

**PROJECT IMPLEMENTATION PROCESS, MONITORING AND  
EVALUATION PRACTICES AND PERFORMANCE OF HYBRID SWEET  
POTATO PROJECTS IN KENYA: A CASE OF NAKURU COUNTY.**

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**A thesis Submitted in Partial Fulfillment of the Requirements for the Award of  
Doctor of Philosophy Degree in Project Planning and Management of the University  
of Nairobi**

**2020**

## DECLARATION

This theses is my original work and has not been presented for an academic award in any other University.

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## **DEDICATION**

This thesis is dedicated to my wife Wambui Lucy Mwaniki, my daughter Dolyn Wangare Mwaniki and my sons Immanuel Taiti Mwaniki and Elijah Marieta Mwaniki, you gave me time and moral support during the development of this study and I shall forever remain indebted to you. To my parents, Mr. and Mrs. Taiti, my brothers and sisters, I express my heartfelt regards for your material and financial support extended to me during the development of this study.

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

<b>AKIS</b>	Agricultural Knowledge and Information Systems
<b>ASCU</b>	Agricultural Sector Coordination Unit
<b>ASDP</b>	Agricultural Sector Development Project
<b>ASDS</b>	Agricultural Sector Development Strategy
<b>CDA</b>	County Director of Agriculture
<b>CGN</b>	County government of Nakuru
<b>CIG</b>	Common Interest Group
<b>CIP</b>	International Potato Center
<b>ESPs</b>	Extension Service Providers
<b>ENRD</b>	European Network for Rural development
<b>FAO</b>	Food and Agricultural Organization
<b>ICT</b>	Information and Communications Technology
<b>JICA</b>	Japan International Cooperation Agency
<b>KCEP</b>	Kenya Cereals Enhancement Project
<b>KES</b>	Kenya Economic Survey
<b>NAEP</b>	National Agriculture Extension Policy
<b>NAFIS</b>	National Farmers Information System
<b>NALEP</b>	National Agriculture and Livestock Extension Programme
<b>NASEP</b>	National Agricultural Sector Extension Policy
<b>NIDP</b>	Nakuru Integrated Development Plan
<b>M&amp;E</b>	Monitoring and Evaluation
<b>MIS</b>	Management Information Systems
<b>SCAO</b>	Sub county Agricultural Officer
<b>SCADO</b>	Sub County Agribusiness Development Officer
<b>SCHDO</b>	Sub County Horticultural Development Officer
<b>SCSEDO</b>	Sub County Soil and Engineering Development officer
<b>SCCDO</b>	Sub County Crop Development Officer
<b>SHHEP</b>	Small Holders Horticulture Export Programme
<b>WAEO</b>	Ward Agricultural Extension Officer

## ABSTRACT

Hybrid sweet potatoes have been a target crop in improving the livelihoods of farming communities through diverting and aiming to produce the crop for subsistence and for commercial purposes, however, this is still far from being realized. The crop is mostly produced by farmers in the sub-county for subsistence purposes by a big percentage of the peasants. Currently; efforts to raise awareness in the crop to be embraced by all stakeholders in the agricultural sector as a commercial crop are still low with most of them unaware of such initiatives. This study therefore sought to establish the influence of project implementation process on performance of hybrid sweet potato projects in Kenya: A case of Njoro Sub-County, Nakuru County, and the moderating effect of monitoring and evaluation practices on the relationship between the two variables. The study also sought to examine how capacity building, stakeholder's engagement and utilization of extension services influence the performance of hybrid sweet potato projects in Njoro sub-County. The study further sought to establish the combined influence of project implementation process on performance of hybrid sweet potato projects in Njoro sub-County; to determine the extent to which monitoring and evaluation practices influence performance of hybrid sweet potato projects in Njoro sub-County; and to establish the moderating effect of project monitoring and evaluation practices on the relationship between project implementation and performance of hybrid sweet potato projects in Njoro sub-County. The study was grounded on; stakeholder's theory; resource dependency theory; innovation adoption theory, diffusion of innovations theory, theory of collective action and structural-functional theory. The philosophical underpinning of this study was pragmatism where a mixed method approach was used in a descriptive survey study design. The target population of this study were respondents from the three strata of 951 respondents; namely 909 farmers in hybrid sweet potato projects in Njoro Sub-County, 36 extension service providers in Njoro Sub-County and 6 plant breeders at Kenya Agricultural research organization at Njoro. The sample size was determined using Slovin's Formula by John Wily and Son's. To sample the target population, cluster sampling technique was used that divided the main population into three sections (clusters) where samples were put into a sampling frame. Simple random technique was used to draw samples independently from each stratum. The sample size of this study was 282 respondents comprising of 264 hybrid sweet potato farmers, 12 extension service providers and 6 plant breeders. Data collection instruments included self-administered questionnaires and structured interview guide. A pilot study was conducted in a neighbouring Sub-County named Molo to test the validity and reliability of the research instruments. Qualitative data was analyzed by the use of thematic analysis and the results presented in prose form. Descriptive data was analyzed by using frequencies and percentages and presented in a table. Both the arithmetic mean and standard deviation were used as statistical tools to measure central tendency and dispersion respectively, while the statistical tools for inferential analysis was Pearson's Product Moment Correlation. Regression analysis was used to test the strength of these relationships and F-test to study the hypotheses. Hierarchical Regression two (R<sup>2</sup>) was used to analyze the influence of moderating variable on the relationship between independent variables and the dependent variable. The study established that overall; on regression  $r=0.225$  implies a positive slope between the independent variable (Combined influence of project implementation process) and the dependent variable (Performance of hybrid sweet potato projects). R- Squared was 0.051 meaning that 5.1% of the variation in the performance of hybrid sweet potato projects was explained by variation in the combined influence of project implementation process. ANOVA results indicated that the model was statistically significant at  $(F(1,253) = 1.192)$ . The results indicate that  $p=0.000 < 0.05$ ,  $r=0.225$  and  $R\text{ square} = 0.051$ . Since the overall F

statistics was ( $F(1,253) = 1.192$ ) this study established that there exists a positive correlation and the slope of the population regression line is not zero. Hence, based on these findings we reject the null hypotheses that there is no significant relationship between the combined influence of project implementation process and performance of hybrid sweet potato projects in Njoro Sub County. The study concluded that it is critical to consider; Capacity building, stakeholders' engagement and utilization of extension services in hybrid sweet potato projects. The study also concludes that it is critical to consider project monitoring and evaluation practices in hybrid sweet potato projects. The study recommends that Stakeholders should be involved adequately in monitoring and evaluation activities and that their engagement should be in both lower and higher level activities from the initial to the last project stage. This would ensure project ownership and relevance to the beneficiary needs. Organization leaders should take active part in designing monitoring and evaluation system in order to offer timely support and guidance to projects' staff. This will also ensure that monitoring and evaluation activities are well executed, findings communicated for effective decision making. The use of formal collaboration methods among private and public ESPs could lead to a more vibrant interaction and avoid repetition of project implementation labors. This enhanced partnership and interacting amid extension and other service providers in hybrid sweet potato project implementation process should result in high appreciation of their position, inject more energy and increase their confidence in a consistent planning agenda.



# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Background of the Study**

Sweetpotato has become well established in many humid areas of Africa as a result of its high productivity commensurate to the land and labor input factors, (Wariboko and Ogidi, (2013). In addition, its nutrients value in terms of vitamins, (International Potato Center, (CIP), 2013), and carbohydrates is a vital component. According to FAO, (2015), the importance of Sweet potatoes among farm families cannot be limited to its high adaptive nature, Huang, and Sun, (2000), in a world experiencing climatic changes with an impact on rainfall patterns. Sweet potato withstands different weather cycles,(Kodjo, Atsou, Ndjido, Diallo, Marie, Leila, Nora, Adeline, Yves, 2017).NAEP, (2005), indicated that due to its ability to withstand production without pesticides, Stathers, Namanda, Mwanga rom, khisa, kapinga, (2005), and utilization of small land spaces, Edmond, (2004), it is highly recommended as a food security priority crop, (Woolfe, 1992). This is a good safety net for farmers against extreme food crisis and offers an income generation avenue out of sale of the surplus in the long term,(Kamau, 2012).Weeds as a difficult phenomenon to transcend is dealt with the short time line sweet potato spreads, (Davis,& Place, 2003). Its ability to aid in soil fertility maintenance and curb soil erosion makes it a significant crop suitable for various farming techniques, (Stathers, Low, Mwanga, Carey, McEwan, David, Gibson, Namanda, McEwan, Malinga, Muzhingi, 2018). Sweetpotato can produce more energy per land area and over time than rice or cassava, two of Africa's other major staple crops, and in several countries in Africa, it's a particularly important source of food in the dry season, (Anderson, and Dillon, 2008).

Sweet potatoes trace their origin to Central and South America. Historically, sweet potatoes are re-known as human vegetables as proven from relics discovered by anthropologists in Peruvian caves, (Luisa Huaccho and Robert Hijmans,2012).Christopher Columbus is credited with the spread of sweet potatoes in Europe in the 16<sup>th</sup> C. Later it spread to Philippines, Indonesia , Southern Asia and was introduced to the East African coast by aid of Spanish and Portuguese explorers. History notes that in the United States, sweet potato farming was adopted around this time, and is still a traditional staple food to date, (Luisa and Robert, 2012).

Sweetpotato is among the world's major crops, (Wariboko and Ogidi, 2013). It is a crop amenable to different climatic conditions such as Asia, Africa and the Pacific, (Kodjo, et al, 2017). It is difficult to obtain accurate production statistics for sweetpotato, as most is produced for home consumption. However, from the available, FAO, (2018a) statistics, China is by far the largest producer, with about 84% of the world's production statistics; Uganda and Nigeria with combined production of about 3.6% while Vietnam and Indonesia produce 2.5% of total sweetpotato in the world, (FAO, 2015). In 2001, it was highest in Rwanda (143 kg/year), Uganda (104 kg/year) and Papua New Guinea (98 kg/year).(FAO, 2018a), notes that the biggest percentage of sweet potato production is in Asia, specifically China taking a lion's share of about 80%. Sweet potato is not only a subsistence crop but also used for livestock feeds. In China and most of Eastern Asian states, sweet potato use has been diversified. It is applied at the subsistence level as food, and for animals feed especially pigs. Also, it has an industrial attraction in provision of starch and as such it forms a source of capital accumulation.

European markets are the main recipients of US sweet potato exports at approximately 1.1 million tonnes according to food and agriculture organization. Despite the exports to Europe, this forms only one percent, and the rest is used locally. Globally, approximately 80 million tons of sweet potatoes are full-grown in China every year, with Africa generating nearby 14 million tons, Central and South America roughly 2 million, and U.S. about 1 million tons. In U.S, over half of all commercially full-grown sweet potatoes originate from southern states and particularly in North Carolina, (FAO, 2015).

In Europe sweet potatoes are grown in Spain, Portugal, Italy and Greece. (FAO, 2015) notes that collectively this states accounted for 56,000 tonnes produced in 2013, on the contrary, they are not the major nations with the UK, Portugal and Netherlands taking the largest share. Globally, its production has been on an upward trend since 2012. China's 70 million tonnes puts it head and shoulders above other states at the global level in production (Chang, and Huang, 2010). Tanzania and Nigeria generating 3.5 million tonnes, Uganda 2.6 million tonnes and Indonesia 2.4 million tonnes. Sweetpotatoes has become well established in many humid areas of Africa for optimum labor and land use and ability to withstand nutrient deficient soils, Pedercini, Gunda, and Kaveh,(2015), as well as the high carbohydrates and vitamins levels. Sweetpotatoes can produce more energy per land area

and over time than rice or cassava, two of Africa's other major staple crops, and in several countries is a particularly important source of food in the dry season, (Woolfe, 1992). It is a major crop of economic importance in countries like Angola, Malawi, Mozambique, Zambia, while Nigeria, Tanzania and Uganda are the largest producers in Africa.

The consumption of sweet potatoes transcends classism in the society (FAO, 2015). The consumption of sweet potatoes is on an upward scale due to its nutritional content, Low, Arimond, Osman, Cunguara, Zano and Tschirley, (2007), and ability to grow in nutrient deficient soils, (Low, 2011). Locally, consumption has improved too due to its production being chemical free, (NAEP, 2001). Marketing and sales is dominated by merchants from Mombasa, Nairobi and Nakuru through creating market awareness and ready market to farmers. At the subsistence level, they serve as close substitutes for increasingly expensive bread and cakes. International potato Center, CIP, (2013), notes that despite its reputation, the demand for sweet potatoes has spread to different parts of the state with more nutritional value, (Kivuva, 2013). The tuber has many health valuables such as antioxidants, anti-inflammatory nutrients and blood sugar-regulating nutrients.

### **1.1.1 Performance of Hybrid Sweet Potato Projects in Njoro Sub-County**

Performance can be defined as the completion of a task with application of knowledge, skills and abilities,(John Shields et al., 2015). It could also be defined as the set of activities and programs that are carried out in order to achieve a series of previously established objectives and goals. Performance in Hybrid sweet potato projects under this study entails the combined effort of pulling material and non-material resources in order to achieve an improved performance measured in terms of availability of famers, agronomic efficiency, technical efficiency, economic sustainability by enlarging the population of farmers in hybrid sweet potato crops and level of environmental safety. Performance denotes the outcome of the inputs and activities towards actualization of a certain goal or objective, with resource optimization, (Melak Ayenew and Steven Arquitt, 2018).Under this study, performance of hybrid sweet potato projects forms the dependent variable. The performance of these projects under this study has been understood as the result of individual influence of the independent variables and the combined influence of monitoring and evaluation systems and extension services.

Availability of hybrid sweet potato projects is the product of the work of Agricultural extension services which constitute of identification of the farmer's needs (Mwangi J., Mbai, Hedlund, & Cuellar, 2006). The attainment of enhanced performance of sweet potato projects in Kenya through a vibrant monitoring and evaluation system and extension service, are the broadest objectives, (CIP, 2013). However, the availability of farmers concerns like run away soil erosion and detrimental effects of chemicals are still the biggest challenges, (Stathers, T., et al., 2018). The National Agricultural Extension Policy of 2012, in coordination with other stakeholders like the private sector under NALEP spurs productivity. Despite this noble objective, budgetary constraint' and inadequate services to go in tandem with core services curtail this achievement. Poor coordination and civic engagement between stakeholders in NALEP curtailed its goals, Republic of Kenya, (NASEP, 2012). The National Agricultural Sector Extension Policy NASEP, (2012), receipt sector-wide tactic, besides, takes into consideration of the execution of extension services. As a result, it spurs the adoption of business solutions to agriculture, and improvement of the regulatory framework for quality control in inputs and services and competitive advantage.

Njoro Sub County is within Nakuru County which is among the 47 counties of the Republic of Kenya in Constitution of Kenya 2010, CGN, (2017), and lies in the Great Rift Valley and bordering eight additional counties. Nakuru County is separated into eleven administrative Sub-Counties i.e.; Naivasha, Gilgil, Nakuru Town West, Nakuru Town East, Bahati, Rongai, Subukia, Njoro, Molo, Kuresoi South and Kuresoi North, (CGN, 2017). Njoro sub-county was selected because of its uniqueness in relation to the study, as it is characterized by the presence of an Agricultural research organization involved in seed potato breeding and multiplication, large intercultural farming communities that manage and utilize land resource for different crop and livestock based projects where sweet potato projects rank high among the crops bred for food security, (Kivuva, 2013). The diversity in the social norms and cultural values provides a framework within which men and women participate in management and utilization of land resource.

This sub-county was also selected due to its unique climatic range. There remain three extensive climatic zones (II, III and IV). Zone II shelters ranges by an elevation amongst 1980 and 2700 m above the aquatic level and obtains lowers train of 1000mm per annum,

Republic of Kenya, (KAPP, 2015). This region shelters particular areas of Njoro ward and Mau Narok Zone III gets rain amid 950 and 1500 mm per annum and shelters zones by elevation of amid 900-1800m above sea level. This region refuges utmost portions of the sub-county and stands the greatest important for cultivation and crop farming,(KAPP,2015). Zone IV inhabits extra or fewer the similar elevation of (900-1800m) as Zone III. Nevertheless, it got less rain of around 500-1000mm per annum. This zone leads lower parts of Njoro Sub County and is moderately the drier part of the Sub-county though it's a small section. The Sub-county is characterized by a bimodal rain pattern, County Government of Nakuru, (CGN, 2018). Short rains decrease amid October and December, make up short term falls, March-May make long-term rains. Temperatures in Sub-county varieties as high as 29.3°C amid months of December, January, February, and early March to low heats of 12°C throughout June and July. Nevertheless, deforestation practiced in sub-county's plantation lumps, effect from climate variation, different rainforms and advanced temperatures are proficient, (CGN, 2017).

Land is main factor of production and cause of living sustenance for everyone in Njoro Sub-County. Njoro-Sub County is composed of a very low number of large scale land owners at an average of 93 Hectares (Ha) in parts of Njoro and Mau-Narok wards of Njoro Sub-County. On the contrary, many small unit holders at an average of 0.77 Ha make the bulk of land owners. These are located in Njoro, Lare, Mauche and Kihingo wards that are highly productive. As much as the medium and large units make up a small fraction of land, they are the dominant farms under farming, (NCDP, 2018).

Many factors account to the increase in land under cultivation namely; the rich volcanic soils of Njoro Sub County that give great potential for crops, reliable rainfall in most parts of the county, readily available labour force and the availability of ready market for crop produce both in the urban centers and the proximity to other major urban centers such as Njoro, Nakuru, Naivasha, Gilgil and Narok which offers incentives for the sector to flourish.

### **1.1.2 Implementation Process and Performance of Hybrid Sweet Potato Projects in Njoro Sub-County**

This study indicates that sweet potato projects in Njoro Sub County implementation process entails the combined components of an active stakeholders' participation in every stage of the implementation process, working and vibrant capacity building interventions and enhanced utilization of extension services. According to Mburugu, Mulwa, & Kyalo, (2015), implementation processes is vital for the success of any organization in achievement of goals and objectives. Asenso, and Davis, 2009), poses that, without a proper implementation process, even the most superior of the strategies becomes of no benefit, (Viravaidya, & Hayssen,2001). This means that planned strategy and realized or emergent strategies just emerge from the actions and decisions of organizational members.

Implementation of sweet potato projects is the joint effort of establishing a strong capacity among all the stakeholders including the project managers,(CIP, 2013). The management is tasked with policy implementation and coordination of its execution. It is the coordination and integration of resources, competencies and skills set from top management to the line managers for achievement of objectives. Staff's support the project's efforts towards their achievement and ensuring programs acceptance by clients and beneficiaries is a key variable in implementation. Sound resource utilization and a good interface between the public and staff also promotes buy in.

In the stakeholder's engagement strategies, project members should be highly for success, (NASEP, 2012). A project has to ensure there is active participation of stakeholders at all stages and monitoring and evaluation ought to be an integral component. Local ownership is achieved through the authoritative participation of the locals, (George Kuepper,2014).When monitoring is a continuous process, where emergent issues can be dealt with before a snowball effect arise.

### **1.1.2.1 Capacity Building Interventions and Performance of Hybrid Sweet Potato Projects in Njoro Sub-County**

The first among the three independent variables under this study is the capacity building interventions during the implementation process of sweet potato projects. The design of a vibrant implementation process includes clearly identifiable and measurable capacity building indicators among stakeholders, Dieter Muller, (2010), posits that size denotes “the skill to transmit out specified aims”, Melak Ayenew and Steven Arquitt, (2018), opine that it is the “stock of resources” at the disposal of any system and the initiatives to change them into productivity. Capacity building therefore is a set of processes that improves the competencies and skills-set of a people or individual for optimum output.

The focus of this study is quantity of volume aimed at the drive of implementation of hybrid sweet potato projects through capacity-building interventions. It is commensurate to the calls by government horticultural project planners, evaluators, and experts for instruction in assessing numerous features of agricultural programs that descend beneath perimeters of capability structure interventions, (Ssebuliba, Muyonga and Ekere, 2006). It’s therefore beneficial to the government in conceptualization of capacity and capacity building. It acts as a yardstick for examining the drawbacks and strengths in the adopted paradigms and thereby adopts designs in line with every need at the time, (Ssebuliba, Muyonga, and Ekere, 2006).

