are blending in with the existing technology. For instance, the farmers in Nyandarua County are dairy farmers and thus incorporating aspects of the project that in conformity ensured adoption which in return shows the extent to which such strategies could be successful in alleviating poverty I the study area. Projects that conflict or are likely to conflict with the beliefs of the people are highly unlikely to be adopted by farmers and this means that their aim of alleviating poverty is not achieved. Availability of other supporting resources could also play a vital role in enhancing uptake of projects geared towards poverty alleviation.

The adoption of terraces was driven by the high rate of land degradation the area. Farmers noted that the area was prone to severe soil erosion and loss of topsoil during heavy rains, which fall, in torrents. To that end, they realized that digging terraces was one of the fundamental ways to stop the loss of topsoil, which is the main source of nutrients for crops. The project component of a capacity building in the form of educating farmers on the importance of soil erosion control and the best methods to do so also played a key role in the effort. Farmers were continuously trained on the importance of soil erosion control as a method of sustainable land management. Thus, when they weighed all the available options, given the steep land gradient, they opted for terraces.

Bee farming was easy to implement since there were little resources in terms of land that were required. The farmers only had to make the hives and hang them on trees, and the bees

would just populate the hives. Since the project was low-cost, the framers normally implemented the project since it could be combined with another farm enterprise easily. Apiculture, therefore, was implemented easily. It is also noteworthy that the main places where the hives were placed are I areas where fruits and vegetable farming was done. The farmers noted that the bees helped in pollination of the fruits and thus they became easy to adopt. More so, honey is a commodity in demand in the area, and it increased household incomes for the farmers. Various scholars have pointed that farmers tend to adopt technologies that have multiple benefits for them as opposed to those that serve only one purpose. To farmers, bees serve as a source of income, a source of pollination agent for crops and also they increase the aesthetic value of the land. As a consequence, farmers will tend to take it more.

However, the likely reason why it was not implemented in all farming households is that of lack of structures where to hang them. Since many land sizes are small, (between 0.5 ha and 2.0 ha), the farmers would see it as a risk to have the bees on the farm because of the proximity of the hive to the homestead which would pose a threat to the family members. Since most homesteads are located within the farms, the bees would pose a potential threat to the family members especially in the event they turn hostile if agitated. They would pose a threat not only to humans but also the domestic animals such as cows, which could agitate them unknowingly. If farmers consider a technology to be threat to the family or any other domestic animal, the potential risk associated with such a technology significantly reduces its adaptability by farmers (Meijer, Catacutan, Ajayi, Sileshi & Nieuwenhuis 2015), if the farmers must adopt a technology with high risks, then the pros of the project must outweigh the cons to make the project more attractive to the farmers.

Table 4.3: Prevalence of the effects of poverty reduction projects

Farmers	Before	After	Frequency	Percentage
Fruits	2000	6000	35	30.2
Dairy Farming	1000	2000	25	21.5
Nippier Grass	700	1000	18	15.5
Apiculture	500	800	16	13.8
Terraces	200	500	13	11.2
Aquaculture	100	300	9	7.8
Total	4,500	10,600	116	100

4.3.1 Impact of terraces on poverty reduction

Pinstrup-Anderson and Pandya (1994), argue that rural poverty combined with the day-to-day increase in population has been a major cause of environmental degradation. They further explain that those who are poor and hungry will always destroy the immediate environment to survive. It is in this respect that farmers were to dig terraces on their farms by themselves either in groups or as individuals. Another alternative was for the project to pay the youths in the area to dig the terraces for the farmers, and all the farmers had to do was to allow the youths to do it.

Many farmers settled for the later option, as it was convenient. However, not all farmers were to benefit from the program-funded terraces. So the farmers choose to adopt or not was influenced by the element of cost and the impact on land. Some farmers who did not adopt the terraces argued that the terraces would reduce the size of land that can be tilled with an advanced impact on incomes. Only 19% of the farmers interviewed had dug terraces in their farms or allowed the youths to do it for them. The results from those that had dug the terraces showed that the lands had reduced the rate of soil erosion. Besides, the farmers had grown on the terraces to help in holding the soil together. The result here was indirect, and the animals noted that they had increased fodder for their livestock and thus during the dry spell they did not suffer from lack of animal feeds which is rampant in the area during those times.

Terraces, especially the *fanya juu* terraces acted as a water retention ditch and would facilitate easy percolation of water during the rainy season. The water would seep through slowly making an irrigation system. As a consequence, the farmers enjoyed green fields even two months after the rains had stopped. The farmers who dug terraces also were compensated at a rate of 30% of their effort. So this acted as an indirect motivation for the farmers. The income generated there was used to meet various needs of the farmers. The terraces also allowed farmers to drain their lands.