Lack of extensive knowledge in the ground on capacity-building in agronomic segment and capacity-building practices are part of limitations in performance of agricultural projects and the methodology for testing and monitoring their outcomes are not clearly documented. With regard to results based programming; various inputs are done with indicators to track the performance of agricultural systems with the objective of optimal productivity. For sustainability of performance and productivity in the agricultural sector, it calls for capacitation of all the stakeholders such as the beneficiaries, organizations and individuals. Capacity implies there’s an optimum utilization of resources, little or no dependence on external support and sustainability of outcomes, (Anderson, and Dillon, 2008). Alex, Zijp and Byerlee, (2012), posit that through an elaborate design, a financial mechanism for extension services, the capacity of farmers can be improved. Also a clear network for access

needs to be in place. This is by establishing modalities for effective capacity building for hybrid sweet potato farming among farmers and other stakeholders.

Under capacity building interventions, the study looked at the capacity of the beneficiary farmers in sourcing of the hybrid sweet potato planting materials, the farmer's capacity during the field management practices of the crop and in documentation of activities involved. The study hypothesised that a good capacity building intervention should have a well spelt out code of ethics for all extension service practitioners and an elaborate financial support system.

### **1.1.2.2 Stakeholder's Engagement strategies and Performance of Hybrid Sweet Potato Projects in Njoro Sub-County**

Unless a reliable system in measurement of participation; ownership and sustainability of a project can be compromised through bias, (Alex, Zijp and Byerlee, 2012). Research has shown that the results of scoring the level of participants' involvement contrary to range of contribution centered on Arnstein's partaking gauge, 54% of programs, clients remained not deeply intricate in emerging indicators for the project implementation. In extreme, 7.5% of the programs involved the customers with an existence eased to convey out their own assessment afterward on development application.

In many instances in agriculture, Brody, (2003), emphasizes that project designers are not obligated to factor in clients. However, it has been proven that in agricultural extension this is a critical ingredient for productivity particularly with respect to superior of signs (Andreas, Dieter, 2010). Andreas and Dieter, (2010) also contends that the involvement of participants ought to be driven by the need to empower the locals to be self-sufficient and effective. In these scenarios, continuous empowerment evaluation helps in supporting program's desired outcomes. First, it recognised that additional initiates to wide-ranging base Andreas, Dieter, (2010), omit data bases by exploiting agribusiness schemes method. Considerations therefore ought to be given the requirements of farmers in fall nourished zones, and to varying postponement databases into livestock, cultivation and high customer changes that increases farm house profits. Secondly, to assist and reinforce the Agricultural Schemes method, matters of economic sustainability, contribution in plan preparation, and research-extension connections, promotion and cost count would be simultaneously



spoken. Crop agriculture is definite by crucial ideas of firmness, sustainability, variation and commercialization. Clark, Smith, and Hirvonen, (2007), contend that it is necessary to re-examine the paradigm of technological advancement in agricultural extension. CORE, (2006), emphasized adoption of a wider framework in scope that would entail a holistic approach for effectiveness and efficiency in technological transfer and information spread. Extension agencies will play a forward and backward linkage role in a simple, reliable and cheap manner. Dinar, and Keynan, (2001), asserted that technological advancement in agriculture ought to ensure resource optimal use, diversification and adaptation to various ecological features as well as sustainability. Stakeholder's participation will lead to projects sustainability through information sharing, quick communication and promote ownership and local buy in, (Tuftte, & Mefalopulos, 2009).

### **1.1.2.3 Utilization of Extension services and Performance of Hybrid Sweet Potato Projects in Njoro Sub-County**

Utilization and consumption of extension service under this study has been discussed under the themes of the extension approach used, the availability of extension schedules, the extension methodologies employed and the extension impact assessments done after an extension cycle. The extension approaches in Kenya have gradually grown over the years since the colonial era, (NAEP, 2005). During this era, extension approaches were not well conceptualized and articulated. The extension service included offering subsidized farm inputs and financial proceeds skewed towards the white settler farmers on commercial production. On the contrary, the African indigenous approaches remained neglected and backward, (NALEP, 2005). The earlier approaches were predominantly top down and had little or no input and participation of the farmers at the grassroots, (NASEP, 2012). As a result of the failures of the earlier approaches, the state adopted a farmer centered approach to spur growth and private-public sector collaboration. Some of these approaches as discussed in forthcoming themes comprise of focal zone method and farmer field schools.

After independence, a more proactive, participatory and emancipatory educational and extension approaches were rolled out even in subsistence production. Under this study, the various approaches used over time including training and visit, farmer field schools, commodity interest groups and demand driven have been discussed. Utilization of extension services have also been discussed looking at the availability of extension

schedules. The extension schedules as key indicators of utilization of extension, have been discussed looking at the term schedules on a production cycle. The schedules have been discussed in three categories namely; monthly, quarterly and annually. On extension methodology, the study has discussed the instruments used, means of reporting and feedback and record keeping. Extension impact assessment has also been discussed as an important measure of extension utilization. Under extension impact assessment, the adoption level, the intended and unintended effects of extension service has been discussed. Agricultural training, integrated agricultural development, the set-up of agriculturalist/pastoralist training centers, Stewart, Langer, Da Silva, & Muchiri, 2016), the entire farm extension method, use of united agronomic growth tactics have all seen the evolution in utilization of extension services in the country in tandem with development agenda and in answer to the question of hunger and malnutrition.

### **1.1.3 Monitoring and Evaluation Practices and Performance of Hybrid Sweet Potato Projects in Njoro Sub-County**

Monitoring denotes a systematic data collection in reference to project indicators for continuous reference in decision making at various project phases on the utilization of resources to meet a desired goal,(Sutherland, 2011). Evaluation instead, is intermittent assessment of project in progress towards informed changes or corrective measures with the aim of identifying possible areas of improvement in its design, implementation process or results dissemination.

Monitoring and evaluation practices in this study have been conceptualized to take place before and during the implementation of the sweet potato projects in the agricultural sector. The major components include; the monitoring and evaluation models used in extension service statistics gathering, data breakdown and dissemination of results, documents used such as feasibility studies, proposals, progressive reports, budget reports, project completion reports and post project evaluation reports. This study have also discussed the monitoring and evaluation methodologies used including surveys, observations, direct measurements, field visits, unstructured and structured interviews done, and community meetings. Monitoring and evaluation therefore moderates capacity building interventions, stakeholders engagement activities and controls utilization of extension service in to strengthen aspects such as capacity building components, empowerment and accessibility

of information sources, knowledge generation and use and strategic management and operational support. The key players in agricultural knowledge and information systems (AKIS) in Kenya comprises of study forms, ESPs, teaching institutes, campuses, global organizations, Government divisions, agriculturalist organizations and discrete agriculturalists, (Rivera, Zijp, and Alex,2000). They share mutual aims of producing, endorsing common allocation of agricultural-related information, abilities and information schemes and use varied ways of accomplishing goals.

In reference to data collection the interface between the community and interventionists is poor, (ASDSP, 2017). This is exacerbated by inadequacy of resources, both human and financial as well as uncoordinated and skilled leadership (Mwangi, Mbai, Hedlund, & Cuellar, 2006).As a result, a more reliable information source is lacking. AKIS viability is dependent on application of its Information Communication, Rivera, Zijp, and Alex, 2000), and technology (ICT). As much as nationwide adopted Information Communication and Technology, its uptake in agricultural extension has been hampered by poor grassroots infrastructure, ignorance and high illiteracy levels. Equally, related services have not been integrated such as electronic forms of data collection and dissemination, (Rivera, Zijp, and Alex, 2000).

In the AKIS, the study seeks to lay foundation for communication and feedback in agricultural extension and research services. This is geared towards a broader networking, linkages and sharing of information between stakeholders. Partnership with other strategic development agencies, harmonization of agricultural policies, Vanesa& Gala, (2011), and standardization of the agricultural syllabus for uniformity is a key requirement. Stakeholder's engagement in M&E practices like data collection and analysis, the study has a conception that engagement through active involvement of the people at the core of the project environment and authoritative decision making organ key components in the overall performance of the agricultural projects. Components such as farmer's access to both qualitative and quantitative data that is later used in decision making during project implementation, day to day activities and indicators of participation through active and updated records of the duties and responsibilities allocation right from planning to final evaluation of a project influence the performance of agricultural projects. Operational mechanisms should include; Baseline studies done before implementation of a given

project and how the information obtained from such studies is used in the construction and implementation of a given project, social and environmental impact studies done and their implication to a proposed project, institutional capacity assessments and operational indicators of progress do greatly influence the performance of agricultural projects. Integration of M&E practices with management information systems, this study conceptualizes that adequate technology use in M&E systems in such aspects like capacity building components, empowerment and accessibility of information sources, knowledge generation and use and strategic managements and operational support in the extension service influences both implementation and performance of sweet potato projects.

#### **1.1.4 Hybrid Sweet Potato Projects in Njoro Sub-County**

Hybrid sweet potatoes refers to crop varieties that are bred for high productivity in terms of yields per acre, nutritional levels, profitability and a high level of environmental safety in terms of pesticide application, Stathers, Namanda, Mwanga rom, khisa, kapinga, (2005), relative to human health and control of soil erosion. 70% of the total Nakuru County land is highly productive, majority of small holder farmers in this county have an average land holding of 1.9 acres. 49% of these people are poor while 36% of the county's population is food poor. 60% of the county's population is either directly or indirectly employed by the agricultural sector, (CGN, 2018).

Historically, small scale farmers within the county have attempted to diversify their farming activities in the growing of traditional vegetables; these have included greens such as spider plant, Amaranthus, Night shade, Cow peas and Sweet potatoes. Production was mainly for subsistence to supplement other household foods. Over time and with the introduction of exotic vegetables farmers have diversified and concentrated more on the exotics at the expense of the traditional vegetables. The Kenyan extension program has also focused more on the exotics due to their economic value in disregard of the nutritional value in the traditional vegetables, (NASEP, 2012). This could be attributed to inadequate competence levels and uncoordinated efforts with poor entrepreneurial development, (Juma,2014). Equally, the extension communication and feedback channels are at times unclear and messages aren't well articulated with context specify in promotion of these vegetables.

The main challenge in enhancing performance in hybrid sweet potato productivity in Njoro Sub County is the development of a comprehensive and dynamic implementation process packed with a vibrant capacity building component, a participatory approach and an empowered ability to utilize extension services. Another challenge in Njoro sub County is improving and broadening the web of skills set and empowering clientele for learning and adapting to new technological interventions. The government works in collaboration with other development partners in capacity building of marginalized areas to authoritatively make market and production decisions. Despite, the application of various techniques by ESPs such as training, Stewart, et al, (2016), study tours, exchange visits, and providing inputs for demonstrations and technology validation sometimes through a competitive grants system for allocating resources, there has been minimal success. It has been proved that enhanced monitoring and evaluation systems during implementation of projects and extension services among clients can play a bigger role in extension management if properly mobilized and sensitized for improved performance of hybrid sweet potato projects.

More so, the interventions to improve extension services delivery in NjoroSub-County have been significant in clientele group's capacitation through linkage of associations such as common interest groups, farmers associations, savings and credit cooperative organizations (SACCOs), and cooperatives for backward and forward linkages. However, at the local there is still an underdeveloped M&E extension system. The major bottleneck has been on availability of information and communication channels to link clients and service providers such as finance and markets,(Juma, 2014). Also, poorly developed systems of governance at the local level and access of resources from providers such as the Constituency Development Fund (CDF), Local Authorities Transfer Fund (LATF), Agricultural Finance Cooperation (AFC) and Produce Cess Fund is a challenge. Appropriateness of technological and entrepreneurial skills transfer has limited hybrid sweet potato production.

## **1.2 Statement of the Problem**

The global concern of any government is to maximize the welfare of its citizens, achieve a broad based attainment of goals and sustainable livelihood improvement on people's well-being,(Nalianya, 2018).The public sector is critical in optimal service delivery and the state of the economy, (Adams & Dickson, 2010).Poor service delivery has a net effect of derailing the economy and peoples well-being, (FAO, 2018b). In review of Kenya economic Survey, 2018,observations made from the completed hybrid sweet potato projects, it is evident that generally, the yields per acre, profitability, level of environmental safety and ecological adaptation of the crop are key components in all the agricultural intervention activities but their application is much limited since there exists significant research gaps between the National priorities and importance in implementation of the various crop production projects in the larger Nakuru County,(CGN, 2018).

The Kenya Economic Survey of 2018 from which each county crafts its integrated plan, highlights the importance of capacity building through training of farmers, Stewart, Langer, Da Silva, & Muchiri, (2016), on production strategies and improvement of traditional crops though there exists a gap as more emphasis has been put on the mainstream crops such as cereals and other horticultural crops and by giving a shallow emphasis on such an important traditional crop in lieu of the fact that, Sub Saharan countries are experiencing acute climatic changes that could favour production of such a drought tolerant crop, (Juma, 2014). The economic survey of 2017 indicates an estimate of sweet potato production of 1150MT all over the country where 115MT went into waste. The survey continues to indicate that 1036MT was used at household level. Given Per Capita annual consumption of 22.2kgs, it's evident that the national production level falls far below the expectation to feed a population estimate of 40Million Kenyans. From computations, an estimated deficit of 876,850MT is obtained. This is a possible reason why Kenyans continue to suffer from hunger and malnutrition.

There exists more significant evidence that the full potential of hybrid sweet potato projects is far from what is expected as stipulated on the Nakuru County Integrated development plan, CGN, (2017), in Agriculture and especially on improvement of traditional crops. The ministry of Agriculture indicates on its agricultural development agenda, strategies on improvement of traditional crops including sweet potatoes. The plan has indicated a

potential yield of over 40 tonnes per acre from hybrid sweet potato varieties as opposed to 8 tonnes realized by farmers from the traditional sweet potato varieties. The crop had also been a target in improving the livelihoods of farming community through diverting and aiming to produce the crop for commercial purposes, Belefu, (2003), however this is still far from being realized. The crop is mostly produced by farmers in the sub-county for subsistence purposes by a big percentage of the peasants, currently; efforts to raise awareness in the crop to be embraced by the rich cadre of the society are still low with most of them unaware of such initiatives. Hybrid sweet potatoes have numerous advantages over un-improved varieties in terms of nutritional value, maturity period, yields, and provision of feeds for livestock and can also grow in relatively low nutrient soils, (Pedercini, Gunda, and Kaveh, 2015). Orange, Yellow and white Fleshed hybrid varieties contains in addition, vitamin A, a group of unsaturated nutritional organic compounds including, retinol, iodeosin, carotene necessary for visionary improvement and rhodopsin which is good for immunity, blurred vision and has an antagonistic effect on short gestation period, however, documented and recorded data on this crop in Njoro Sub-County is still scanty. In spite of the importance in the cultivation of this crop, it's still grown to supplement family income or for consumption at household level in the sub county. There exist huge variances on the potential data in terms of the crops agronomic and technical efficiencies, environmental and economic sustainability in relation to what the farmers are achieving from their farming practices in the sub-county.

A thorough investigation on why such variances are observed generates a discussion that only yields a conclusion that implementation of hybrid sweet potato projects lacks the impetus to significantly reflect its performance, (CIP,(2013). In view of this, this study therefore investigated the factors that have caused the failure or inadequate implementation process needed to transcend the discrepancy between the actual and the intended deliverables in hybrid sweet potato projects. In addition, there lacks a wealth of knowledge and expertise in M&E practices data collection, analysis and dissemination of information to reflect a vibrant agricultural extension sector, (Chipeta, Henriksen, Wairimu, Muriuki, & Marani,2015), and improved performance of sweet potato projects in Nakuru County, (CGN, 2018). Monitoring and evaluation programs exist, yet, methods for testing and tracking their influence on performance of sweet potato projects are rare. This study therefore is premised on the lessons learned from current practices in the implementation

process of hybrid sweet potato projects with the aim of filling the knowledge gaps in the inadequacy of implementation process, monitoring and evaluation practices and performance of sweet potato projects in Nakuru County and the nation at large.

This research was also based on vision 2030 on achievement of food security, Wabwoba, & Wakhungu, (2013), and global action plan to address sustainable development goals number two which is geared towards the attainment of zero hunger. It is also geared towards increased food production as an answer to a call on African governments to address hunger and malnutrition, (CGN, 2018). This research is also in line with President Kenyatta's big four developmental agenda on the draft budget policy 2018 in expanding food production and supply among the Kenyans.

### **1.3 Purpose of the Study**

The purpose of this study was to establish the influence of project implementation process on performance of hybrid sweet potato projects in Njoro Sub-County and the moderating effect of monitoring and evaluation practices on the relationship between the two variables.

### **1.4 Research Objectives**

The study was guided by the following objectives;

- i. To examine how capacity building influence performance of hybrid sweet potato projects in Nakuru County.
- ii. To examine how stakeholder's engagement influence performance of hybrid sweet potato projects in Nakuru County.
- iii. To establish how the extent of utilization of extension services influence performance of hybrid sweet potato projects in Nakuru County.
- iv. To establish how the combined influence of project implementation process on performance of hybrid sweet potato projects in Nakuru County.
- v. To examine how project monitoring and evaluation practices influence performance of hybrid sweet potato projects in Nakuru County.
- vi. To establish the moderating effect of project monitoring and evaluation practices on the relationship between project implementation process and performance of hybrid sweet potato projects in Nakuru County.



## **1.5 Research Questions**

- i. To what extent does capacity building influence performance of hybrid sweet potato projects in Nakuru County?
- ii. In which ways do stakeholder's participation influence performance of hybrid sweet potato projects in Nakuru County?
- iii. To what extent does the utilization of extension services influence performance of hybrid sweet potato projects in Nakuru County?
- iv. What is the combined influence of project implementation process on the performance of hybrid sweet potato projects in Nakuru County?
- v. To what extent do project monitoring and evaluation practices influence performance of hybrid sweet potato projects in Nakuru County?
- vi. To what extent do the moderating effect of project monitoring and evaluation practices influence the relationship between project implementation process and performance of hybrid sweet potato projects in Nakuru County?

## **1.6 Research Hypotheses**

The following are the alternate and null hypotheses that were tested in this study:

H<sub>1</sub>1: There is significant relationship between capacity building and performance of hybrid sweet potato projects in Nakuru County.

H<sub>0</sub>1: There is no significant relationship between capacity building interventions and performance of hybrid sweet potato projects in Nakuru County.

H<sub>1</sub>2: There is significant relationship between stakeholder's engagement strategies and performance of hybrid sweet potato projects in Nakuru County.

H<sub>0</sub>2: There is no significant relationship between stakeholder's engagement strategies and performance of hybrid sweet potato projects in Nakuru County.

H<sub>1</sub>3: There is significant relationship between utilization of extension services and performance of hybrid sweet potato projects in Nakuru County.

H<sub>0</sub>3: There is no significant relationship between utilization of extension services and performance of hybrid sweet potato projects in Nakuru County.

H<sub>1</sub>4: There is significant relationship between the combined influence of project implementation process and performance of hybrid sweet potato projects in Nakuru County.

H<sub>0</sub>4: There is no significant relationship between combined influence of project implementation process and performance of hybrid sweet potato projects in Nakuru County.

H<sub>1</sub>5: There is significant relationship between monitoring and evaluation practices and performance of hybrid sweet potato projects in Nakuru County.

H<sub>0</sub>5: There is no significant relationship between monitoring and evaluation practices and performance of hybrid sweet potato projects in Nakuru County.

H<sub>1</sub>6: There is significant relationship between project monitoring and evaluation practices on the combined influence of the implementation process and performance of hybrid sweet potato projects in Nakuru County.

H<sub>0</sub>6: There is no significant relationship between project monitoring and evaluation practices on the combined influence of the implementation process and performance of hybrid sweet potato projects in Nakuru County.