The farmers in highly waterlogged soils noted that since the terraces were dug, they enjoyed harvesting even when they did not have such an opportunity in the past. Such increase in harvest or likelihood of harvesting became a major source of income thereby reducing poverty. The terraces also helped to retain the topsoil as farmers noted that the rate of losing the topsoil had reduced since the project inception. The farmers noted that they did not have to apply as much fertilizer as they used to do before and yet their crops yield had been on an upward trend.

However, the farmers lamented that the routine maintenance of the terraces was a major challenge since they had to continuously remove the soil from the terraces every three times in a year after the long rains. The cost of maintaining the terraces was 300 per meter, and for farmers with so many terraces, it was a major strain. However, they noted that the economic cost of working on the structures outweighed the benefits on the land especially the sustainability of soil. Thus, it is arguable that the terraces helped to increase the incomes of the farmers; control soils, which later led to higher yields, provide animal feeds in the form of grass, planted on top and maintain soil fertility. While these impacts do not have a direct link to poverty reduction, it is evident that the accrued impacts will lead to higher incomes later.

4.3.2 Impact of nappier grass on poverty reduction

Farmers were supplied with Kakamega nappier variety that is high yielding, and early maturing compared to the traditional varieties the farmers were planting. About 15.5% of the farmers in the study area adopted and planted the nappier varieties on their lands. The nappier would not only act as a source of livestock feeds, but it would also act as soil erosion

control measure. This second Broad (1994) who observes that in the Philippines to disagree with the traditional paradigm of poor people as environment destroyers, the author confirms that the society had been transformed from environment destroyers to environmental protectors. Planting the nappier meant that the livestock feeds would increase. The farmers would then get more livestock feed, especially in drought season.

The nappier that the farmers received were drought tolerant, and thus it would be harvested throughout the year. As a consequence, 72% of the farmers who planted the nappier noted that their milk yield per animal did not significantly change even during the dry spell. Thus the income levels, one of the measures of poverty incidence remained stable. With unstable incomes, the farmers would go on with their lives in the dry spell uninterrupted. The rest 28% noted that the milk production for their livestock increased during the dry spell. They asserted that the nappier was high in fiber and so during the dry spells, animals produced more milk since the food was available. In the wet season, they noted that the milk was higher compared to their counterparts who had similar animals but gave a different variety of nappier. It is therefore evident that the nappier improved the incomes of the farmers that helped to reduce the likelihood of poverty incidence. Ayele, Duncan, Larbi, and Khanh, (2012) noted that if livestock is fed with the improved varieties of fodder especially grasses, they are likely to increase their output or retain it, on the least. Adopting and implementing such technologies allows fighting poverty in the long run because animals are satisfied and can produce continuously. For dairy animals, constant feeding even during the dry spell will imply higher milk yields. The nappier grass, therefore, played a double role in the farms. It ensured constant supply of feeds for livestock while at the same time controlling soil erosion. Controlled soil erosion ensures a steady and stable soil which will support food production for the current generation and for the future generations.

The low number of farmers who did not plant the nappier despite it being promoted can be explained by the shortage in supply, and also the farmers still had the old varieties. The farmers who had already planted the old varieties considered it hard to uproot their varieties which they known for years to take the new ones which they knew little about. As a consequence, they chose to stick to their old ones and wait to see what the results those that

planted will get. According to Rogers (2004) in his adoption theory, he argues that not all farmers are early adopters. There are those that will remain a put to and see what will do. There also laggards who will wait for so many years after the project has been implemented even to try. From the study; it is expected that the farmers who have not adopted the nappier grass yet will still adopt over the years after they realize from their fellow farmers the importance of the nappier.

4.3.3 Impact of fruits and vegetable implementation on poverty reduction

The introduction of fruits and vegetables was part of the project design. The farmers were encouraged to plant and grow fruits including tree tomatoes, strawberries, and traditional vegetable. The study revealed that 30.2% of the farmers interviewed had implemented this particular aspect of the project. It is, in fact, the part of the project that was highly implemented in the study area. The most likely reason for this is that the fruits not only provided readily available vitamins for the family, it was also as a source of income for the households. As noted by Reardon and Vosti (1995), increased market integration is important as this makes farmers be more motivated to produce more yields. Farmers noted that the fruits had a ready local market. The vegetables also had a local market and also supplemented the traditional vegetables that the farmers used for food. The fruits such as strawberries were grown under organized groups to facilitate value addition and enhance group marketing. The fruits were harvested continuously thus allowing farmers to have a steady income that was available throughout. The farmers asserted that in the event of failure of other crops such as potatoes and cabbages, the fruits redeemed the farmers.