### **1.7 Significance of the Study**

The beneficiaries of this research would be the Government of Kenya through the Ministry of Agriculture particularly the National Agricultural Sector extension program, County government of Nakuru agricultural department, Njoro Sub-County agricultural sector, policy makers, and the farming community as consumers and traders of agricultural products, extension service providers and sweet potato project managers, researchers in plant breeding institutes like Njoro Agricultural research organization and academicians.

To the Government of Kenya agricultural sector, the study will provide information on the influence of sweet potato projects implementation process, help in addressing challenges of extension and food insecurity in the country by channeling more support in undertaking the projects. This will greatly improve the performance of sweet potato projects, address household food security, by concentrating on a crop that is drought resistant and with a wider production scope in its ecological requirements. This will also assist meet the objectives of vision 2030, address global warming effects, climate change challenges, and create more jobs and improve the gross domestic product.

Findings of the study will be availed to all the farmers as major project's stakeholders to assist them understand the factors influencing performance of sweet potato project's

implementation process in Njoro Sub-County. The study will provide useful information to farmers on sourcing of planting materials, capacity interventions and institutional support available from the government sector which will boost their projects in the crop, increase food production and through extension improve their living standards through trade on the crop or its other products.

To the researchers and especially the plant breeders, the study will fill the gaps in addressing hybrid sweet potato projects within the Sub-County, address breeding requirements for high performance varieties for the various agro-climatic conditions. Together with extension service providers, establish an elaborate and improved monitoring and evaluation system that can be of practical use by all stakeholders to the sweet potato projects. The study will form a knowledge reservoir on the farming of hybrid sweet potato projects. This will be of benefit to the researchers and to change agents for gaining deeper insight, appreciate and understand the problems faced in the project implementation process, monitoring and evaluation practices on performance of sweet potato projects as an alternate staple food in a dynamic agricultural production world.

### **1.8 Limitations of the Study**

The quality of information secured under survey as a method of data collection under this study depended heavily on the quality and willingness of the respondents to cooperate. However this study provided the respondents with a comprehensive introductory letter to elicit clarity as to the use of any information they were required to provide. The researcher was limited to the information collected by interview schedules and questionnaires hence had no control on the legitimacy of the information given, however the physical interaction of the researcher with the key informants, farmers and extension service providers and document reviews were authenticated by information collected through research instruments.

### **1.9 Delimitations of the Study**

The study was exclusively delimited to the hybrid sweet potato projects implementation process, monitoring and evaluation practices and performance of hybrid sweet potato projects in Njoro Sub-County. The study targeted only public agricultural projects in hybrid sweet potato projects as its population of study. The study was also confined to the

performance of sweet potato projects and the moderating effect of monitoring and evaluation practices between the two variables. The study was also delimited to time constraints.

### **1.10 Assumptions of the Study**

To actualize this study, the following assumptions were made: That there exist observable differences between the actual and the intended project deliverables in terms of performance of hybrid sweet potato projects. That there were factors that influence project implementation process, monitoring and evaluation practices on performance of hybrid sweet potato projects and there was a general awareness that a vibrant implementation process, monitoring and evaluation practices provides accountability and transparency to the stakeholders and that the resources provided with set objectives were adequately responding to the factors influencing the stated variables. The study further assumed that the researcher would be financially capable to undertake the study from inception to the last stage of dissemination of information, and it would be a true reflection of the sample generalized.

### **1.11 Definitions of Significant Terms used in the Study**

For the purpose of this study, the following terms referred:-

<b>Performance of Hybrid Sweet Potato Projects</b>	This refers to sweet potato varieties that are bred for high productivity in terms of yields per acre, profitability and a high level of environmental safety in terms of pesticide application relative to human health and control of soil erosion
<b>Project Implementation Process</b>	This refers to the stage in the sweet potato project's development process in which the goal, objectives and intended outcomes are described and the project's inputs and activities are identified through a collaborative undertaking by all stakeholders. It requires integration of the management skills needed to allocate resources and the technical skills needed to realize performance on hybrid sweet potato projects.
<b>Hybrid Sweet Potato Projects</b>	Refers to the improved sweet potato varieties that bear the combined characteristics of high yields, resistance to pests and diseases, high nutrition, early maturity and better adapted to

perform better in different agro-ecological zones. Upon breeding at the research station, they are distributed to individual farmers by Kenya agricultural and livestock research organization at Njoro Nakuru.

**Project Monitoring** A continuous and systematic process of recording, collecting, measuring, analyzing, and communicating information that is used for the progressive control purposes of projects in hybrid sweet potato production.

**Project Evaluation** It refers to a systematic and impartial examination of humanitarian action intended to draw lessons that improve policy and practice, and enhance accountability in the performance of hybrid sweet potato projects.

**Capacity Building** The development of an infrastructure of knowledge and ability among stakeholder's in hybrid sweet potato projects that helps embrace and sustain changes that have agreed-upon public value and benefits in hybrid sweet potato production.

**Stakeholder's Engagement** The process where the government as an organization, extension service providers and farmers are involved in a beneficial interaction through planning, monitoring, evaluation and implementation of hybrid sweet potato projects.

**Utilization of Extension services** Refers to a catalyst and powerful tool used by knowledgeable and skillful personnel in the ministry of agriculture for enhancing crop production interventions among the farming communities as collaborators and responds to their needs through an interaction in which they identify and analyze problems; share knowledge, technologies, innovations and experiences; and initiate actions as per the agricultural policies.

### **1.12 Organization of the Study**

This research report was organized into five chapters. Chapter one of this study, is the introduction and gives an overview of the study. It contained the background of the study, which gives a brief overview of the main concepts including performance of hybrid sweet potato projects, hybrid sweet potato projects implementation process, capacity building interventions in hybrid sweet potato projects, stakeholder's participation, and utilization of the extension services. It also gives information on monitoring and evaluation as a moderating variable between implementation process and performance of hybrid sweet potato projects in Njoro Sub-County. The section is then followed by a statement of the problem, objectives of the study, research questions, research hypotheses, significance of the study, limitations of the study, delimitations of the study, basic assumptions and the definitions of the significance terms as used in the study.

Chapter two contains literature review from scholarly works to show how other research findings relate to this research and identify study gaps. This chapter also contains theoretical framework that comprises of theories on implementation process amid performance of hybrid sweet potato projects. The theories that were closely supportive to this study include; stakeholders theory, theory of collective action, structural functional theory, resource dependency theory, innovation adoption theory and innovations diffusion theory. The conceptual framework indicates the hypothetical relationship between the independent, moderating and the dependent variable. The chapter concludes with a matrix of identified research gaps and a summary of literature review.

The third chapter contains the research methodology used for this study, captures the research design, the target population, sample selection and sample size, research instruments, pilot testing of the instruments, validity and reliability of the instruments used. It also indicates the data collection and analysis procedures used, the ethical considerations made during the research process and has defined the operational definition of the variables that were used in the study.

The fourth chapter presents the analysis and interpretation of data; and finally, Chapter five presents summary of the study findings, discussions, conclusions, recommendations and suggestions for further research.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presents a review of related literature in line with the objectives. The theoretical and conceptual frameworks have also been discussed.

#### **2.2 Performance of Hybrid Sweet Potato Projects**

Performance of hybrid sweet potato projects, Assefa, Teshome, Engida and Tesfaye, (2007), ought to be geared towards alleviation of hunger by improving food security, household income and self-reliance. In line with the global food policy, strategy to revitalize agriculture, SRA, (2004), under the National agricultural extension policy NASEP, (2012), Nakuru County strategic plan,(CGN, (2017), and the presidential big four strategic initiatives, the study provides a framework for improving efficiency and effectiveness of monitoring and evaluation practices in utilization of extension services through an enhanced capacity building interventions, improved stakeholder's participation, Assefa, Rivera, & Vencatachellum, (2013), during the implementation phase of the hybrid sweet potato projects.

Hybrid sweet potato projects in Njoro sub county shortcomings in performance, arise due to unjustifiable tactics and means such as aids masked as enablement gears by service providers, CGN, (2017), leading to formation reliance condition and partial investor contribution within the country, (NASEP, 2012). Some approaches are justly still, stressing growing production with regard to rate totaling Belefu, (2003), and advertising, acute in converting sweet potato developments as of existence to profitable initiative. Despite the lack of organized strategies investors escalate need to adapt suitable leeway methods, Heritier, Kahi, Florence, Benjamin, James, Muthomi & Felister Nzuve, (2018), rendering to agro-ecological regions (high, medium and low enterprise manufacture capacities) socio-economic stratification of the extension trade, (Birhanu, Adanech, Genet, 2016). The ability to share burden so long as allowance amenities and manipulating the growth in presentation of hybrid sweet potato projects, is key to performance, (CGN, 2017).

### **2.3 Project Implementation Process and Performance of hybrid Sweet Potato Projects**

In sub Saharan Africa, Oruko, & Elliott, (2011), the Forum for Agricultural Research in Africa (FARA) established in 2001, poses as a forum for coordination and exchange of information and support of the sub regional organizations. FARA has grown to cover the African continent in agricultural activities such as research, extension, education, and training. According to Oruko& Elliot, (2011), its broad goal was to act as an umbrella body to facilitate agricultural productivity growth in Africa. The setup of such institutions' and innovation incubation centers Ashuma, Nganga, & Kagiri, (2015), was critical for development. As a result FARA set up an M&E strategy for tracking changes and informing agricultural development in the continent. It includes, Kaguongo, Ortmann, Wale, Darroch, (2012), learning, adaptation and reporting. Implementation, Ashuma et.al,(2015), should also factor post impact assessment as a path towards attainment of poverty alleviation and sustainable growth. However, Anderson, et al, (2008), notes that this is just a follow up to the development of M&E strategy. Alston, Anderson, James &. Pardey, (2011), asserts that African agricultural Research and Development Institutions (FARA, the SROs, and NARIs) had inconsiderable success in operationalizing M&E, (Omamo, Diao, Wood, Chamberlain, You, Benin, Wood- Sichra, &Tatwangire, (2006), attribute this to planning and need identification. At operational level, FARA and Sub Regional Organizations (SROs) have sound combined outcomes and outlines that enable presentation reportage for database organization. The challenge in these institutions is gauging and reportage influences, (Bhatti, (2005).Alston et al, (2011),posits that SROs particularly learn from the reformed Consultative Group on International Agricultural Research (CGIAR) by receiving a thematic method to ex-post influence and valuation. In the wider Global Forum for Agricultural Research (GFAR) structure, Institutional Learning and Change (ILAC) could backstop the SROs in plan and administration of their influence as assessment creativities. The national equal, Birner, Davis, Pender, Ephraim, Ponniah, Ekboir, Mbabu, Kisamba, (2006), is the planned prolonged usage of Agricultural Science and Technology Indicators (ASTI). Data and distribution of their knowledge by National Agricultural Research System NARSs aids in talk trials of data assortment and study, (Gladys, Katia, Lycia, & Helena, 2010).

In Ghana, Anderson & Van Crowder, (2000), the Government recognizes that Monitoring and Evaluation is a vital element of sound planning and management. It was noted that lack



a comprehensive framework impeded its success and failed to meet people's needs. Further, he notes, policy planning a legal framework and an M&E structure in all strata of the economy, (UNESCO, 2010). This would broaden the scope and not particularistic to a sector. Monitoring is at present limited in scope and clarity, argues Omamo, et al, (2006), in its understanding and in relation to performance parameters and to any extension program (Oruko& Elliot, 2011).

In Kenya, NALEP was the national programme which focused on creating a link between research institutions and extension up to the year 2012 when it took another perspective as a policy to be implemented under the ASDS 2010-2020. NALEP has been instrumental in rural credit accumulation and mobilization in key areas of intervention, (Shehzad, 2005). Even though NALEP reached many people in social and educational standards, Mwangi et al, (2006), posits that it has lacked a clear cut and systematic M&E framework for its activities. This study therefore seeks to establish a sum of trainings about endorsing the effective features of NALEP which have not reached farmers because of the lack of systematic information network, (CGN, 2018). According to a report by Strategy to Revitalize Agriculture in the, (SRA, 2004), poor utilization of design in the monitoring and evaluation had been identified as a factor on the declining effectiveness of the public extension service and curtailing the growth of agricultural sector in Kenya. Consequently, SRA, (2004), called for overhaul of the extension system to link research, extension and local farmers, the recipients' of the services. Alex, Zijp, and Byerlee, (2012), states that extension ranked high among SRA areas that need urgent attention. The ineptness of this extension system has called for integration of the private sector (Katz, 2002).

Inadequacy of expertise in program monitoring and evaluation has been detrimental in the agricultural sector, (Kamau, 2012). The theory of diffusion of innovation contends that it is a key variable in agricultural extension. Mwakaje,(2010), contends that data is outdated and where updated is inaccessible. Most extension service officers are also poorly trained and poorly facilitated in movements. NASEP, (2012), points that, KARI runs twenty major research centers throughout the country. Most of the centers are specialized in certain local agro-ecological conditions and potential (Kamau, 2012). The World Bank, (2004), mostly funds the programs that include technological assessment and transfer of information and training, (Mwangi et al, 2006). According to Mwangi et al, (2006), the other impediment to

monitoring and evaluation by research institutions has the propensity of the study administrations (and not partial to KARI) to disseminate the study out comes openly. There are reasons for this, Kaguongo, Ortmann, Darroch, (2012), poses, is to ensure advance and revive the researchers' interaction through agricultural realism, an exclusive exercise and insufficient effect. CORE, (2006), posits that these small on-farm education training centers are a great resource though insufficient among farming communities.

It has been argued on the importance of networks, Clark et al, (2007), poses that those networks amid study and postponement are problematic characters and appears overlying. Farmers are institution demand agents at KARI local hubs, additional examination institutes, requests to talk precise difficulties, (Chipeta, et al, 2015). Farmers depend on allowance package to link hitches academically. Whereas decent investigators practice on farm situations to confirm sure equal significance, hinge on addition shared response organized farming. Camara, (2011), poses that this aspect is mainly important in relation to harvests that are appropriate for the inferior sections of the farming societies. Therefore obligation complete checking and assessments cheme intended was realized. M&Es cheme must hold actions outcomes connected to production and promotion as cross-cutting matters connected femininity, scarcity, authorization, hit on belongings etc.

Egerton University has great potential as a centre of excellence in agriculture to influence national development (Mwangi, et al., 2006). The University has a Research and Extension Division whose mandate is to offer extension services throughout the country, (Egerton University Ruforum, 2015). Extension and outreach activities are carried out with full involvement of communities in a consultative manner through partnerships based on their problems, needs and priorities as well as national policies and priorities, (Vanessa & Gala, 2011). The emphasis is to reduce hunger by improving food security, household income and self-reliance. According to Mwangi, et al (2006), the Policy provides the framework for improving efficiency and effectiveness of extension and outreach services and should be read in tandem with the Universities Act No. 42 of 2012 and the Egerton University Statutes and Strategic Plan (Egerton University, Extension and Outreach Policy, 2014). The University identifies and approves extension and outreach projects/activities through Stakeholder involvement. The University also develops and uses a Monitoring and

Evaluation (M&E) framework for all extension and Outreach project in consultation with all the stakeholders.

The public delivery system suffers various challenges including inadequate and inappropriate, International Finance corporation, IFCA, (2006), amid requirements of diverse groups of farmers and advice assumed or mails complete; emerging protests have partial applicability for most farmers; prejudiced contact-farmer choice; attention on watered crops to the loss of usual possessions administration, rain-fed farming, and livestock production as well as corrupt administration procedures comprising lack of reassurance, enticements, or authorizations that go unhindered for long periods. This has been mainly caused by lack of farmer controller over exploration and leeway,(Patricia, & Mbote,(2000).Considering the M&Es cheme aids in consideration of the variety of M&E errands that diverse people needs to start throughout the development series. Well-constructed monitoring and evaluation scheme by the communal sector projects can payon the way to accomplishment of aims, (IFCa, 2006). Equally desperately built checking and assessments cheme could destructively shake the accomplishment of objectives. Complex communal growth packages, there is no awareness on eccentric and determination of attractive allocation and agreeing way to examination embraces the categorized as 'receivers' (Adams & Dickson, 2010). The isolated segment is growing from head to footin latent zones, particularly areas near Nairobi, and inclines to provide leeway amenities where gainful. Profitable facility learners are beneficial up early stages anywhere community leeway is weak such as in floriculture. According to review of NAEP, (2005), corporations and entities in the dairy segment are counseling agriculturalists about fodder, AI, veterinary amenities and sanitation. Providers escalate latent uses of CIGs recognized beneath NALE Penetrance for profitable activities, (Mwangi et al, 2006).

To realize improved performance of hybrid sweet potato projects, this study emphasizes the critical role played by vibrant and elaborate monitoring and evaluation systems and extension services through efforts and provision from permitting issues like macro-economic atmosphere, Stathers, McEwan, Gibson, Mwangi, Carey, Namanda, Abidin,...Mkumbira, (2012), total ingrefuge, infrastructural growth, learning and communal growth. Institutional improvements and organization resolve critical to deliver vision of agronomic segment. The ASDS connections are realized to surge efficiency in

earnings, improve competitiveness, Webber,& Labaste, (2010), through value addition, advance leeway facility's cheme over manpower growth, use resources through a realization of a high return on hybrid Sweet potato projects, Stathers, et al, (2012), as investment and efficiency in resource use realized through improved environmental safety in terms of soil conservation, Woodhill, and Jim, (2007), through control of erosion and minimal water and soil pollution from synthetic pesticides use, (Stathers, Low, Mwanga, Carey, McEwan, David, Gibson, Namanda, McEwan, Malinga,.. Muzhingi, 2018).The trial of optimal and suitable lively and full procedures that deliberate customer socio-economic atmosphere, cost arrangement, market plea, cost effectiveness, agro-ecological diversity and customer inventiveness that major in important cross-cutting matters, (Nancy, Mary, Kuria, Anthony, and Patrick, 2010).

### **2.3.1 Capacity Building Interventions and Performance of Hybrid Sweet Potato Projects**

Unless the agricultural sector focuses on establishment leeway suggested service delivery, assembly trials of 21<sup>st</sup>period in agricultural productivity shall be an uphill task,(Kamau, 2012). This is actually so on the basis of investment in human skills, Adams & Dickson, (2010), and operational infrastructure for personnel and clientele capacity building in ICT and the establishment of combined and active record for segment, (Holleman, Jackson, Sánchez, and Vos, 2017). As a result MIS centers provide formalized approaches on management cutting across board from the external and core sources, (Ahmed A, and Morse, 2010). Assimilating M&E Project Management System, Clark et al, (2007) contends that it creates a unifying network that sustains accountability, empowerment through feedback and knowledge generation.

Equally it is of essence in provision of quick first hand management support, Chikaire, Ani, Atoma, and Tijjani, (2015).Dutta S and Bilbao, (2012), asserts that the inadequacy of skills to apply ICT in M&E activities has curtailed states that underestimate complexities of data collection, machine bureaucratic systems that has led to implementer frustrations, inadequate qualification of extension service providers in management information systems, is a cause in the failure of M&E utilization. As a result, M&E has been a subsidiary or an afterthought in budgetary allocations. Diamond & Khemani, (2005), calls for integration of M&E in all aspects of project management to transform the results. This

means that, proper clarity about what to monitor and evaluate. Davis and Place,(2003), elaborated that the indicators on monitoring of inputs, documentation and analysis is key for relevance and results end evaluation. Asenso Okyere, and Davis, (2009), calls for triangulation in data collection. The pitfalls of qualitative are masked by quantitative approaches and vice versa. However, technical assistance is essential to help in methods appropriateness at every stage.

Adoption of ICT is a cost effective means of sharing M&E findings to help in making accountable as well as transparent choices (Diamond, 2005). Equally, Adhiguru, Birthal, and Kumar, (2009), stated that a well-structured communication channel for feedback ought to be in place. Mungai, (2005), associates the failures in agricultural extension in Kenya to reactive communication and poor information sharing and dissemination to make management decisions, (Mukhtar, Tanimu, Arunah, Babaji, 2010). It ought to be well coordinated and departmentalized for efficiency and responsibility. Agricultural extension systems, mostly lacks clear information and are large and poorly coordinated, (Mukhtar, et al, 2010). For instance in India over 125,000 people were employed in the sector, however, there is little coordination to the grassroots hence ineffectiveness in decision making,(Mungai, 2005).

It is postulated that efficient MIS systems working under a unified centralized treasury can help developing countries manage their resources effectively and enhance transparency and accountability, (Chikaire et al, 2015). This is because decisions will be made from a pool of reliable data base and not political whims and expediency. Patronage to leadership and resources will be limited too as there are checks and balances through grassroots participation from an informed point of view, (Casals& Associates, 2004). Updating of information will also inform budgetary process, as most states either lack a data base or are not always up to the required standards and timelines (Diamond &Khemani, 2005). Consequently this has snowballed costs, and delaying service delivery as well as transparency and accountability.

The World Bank, (2015), posits that agriculture is a major component across the GDP and employs the biggest percentage of the population. Consequently, significant programs have been rolled to tap on the potential of the subsistence farmers as well as to improve their

capacity,(Singh, 2003). Despite this, a poor infrastructural development has been a great bottleneck to adoption of ICT, Mwakaje, (2010) and (Dutta & Bilboa-Osorio, 2012). In recent times, modern information and communication systems have been adopted making access to information easier and fast, (Bashir, 2008). Infonet-biovision is one of the breakthroughs that allow information sharing in training and farmers in East Africa (Mungai, 2005). However, critics point to the social, cultural, technical and educational challenges of information management systems to failure to effectively spur development, (Maputo Declaration, 2014).

M &E systems are designed to aid in decision making on project appropriateness, tracking and making informed choices, (World Bank, 2004). In as much as these two aspects are complementary, their roles are miles apart (Diamond & Khemani, 2005). (Asenso and Davis, 2009), contends that stakeholders buy in is critical. A unified approach provides a shared responsibility and accountability. The design of any Monitoring and Evaluation system in Extension service determines operationalization of the planned objectives in relations of human, material resources, effort schedule and scheme efforts (Davis and Place, 2003). A general consensus exists that Monitoring and evaluation in leeway facilities, appropriately calculated and realized, progress agronomic output (Romothamo, 2013). 'Extension' denotes advisory and other services to the grassroots that aide them in the use of resources, new trends in crop management, seed varieties and market trends (Katz, 2002).Kamau, (2012), suggests that when one designs a monitoring system, it entails setting up of a system that can channel out information in a continuous process to improve the application process. Evaluation, on the reverse side, an evaluation process denotes a term of reference for such a process at periodic intervals. Mwangiet al, (2006) contends that the design of extension services lays the path for M&E and as a result accounts for success or project failure. Lack of realistic objectives means M&E process is designed to fail. Indicators become ambiguous and cloud judgment process with uncertainty and a lot of guess work. Allocation of resources and a continuous learning process also is critical to project success. A project ought to be flexible in its objectives to be amenable to any changes informed by indicators. M&E ought to be an integral part of planning and not an afterthought.

After project selection, the locus of action moves to its implementation, Laurie, (2004), thus capacity building, employing numerous possessions which include extension services, materials, machine, cash, and time to ensure the project is concrete reality. In their study, Rivera et al, (2000), found that factors such as capacity building among stakeholders, their participation in the implementation process and how extension services are utilized are significant influential parameters. Capacity development is a center stage agenda of development projects in many establishments. Davis and Place,(2003), observe that great deals of resources are factors in capacity building programs but with little to write home about. This could have been as a result of untested, unrealistic assumptions and the fact that the results of many programs are not in line with goals, (Sudha Kumari & Dr. Veena Khanduri, 2019). Evaluations are desired to test models and norms on which growth programs are founded, (Ndwiga, 2014). To file outcomes, stakeholders must reach out in improving future plans, (Sudha Kumari & Dr. Veena Khanduri, 2019). Constitute ability structure in agricultural exercise varies, NASEP, (2012), and the concept continues to develop as field management practices and experience. Capacity building interventions among the farming communities, Alex, et al (2012), asserts that many practitioners equated capacity building with training of farmers in the agricultural training centers in most organizations. It is contested that the approach of basing on skills set and competencies to individuals limits growth of extension services, (Laurie, 2004). Skills ought to be shared on a collegiality basis, Kilewo, & Frumence, (2015), and inter disciplinary training involving various actors promote transference of competencies and cross functions. Aker, (2010) elaborates that capacity building is an essential component in development, Tedson Richard Nyongesa, (2017), but it is hardly practiced in line with required principles, (Mburugu, Mulwa, & Kyalo, 2015).

### **2.3.2 Stakeholder's Engagement Strategies and Performance of Hybrid Sweet Potato Projects**

Assessment of involvement levels by clients in a program is riddled with bias (Anderson, et al, 2008). This can only be transcended if a well-organized measurement system Amponsah, (2010), is set up. Research on participants partaking gauge has shown that, 54% of clients were not involved in developing the evaluation and 7.5% of the clients involved, carried their own evaluation. In many instances in agriculture, Dutta and Bilbao, (2012), emphasizes that evaluators are not willing to incorporate clients in projects. However,

Brody, (2003), argued that involvement of clients in project cycle especially at the indicators identification is critical to project success. Ireland, (2002), states that adoption of empowerment evaluation is of great significance due to self-sustainability of the community as a result of authoritative decision making and competencies. This ensures that project outcomes are in tandem with the goals set, (ENRD, 2015).

Extension services ought to adopt a farming systems approach, (FAO, 2018a). This is broad in scope and incorporates the needs of farmers in rain fed areas and diversification of scale up farm returns, (French, & Morse, 2015). Clark, Smith, and Hirvonen, (2007), called for reorientation of the paradigm of incorporation of technology in agricultural extension. Oruko & Elliot, (2011), further observed that improved service delivery is not limited to technological agronomic practices transfer but through a broader scope and holistic focus. A participatory way will link various service providers in exchange of information for informed decision making, (Dundee Precious Metals, 2014). Technological use ought to be geared towards agriculturalist participation, ENRD, (2015), poses that in programme planning together to promote stability in production, commercialization to add value, sustainability for longevity and diversification for variety of produce and ways, (Dinar and Keynan, 2001). Farmers have set a precedence of pulling together in associations or cooperatives, (IFCB, 2007). These associations help in making informed market choices, Bowen, (2013), farm inputs acquisition and access of other agricultural oriented services as well as accessing various other services they require in their farming activities, IFCB, (2007), including Agricultural Extension Services, which are provided during group meetings. These groups were either invited Agricultural Extension Services' experts who then talk to the members at one point and the members can learn on any agricultural aspect they are interested in JICA, (2016), and also invite successful farmers to share with the rest of the members, Kang'ethe, Gitu, (2006), suggests that its on certain extension aspects. They are successful at sharing Agricultural Extension information as they are easily accessible and very affordable, (JICA, 2016). The World Bank, (2015), has noted that many development agencies have been in active processes to build grassroots capacity and are well elaborated in many parts such as "Saga", "Ngwatio", "Bulala" and "M'wthya".

Pooling together in community groups, helps in the transfer of skills and bridge the location distance between service providers and farmers (World Bank, 2004). The Kenya National



Federation of Agricultural Producers (KNFAP) is the major union in Kenya whose mission is to “empower its members to make better choices for improved supportive living. Organizations that provide agricultural info and amenities to members are: Fresh Produce Exporters Association of Kenya (FPEAK), Kenya Flower Council, Kenya Horticultural crops Development Authority, Cereal Growers Association and Co-operative Societies. World Bank, (2004), contends that stakeholders ought to factor in phases from identification, setting of objectives and indicators. Other phases also need to be factored in too, Luyet, Schlaepfer, Parlange, & Buttler, (2012), and leeway schemes. Assessments are strategy phase enablers to the project stockholders in form of community based organization to performance measurement even before implementation starts with a clear picture of expectations of what a successful project would look like. Once information remained composed needs to be examined and deliberated by project stakeholders, (Sam Erevbenagie, Usadolo and Marc Caldwell, 2016). The ideal way is the involvement of community in preparation and enactment of project in all phases of checking (NASEP, 2012). In discussion and partnership they regulate observed and assessed, how it takes place comprising identification of signs, they do the analysis of the data and measure the presentation of the scheme and be talented to produce leadership continue through the project (Core, 2006).

According to the ASDS, in implementation of the NASEP of 2012, the delivery of leeway amenities would be supported and transformed by means of well organized, devolved, multi-sectoral and multi-disciplinary attitudes reply employer anxieties. Procedures should include re-arrangement and improving community leeway schemes to enable multi-stakeholder and enabling the growth of stakeholder-operated market info-schemes, (Kang’ethe and Gitu, 2006). The key objectives are to empower the stakeholder’s contribution through distribution of information and skills, and varying approaches so that they can efficiently manage resources for better quality livings. This impartial was fulfilled by endorsing mixed sharing amongst recipients and administration which is achieved and the need for this study. In gratitude cumulative stakeholders participation in development application procedure, Government was to endorse diversity leeway transmission and founding devices to direct services, Karanja, (2013), for better services and continue to be involved in monitoring and evaluation or ultimately by diminishing out to isolated

provision wage-earners and universities/colleges mostly where secluded segment contribution was low, (Sam et al., 2016).

### **2.3.3 Utilization of Extension Services and Performance of Hybrid Sweet Potato Projects**

Utilization of extension services and delays in conducting baseline surveys and impact assessments, inadequate resources, Ahmed, & Morse, (2010), and inadequacies account M&E purposes in the operation measures, all constitute to limited operationalization of M&E results, (Gladys, Katia, & Helena, 2010). Factors paying deprived operationalization M&E recognized under this study include, lacking recognized ability, scarcity of experienced team, mix-up on usefulness of M&E, and insufficient order of M&E duties, (Leeuwis, & Pyburn, 2002). Hilhorst, Thea and Guijt, Irene, (2006), observed that full operationalization of the M&E scheme foresaw assessment certainly not happened. This was due to supply restraints in terms of monetary incomes and eminence work, particularly the Local Government stages, (IFAD, 2002).

Monitoring was assumed to meet contributor report agencies than inner organization instrument, seeming sound amid M&E and organization choice care organizations, information produced not efficiently used for running choice creation, Rivera et al, (2000), noted. M&E fairness and operative restrictions were recurrent theme pronounced by World Bank supervision assignments. This occurrences leading to action later seen works, Hilhorst, et al, (2006), in the Philippines Agrarian Reform Community Development Project (1997), M&E were rectified after the midterm review. This reflected weak design and in comes in relations to scheme recruitment, procedure checking and influence assessment below parrealized. M&E presentation forced report age problems amid diverse executives, ground staff and M&E, (Bowen, et al, 2013). Provision in development board, triggered by absence of clearness on parts and tasks antagonizes extension delivery.

The Viet Nam-Agricultural Diversification Project of 2008, M&E scheme fascinated on checking of corporal development and efforts rather than evaluation of influence and duty. Organization information systems and schemes appearance on regular doings of work plan, Aker, (2010), argues that flagship doings take place for organization remedial action. Another example, Asenso and Davis, (2009), was the China-Yangtze Basin Water

Resources Project of 2004. Clark, Smith, and Hirvonen, (2007), stated in the Mongolia-Poverty Alleviation for Vulnerable Groups Project of 1995, that significant incomes consumed on emerging scheme of participating watching and assessment which produce valuable information. Clark, et al, (2007), observed that lack of pro-activity in technical support to implementing agencies such as the India-Uttar Pradesh and Uttaranchal Forestry Project, 1997 and the Nepal-Hill Community Forestry Project, 1989. They have noted that in this project, the necessity for easing care to implementing agencies in setting out priorities for monitoring and learning was not recognized by successive supervision missions, for the latter however they state, important risks were identified, Stephen, Jorge, John, and Simon, (2015), at project preparation stage, should have triggered early support to M&E system establishment, but had been glossed over.

Checking is significant yet often deserted purposes in most administrations (UNESCO, 2010). In the worldwide survey of national extension systems, it was found only half of national extension schemes have monitoring and evaluation M&E in size. The consultation notes that many M&E are feeble and partial to ad hoc studies. Instead should be cast-off in confident way to advance leeway's presentation and surge its effectiveness, (IFAD, 2002). Therefore, arrogances around and in the use of M & E must be different if capacity used to benefit in establishment of extension's act and influence, (Sulaiman, Andy Hall and Suresh, 2005). According to World Bank, (2015) agricultural schemes should be powerfully fortified to create monitoring events and assessment studies both to improve extension performance and to communicate the results of extension programmes to policy makers and clientele being served. Until 1965, technologies were developed and run through extension pipeline to farmers, with agricultural development being the desired product. Research and extension systems were focused mainly on large-scale farms or smallholders in high and medium potential areas. Trials and demonstrations were mostly undertaken in research stations (Davis & Palace, 2003).

Nowadays technical support monitoring and contribution of possessions in policymaking procedure can be huge causes of how the evaluation's lessons are produced, communicated and professed, (Vanessa & Gala, 2011). The Public delivery of extension is offered by the Government, implemented by Ministry of Agriculture and reinforced by Government of Kenya, NALEP (2005), and Swedish International Development Agency (NALEP-Sida).

Its objectives aim at improving the input of farming and livestock to social and economic development and poverty alleviation, (Muyanga, & Jayne, 2006). Public sector includes Ministries and Departments of Agriculture and Agricultural Research Centers. In Kenya, the public sector is provided by Ministry of Agriculture (MOA) over Direction of Extension, Research and Technical Training, Ministry of Livestock and Fisheries Development (MLFD).

The Global Consultation on Agricultural Extension experimental that monitoring and evaluation are significant neglected purposes in utmost administrations (World Bank, 2015). Frequently, these M & E units are uncontrolled when project subsidy ends, (IFAD, 2002). In many organizations, monitoring and evaluation have had adverse blue print implications because these units have often derailed on difficulties, revealing faintness and disappointments, (Low, Ball, Magezi, Njoku, Mwanga, Andrade, Tomlins, Dove, van Mourik, 2017). Commercial extension creativities have given profitable in latent areas. These include show found and representing the skills the company endorses hybrid kernels. Private companies are also co-finance major agricultural shows, Republic of Kenya, (NALEP, 2001).

In India, for example agricultural extension activities are being operationalised through active involvement of people, especially the group members, (Leeuwis, & Pyburn, 2002). A number of Farmer Interest Groups (FIG), Commodity Groups (CG), and Women Self Help Group (WSHG) formed in villages with help of NGOs, (Patricia, & Mbote, 2000). Initiatives have been put in place slowly improving the full cost of services and inputs and gradually withdrawing from direct provider of services like inputs and technology dissemination activities (Singh, 2003). In Kenya, farmers have a tradition of organizing themselves at local level into membership-based units, (NAEP, 2005). To enable such ventures the advertising of farming production, joint assistance aid and fast of farming praise. Community labor-sharing groups in Kenya are one of the fruitful farmers' based organizations providing supply of labor to farmers during critical periods of the cropping season, (Ndwiga, 2014). These groups permit the members to help each other to complete heavy farm tasks such as ploughing, planting, and harvesting. Different extension providers use diverse methods, NALEP, (2005), these approaches include focal area and farmer field schools. Equally, numerous techniques such as face-to-face extension, on-farm

demonstrations, shows, field days, film shows, adaptive on-farm trials, and mobile training units are cast-off. However, NASEP, (2012), there has been repetition approaches across varied agro-ecological zones and farming systems. Similarly, lack of multi-skilled extension agents has led to piece-meal extension service delivery to clients usually faced with multiple problems, (Akinbile and Otitolaye, 2008). There is little formal collaboration among ESPs, NASEP, (2012), this condition led to absence of interaction and repetition of project implementation labors. The deprived partnership and interacting amid extension and other service providers in project implementation, Njiru, Rambo, (2017), is a result of low appreciation of their position, pursuing of unusual agenda among some of the service providers, and lack of confidence and consistent planning. The main trial consequently is to invent modalities for improving collaboration and networking among investors to deliver a mutual pounded for jointly addressing matters in M&E and extension service delivery and other pastoral growth provision facilities, (Langellotto, Moen, Straub, & Dorn, 2015).

Under this study, the extension services in hybrid sweet potato projects has been used to emphasize the need for operational mechanisms in monitoring and evaluation systems, Njiru, Rambo, (2017), and extension service providers, farmers and project technical support staff. Operational mechanisms can be exhibited by institutional capacities in conducting baseline surveys and impact assessments, how an M&E system describes M&E objectives in the implementation arrangements and availability of resources at the local context. The study also conceptualizes that the operational mechanisms as stated in M&E systems and how they are actualized in extension service influences performance of agricultural projects. Operational mechanisms discussed in the study include; Baseline studies done before implementation of a given project and how the information obtained from such studies is used in the construction and implementation of a given project, social and environmental Impact Studies done and their implication to a proposed project, Institutional Capacity assessments and operational indicators of progress and their influence on the performance of agricultural projects.

The study sought establishments are cognized outline that operates and impose values for ESPs and particularly code of morals, recover competence and display presentation. The goal is to assist authorize and progress the checking and evaluation schemes in the agricultural sector in enhancing collaborative relationships with other stakeholders to form

a coordinating unit and achieve synergy and ensure sustainability of extension services provision, (IFAD, 2002). Exact strategies on the starting and operationalising such opportunities shall be industrialized by this learning which is applied for refining presentation of hybrid sweet potato projects in Njoro Sub-County.

#### **2.4 Monitoring and Evaluation and Performance of Hybrid Sweet Potato Projects**

Development organizations in the modern world, Nalianya, (2018), have tackled outside burden to develop deficient and have launched agendas for results location (Anderson & Van Crowder, 2000). In line with his argument, (Gladys, Katia & Helena, 2010), observed that Agricultural Sector Development Strategy 2010–2020 (ASDS) emphasized the need to advance leeway scheme distribution and has assumed extra motivation to quest for consequences and for representative in their attainments, (Geert, Andersen, 2005).

While M&E is familiar key element in sympathetic and efficiently following and detailing the results of growth interventions, Dutta and Bilboa, (2012), do admit general need to advance M&E systems in agricultural extension in view of the technical developments of farming production. M&E methods and guidelines expected ample global care, Dieter Muller, Lai, William Sorrenson, (2010), but difficulties of hitting M&E into repetition and sketch trainings from any field of information, (Lily, Harriet, Christopher, (2017), have not been studied. Asenso and Davis, (2009) in their study on information and invention for agricultural growth declare numerous issue syndicate to make assessment and significant matter in agricultural extension programs. The varying look of agricultural extension, the crush on finances, and the weather of answerability for database expenditure all donate to the cumulative part that monitoring and evaluation has to play, (Erik, Patrick, and Fiona, 2010).

As far as finished projects are concerned, though with very few exceptions, the M&E systems are poorly industrialized, Zjosh, (2001), and applied at the field equal and these faults in M&E systems, (Dieter, Muller and William, 2010), could be drawn back to design of the M&E scheme, mainly the lack of clearly recognizable indicators and lack of possession and contribution by the investors (Anderson, et al 2008). M&E systems have reflected inadequacies in the description of project purposes, mechanisms and application arrangements. Anderson, (2008), continues to argue that results-based outline in agricultural

interventions, takes more leading part. Sulaiman, Andy Hall and Suresh, (2005), in their study on effectiveness of public sector extension in India, observes that initial agricultural extension, suggests a number of theoretical and useful subjects needs additional modification, (CIP, 2015).

Over-all,(Melak, and Steven, (2018), trainings are greater in M&E systems in agricultural extension for better combined project organization procedures, continued provision and promise by project staff of the government or donor funded projects, Ramothamo, (2013), and investors participating and results-oriented review approaches are major tools for project management. This depicts that formal inspection and valuation of size growth necessities of realizing activities and other local growth associates are vital elements for M&E schemes enterprise. Alex, et al, (2012), posits that, it's vital to have thorough M&E plan strained up at project start-up, investors must donate and clearly be recognized. M&E data group analysis and reporting stresses need to be controllable and well-matched with technical and institutional dimensions, Nyamboke, (2011), over the project cycle and much information on project results should be accessed through well-targeted participatory assessments, Sultana, & Abeyasekera,(2007), by experienced personnel on randomized samples of the project population repeated over short intervals.