Thus they saw fruits as the best option to give them steady incomes. Incomes generated from the fruits and vegetables help in cushioning the farmers during extreme events. The tree tomatoes are reported to be resistant to various weather events such as floods, and therefore they allow farmers to enjoy incomes at reduced cost of production. A fruit like Pepino melon, which was recently introduced in the area, is reported to be highly nutritious and provides farmers with alternative sources of income.

According to Kandulu, Bryan, King, and Connor (2012), farm enterprises diversification helps the households to distribute risks and thus ensure that farmers' incomes are not

tampered with in case one enterprise fails. For instance, if a farmer relies only on dairy farming and then the dairy industry is hurt by external forces, then the farmer may have to incur huge losses and become exposed to hunger or poverty. However, if the farmer has many alternative sources of income, such situations can be controlled for easily.

Fruits are also a source of vitamins for households. Despite the importance of the fruits and vegetables on the household incomes and by extension reduction of poverty, not all farmers had adopted them. According to the diffusion of innovation theory, technology has four main elements that influence its adoption. They are the innovation itself, the communication channels, time and the social context within which the adapter institutions are located (Rogers, 2010). Factors such as the cost of implementation, perceived profitability, and ability to communicate information between the various players in the innovation and adoption process, as well as the compatibility with value systems are among the various attributes that influence adoption.

The cost of establishment of the enterprises was the key element of the project that could have hindered the adoption of fruits and vegetables in the study area. The cost of one seedling of Pepino melon was Ksh30 which was not affordable to many farmers. Similarly, the establishment of the strawberry nurseries was also cost which also hindered the adoption. The costs were a key factor in determining the extent of adoption. The study thus asserts that fruits and vegetables helped to reduce poverty in the study area by giving farmers a steady income. The incomes helped to cushion farmers from any extreme strains in economic situations by diversifying farm enterprises. As a result, the fruits and vegetable components of the project helped to reduce the farmer's poverty indirectly.

4.3.4 Impact of apiculture implementation on poverty reduction

Apiculture was implemented by 16 farmers in the study area which represented 13.8% of the total population studied. Bees play a significant role in pollination (Aizen & Harder, 2009). Farmers who implemented this aspect of the project aimed at gaining incomes from the sale of honey and at the same time help in pollination of their crops. The area lies on the slopes of Aberdare ranges, and thus there are many trees which act as a source of bees from the forests. Thus, for farmers who put bee hives in their farms, the bees would come from the wild and populate the hives. The sale of honey, which is in high demand in the area, played a key role

in increasing the incomes of the farmers. Besides, crops especially fruits benefited a lot from the pollinating agents. The project educated farmers on how to do beekeeping in the area and many farmers did not implement it. The reason for the low-level of implementation of the project could be due to the small sizes of farms where farmers would fear to keep bees near to homesteads. Many farms in the area are close together and measure 0.5 ha to 2 hectares in many cases. Thus even if a farmer implemented beekeeping in their farms, there are chances of causing conflicts with the neighbors' if the neighbor's bee hives are close the homestead of another farm.

Bees provide honey which is a source of energy and sugars for the body. In the community, the honey has a social value as it is used in preparing local brew called Muratina used in many cultural events especially in the payment of bride price. The use of honey in the area for such activities makes it a highly valued commodity with high demand and fetches good prices. Thus for families that practice bee keeping, the market is ready and stable. Thus, bee keeping increases and diversifies the sources of incomes for the families. Moreover, the beehives do not need special space for keeping. Just hanging them in the trees around the farm is all one needs to do. By this, apiculture does not reduce the size of land that the farmers can till.

4.3.5 Impact of aquaculture implementation on poverty reduction

Aquaculture implementation in the project area was done by 9 farmers who represented 7.2% of the population studied. The main method of aquaculture implemented was fish farming. Fish farming has been promoted by various organizations in the past in various parts of the country with a view to diversifying sources of proteins. Fish provides white meat to the family and the major source of fats rich in omega 3. To curb malnutrition especially among children, the project designers intended to introduce fish farming in the area. Although numerous efforts have been put in the past in Nyandarua County to foster adoption of fish farming as a poverty reduction strategy, it is clear that the majority of farmers do not conform. The farmers that conformed to fish farming noted that fish farming is part of their farm enterprises diversification and it also offers alternative livelihoods to them. The fish harvested is sold locally in albeit where the market is not so big. As a result, much of the fish produced is consumed at the household level providing an alternative source of proteins for

the family. The main motive for fish farming for the farmers that practiced it was food sources rather than incomes generation since the local community is not fond of fish consumption. Besides the fish market in Nyandarua County faces stiff competition from the nearby Nakuru County with fish coming from Lake Naivasha. Thus, the fish market does not favor local farmers, and so they end up producing fish for their domestic consumption and little for sale.

For the large number that did not take fish farming, the main reason could be the water demanded in the fish farming endeavor. Fish farming requires water in the fish ponds and also space for construction of the ponds. The land sizes are small, and so farmers would not implement it as individuals. The area also suffers from water scarcity especially during dry spells, and this is a major hindrance to the uptake of the project. Another reason that could have limited the uptake of fish farming as a poverty reduction strategy is the high cost of implementation. The project requires the purchase of polythene bags to make the fish pond which is costly for the farmers.

Moreover, the sourcing for fingerlings is costly since there are no known local breeders in the area. Thus farmers have to procure them from other counties which limit the extent to which they can practice fish farming. Thus it is only likely that fish farming played a role in poverty reduction by acting as a food diversification strategy. The concept of income generation for fish farming may not have been a major motivating factor for farmers due to reasons cited above. As noted by Smith, Sones, Grace, MacMillan, Tarawali, and Herrero (2013), farmers have different strategies they use to fight poverty.

Among them is diversifying their sources of various foods. For instance, if they have various sources of proteins, they can always use the best option that suits them when the need arises. With milk and meat is a major source of animal proteins, diversifying it with other alternatives like fish becomes a strategy. Besides, if they have fish, they can reduce the extent to which they consume milk and meat which can be marketed locally. The money that could be used to purchase meat or the opportunity cost of consuming milk as a source of protein is

taken care of by the fish. In the end, fish farming as a poverty reduction strategy becomes a source of alternative foods especially proteins.

4.3.6 Impact of dairy farming implementation on poverty reduction

Dairy farming is one the major economic activities of the farmers in Nyandarua County. Twenty-five farmers who represented 21.6% of the farmers interviewed had implemented poverty reduction strategies aimed at improving dairy farming in the study area. The main strategies employed was the formation of a joint group for selling the milk, growing of animal fodder crops like tree Lucerne and Calliandra as well as attending a training session on how to improve dairy farming.

Many farmers implemented various aspects of the project in relation to the dairy farming. The result was that the farmers who sold milk to joint group received better prices than those that sold individually. More so, for those that planted the fodder crops provided, they indicated that they realized an increase in milk production. The increase in milk production implies an increase in incomes for the farmers and more milk for domestic consumption. Since milk plays a major role in promoting wealth creation, increasing milk production and sustaining it goes a long way to ensure that the families have enough financial resources to fight poverty.

The probable reason for the adoption of the strategy is that the fodder crops provided do not need special skills to plant and maintain. Besides, they are all planted once, and the subsequent periods, the farmer just needs to follow-up with manuring after harvesting. The training was provided by specialists who were hired by the project, and so all the needed to do was to attend without paying for the services. Thus many farmers benefited from the training. However, not all farmers participated in the training as some found them time-consuming. The farmers were supposed to be organized in groups within which they would be trained on various aspects of dairy farming. This partly explains why many farmers who were involved in dairy farming were in opposition to attend and increase their milk production.

The lack of seeds for the fodder crops may help to explain why not all farmers were involved in the dairy farming project. The number should have been higher since dairy farming is one of the key activities in the project area. But due to the lack of resources to implement the fodder crops and also the ones provided by the project were limited, many farmers withdrew from the project with time. The sale of increased milk is one of the ways the project assisted in reducing poverty. Some farmers indicated that they had increased their dairy herd as a result of participating in the project which is also a significant poverty reduction strategy.

In the study by Smith et al. (2013), the scholars showed that dairy farming is one of the major ways farmers can generate incomes and thus help in reducing household food shortage. Milk provides the family with a cheap source of proteins thereby making it possible for them to remain food secure. Besides, the sale of milk and other animal products helps to enhance income diversification for farming households which in return acts as poverty reduction strategy. Nyandarua County is one of the counties in Kenya known for dairy farming. With enhanced dairy production, the farming households can increase their incomes and thus help in fighting poverty. The group sale of milk has been significant in making sure that the farmers can bargain for better prices for their produce.

The farmers asserted that if they sell milk as individuals, they sell at the rate of Ksh. 24/liter in high production season and Ksh 28/liter in low production season. However, when they merge and sell as a group, they sell the same amount of milk at the rate of Ksh. 28 and 32 respectively. Thus, the project encouraged them to sell the milk in groups, and they did so. As a result, their incomes increased significantly from the sale of milk which in return will play a significant role in poverty reduction in the short and long run.

4.4 Benefits of the projects implemented

The project intended to investigate the benefits in general that the farmers gained from participating in the project. The results are provided in Figure 1. The results reveal that 14% of the farmers noted that the main benefit was higher crop yields, 34% reported reduced soil erosion, 16% said that increased community cohesion was the main benefit while 13% said it was increased incomes. A further 15% said that the main benefit was diversified food sources and another 9% said it was the diversified farm enterprises.