Over decades, extension has stressed on cumulative production with slight or no regard to cost totaling and advertising, (Ndagi, 2017). Ideas existence comprised largely to address financing of postponement amenities containing cost sharing, commercialization and privatization. Implementation of these ideas with knowledge of pure departure and entrance instruments to evade disturbance of the facility needs consideration, (Stufflebeam, 1994).

The delivery of postponement provision, Ramothamo, (2013), is conquered by the community subdivision over own departments of postponement in the segment departments. In late 1980s, civic leeway facility was ran awake to the sub-location flat and sufficiently eased to achieve its obligations. However, over the last 15 years, the recruitment and easing of community segment leeway reduced due to restriction on community service, Nyamboke, (2011), and abridged backing for processes and upkeep. For instance the fraction of front leeway employee to farmers is 1:1000 linked to the anticipated level of 1:400, (NALEP, 2005). In the absence of effective private sector

operations to fill the vacuum, the state has condensed spatial attention, aiming an efficiency of service delivery imitated by custom grievances, (NASEP, 2012). There are similarly numerous schemes and packages with agricultural extension constituent realized in the Government scheme, (ASDSP, 2017). They use methods to extension organization, which occasionally outcomes in inconsistent mails to the custom, repetition of exertion and consumption of funds, (ESMF, 2018). The entrance of numerous ESPs has latent of making balancing interactions amid agents and donation leeway customers extra selections, (KCSAP, 2018).

Presently, ESMF, (2018), on implementation report has explained that leeway amenities are delivered through both mixture of three diverse representations: The first model deals with free community leeway amenities typically to smallholder farmers affianced, Singh, (2003), in increasing main foods and slight cash crops through all the agro-ecological zones. The second classical indicates an incomplete cost-shared delivery of leeway amenities within the community where incomplete commercialization has occupied, USAID, (1996), while the third classical is completely commercialized and connecting the secluded and quasi-public administrations for precise merchandises like drink, chocolate, honey, pyrethrum, barley, tobacco, agriculture and dairy. In this scheme, the public leeway amenities are usually embedded in agricultural services. Notwithstanding bright features varied leeway scheme, has its trials which include necessity for governing scheme to organize the companies. An intervening trial for both community and isolated leeway delivery, Koontz, (2005), is to assemble adequate possessions to deliver the obligatory amenities, and expressing a plan for cumulative isolated contribution.

## **2.5 Theoretical Framework**

This study has been based on the Stakeholders' theory, Resource dependency theory, Innovation adoption theory, Diffusion of innovations theory, Theory of collective action and Structural functional theory. These theories have been used by the researcher in this study due to their strong arguments in support amid critique of the proposed themes under investigation. The stakeholders' theory is highly oriented to the project implementation process theme as the independent variable under this study, monitoring and evaluation practices in addressing the performance of hybrid sweet potato projects as the dependent variable. Resource dependency theory has been used to indicate the importance of resource



mobilization during project implementation phase and to generate more insight in the over-dependency associated with continuous and overly supply of resources among project beneficiaries. The innovation adoption theory is quite skewed to the production of hybrid sweet potato varieties as a new venture among the farming communities who over time have repeatedly based their production on traditional varieties. The diffusion of innovations theory has been used by the researcher to emphasize the need for community mobilization in adopting the hybrid sweet potato varieties as a priori crop over the traditional varieties. Theory of collective action is a call to engage as many stakeholders in the implementation process of these projects. Structural functional theory has been used to invite and engage the relevant government institutions as important structural foundations on which the hybrid sweet potato projects are hinged.

### **2.5.1 Stakeholder's Theory**

Stakeholders are critical components in organization decisions and an important component in management, (Freeman, Wicks, & Parman, 2004). The theory was first proposed by Klaus Schwab in 1971 and later emphasized by Freeman in his stakeholder concept. The end value of profit maximization for managers and optimum benefits to the local should be in tandem to moral values in the society. The scope of information to which authoritative decisions are made is broadened with stakeholders' participation. The local appropriateness of the information factoring in aspects like culture and the institutional frameworks and peoples capacities is significant for sustainability of hybrid sweet potato projects.

Accountability shifts from activities to accountability on results through a mutual stakeholder engagement in the implementation of hybrid sweet potato projects. There is local ownership of the implementation process and stakeholders buy in, (Koontz, 2005). The process is inclusive from start to end and therefore realizable targets are set, monitored and changed in line with emerging trends in the hybrid sweet potato projects.

### **2.5.2 Resource Dependency Theory**

This theory was advanced by (Dorfman, Hanges, & House, 2012), who argued that organizations are dependent on utilization of resources within their environment. They noted that community needs for resources and need for outlay of the end products leads to environmental dependence. The environments in return do exerted influence on the entities

that depend on it. Hatch, (2013), opines that a vertical and horizontal integration with suppliers and competitors respectively is critical to continuity of organizations. The performance of hybrid sweet potato projects is also contingent on the environment it operates. It advances the argument that, despite availability of raw materials and other factors of production, the failure to link with the community impedes its activities. Equally, the input-output model presupposes that social legitimacy is equally important as other factors of production. New agricultural extension theories and methods are gaining acceptance, such as those of Rivera et al, (2000), who posits that research activities ought to be farmer-centered as a key resource. This theory bears much of what has become action oriented learning through a participatory approach essential for a holistic project implementation by the stakeholders. This study uses this model to indicate the importance of project resource identification through instructing stakeholders on how best to enhance project implementation practices and extension service by adopting proper M&E systems, (Fadare, 2013). These models ought to be highly innovative, inclusive and able to empower the people to make authoritative and right decisions on resource utilization during project implementation.

### **2.5.3 Innovation Adoption Theory**

Innovation under this study could be viewed as the introduction of hybrid sweet potato varieties while adoption has been viewed as the uptake or continuous recruitment and engagement of hybrid sweet potato project stakeholders. Focus ought to be inside natural like incentive, choice, and thoughtful consideration in innovation adoption. Behavioural theories base learning on the idea that all behaviour is acquired through conditioning as used in healing situations to aid customers acquire different abilities and actions. In agriculture as opposed to medicine which focuses on economic models on interest and profit maximization, financials emulations fail to hypothesize the communal scopes of information, message and prudence, (Lewis,2014). This is attested to the structural limitation of economic models in integrating the variable farmer's attitudes and behavior. The innovation adoption theories therefore try to fill these gaps. Theory of psychological field by Kurt LEWIN, a psychologist asserts that through the interface between the principal agents and the environment human behavior is shaped, (Simon Albrecht, Arnold, Jamie, William and Alan, 2015). Human behavior therefore defines the sense of agency

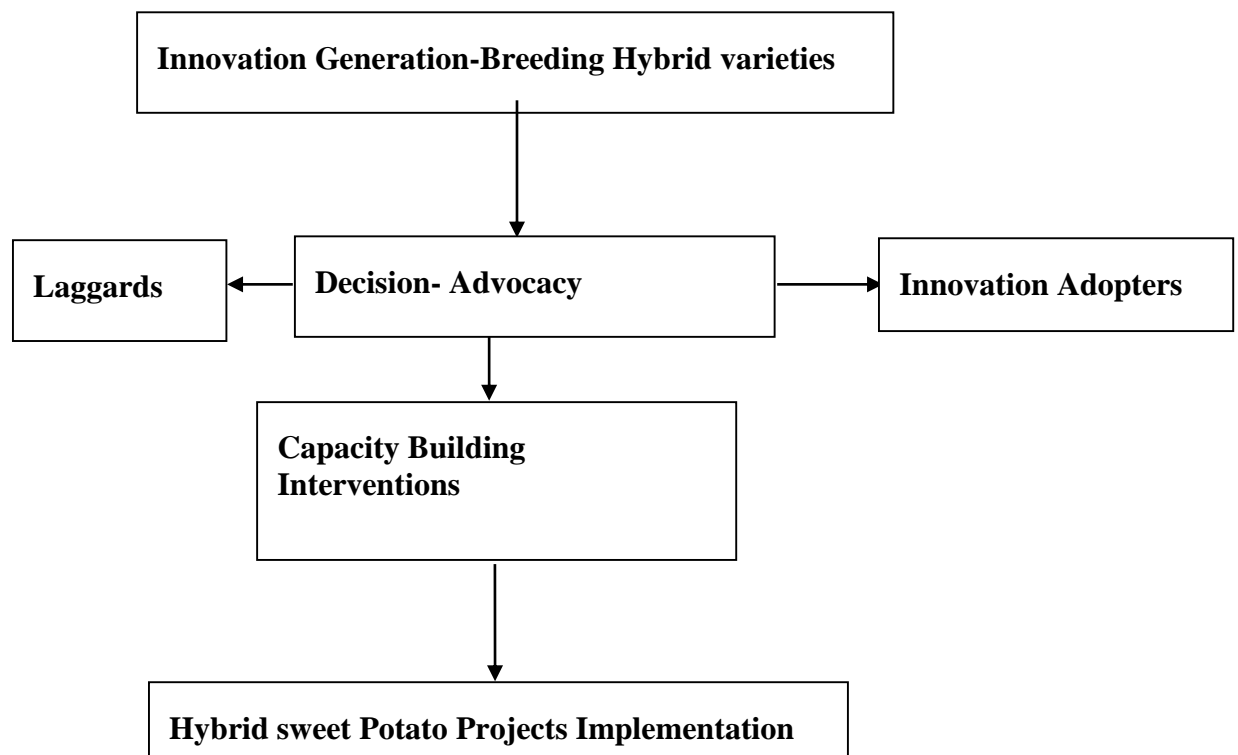
with which action is taken, (Lock, 2007). This in turn promotes innovation and invention in agriculture.

Theory of innovation adoption, Simon et al,(2015), poses that inhibiting forces negatively influence behavioural change (adoption) example, lack of grants, incomplete liquidity (for labour hiring, buying herbicide, seeds of legumes for soil coverage, etc), lack of equipment, and incomplete information while energetic militaries are helpful to optimistic mark (implementation) for instance, monetary support, practical information, training, running of ideas, linkage with market outlets .Once such militaries are recognized in the farmers' choice procedure, probabilities of dispersion can be projected and significances for raising new crop varieties in projects can remain determined.

Determinants of adoption which include perceived attributes such as comparative advantage and complexity, the trial ability degree refers to the extent to which an invention can be replicated, (Valters, 2015). Compatibility on the other hand is the degree to which sustainable practice is perceived to be contingent through societal standards needs and experience, information on decision making process and communication channels that determine what, when, and how knowledge and information is spread. Theory of planned behavior aids to appreciate in what way people's (acceptance choice) behavior, (engaging in hybrid crops) can remain subjective. Considerations are crucial in circumstances such as projects when analyzing people's behavior or attitude towards a practice. Conceptual Models of Innovation Systems approach are applied to help us understand; which stakeholders are lacking (diagnostic), may be needed (recommendation), in the development process to overcome bottlenecks and constraints and generate the needed knowledge, technologies or institutional arrangements. Various conceptual models of local innovation systems can be used as frameworks for analyzing the quantity and quality of the flows of information (exchanges of knowledge, training processes) and the decision processes (technical adaptations) between the main actors. Relating the innovation system to the case of hybrid sweet potato projects, all actors (Farmers, experts, input suppliers, and policy makers) and their linkages (interactions) are all important.

### 2.5.4 Diffusion of Innovations Theory

Investigation of the behavior and practices of stakeholders in adopting new technological innovation in a given capacity building intervention; confirms Valters, (2015), that an innovational knowledge or skill transcends from an individual to another. Different organizations and institutions across the globe diffuse innovations among their members by using different channels within their organizational structure. Improving a crop variety from a traditional low yield to hybrid high yield, involves a combined effort from the breeding station to the multipliers and to the farmers and back to the research station. Through these stages, various members may find it difficult to consume the technological innovation without a careful understanding of the diffusion process. A contradiction of the process can bring frustrations and create a barrier due to misconceptions by the parties involved, (Karanja, et al, 2006). Relationship between variables in the diffusion of innovation theory is illustrated in figure 2.1



**Figure 2.1: Diffusion of innovations in hybrid sweet potato projects**

**Adopted by the author from (Rodgers, 2003)**

Figure 2.1 illustrates a conceptual model of diffusion of innovation theory. The process suggests that an innovation once generated from the source, contrary to, Valters, (2015), falls on the decision making stage (advocacy) where some members adopt the innovation while others lag behind. This paper has labeled the hybrid sweet potato farmers who take long to adopt an innovation as laggards though they may adopt the innovation much later from the success stories shared. However, accepting or rejecting an innovation may bring along unexpected outcomes leading to uncertainty, (Juma, 2014). To reduce this uncertainty, individuals who adopt the innovation among the members of the society must be involved in capacity building activities to make informed decisions,(Sutherland, 2011).

### **2.5.5 Theory of Collective Action**

This theory was first published by Mancur Olson in 1965 who argued that groups and individuals attempting to offer public goods experience many challenges. He contends that provision of public good comes amid diverse member interests where some will either fail to uphold the initiative while some will not advance their interests in a sustainable way. He explains that, when the decision to provide the collective good is analyzed from the individual point of view, there is a high incentive to free-ride on the efforts of the others and to provide a sub-optimal level of performance in implementation. It is this collective action orientation that makes some farmers successful, Sumberg, Okali, and Reece,(2003), in project implementation to realize improved crop performance. This theory argues that the key to the existence of an intermediate group is that the group is not big enough so that the actions of an individual can considerably affect the utility of the other members. If this is the case then a combination of strategic interaction and institutions might be enough to facilitate an adequate provision of the collective good. This theory has been challenged by institutionalisms thought, Jonker, (2009), in its compliance with reality and proper depiction of incentives that drive human behavior. Nonetheless, it still remains a key milestone in the process of recognizing the mechanisms of collective action. This theory is very relevant to this study in view of the fact that, the utilization of extension services is more or less a public good. It is therefore, based on the collective action that farmers shall be more vibrant in acquisition of the planting materials and how well they collaborate with extension agents for the success of these hybrid sweet potato projects.

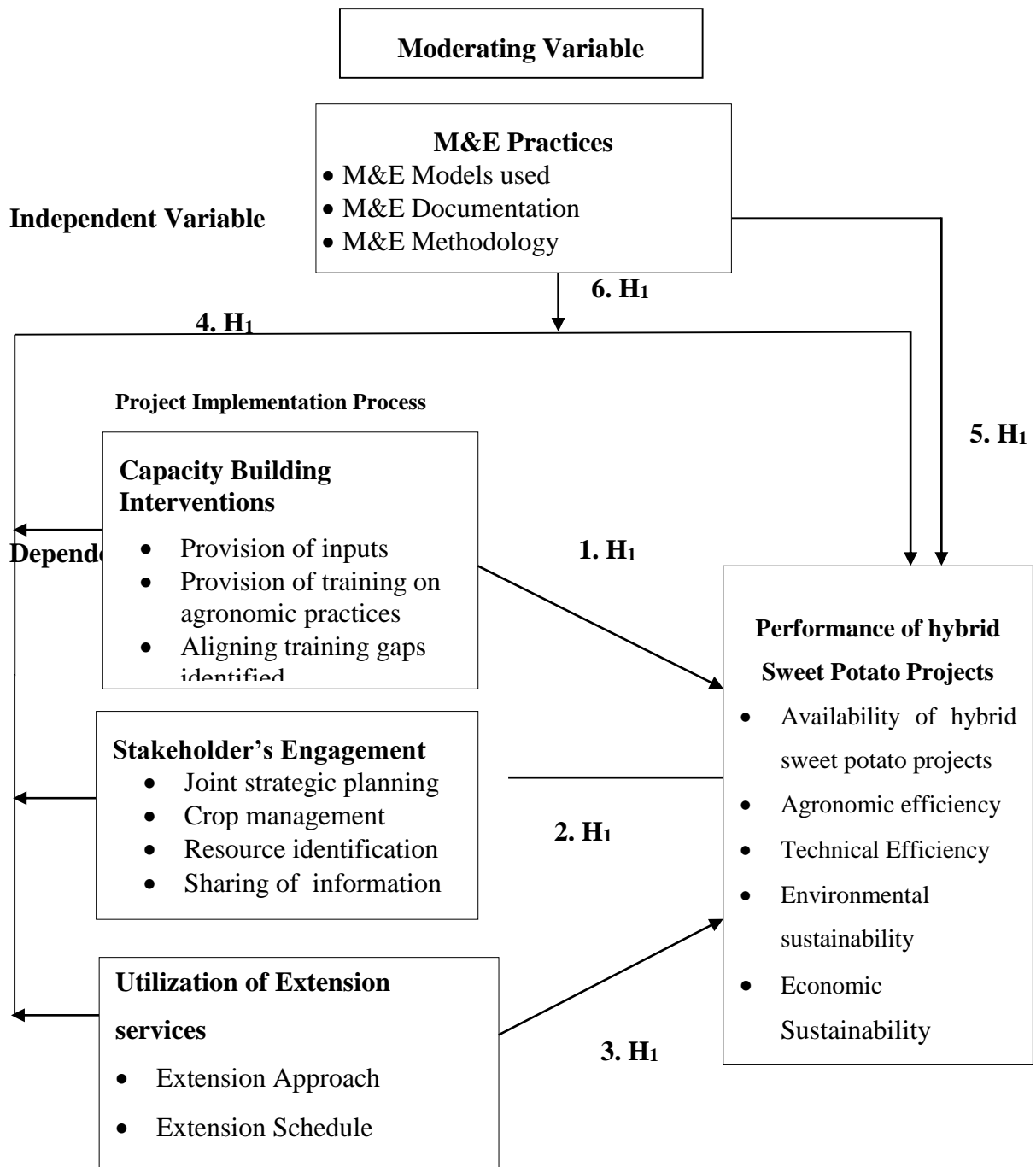
### **2.5.6 Structural-Functional Theory**

The proponent of this theory was Herbert Spencer who was a prominent social philosopher of the 19<sup>th</sup> Century. He was famous for the organic analogy of human society as he viewed society as an organic system, having its own structure and functioning in ways analogous to the biological system. The theory tries to explain how the relationships among the parts of society are created and how these parts are functional (meaning having beneficial consequences to the individual and the society) and dysfunctional (meaning having negative consequences). It focuses on consensus, social order, structure and function in society. The structural-functionalist theory sees society as a complex system whose parts work together to promote solidarity and stability; it states that our social lives are guided by social structure, which are relatively stable patterns of social behavior. The Structural functionalist theory pays considerable attention to the persistence of shared ideas in society. The functional aspect in the structural-functionalist theory stresses the role played by each component part in the social system, whereas the structural perspective suggests an image of society wherein individuals are constrained by the social forces, social backgrounds and by group memberships, (Saunders et al, 2007). This theory gains its relevance under this study in view of the interrelationships that exist between the various stakeholders where each stakeholder is viewed as a functional unit to the success of the hybrid sweet potato projects. It's important to note that individual stakeholders cannot achieve much, farmers, extension service providers and plant breeders must work in cohort with other government institutions such as; agricultural crop research institutions such as KALRO, higher institutions of learning, and agricultural knowledge institutions in order to realize successful hybrid sweet potato projects.

### **2.6 Conceptual Framework**

The conceptual framework in figure 2.2, illustrates a methodical approach placed together to deliver an emphasis and demonstrate dealings amid ideas. It displays the association amongst the independent and the dependent variable. The procedure of hybrid sweet potato projects operation procedure is though prejudiced by capacity construction involvements amid investors in terms of obtaining the established resources, capacity building in the arena of performance applies. Implementation process is also influenced by the stakeholder's engagement, and the utilization of extension services. The study poses that

leeway and assessment practices on monitoring and evaluation as the moderating part in presentation of hybrid sweet potato projects delivers improved performance.



**Figure 2.2: Conceptual Framework**

**Table 2. 1: Summary of Literature Review**

<b>Variable</b>	<b>Author/ Year</b>	<b>Title of the Study</b>	<b>Methodology</b>	<b>Findings</b>	<b>Knowledge Gap</b>
Capacity Building Interventions on Performance of hybrid sweet potato projects	Ndagi, Mugo (2017)	M&E Practices, Ethics and Sustainability of Agric food crop Projects in Nyeri County	Mixed method descriptive survey design  Stratified sampling	M&E Capacity Building influences sustainability of Agric food crop projects	This study has gone further to look at other aspects of capacity building; Provision of inputs and alignment of training gaps  This study is specific to performance of hybrid sweet potato Projects
Capacity Building Interventions on Performance of hybrid sweet potato projects	Tedson, Nyongesa (2017)	Capacity Building Interventions on small holder farmers and food security in Siaya County	Descriptive Survey and correlation analysis  Used only structured questionnaires as data collection instruments	Found significant contribution of training, networking and gender mainstreaming practices on small holder farmers and food security	This study has used mixed methods in a descriptive survey, open and closed ended questionnaires &interview guides  This study is specific to hybrid sweet potato projects
Stakeholder's Engagement Strategies on Performance of hybrid sweet potato projects	Sam,& Marc (2016)	A stakeholder approach to community participation in a rural devt. Project.	Descriptive survey  Used field visits, experiential learning and interview guides	Beneficiary representation through PRA was not sufficient, Close r/ships between primary and secondary stakeholders was beneficial	This study investigates stakeholder engagement through joint strategic planning, Crop management, Participatory resource identification and sharing of information
Utilization of Extension services on Performance of hybrid	Sulaiman and Suresh, (2005)	Effectiveness of private sector extension in India and lessons for the new	Descriptive survey stratified sampling design.	Providing a wide range of extension services requires a wide range of	This study looks at the utilization of extension services in the public sector.



sweet potato projects		extension policy agenda	Quasi experiment involving 120 farmers	partnerships with both the private and public institutions.  There exists a dire importance of providing an integrated set of extension services	Investigates the extension approaches, schedules and impact assessments done
Monitoring & Evaluation Practices on Performance of hybrid sweet potato projects	Eric, Patrick, and Fiona, (2010)	Monitoring and evaluating agricultural science and technology projects. Theories, Practices and problems	Detailed desk research  Evaluation of journals, books and other research papers on M&E approaches, theories and models	Innovations are most successful when they are accomplished by multiple protagonists  Innovation projects presuppose a change that's geared towards improvement in lives of intended beneficiaries	This study is empirical involving a population of farmers, extension workers and crop breeders.
Performance of hybrid Sweet Potato Projects	Grace, and Makori, (2016)	Determinants of performance of agricultural projects in Kenya. A case of Nyeri County	A census survey design was used to collect data from 75 agricultural projects by the use of open and closed questionnaire items	Project team and stakeholder involvement had a positive significant impact on performance of agricultural projects	This study has looked at availability, agronomic, technical efficiencies, environmental and economic sustainability on performance of hybrid sweet potato projects.
Project Implementation Process on Performance	Heritier, Kahiu, Florence Benjami	Agronomic Performance of Kenya orange	Randomized complete block design with	Ten genotypes were recommended as potential	This study looks at implementation process in terms of capacity building, stakeholders'

of hybrid sweet potato projects	n, James and Felister, (2018)	fleshed sweet potato varieties	three replications	parents for sweet potato breeding for high performance	engagement and utilization of extension services by use of a survey in a descriptive mixed method design
Performance of hybrid Sweet Potato Projects	Wariboko and Ogidi (2013)	Evaluation of the performance of improved sweet potato varieties in Bayelsa state, Nigeria	Randomized complete block design with three replications.  Evaluated both the phenotypic and genotypic characteristics	Found that improved sweet potato varieties were better in performance in terms of flesh root yields, trailing characteristics, vitamin A content and were well adapted to the various agro-ecological zones	This study looks at Phenotypic characteristics in terms of flesh root yields, agronomic and technical efficiencies, economic and environmental sustainability

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter discusses the methodology for the study. It outlines research paradigm, design, variables, target population, sample selection and sample size, data collection instruments, validity and reliability of instruments, data collection procedures, data analysis techniques, the statistical measurement models to be used in the analysis and the tests for hypotheses as well as the ethical considerations observed.

#### **3.2 Research Paradigm**

This research study is based on pragmatism research philosophy in placing value to research. Maxcy, (2003) and Watson, (1990), posit that this is an approach that enables a clear line of communication for linkages between researchers. Pragmatism sets the foundation for the adoption and integration of approaches with efficiency, (Hoshmand, 2003). In summary, research approaches need to be adopted and integrated for optimum results,(Jonker, & Pennink, 2009). The social phenomenon under this study was the performance of hybrid sweet potato projects in Njoro sub-county, Nakuru County. Under this study, hybrid sweet potato projects were subjects in the social world hereby referred to as the projects. In this case, the participants were constructors of a social entity hereby referred to as the project. The researcher assumes that all knowledge in the value of a project is constructed from the participant's previous knowledge and experience, therefore pragmatism theory as a paradigm explains learning about project performance as a constructive process between qualitative and quantitative data available. As a departure from constructivism and naturalism approaches, pragmatism states that learning about the performance of agricultural projects is dynamic, contextualized procedure of building information relatively, (Hoshmand, 2003).

Information about the influence of the implementation process, monitoring and evaluation was socially constructed based on personal experiences of the stakeholder's and hypotheses testing by the researcher and the interactions in the environment,(Orodho, 2004).The researcher therefore continuously tested hypotheses through social negotiations by responses that were received through the research instruments hereby constructed,(Orodho,

2004). This paradigm, suggests that the role of the pragmatist investigator is to use the stakeholders point of reference as the credible starting point and place value on them, (Olsen, et al, 2004). Pragmatism methodology therefore aimed to develop an agreement among stakeholders with variant ideas and opinions that could have derailed implementation.

### **3.3 Research Design**

The study adopted a mixed approach incorporating both qualitative and quantitative methods, (Zorabi, 2013). A mixed method research formally denotes a methodology that adopts and integrates quantitative and qualitative approach in a unitary study,(Zohrabi,2013). In cross-sectional study, Olsen, & George, (2004), suggest that where data was collected, and in order to survey the correlation amid the variables of attention, Rahis, (2017), posits that implications on experimental process on variables handled by the researcher were eminent. Time measurement and a dependence on current variances relatively than alteration resulting interference, (Zohrabi, 2013). Additionally, the cross-sectional design mainly ration change amid or from amid a diversity of populaces, topics, or spectacles relatively than variation,(Rahi, 2017). Cross-sectional descriptive survey design was used, Olsen and George, (2004), as the respondents appeared in cross sections of wards and was fairly cheap in terms of time used. It delivered better conceptualization of research problem, (Osborne and Suarez, 2002).

This design was suitable for the study since it helped evaluate the correlation of the various independent variables amongst themselves and on the dependent variable,(Orodho, 2004), and by use of open and closed ended questionnaires, interview schedules, document analysis and observational guides to collect the data. The main reason for this type of design was that it aided the researcher in assessment of the situation at the study site before and after,(Kothari, 2009). In context, the study sought to investigate the effect of project implementation, leeway and assessment on presentation of hybrid sweet potato projects in Njoro sub-county in Nakuru County.

### **3.4 Target Population**

This was the totality of elements under study consideration, (Kothari, 2009). The population was also defined by, Fox, & Amanda, Hunn, (2009), as a set of individuals,

situation or substances with mutual noticeable features. Target population of 951 comprised of 909 farmers, 6 plant breeders and 36 Agricultural extension service providers in Njoro Sub-county of Nakuru County. This range was chosen because Njoro is an agricultural Sub-county with high potential in food production due to its diverse agro-ecological range and virtually accommodates production of all the food crop varieties in Kenya. The researcher's units of analysis was the hybrid sweet potato projects amid public extension officers, sweet potato farmers and plant breeders at the Kenya Agricultural research organization based at Njoro.

**Table 3. 1: Target Population**

<b>Ward</b>	<b>Sweet Potato Farmers</b>	<b>Extension Officers</b>	<b>Plant Breeders</b>	<b>Total</b>
Njoro	198	6	1	205
Kihingo	211	6	1	218
Mauche	136	6	1	143
Lare	121	6	1	128
Nesuit	126	6	1	133
Mau-Narok	117	6	1	124
<b>Total</b>	<b>909</b>	<b>36</b>	<b>6</b>	<b>951</b>

**Source: Ministry of Agriculture (2016)**

### **3.5 Sample Size and Sampling Techniques**

This section described the sample size and sampling techniques used in the study. In this study, sample size refers to the selected respondents from all the farmers, extension service providers and crop breeders and was determined by use of the Slovin's formula. This was further discussed in sub-sequent sub themes.

#### **3.5.1 Sample size**

Sample size ought to be big enough and be highly representative of an entire population (Kothari, 2009). It ought to be based on its ability to give the desired information and its analysis ought to be without a lot of difficulty (Creswell, 2013).

The sample size was determined using Slovin's Formula. This formula was used to calculate the sample size (n) given the population size (N) and a margin of error (e). It is a random sampling technique formula to estimate sample size.

$$n = \frac{N}{1 + Ne^2}$$

Whereby:

n = Sample size

N= total population

e = error margin/margin of error/confidence level (0.05)

$$n = \frac{951}{1 + (951 * 0.05^2)}$$

$$n = 282$$

**Table 3. 2: Sampling Table**

Wards	Target Population				Sample Size Total			
	Farmers	Extension Officers	Plant Breeders	Total	Farmers	Extension Officers	Plant Breeders	Total
Njoro	198	6	1	205	58	2	1	61
Kihingo	211	6	1	218	62	2	1	65
Mauche	136	6	1	143	39	2	1	42
Lare	121	6	1	128	35	2	1	38
Nesuit	126	6	1	133	36	2	1	39
Mau-	117	6	1	124	34	2	1	37
Narok Total	909	36	6	951	264	12	6	282

### 3.5.2 Sampling Procedures

Multistage systematic, Fox, & Amanda, Hunn,(2009), sampling was used under this study due to the cluster characteristic nature of the population under study to enable sampling of the farmers in these projects, however, a census was used to gather responses from public plant breeders. Simple random sampling was adopted to reach the respondent farmers and extension service providers in all the wards. Sampling denotes a selection process where each respondent has an equal chance of being chosen for each fraction or sub group,(Cooper, and Schindler, 2014). Every subdivision of k individuals has same adoption

like any other subset of  $k$  individuals, (Creswell, 2013). It has likelihood of existence accepted in various studies or other more complex sampling methods.

### **3.6 Research Instruments**

The study used primary and secondary data. Self-administered open and closed ended questionnaires were used to collect primary data. On the contrary, secondary data was collected from already published works. Sources of secondary data were from census, information files from administration sections, organization archives and other document analysis. The questionnaires included closed and open ended questionnaire to obtain quantitative and qualitative material and was administered to farmers, public extension service providers, while key informant interview guides were administered to plant breeders at the research organization.

#### **3.6.1 Questionnaire for Hybrid Sweet Potato Farmers in Njoro Sub-County**

The questionnaires for hybrid sweet potato farmers in Njoro sub-county had been designed to address the various research objectives under this study. The questionnaire had been structured into six sections. Each section was designed to generate responses for each of the objective. Section A was designed to generate responses to capture the farmer's personal profile while the rest of the sections generated specific information on performance, implementation process, capacity building, stakeholders' participation, utilization of extension services and Monitoring and Evaluation practices on section B, C, D, E and F respectively. The Questionnaire had closed and open ended items.

Closed ended items were destined to explain information free of prejudice and enable data analysis. This was in form of a Likert scale anchored on five point rating ranging from strongly disagree (1) to strongly agree (5). Open-ended items were used because they gave respondents freedom to express their views or opinions and also made suggestions for collection of qualitative data.

#### **3.6.2 Questionnaire for Extension service providers in Njoro Sub-County**

The questionnaires were designed to address the research objectives under this study. They were structured into six sections where each section was designed to generate responses for each of the objectives. Section A was designed to generate responses to capture the

extension service providers' personal profile while the rest of the sections generated specific information on performance of hybrid sweet potato projects, implementation process, capacity building interventions, stakeholders' engagement activities, utilization of extension services and Monitoring and Evaluation practices on section B, C, D, E and F respectively. The Questionnaire had closed and open ended items to capture both quantitative and qualitative data respectively.

### **3.6.3 Key Informant Interview Guide for plant breeders**

Key informer interview guide was prepared to collect information from plant breeders at Kenya Agricultural and Livestock research organization at Njoro Sub-County. The interview guide was organized into six sections with the first section (A) generating personal information from the crop breeders while the other sections generate information on performance of hybrid sweet potato projects, implementation process, capacity building, and stakeholders' participation, utilization of extension services and Monitoring and Evaluation on section B, C, D, E and F respectively. The interview guide was qualitative in-depth interview for the crop development officers who know and were involved in the breeding of sweet potato varieties at the Njoro plant breeding station. Face to face interview, were conducted where the plant breeders at the research station were interviewed because they deal with the actual breeding of sweet potatoes for distribution as planting materials among farmers.

### **3.7 Pilot Study**

Pilot testing was a limited experimental, where 27 respondents which comprised 10% of the sample size. It was conducted in the neighbouring Molo Sub-County where the respondents took and filled the instruments to determine their validity and reliability. This included a random administration of the open and closed ended questionnaire to the farmers and extension service providers. Piloting helped in testing the suitability of research instruments. The review of the instruments focused on representativeness of the items in relation to the objectives, Carifio, & Perla, (2007), and variables covered in the study. Appropriate adjustments were made on the content item construction and order of the items, Brown, (2011), in the instruments used based on suggestions or recommendations from the pilot testing.



### **3.7.1 Validity of Research Instruments**

Validity of research instruments is the degree to which a research instrument measures what is proposed,(Kostas-Polston, 2007). Satisfied rationality and face validity are the two variants,(Zohrabi, 2013). The former addresses the suitability of items to measure adequately the intended construct, (Kothari, 2009). For no statistical test to regulate whether an amount sufficiently represents a construct, it is dependent on the field expert's inference. The latter, addresses the biased view in line with the concept intended to be measured. Experts in the field of hybrid sweet potato projects like the propagators were relied upon to enhance face validity of the research instruments as it is one of the best type of validity that is relevant as far as the nature and the purpose of the questionnaires and interview schedules are concerned. To ensure face validity of the research instruments, members of the department and supervisors' scrutinized the research instruments in line with the objectives. Their inputs were incorporated in the final copies of the instruments. Construct validity denotes an inference based on the application of a specific instrument but from a variation of studies. It is done in reference to the relationship between variables associated with the construct deemed to be measured by the instrument.

### **3.7.2 Reliability of Research Instruments**

Reliability denotes extent of consistency of an instrument,(Korb, 2013). To determine the reliability of research instruments, the study will use split half method. Newbert, (2008), posits that this is the extent to which an instrument produces similar results under consistent conditions. This involved grouping data into two and measuring correlation coefficient  $r$  Cronbach's alpha coefficient was used to measure of inner steadiness. Therefore, it gave the scale reliability, (Kostas, 2007). Lower alpha coefficient values mean there is inconsistency among the items in measuring the concepts of interest. A Cronbach's alpha( $\alpha$ ) of more than 0.7 is appropriate while a Cronbach's alpha ( $\alpha$ ) of less than 0.7 is inadequate or inappropriate.

## **3.8 Data Collection Procedures**

The researcher got an introductory note from the University of Nairobi which was used to obtain a permit from National Council for Science and Technology (NACOSTI). The researcher then booked an appointment with the County government of Nakuru, Ministry of Agriculture Njoro Sub County and the research station based at Njoro which was then

followed by recruitment of research assistants for each of the sample population on the sampling frame. The researcher and the research assistants used a drop and pick method in the data collection. The researcher and the research assistants personally administered the questionnaires for the main research and collect them later at an agreed date. This gave respondents reasonable time to answer the instruments well by giving the appropriate information required for the study. This method was suitable in line with respondents' distribution in the geographical area.

### **3.9 Data Analysis Techniques**

Data collected was analyzed both quantitatively and qualitatively. However, before data analysis, all data went through a process of data preparation. This included checking for research instruments completeness,(Zohrabi, 2013). For all quantitative the Statistical Package for Social Sciences (SPSS version 22) was used as a tool. The fourth step was data entry to transfer data into the computer. The fifth step was data cleaning to rid it off inconsistencies. The sixth step was to carry out diagnostic test. Shapiro-Wilktest and Watson method were used for normal distribution and autocorrelation respectively.

Quantitative data was analyzed by use of descriptive and inferential statistics. Descriptive statistics was used to analyze the preliminary information of the respondents and in describing the responses of the respondents in relation to the indicators of the independent and moderating variables, (Kothari, 2009). Descriptive statistics included frequency distribution, percentages, measures of dispersion (mean) and measures of dispersion (standard deviation).

Inferential data analysis was done using Pearson correlation coefficient, regression analysis (enter method) and multiple analysis (stepwise method). According to Osborne and Suarez, (2002), in many statistical methods in particular parametric measures, one measures a (at least approximate) normal distribution of the variables.

According to, Zjosh, (2001), the link method is used to analyze the degree of relationship amid two variables. The computation of a correlation coefficient yields a statistic that ranges from -1 to +1. The direction of relationship is also important in that if it is positive (+) it means that there is a positive relationship between the two variables and this means

that when one variable increases the other variable increases or when one variable decreases the other variable also decreases. A negative relationship (-) means that as one variable decreases the other variable increases and vice versa and hence an inverse relationship. If there is no relationship the coefficient is equal to zero. Pearson's product moment correlation coefficient will be used to determine the strength and the direction of the relationship between dependent and independent variables. The simplest form of regression analysis is a univariate regression or a model with one independent variable (Saunders et al, 2007). Univariate regression analysis will be used to establish the influence of each of the independent variables on the dependent variable.

The following are regression models for testing the relationship between the independent and dependent variables.

Regression model for objective one;

**H<sub>11</sub>**: There is a significant relationship between capacity building and performance of Hybrid sweet potato projects in Njoro Sub-County.

$$Y = \beta_0 + \beta_1 x_1 + \epsilon$$

Whereby;

**Y**= Performance of hybrid sweet potato projects in Njoro Sub-County

**$\beta_0$** = Constant

**$\beta_1$** =Coefficients of determination

**$x_1$** =Capacity bu

ilding interventions

**$\epsilon$** = Error term

Regression model for objective 2;

**H<sub>12</sub>**: There is a significant relationship between stakeholder's participation and performance of sweet potato projects in Njoro Sub-County.

$$Y = \beta_0 + \beta_2 x_2 + \epsilon$$

Whereby;

**Y**= Performance of Hybrid sweet potato projects in Njoro Sub-County

**$\beta_0$** = Constant

**$\beta_2$** =Coefficients of determination

$x_2$ =Stakeholder's participation

$\epsilon$ = Error term

Regression model for objective 3;

**H13:** There is a significant relationship between utilization of extension service and performance of Hybrid sweet potato projects in Njoro Sub-County.

$$Y = \beta_0 + \beta_3 x_3 + \epsilon$$

Whereby;

$Y$ = Performance of hybrid sweet potato projects in Njoro Sub-County

$\beta_0$ = Constant

$\beta_3$ =Coefficients of determination

$x_3$ =Utilization of extension service

$\epsilon$ = Error term

Regression model for objective 4;

Multiple regression analysis was used to establish the relations between the combined influence of project implementation process and performance of sweet potato projects in Nakuru County. Multiple regression attempts to determine whether a group of variables together predict a given dependent variable (Olsen and George, 2004)

**H14:** The combined influence of project implementation influences the performance of hybrid sweet potato projects in Njoro Sub-County.