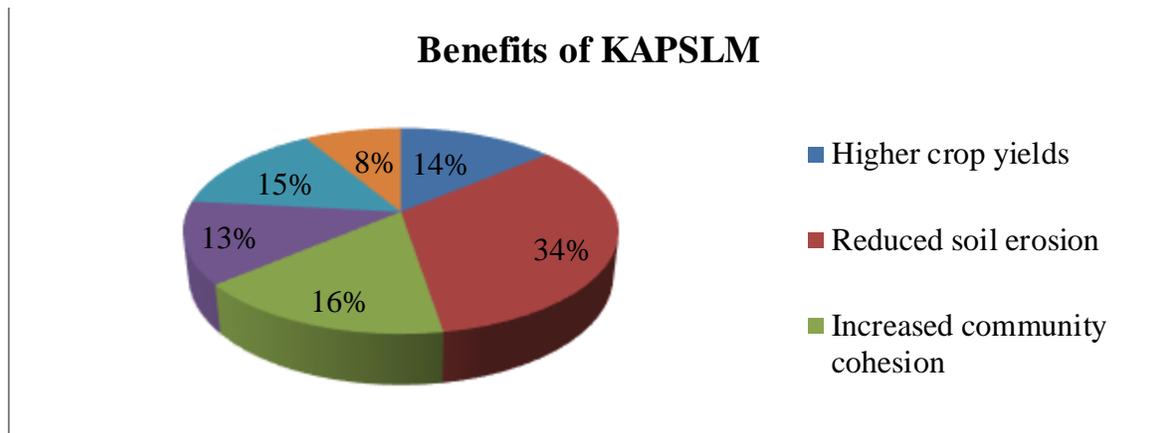


Figure 4.1: The benefits of KAPSLM

The higher crop yields could be associated with the improved methods of farming emanating from the training that the farmers received. Besides, as the farmers implemented terraces, they helped to reduce soil erosion, enhance water retention of the soil and limit the sudden flow of water from the land. All these factors combined helped to promote crop growth. The reduced soil erosion was a result of terraces and nappier grass planting. The reduced soil erosion in return ensured that the land would remain fertile for long and the future generations will have a chance to explore the soil for their benefits. Soil erosion limits crop productions since the top soil that promotes crop growth is taken form the land. In the end, the land becomes unproductive due to soil degradation and infertility. As observed by Martínez-Murillo, Nadal-Romero, Regüés, Cerdà, and Poesen (2013), soil erosion takes away the topsoil, which has the necessary nutrients for crop growth. In the end, the quality and quantity of soil that can promote crop growth reduces significantly leading to declining land productivity. In addition, the erosion may result in clogging of water bodies as the fertile soil from the farms is deposited.

The aspect of increased community cohesion comes from the idea that much of the project was implemented along common interest groups (CIG). People with the same interest in an enterprise were lumped together and trained on the same. For instance, those interested in dairy farming were trained together. Similarly, those interested in fruits and vegetables or apiculture were trained together. The groups had similar meeting places, and they shared and exchanged ideas. As a result, the community cohesion was increased as pole learned together

with and from each other. Srisopaporn, Jourdain, Perret and Shivakoti (2015). Note that when people learn from and with each other, they become acquainted with one another, and thus they end up being close. They are likely to conduct other activities together and even form long lasting bonds as a result.

A significant number of farmers noted that the project led to increased incomes. Increased incomes could come from increased land output, increased output from the various farm enterprises including dairy, crop farming and so on. Increased incomes play a significant role in poverty reduction since the extra amount of money generated can be used to start other projects on the farm or to increase the ones that already exist. For instance, a farmer with increased incomes could purchase more animals or could use the money to improve the breeds. Research has shown that if farmers have increased incomes, they have more to save and invests which in return helps to break the vicious cycle of poverty (Tittone 2014). On the contrary, reduced incomes lead to lower amounts of money for saving, little or no investment which ultimately leads to the continuation of the vicious cycle of poverty. Thus, the project helped farmers to increase their incomes, and in the long run, it will help them in breaking the cycle and reduce poverty.

The diversification of food sources was also a fact the farmers considered a benefit from the project. Initially, the farmers grew cabbages and potatoes as the main crops for subsistence and commercial purposes. However, after the project was introduced, they started fruits farming especially tree tomatoes and strawberries which are fast maturing and fetches better prices in the market. They also have a ready local market and the surplus can be exported to neighboring counties like Nakuru and Nairobi. Fish farming provided the households with alternative sources of proteins for the family and the community. According to Gebbers and Adamchuk (2010). When families have many options for food sources to pick from, they are better off than when they have a few options. Such diversity in food sources helps to enhance household food security and in return mitigate the impacts of poverty. It is also clear that when families have diverse sources of food, the likelihood of suffering during low food supply seasons are reduced. Some crops will be available in other seasons while others will not. So with diverse sources, families remain secure throughout.

The respondents also identified the diversification of farm enterprises as another major benefit they realized from the project. Having more than one farm business to rely on is critical as it helps to spread the risks associated with agricultural production (Zeza & Tasciotti 2010). Agricultural production is characterized by overproduction in some seasons and no production in some others. When such variation in production happens, the family incomes are highly affected especially for households that rely on only one commodity. But with more than one enterprises to rely on, the families can shield themselves from the negative production impact that may arise. For instance, in a season where there is crop failure in potato or cabbages, the household food security is cautioned by dairy or animal husbandry. The reverse is also true. In seasons when the milk prices are significantly low, the other farm enterprises come in handy to ensure that the family incomes are not significantly affected. The households in the study noted that with the introduction of fruits and vegetables, for example, the families that relied mainly on dairy had an alternative source of income.

4.5 Impacts of costs on poverty reduction strategies implementation

The costs that the farmers incurred for the projects they implemented are shown in Table 4.

Table 4.4: Costs incurred by farmers in the implementation

Cost incurred	Frequency	Percent
0-10000	58	50.0
10000-20000	51	44.0
>20000	7	6.0
Total	116	100.0

The study showed that 50% of the farmers who implemented the project spent between 0 and 10000 shillings. A further 44% spent between Ksh 10000 and Ksh 20000 shillings while only 6% spent more than Ksh 20000. The cost incurred was mainly for the implementation of the projects. For terraces, the costs were mainly for digging where laborers were paid Ksh. 300 per meter for a terrace that was dug 2 feet wide by 2 feet deep. The cost implied in the study is the actual money that the farmer paid for the work and does not include the opportunity cost for the farmer. In cases where the farmers dug the terraces, that cost is not captured. For dairy farming, the cost was incurred in breed improvement and purchasing of new fodder crop varieties. For nappier, the cost was incurred in the establishment as well as procurement of the seeds. For fruits and vegetables, the costs were incurred in sourcing for seeds, crop establishment, and land allocation. Tree tomatoes require high initial capital, and thus many farmers would use much of their resources to establish the crop. For fish farming, the costs were incurred in sourcing for fingerlings and digging of the fish pond as well as the acquisition of polythene bags for use in the pond construction. The cost in bee keeping was for making the hives.

According to Rogers (2010), the cost associated with the implementation of a project may hinder its adoption. Farmers look at cost as an obstacle and only embrace projects that they feel have a higher marginal return to scale. Activities such as fruits and vegetable implementation may require a lot of resources. However, since the returns are also high, they act as a motivating factor for the farmers. This may help to explain why in spite of the project taking a lot of resources compared to other endeavors; it had the highest number of farmers implementing it. Costs act as a limiting factor to full-scale adoption of projects, and this has a negative impact on poverty reduction strategies.

CHAPTER 5: SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This chapter is divided into three sections. The first section provides an overview of the entire study; the second section gives the conclusions of the study. The third section gives recommendations made for the study area as well as for further studies.

5.2 Overview of the Study

Various development agencies have put in different efforts to reduce poverty in developing countries in the past. The Kenya Agricultural Productivity and Sustainable Land Management Program (KAPSLM) is one such effort that was put in place in Kenya. The project covered various aspects of community development and aimed at increasing incomes, diversifying farm enterprises and providing households with alternative livelihood sources. In Nyandarua County, various components of the project were implemented including dairy farming, apiculture, aquaculture and soil management practices. The impacts that the program had on reducing poverty in the area has not been studied in the past. The current study aimed to assess the impact of KAPSLM on poverty reduction in Nyandarua County.

The purpose of this study was to investigate the impacts of KAPSLM project as a tool for poverty reduction in Nyandarua micro-catchment. The study will lay grounds for future scholars who would want to assess other development agenda's impacts in the study area. The study was guided by four objectives and four research questions which were derived from the study objectives. The objectives were:

- i. To establish the incidence of the various projects implemented by KAPSLM on poverty alleviation in Nyandarua micro-catchment
- ii. To investigate benefits derived from participating in the KAPSLM project on poverty reduction in Nyandarua micro-catchment
- iii. To assess the impact of the sustainable land management techniques implemented by farmers involved in KAPSLM project on poverty reduction in Nyandarua micro-catchment
- iv. To investigate the effects of costs incurred by farmers involved in KAPSLM project on poverty reduction in Nyandarua micro-catchment

The study was guided by the theory of adoption of innovations and the livelihoods theory. The theories were found to be much applicable in the study. The study used a cross-sectional survey study design. The target population was all the farmers who were engaged in the program since its inception to the end. The sample used was derived from all the micro catchment namely Rwanyambo, Njambini, Githabai, and Bamboo. A sample of 116 farmers was obtained using a statistical procedure. Proportionate sampling was used to ensure equal representation of the households. An interview guide with both open-ended and closed ended questions was used to collect the data from the farmers. Data was analyzed using SPSS version 21, and it was used to compute descriptive statistics using numerically coded responses obtained from the field. Tables and charts showing frequencies and percentages were used to present the data.