Since there are three independent variables in this study, the multiple regression model will be as follows:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \epsilon$$

Whereby:

$Y$ = Performance of Hybrid sweet potato projects in Njoro Sub-County

$\beta_0$ = Constant

$\beta_1, \beta_3$  = Coefficients of determination

$x_1$  = Capacity building

$x_2$ = Stakeholder's participation

$x_3$ = Utilization of extension service

$\epsilon$  = Error term

A moderator is a variable that affects the direction and the strength of the relationship between an independent or predictor variable and a dependent criterion variable. This

variable may reduce or enhance the direction of the relationship between a predictor variable and a dependent variable, or it may change the direction of the relationship between the two variables from positive to negative. A moderator is supported if the interaction of predictor and moderator on the outcome of the dependent variable is significant. The study used multiple regression analysis (Stepwise method) to establish the moderating effect of project monitoring and evaluation practices (Z) on the relationship between independent and dependent variable.

**H15:** There is a significant relationship between project monitoring and evaluation practices and performance of hybrid sweet potato projects in Njoro Sub-County.

The statistical model used for analysis will be as follows:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_{1z}X_1Z + \beta_{2z}X_2Z + \beta_{3z}X_3Z + Z\epsilon$$

Whereby:

**Y**= Performance of hybrid sweet potato projects in Njoro Sub-County

**$\beta_0$** = Constant

**$\beta_i$** = Coefficient of  $X_i$  for  $i = 1, 2, 3$

**$x_1$**  = Capacity building

**$x_2$** = Stakeholder's participation

**$x_3$** = Utilization of extension service

**$z$** = Hypothesized moderator (Monitoring and Evaluation practices)

**$\beta_{iz}$**  is the coefficient of  $x_i$  and the interaction term between monitoring and evaluation and each of the dependent variables for  $i = 1, 2, 3$

**$\epsilon$**  = Error term

**Table 3. 3: Test of Hypothesis**

<b>Research Objective</b>	<b>Hypothesis</b>	<b>Statistical Analysis</b>	<b>Model for Hypothesis Testing</b>
Capacity building and performance of hybrid sweet potato projects.	H <sub>1</sub> 1: There is significant relationship between capacity building and performance of hybrid sweet potato projects in Njoro Sub-County.	Pearson's Correlation Linear Regression	$y=a+b_1X_1+e$ y= Performance of hybrid sweet potato projects a= Constant b <sub>1</sub> =Beta coefficient X <sub>1</sub> = Capacity building interventions e= Error term
Stakeholder's engagement strategies and performance of hybrid sweet potato projects.	H <sub>1</sub> 2: There is significant relationship between stakeholder's participation and performance of hybrid sweet potato projects in Njoro Sub-County.	Pearson's Correlation Linear Regression	$y=a+b_2X_2+e$ y= Performance of hybrid sweet potato projects a= Constant b <sub>2</sub> =Beta coefficient X <sub>2</sub> = Stakeholders engagement e= Error term
Utilization of extension services and performance of hybridsweet potato projects.	H <sub>1</sub> 3: There is significant relationship between utilization of extension services and performance of hybrid sweet potato projects in Njoro Sub-County.	Pearson's Correlation Linear Regression	$y=a+b_3X_3+e$ y= Performance of hybrid sweet potato projects a= Constant b <sub>3</sub> =Beta coefficient X <sub>3</sub> = Utilization of extension services e= Error term

Combined influence of project implementation process on performance of hybrid sweet potato projects.	H <sub>14</sub> : There is significant relationship between the combined influence of project implementation process and performance of hybrid sweet potato projects in Njoro Sub-County.	Multiple Regression	$y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e$ <p>y= Performance of hybrid sweet potato projects</p> <p>a= Constant</p> <p>b<sub>1...n</sub>=Beta coefficient</p> <p>X<sub>1</sub>= Capacity building practices</p> <p>X<sub>2</sub>= Stakeholders engagement</p> <p>X<sub>3</sub>= Utilization of extension services</p> <p>X<sub>4</sub>= Combined influence of project implementation process</p> <p>e= Error term</p>
Project monitoring and evaluation practices and performance of hybrid sweet potato projects.	H <sub>15</sub> : There is significant relationship between monitoring and evaluation practices and performance of hybrid sweet potato projects in Njoro Sub-County.	Pearson's Correlation Linear Regression	$y = a + b_5X_5 + e$ <p>y= Performance of hybrid sweet potato projects</p> <p>a= Constant</p> <p>b<sub>5</sub>=Beta coefficient</p> <p>X<sub>5</sub>= Monitoring and evaluation practices</p> <p>e= Error term</p>
Moderating effect of project monitoring and evaluation practices on the	H <sub>16</sub> : There is significant relationship between project monitoring and	Multiple Regression Hierarchical Regression	$y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + \beta_{1z}X_1Z + \beta_{2z}X_2Z + \beta_{3z}X_3Z + z\epsilon$

combined influence of project implementation and performance of hybrid sweet potato projects.	evaluation practices on the combined influence of the implementation process and performance of hybrid sweet potato projects in Njoro Sub-County.	<p><math>y</math>= Performance of hybrid sweet potato projects</p> <p><math>a</math>= Constant</p> <p><math>b_{1...n}</math>=Beta coefficient</p> <p><math>X_1</math>= Capacity building practices</p> <p><math>X_2</math>= Stakeholders engagement</p> <p><math>X_3</math>= Utilization of extension services</p> <p><math>X_4</math>= Combined influence of project implementation process</p> <p><math>z</math>= Hypothesized moderator</p> <p><math>\beta_z</math> =coefficient of <math>x_1</math> and the interaction term</p> <p><math>e</math>= Error term</p>
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**Table 3. 4: Operational Definitions of Variables**

Objective	Variable	Indicators	Scale of measurement	Research Approach	Type of statistical Analysis	Tools of Analysis
Influence of project implementation process and the Performance of Hybrid Sweet Potato Projects	Performance of Hybrid sweet potato projects	Availability of hybrid sweet potato projects Agronomic efficiency Technical efficiency Environmental sustainability Economic Sustainability	Interval Section B: 2; 6 to 8 of the questionnaire	Quantitative	Parametric	Pearson's correlation and linear regression
To examine how capacity building interventions influence performance of hybrid sweet potato projects.	Capacity Building Interventions	Provision of inputs Provision of training on agronomic practices Aligning training gaps identified	Items on Section C: 9; 10 and 11 of the farmers questionnaire	Quantitative	Parametric	Pearson's correlation and linear regression

To examine how stakeholders' engagement strategies influence performance of hybrid sweet potato projects	Stakeholders engagement strategies	Joint strategic planning Crop management practices Resource Identification Sharing of information	Items on Section D: 12; 13 and 14 of the farmers questionnaire	Quantitative	Parametric	Pearson's correlation and linear regression
To establish how utilization of extension services influence performance of hybridsweet potato projects.	Utilization of extension services	Extension approaches Extension Schedule Impact Assessments	Items on Section E: 15,a to f; 16 and 17 of the farmers questionnaire	Quantitative and Qualitative	Parametric and non-Parametric	Descriptive analysis and Pearson's correlation and linear regression
To establish how the combined influence of project implementation process influence	Combined influence of Implementation process	Capacity building interventions Stakeholders engagement strategies	Items on Section C to E of the farmers questionnaire	Quantitative and Qualitative	Parametric and non-Parametric	Descriptive analysis and Pearson's

performance of hybrid sweet potato projects.		Utilization of extension services				correlation and linear regression
To examine how project monitoring and evaluation practices influence performance of hybrid sweet potato projects	Monitoring and evaluation practices	M&E Models M&E Documentation M&E Methodology	Items on Section F; 18 a, to g; 19 (Likert scale); 20 the farmers questionnaire	Quantitative	Parametric	Multiple Regression
To establish how the moderating effect of project monitoring and evaluation practices influence the relationship between project implementation process and performance of hybrid sweet potato projects	Combined Influence	Moderating variable and Implementation Indicators	Items on Section C;D;E; and F of the farmers questionnaire	Quantitative and Qualitative	Parametric and non-Parametric	Descriptive statistics Hierarchical multiple regression Inferential statistics

### **3.10 Ethical Considerations**

The researcher obtained a permit from National Council for Science and Technology (NACOSTI) as an authorization to conduct the research activity. The researcher then contacted the County government of Nakuru, Ministry of Agriculture Njoro Sub County and the research station based at Njoro. The researcher then recruited research assistants for each of the sample population on the sampling frame. The researcher advised the research assistants to use a drop and pick method in the data collection. The researcher and the research assistants personally administered the questionnaires for the main research and collected them later at on the agreed date. This gave respondent farmers and extension service providers reasonable time to answer the items on the instruments well by giving the appropriate information required for the study. This method was suitable in line with respondents' distribution in the geographical area. There was no single individual respondent who was coerced to take part in the study. All the respondents were assured that their identity and the organizations they represented would remain anonymous and therefore they were requested not to indicate their names or that of the organization they represented on the questionnaire.

## **CHAPTER FOUR**

### **DATA ANALYSIS, PRESENTATION, INTERPRETATION**

#### **4.1 Introduction**

This chapter focused on data analysis, presentation and interpretation. Data analysis is the process of bringing order, structure and meaning to the mass of collected data. It is the activity of making sense of, interpreting and theorizing data that signifies a search for general statements among categories of data. Analysis and interpretation of data represent the application of deductive and inductive logic to the research. This chapter presents the questionnaire response rate, demographic information of the respondents which focused on the demographics of the hybrid sweet potato farmers, public extension officers and plant breeders, how capacity building interventions, stakeholder's engagement strategies, utilization of extension services in project implementation process, and project monitoring and evaluation practices influence project implementation process and performance of hybrid sweet potato projects in Kenya. The chapter also presents the analysis of the combined influence of project implementation process on performance of hybrid sweet potato projects in Kenya as moderated by project monitoring and evaluation practices. The data analysis is divided into two sections; quantitative data analysis and qualitative data analysis.

#### **4.2. Response rate**

The study established the suitability of the data by examining the response rate for the respondents. The total response rate for the questionnaires was 95.4%. This response rate was considered adequate for analysis. According to Mugenda and Mugenda, (2009) and Saunders, et al., (2007), a response rate of 50 percent is adequate, 60 percent is good, and 70 percent is very good. Therefore, the response rate of 95.5% percent was adequate and hence acceptable for drawing conclusions on the current study.

The findings are discussed in the subsequent sections.

##### **4.2.1. Questionnaire Return Rate**

The target population for the study was 909 farmers, 6 plant breeders and 36 public extension service providers in the agricultural sector in Njoro Sub-county of Nakuru County. The sample population was 282 comprised of 264 farmers, 12 extension service

providers and 6 plant breeders. The focus of the study was on the performance of hybrid sweet potato projects amid public extension officers, sweet potato farmers and plant breeders at the Kenya Agricultural research organization based at Njoro. Questionnaires were sent to all the 282 respondents. 269 out of 282 questionnaires were filled and returned. Interview schedules were subjected to the plant breeders.

#### **4.2.2. Tests for Regression Assumptions**

Various assumptions were made about variables during statistical tests. This was to ensure that the findings were worth using in decision-making and making conclusions. Failure to meet these assumptions could have lead to Type I and Type II errors. Testing for assumptions was beneficial as it ensured that analysis met associated assumptions and helped avoid Type I and Type II errors, (Osborne,& Suárez-Seoane, 2002). This study carried out tests of normality and multi-collinearity.

#### **4.2.3. Tests for Normality**

The use of inferential parametric statistical processes necessitated that the rules of such tests of normality were put to test, (Osborne and Suarez, 2002). This helped in graphical tests that were performed about the normality of the data to plaid for skewness and kurtosis coefficients. These tests helped to confirm whether the data followed a normal distribution or not. If the normality was not achieved, the results would not depict the true picture relationship amongst the variables. In this study, normality was tested using Kolmogorov-Smirnov Test and the Shapiro-Wilk Test. The Shapiro-Wilk Test is more appropriate for small sample sizes (< 50 samples), but can also handle sample sizes as large as 2000. For this reason, this study used the Shapiro-Wilk test as the numerical means of assessing normality. If the Sig. value of the Shapiro-Wilk Test is greater than 0.05, (P-value test statistic) the data is normal. If it is below 0.05, the data significantly deviates from a normal distribution.

**Table 4. 1: Shapiro-Wilk Test of Normality**

Variables	Kolmogorov-Smirnov <sup>a</sup>		Shapiro-Wilk			
	Statistic	df	Sig.	Statistic	df	Sig.
Capacity Building	.464	269	.324	.529	269	.409
Stakeholder Engagement	.423	269	.324	.611	269	.401
Utilization of Extension Services	.412	269	.324	.629	269	.409
Project implementation process	.409	269	.324	.610	269	.409
Project Monitoring and Evaluation	.362	269	.324	.654	269	.409
Performance of hybridsweet potato projects	.375	269	.324	.689	269	.409

a. Lilliefors Significance Correction

The findings from Table 4.1 depict that the significance values for the Shapiro-Wilk tests were 0.529 for capacity building interventions, 0.611 for stakeholder's engagement strategies, 0.629 for utilization of extension services, 0.610 for project implementation process, and 0.654 for project monitoring and evaluation practices. For the Kolmogorov-Smirnov tests, the significance values were 0.464 for capacity building, 0.423 for stakeholder's engagement initiatives, 0.412 for the utilization of extension services, 0.409 for project implementation process, and 0.362 for the project monitoring and evaluation practices. This implies that since the p-value is greater than the chosen alpha level of 0.05 then we fail to reject the hypothesis based on the fact that the data came from a normally distributed population. The results of the tests indicate therefore that the data came from a normally distributed population.

#### 4.2.4. Test for Multicollinearity

When there is a perfect linear relationship among the predictors, the estimates for a regression model cannot be uniquely computed. The term collinearity implies that two variables are near perfect linear combinations of one another. When more than two variables are involved it is often called Multicollinearity, although the two terms are often used interchangeably. Multicollinearity is a test that evaluates whether the independent

variables are highly correlated. The primary concern is that as the degree of Multicollinearity increases, the regression model estimates of the coefficients become unstable and the standard errors for the coefficients can get wildly inflated.

The variance inflation factor (VIF) was used to evaluate the level of correlation between variables and to estimate how much the variance of a coefficient was inflated because of linear dependence with other predictors. As a rule of thumb if any of the VIF are greater than 10 (greater than 5 when conservative) then there is a probability of a problem with Multicollinearity and would be harmful to the study, (Newbert, 2008). Tolerance, defined as  $1/VIF$ , was used by many researchers to check on the degree of collinearity. A tolerance value lower than 0.1, is comparable to a VIF of 10, which means that the variable could be considered as a linear combination of other independent variables, (Newbert, 2008). The results for tests of Multicollinearity were as presented in Table 4.2

**Table 4. 2: Test for Multicollinearity**

Variable	Collinearity Statistics	
	Tolerance	VIF
Capacity building	.840	1.092
Stakeholder participation	.312	1.871
Utilization of extension services	.663	2.312
Project implementation process	.515	1.120
Project Monitoring and Evaluation	.642	1.195

The results in Table 4.2 revealed that there was no problem of multicollinearity. Tolerance levels for all the variables were greater than the recommended minimum of 0.1 (Cooper and Schindler, 2014). Similarly, variance inflation factors for the variables were all below 5 meaning that the variables were not highly correlated.

#### **4.2.5. Test for Heteroscedasticity**

Heteroscedasticity occurs when the variance of the error terms differs across observations, (Glejser, 1996). Heteroscedasticity was useful to examine whether there was a difference in residual variance of the observation period to another period of observation, (Godfrey,



1996). The study utilized Glejser test, (1969) conducted by regression residual value of the independent variable. In the case there is an assumption that if the Sig. value  $>0.05$ , then there is no problem of heteroscedasticity. The results for tests of Heteroscedasticity were as presented in Table 4.3

**Table 4. 3: Test for Heteroscedasticity**

Model	Un-standardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	1.254	.054		2.412	.000
Capacity building	.156	.067	.114	0.167	.015
Stakeholders' engagement	.112	.043	.109	0.223	.024
Utilization of extension services	.209	.077	.241	0.365	.022
Project implementation process	.312	.062	.238	0.417	.021
Project Monitoring and Evaluation	.224	.089	.276	0.461	.013

Dependent Variable: Performance of Hybridsweet Potato Projects

Based on the output coefficients, the obtained Sig. values are  $>0.05$ , thus there is no problem of Heteroscedasticity. Hence, there was no difference in residual variance of independent to dependent variables tested.

### 4.3. Demographic information and respondents Profiles

Demographic information of the respondents was based on, gender, age, highest level of education, the length of time involved in hybrid sweet potato farming. Data on the gender of the respondents is as shown in Table 4.4.

#### 4.3.1. Frequency Distribution of Respondents by Gender

Table 4.4 indicates the distribution of respondents by gender. The frequency and corresponding percentages have also been indicated.

**Table 4. 4: Frequency Distribution of Respondents by Gender**

<b>Gender</b>	<b>Farmers</b>	<b>Percentage (%)</b>	<b>Extension providers</b>	<b>Percentage (%)</b>
Male	112	44.27	6	60.0
Female	141	55.73	4	40.0
<b>Total</b>	<b>253</b>	<b>100</b>	<b>10</b>	<b>100</b>

Table 4.4, was on distribution of the respondents by gender; of the 253 respondent farmers, 44.27% were males while 55.73% were females. The distribution of the 10 respondent extension service providers by gender showed that 60% were males while 40% were females.

#### **4.3.2 Frequency Distribution of the Respondents by Age**

The respondents were also requested to state their age category. The responses were indicated on Table 4.5

**Table 4. 5: Frequency Distribution of the Respondents by Age**

<b>Age Bracket</b>	<b>Frequency</b>	<b>Percentage (%)</b>
18-30	6	2.37
31-35	38	15.02
36-40	66	26.09
41-50	59	23.32
Above 50years	84	33.20
<b>Total</b>	<b>253</b>	<b>100</b>

Table 4.5 indicates the distribution of respondents by age. The frequency and corresponding percentages have also been indicated.

Table 4.5, on the distribution of the respondents by age; of the 253 respondent farmers, 2.37% were aged between (18-30 years), 15.02% were aged between (31-35 years), 26.09% were aged between (36-40 years), 23.32% were aged between (41-50 years) while 33.20% were above 50 years in age.

### 4.3.3 Frequency Distribution of the Respondents by Level of Education

The respondents were requested to indicate their highest level of education and the responses were recorded and analyzed. The results of the analyzed responses were recorded on Table 4.6

**Table 4. 6: Distribution of Respondents by Level of Education**

<b>Education level</b>	<b>Farmers</b>	<b>Percentage (%)</b>	<b>Extension providers</b>	<b>Percentage (%)</b>
Primary Certificate	108	42.69		
Secondary Certificate	102	40.32		
College Certificate	41	16.20	19	100.00
	2	0.79		
<b>Total</b>	<b>253</b>	<b>100</b>	<b>10</b>	<b>100</b>

Table 4.6 indicates the distribution of respondents by level of education; of the 253 respondent farmers, 42.697% had a primary school certificate, 40.32% had secondary school certificate, and 16.20% had a college certificate while 0.79% had a post graduate certificate.

### 4.3.4. Respondents Age vs. Level of Education Cross Tabulation

Table 4.7 shows how the respondent's age was cross tabulated against the level of education. This was important as it showed which age had the highest level of education and how they engaged themselves in hybrid sweet potato farming. The findings are as shown on Table 4.7

**Table 4. 7: Respondents Age vs. Level of Education Cross Tabulation**

	<b>Age group</b>					<b>Total</b>
	18-30 yrs	31-35 yrs	36-40 yrs	41-50 yrs	>50 yrs	
<b>Level of education-</b>						
Primary certificate	2	11	30	36	34	113
Secondary certificate	2	12	29	24	40	107
College certificate	1	18	8	2	12	41
Postgraduate	1	0	1	0	0	2
<b>Total</b>	<b>6</b>	<b>41</b>	<b>68</b>	<b>62</b>	<b>86</b>	<b>263</b>

From Table 4.7, it was found that most (150) of the respondents had secondary level of education and were over 50 years of age as compared to 36 respondents who had primary level of education and were aged between 41-50 years. This depicts that most of the respondents were mature enough and had basic level of education which enabled them to understand the basic hybrid sweet potato farming in Njoro Sub-County.

#### **4.3.5 Respondents Involvement in Hybrid Sweet Potato Projects**

The respondents were requested to indicate the duration in time on their involvement on hybrid sweet potato projects.