5.3 Summary of the Major Findings

The study revealed that many households were male headed, and had family sizes of between 2 to 4 members. The study also showed that the major projects implemented by farmers were terraces, nappier grass planting, dairy farming, apiculture, and aquaculture as well as fruits and vegetables. The largest number of farmers implemented fruits, and vegetable farming followed by dairy farming. Terraces and nappier grass also had a significant number of farmers who had adopted the programs.

The study showed that terraces had helped to reduce soil erosion and thus to enhance the land productivity. In the end, the farmers had realized increased output from the farmer who in return is a significant effort in reducing poverty in the study area. In addition, the study showed that fruits and vegetable project component had helped to increase incomes through increased sales. Moreover, the fruits and vegetables that farmers planted took a short while to mature and had prolonged harvesting periods. This in itself also acted as an alternative source of livelihood for the households. The impact this aspect of the program had on reducing poverty was evident. Through increased incomes and diversified food sources that were of sound nutrition is something that the study revealed. The farmers also had implemented nappier grass growing on their farms. Apart from controlling soil erosion, the nappier provided a steady supply of fodder for livestock throughout the year. This implied that even in dry periods, the farmers did not have issues of fodder and as such, they did not realize a

significant drop in the milk they produced. Increased and steady incomes are a key thing that helps in fighting poverty at the household level.

The farmers also had implemented apiculture on their farms. Bee keeping helps to diversify the sources of incomes for farmers while at the same time helping in crop pollination. The study showed that the implementation of bee keeping in the study area also helped to reduce poverty. The project did this by increasing household incomes while maintaining the size of the arable land. Fish farming was another attribute of the KAPSLM that was implemented by farmers. Although the fish was not mainly meant for sale, it was sold on limited occasions by the farmers. The fish was consumed at the household level and thus diversified the sources of proteins at the homes. The farmers reported that they could sell the milk and other livestock products that are aimed to supply protein and consume fish. Thus, it acted as a source of alternative livelihoods and thus helped to reduce poverty in Nyandarua County.

A significant number of farmers had implemented dairy farming. Dairy farming provides the households with incomes. The increase in milk production due to the enhanced capacity building increased the incomes of the households. At the same time, it helped to increase the amount of milk that households consume making the families have different sources of animal proteins. The study showed that dairy farming had had a role in poverty reduction in the study area.

The costs that the farmers had to bear in the project showed significant influence on the type of projects that farmers implemented. Lack of capital limited the extent to which farmers adopted the various aspects of the program. For instance, terraces digging required farmers to pay laborers at the rate of Ksh 300 per meter. Farmers with limited resources did not implement the project. As a result, the costs incurred hindered full-scale implementation of the poverty reduction strategies as envisioned in the project document.

5.4 Conclusion

Based on the study findings, the following conclusions can be drawn:

The main aspects of the projects that were implemented by the farmers were terraces, fruits and vegetable production, dairy farming, aquaculture, and apiculture as well as nappier grass planting. All these projects helped to reduce poverty in different ways.

The KAPSLM program had impacted poverty reduction efforts by helping to diversify livelihoods and increasing farm incomes. The terraces increased the productivity of the land by reducing soil erosion and allowing slow percolation of water after the rainy season was over.

The dairy farming increased household incomes which in return played a key role in poverty reduction. The farmers who did not implement the project may have been constrained by the resources and lack of capital to change their dairy breeds. The fish farming provided farmers with alternative sources of animal proteins which in itself is a poverty reduction strategy. The sale of honey from bee keeping increased household incomes and thus increased the ability of households to fight poverty. In the end, the project helped to reduce poverty.

The major benefits realized from the programs that the farmers realized included diversification of farm enterprises, diversification of food sources, increased community cohesion. Reduction in soil erosion increased incomes and higher crop yields. The diversification of farming enterprises was through the introduction of new species of crops such as tree tomatoes and Pepino Mello. The increased community cohesion was as a result of the formation of farmer groups based on the enterprises the farmers were involved in the form of common interest groups. The reduction in soil erosion was through the planting of nappier grass and digging of terraces. The increase in incomes was as a result of improved methods of farming due to the capacity building. Also, it was as a result of increased milk production from dairy farming and farm enterprises diversification. The diversification in farm enterprises also meant a diversification of the food sources for the households.

The costs incurred in the implementation of the program hindered some farmers from adopting the technologies which meant that the full advantages of the project might not have been realized in the entire study area.

5.5 Recommendations

Based on the findings and conclusions the study makes the following recommendations

- i. There is a need to encourage more farmers to practice nappier grass farming as it plays the dual role of providing fodder for livestock and controlling soil erosion. Through this, animals can get sustained supply of food and hence a steady milk production.
- ii. The fruits and vegetables are key to reducing poverty as they provide a continued source of incomes. They are also a source of vitamins for the family making them a significant player in poverty reduction
- iii. The future projects could come up with a way of reducing costs for the farmers. For instance, the Kazi Kwa Vijana program could be used to dig terraces in farms instead of farmers bearing the costs themselves. This would encourage more farmers to adopt soil management strategies which in return would make the farms more productive and subsequently increase the incomes of the farmers.
- iv. The government could also play a more Proactive role in offering training to the farmers as this has proved beneficial. Increased capacity building will make the farmers more aware of the improved farming techniques which will help them to increase their incomes.

5.6 Recommendation for further research

There is a need for a study using a longitudinal survey design that will help to establish the actual benefits for individual farmers over the years. Such a study will establish the magnitude of the impacts of the KAPSLM in reducing poverty. Another study that compares the significant difference between the reductions in poverty by various project components would be necessary. A study like that would compare for example the impact of dairy farming on poverty reduction with the impacts of fruits and vegetables to establish which one would be more appropriate to promote in other areas.

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APPENDIX I: LETTER OF INTRODUCTION

ANGELINE KIDIGA
P.O. Box1-30102
Cell Phone 0724-368 804
Burn-Forest

Dear Sir/Madam

RE: LETTER OF INTRODUCTION

I am a Masters student at United States International University currently pursuing a degree of Masters in International Relations. Am in the process of developing a thesis entitled, “AN IMPACT ASSESSMENT OF POVERTY IN KENYA: CASE STUDY OF KENYA AGRICULTURAL AND SUSTAINABLE LAND MANAGEMENT PROGRAM (KAPSLM) IN NYANDARUA COUNTY.

” in partial fulfillment of my degree program.

My main objective in writing this letter is thus to request your express authorization and backing in conducting the survey at your institution. I also appeal that you may propose to me some of the staff members that you determine to hold the pertinent information that may aid this study.

I hereby affirm that I will exercise professionalism and abide by the ethical standards research as demanded by research undertaking. I will also abide by the university and the national regulations regarding research. Rest assured that the survey will not have any negative repercussions on your organization.

Yours Sincerely,

ANGELINE KIDIGA

Appendix II: Interview Guide

Farmers' Interview Schedule

I am Angeline Kidiga a student at United States International University pursuing a Master's of Arts degree in International Relations .You have been randomly selected to participate in this study. May I first assure you that you will remain completely anonymous, that the details you give was treated with the utmost confidentiality and was used only for the purpose of this study. The study is designed to investigate the impacts of KAPSLM project as a tool for poverty reduction in Nyandarua micro-catchment. The results generated may be useful to policy makers in future policy designs for project development and implementation in Kenya

SECTION I: Demographic Data

1. Gender:
 - Male
 - Female
2. Micro catchment
 - Njambini
 - Githabai
 - Rwanyambo
 - Bamboo
3. What is your marital status?
 - Single
 - Married
 - Divorced
 - Separated
4. How old are you?
 - Below 20 years
 - 20-30 years
 - 31-40 years
 - 41-50 years
 - Above 50 years.

5. Highest Level of formal education attained

Primary []

Secondary []

Tertiary []

None at all []

6. Family size (including you)

1-4 members []

5-9 members []

>9 members []

7. What is your main source of labor?

Hired []

Family members []

Both of the above []

Section II: Technologies' Implemented

8. What technologies did you implement in your farm?

Fanya juu terraces []

Fanya Chini terraces []

Cut-off Drains []

Nappier grass []

Fruit trees []

Fish farming []

Apiculture []

9. Any other (please specify)

.....
.....

10. What cost did you incur during the project implementation? Indicate the value in Ksh.....

Section III: Perceived Benefits and Challenges of the project

11. What are the benefits you realized for participating in the project?

.....
.....

12. What are the main challenges you faced during the project implementation?

13.
.....

14. Is there anything you would want to say about the impacts of the projects on the reduction of poverty in your household?

15.
.....

Thank you very much for participating in this research.

GOD BLESS YOU