Table 4.8 indicates the distribution of respondents by their time of involvement in hybrid sweet potato projects. The frequency and corresponding percentages have been indicated.

**Table 4. 8: Frequency Distribution of the Respondents by Time of involvement in Hybrid Sweet Potato Projects**

<b>Time (Years)</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Less than 1 year	6	2.37
1-3	115	45.45
4-6	102	40.32
7-9	12	4.74
10-12	13	5.14
13-15	3	1.19
16-18	2	0.79
Over 19	0	0.0
Total	253	100.0

Table 4.8, indicates the distribution of the respondents by their involvement in hybrid sweet potato projects; of the 253 respondent farmers, 2.37% had been involved in less than 1 year, 45.45% had been involved between (1-3 years), 40.32% had been involved between (4-6 years), 4.74% had been involved between (7-9 years), 5.14% had been involved between (10-12 years), 1.19% had been involved between (13-15years) while 0.79% had been involved between (16-18 years). None of the farmers had been involved in hybrid sweet potato projects for more than 19 years.

#### **4.3.6 Cross tabulation on respondents' Age vs. Involvement in Hybrid Sweet Potato Projects**

Table 4.9 shows how the respondent's age was cross tabulated against involvement in hybrid sweet potato farming. This was important as it showed which age had the highest level of education. The findings are as shown in the Table.

**Table 4.9: Cross Tabulation on Respondents Age vs. Involvement in Hybrid Sweet Potato Projects**

Involvement in Hybrid Sweet Potato Farming	Age group in years					Total
	18-30	31-35	36-40	41-50	Over 50	
1 year and below	1	1	1	1	2	6
1-3 years	1	27	28	29	35	120
4-6 years	1	10	31	21	44	107
7-9 years	2	0	1	2	7	12
10-12 years	1	0	4	4	4	13
13-15 years	0	0	1	1	1	3
16-18 years	0	0	0	1	1	2
19 years and above	0	0	0	0	0	0
<b>Total</b>	<b>6</b>	<b>38</b>	<b>66</b>	<b>59</b>	<b>94</b>	<b>263</b>

From Table 4.9 most (233) of the respondents had been involved in hybrid sweet potato farming for a duration less than 6 years and were over 50 years of age as compared to 30 of the respondents who had been involved for over 6 years and had the same age of over 50 years. This depicts that most of the respondents had not been involved in hybrid sweet potato projects in Njoro Sub-County.

#### 4.3.7 Distribution of Respondents by Size of the Land

The researcher further sought to establish the size of the land of the respondents. They were therefore asked to indicate their size of land in acres. Data on the size of the land of the respondents is as shown in Table 4.10

**Table 4. 10: Frequency Distribution of Respondents by Size of the Land**

Size of the Land	F	%
0-0.5 acres	222	87.7
1-1.5 acres	18	7.1
2-2.5 acres	6	2.3
3-3.5 acres	4	1.6
4-4.5 acres	2	1.0
Over 5 acres	1	0.3
<b>Total</b>	<b>253</b>	<b>100.0</b>

Table 4.10 Distribution of the respondents by their size of land under hybrid sweet potato projects; of the 253 respondent farmers, 87.7% had parcels of land that were between (0-5 acres), 7.1% had parcels of land that were between (1-1.5 acres), 2.3% had parcels of land that were between (2-2.5 acres), 1.6% had parcels of land that were between (3-3.5 acres), 1% had parcels of land that were between (4-4.5 acres), while 0.3% had parcels of land that were over 5 acres.

#### 4.4. Analysis on Performance of Hybrid Sweet Potato Projects

This section presents findings on performance of hybrid sweet potato projects in Njoro Sub-County. Performance of hybrid sweet potato projects under this study is geared towards alleviation of hunger by improving food security, household income and self-reliance. The indicators of performance under this study included; availability, economic and environmental sustainability and technical efficiency. The findings in relation to analysis on the performance of hybrid sweet potato projects are presented in the subsequent sections.

##### 4.4.1 Performance of Hybrid Sweet Potato Projects

The researcher sought to establish the performance of hybrid sweet potato projects. The respondents were therefore asked to respond on the various items that had been constructed to measure on the dependent variable. Data on the responses made has been shown in Table 4.11

**Table 4. 11: Frequency distribution on Performance of Hybrid Sweet Potato Projects**

<b>Performance of Hybrid Sweet Potato Projects</b>	<b>Frequency</b>	<b>Percent%</b>
Availability of Projects	138	52.47
Economic Sustainability	67	25.48
Environmental Sustainability	36	13.68
Technical Efficiency (Diversity in use)	22	8.37
<b>Total</b>	<b>263</b>	<b>100.0</b>

From Table 4.11, 52.47% of the respondents indicated that hybrid sweet potato projects were available, 25.48% indicated that hybrid sweet potato projects had economical

sustainability, 13.68% indicated environmental sustainability while 8.37% indicated that the projects had technical efficiency. This confirmed the availability, economic and environmental sustainability and the technical efficiency

#### 4.4.2 Composite mean on Performance of Hybrid Sweet Potato projects

The respondents were requested to rate the various factors on performance of hybrid sweet potato projects. They were given items rated on a five point Likert scale ranging from 5- Strongly Agree; 4- Agree; 3- Neutral; 2- Disagree; and 1- Strongly Disagree (1). The findings were shown in the table 4.12

**Table 4. 12: Composite Mean on Performance of Hybrid Sweet Potato Projects**

<b>Performance Indicators</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>
Availability	263	4.0237	0.0542
Economic sustainability	263	4.0158	0.0506
Environmental Sustainability	263	3.6680	0.0151
Technical Efficiency	263	3.4560	0.1121
<b>Composite Results</b>	<b>263</b>	<b>3.7909</b>	<b>0.4817</b>

As shown in Table 4.12, the overall composite means (M) for the rate of performance is 3.7909 and the standard deviation SD = 0.4817. The implication of this result is that at M = 3.7909, SD = 0.4817, agreed that performance of hybrid potato farming was high as explained by the various factors on performance.

#### 4.4.3 Qualitative analysis on Performance of hybrid Sweet Potato projects

The respondents were requested to indicate the ways in which farming practices of hybrid sweet potato affect its' performance as an agricultural project. According to one of the respondent farmers,

*“The yields are dependent on the variety which have been planted, the spacing also matters, the assistance provided by the agricultural officers, availability of hybrid varieties, and the management of crop”.*

This was in support of the findings of this study that performance of hybrid potato farming was a function of the various factors on performance.



#### **4.5. Analysis results on Capacity Building interventions and Performance of Hybrid Sweet Potato Projects**

This section presents the analysis results on capacity building interventions and performance of hybrid sweet potato projects. The findings are presented in the next subsections

##### **4.5.1. Provision of Inputs**

The respondents were requested to indicate if they were provided with planting materials and from where. The findings are as shown in table 4.13

**Table 4. 13: Frequency distribution Table on Provision of Inputs**

<b>Source of Inputs</b>	<b>Frequency</b>	<b>Percent(%)</b>
From KARLO	227	86.31
Other farmers	17	6.46
From NGOs	6	2.28
From Extension workers	13	4.94
<b>Total</b>	<b>263</b>	<b>100.00</b>

From the findings majority (86.31%) of the respondents indicated that the source of planting materials was from Kenya agricultural research and livestock organization based at Njoro, 6.46% indicated from other farmers, 4.94% indicated that they obtained from extension workers, while 2.28% indicated from non-governmental organizations. This shows that majority of the respondents received planting materials from the Kenya agricultural research and livestock organization based at Njoro.

##### **4.5.2. Provision of Training on Agronomic Practices**

The respondents were requested to indicate the areas in which the ministry of agriculture has been assisting them on trainings in relation to hybrid sweet potato projects. The results are shown in Table 4.14

**Table 4. 14: Provision of Training on Agronomic Practices**

<b>Provision of Training on Agronomic Practices</b>	<b>Frequency</b>	<b>Percent</b>
Training on crop management practices	54	20.53%
Training on best production practices	127	48.29%
Training on sourcing of planting materials	43	16.35%
Aligning Training Gaps	39	14.83%
<b>Total</b>	<b>263</b>	<b>100.00%</b>

From the findings on Table 4.14, 48.29% of the respondents indicated having been trained on best agronomic practices, 20.53% had been trained on crop management practices, 16.35% had been trained on sourcing of planting materials while 14.83% agreed that aligning of training gaps identified was being done.

#### **4.5.3. Composite mean on Capacity Building interventions and Performance of hybrid sweet potato projects**

The respondents were requested to rate the various factors of hybrid production. They were given items rated on a five point Likert scale ranging from 5-Strongly Agree; 4-Agree; 3-Neutral; 2- Disagree; and 1- Strongly Disagree (1). The findings were shown on the Table 4.15

**Table 4. 15: Composite mean on Capacity Building Interventions and Performance of hybrid sweet potato projects**

<b>Capacity Building Interventions</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>
Provision of Inputs	263	3.6830	0.0012
Provision of Training on agronomic practices	263	3.7991	0.0065
Aligning Training Gaps	263	3.6729	0.0021
<b>Composite Results</b>	<b>263</b>	<b>3.7183</b>	<b>0.0989</b>

As shown in Table 4.15, the overall composite means (M) for the capacity building interventions and performance of hybrid sweet potato projects is 3.7183 and the standard deviation SD = 0.0989. The implication of this result is that at M = 3.6339, SD = 0.9582, agreed that performance of hybrid potato projects was high as explained by the various factors on capacity building.

#### **4.5.4. Qualitative data on Capacity Building Interventions**

The respondents were requested to indicate other ways through which capacity building influence the performance of sweet potato projects. The respondent famers contradicted the views of the extension service providers by saying that;

*“Help from the experts is important but rare and thus affect performance of the projects, follow-ups by extension workers are low, training is important but also rare, as well as availability of hybrid varieties.”*

Three of the twelve respondent extension service providers argued that;

*“We normally visit and train farmers on monthly basis though we employ a demand driven approach.”*

Amid the contradictory views, both parties were in agreement with the findings of this study that capacity building interventions influenced performance of hybrid sweet potato projects in Njoro Sub-County.

#### **4.5.5. Inferential Analysis on Capacity Building interventions and Performance of Hybrid Sweet Potato Projects**

Objective one of this study was to examine how the influence of capacity building on performance of hybrid sweet potato projects in Njoro Sub-County. The following hypothesis was formulated and tested:

##### **Hypothesis 1**

Hypothesis H<sub>0</sub>: There is no significant relationship between capacity building interventions and performance of hybrid sweet potato projects in Njoro Sub-County.

##### **Regression Model**

The corresponding mathematical model for the hypothesis was identified as follows:  
Performance of Hybrid Sweet Potato Projects = F (capacity building)

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

The correlation results of the influence of the capacity building on the Performance of Hybrid Sweet Potato Projects are shown on Table 4.16

**Table 4. 16: Simple Linear Regression results for Capacity Building interventions and Performance of Hybrid Sweet Potato Projects.**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change of R Square	Statistics F	df1	df2	Sig.	F Change
1	.254 <sup>a</sup>	.061	.035	.41153	.050	9.850	1	252	.002	

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	1.668	1	1.668	9.850	.002 <sup>b</sup>
1	Residual	44.109	261	.169		
	Total	45.777	262			

**Coefficients<sup>c</sup>**

Model		Un-standardized Coefficients		Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error				Lower Bound	Upper Bound
	(Constant)	1.719	.162		14.279	.000	1.379	2.059
1	Capacity Building	.157	.090	.124	3.216	.002	.058	.256

Dependent Variable: Performance of Hybrid Sweet Potato Projects

Predictors: (Constant), Capacity Building Interventions

F (1,253) = 9.850, t=3.216, at level of significance p=0.002<0.05, r= 0.254 and r square=0.061

The results in Table 4.16 shows that  $r = 0.254$ , implying a positive slope between the independent variable (capacity building) and the dependent variable (Performance of Hybrid Sweet Potato Projects). The R- Squared was 0.061, meaning that 6.1% of the variation in the Performance of Hybrid Sweet Potato Projects can be explained by variation in the capacity building. The other factors explained 93.9%. The ANOVA results indicated that the model was statistically significant at  $(F (1,253) = 9.850)$ .

The analysis of variance shows that the F calculated (9.850) was greater than the F-critical (3.8415) and the p-value (0.002) was less than the significance level (0.05) and hence the model is a good fit for the data. This implies that the model was appropriate in predicting the influence of capacity building interventions on the performance of hybrid sweet potato projects in Njoro Sub-County.

$Y = \beta_0 + \beta_1 X_1 + \epsilon$  can then be substituted as follows;  $Y = 1.719 + 0.157 X_1$

The results show that capacity building interventions has a positive influence on the performance of hybrid Sweet Potato Projects as shown by regression coefficient (0.157) and a p-value (0.002). Hence based on these findings we reject the null hypothesis that there is no significant relationship between capacity building interventions and performance of hybrid sweet potato projects in Njoro Sub-County since p value of 0.002 is less than 0.05. Therefore, there is significant relationship between capacity building interventions and performance of hybrid sweet potato projects in Njoro Sub-County. The findings are in line with Adhiguru, BIRTHAL, and Kumar (2009) findings that capacity building interventions have an influence on performance of projects.

#### **4.5.6. Correlation between capacity building interventions and performance of hybrid sweet potato projects**

Correlation analysis using Pearson's product moment technique was done to determine the strength of the relationship between capacity building and performance of hybrid sweet potato projects in Njoro Sub-County. Results of the correlation are presented in Table 4.17.

**Table 4.17: Correlation between Capacity Building interventions and performance of hybrid sweet potato projects in Njoro Sub-County**

		Performance of hybrid sweet potato projects	Capacity Building interventions
<b>Performance of hybrid sweet potato projects</b>	Pearson Correlation	1	.094**
	Sig. (2-tailed)		.259
	N	263	263
<b>Capacity Building</b>	Pearson Correlation	.094	1
	Sig. (2-tailed)	.259	
	N	263	263

**\*\*.** Correlation is significant at the 0.01 level (2-tailed).

Results from the Table 4.17 reveal that there is a significant positive relationship between capacity building and Performance of hybrid sweet potato projects ( $r = 0.094$ ). This implies that there is a very strong significant association between capacity building interventions and performance of hybrid sweet potato projects.

#### **4.6. Analysis on Stakeholder’s Engagement strategies and Performance of Hybrid Sweet Potato Projects**

This section presents findings on the influence of stakeholder’s engagement strategies and performance of sweet potato projects in Njoro sub County. The findings are discussed in the subsequent sections:

##### **4.6.1. Frequency distribution on stakeholders’ engagement strategies**

The respondents were requested to indicate the various ways in which stakeholders’ were engaged in the implementation of hybrid sweet potato projects. The findings were as shown in Table 4.18

**Table 4. 18: Frequency distribution Table on stakeholders' engagement strategies**

<b>Engagement Strategies</b>	<b>Frequency</b>	<b>Percent(%)</b>
Joint Strategic Planning	47	17.87
Crop management	51	19.39
Resource Identification	58	22.06
Sharing of Information	107	40.68
<b>Total</b>	<b>263</b>	<b>100.00</b>

From Table 4.18 on frequency distribution of stakeholders' engagement strategies, 40.68% of the respondents indicated that they were engaged in information sharing, 22.06% of the respondents were engaged in information sharing and 19.39% of the respondents were engaged in crop management, while 17.87% of the respondents were engaged in joint strategic planning. The findings affirmed that, joint strategic planning, crop management practices, resource identification and sharing of information were key factors in stakeholders' engagement strategies towards an accerelated performance of hybrid sweet potato projects in Njoro Sub-County.

#### **4.6.2. Composite mean on Stakeholders' Engagement strategies and Performance of Hybrid Sweet Potato Projects**

The respondents were requested to respond to the various items that sought to investigate stakeholders' engagement strategies on performance of hybrid sweet potato projects. The were given various items that were rated on a five point Likert scale ranging from 5- Strongly Agree; 4-Agree; 3- Neutral; 2- Disagree; and 1- Strongly Disagree (1). The findings were shown in Table 4.19

**Table 4.19: Composite mean on Stakeholders' Engagement Strategies and Performance of Hybrid Sweet Potato Projects**

<b>Engagement Strategies</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>
Joint Strategic Planning	263	2.8791	0.5142
Crop Management	263	3.0791	0.2673
Sharing Information	263	4.9921	1.9485
Resource Identification	263	3.4345	0.0261
<b>Composite Results</b>	<b>263</b>	<b>3.5962</b>	<b>1.6601</b>

Table 4.19 indicates the composite mean results on stakeholders' engagement strategies. The overall composite mean (M) for the stakeholders' engagement strategies and performance of hybrid sweet potato projects is 3.5962 and the standard deviation SD = 1.6601. The implication of this result is that at M = 3.5962, SD = 1.6601, agreed that performance of hybrid potato projects was high as explained by the various factors on stakeholders' engagement strategies.

#### 4.6.3. Qualitative analysis on Stakeholders' Engagement Strategies

The respondents were requested to indicate other ways through which stakeholders' engagement strategies influence performance of hybrid sweet potato projects. Regarding this issue, the extension service providers indicated that;

*“A strong link is required between farmers, extension officers, and the plant breeders.”*

Most of the respondent farmers further indicated that,

*“We are normally encouraged to attend field days during agricultural shows at Nakuru but more emphasis on information sharing among stakeholders has been helpful in improving performance.”*

These observations by respondents were in agreement with the findings of this study that stakeholders' engagement strategies influenced performance of hybrid sweet potato projects.

#### 4.6.4. Inferential Analysis on stakeholder's engagement strategies on performance of hybrid sweet potato projects in Njoro Sub-County.

Objective two of this study was to examine how the influence of stakeholder's engagement on performance of hybrid sweet potato projects in Njoro Sub-County. The following hypothesis was formulated and tested:

**Hypothesis Ho** There is no significant relationship between stakeholder's engagement strategies and performance of hybrid sweet potato projects in Njoro Sub-County.

The hypothesis was tested using the following linear regression model

Performance of Hybrid Sweet Potato Projects = f (stakeholder's engagement strategies)

$$Y = \beta_0 + \beta_2 X_2 + \varepsilon$$

Where



$Y$  = Performance of Hybrid Sweet Potato Projects

$X_2$  = Stakeholder's engagement strategies

$\beta_0$ : = Constant term

$\varepsilon$  = Error term

The results on the influence of stakeholder's engagement strategies and performance of hybrid sweet potato projects as shown in Table 4.20

**Table 4.20: Results of Linear Regression Analysis on stakeholder’s engagement strategies**

<b>Model Summary</b>										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change of R Square	Statistics F	df1	df2	Sig.	F Change
1	.185 <sup>a</sup>	.052	.034	.4567	.035	6.146	1	253	.014	
<b>ANOVA<sup>a</sup></b>										
Model		Sum of Squares	df	Mean Square	F	Sig.				
	Regression	1.061	1	1.061	6.146	.014 <sup>b</sup>				
1	Residual	45.153	261	.173						
	Total	46.214	262							
<b>Coefficients</b>										
Model		Un-standardized Coefficients	Std. Error	Standardized Beta	t	Sig.	95.0% Confidence Interval for B			
		B					Lower Bound	Upper Bound		
	(Constant)	2.745	.187		14.735	.000	2.678	2.186		
1	Stakeholder’s engagement	.180	.070	.158	2.213	.014	.031	.269		

**Dependent Variable:** Performance of hybrid sweet potato projects

**Independent Variable:** Stakeholder’s Engagement Strategies

t = 2.213 at level of significance  $p=0.014 < 0.05$ ,  $r = 0.185$ ,  $R^2 = 0.052$

The R-Squared was used to indicate n in performance of hybrid sweet potato projects that can be explained by stakeholder’s engagement strategies. The results in Table 4.20 shows that  $r = 0.185$ , implying a positive slope between the independent variable (stakeholder’s engagement strategies) and the dependent variable (performance of hybrid sweet potato projects). The R- Squared was 0.052 meaning that 5.2% of the variation in the performance of hybrid sweet potato projects was explained by variation in the stakeholder’s engagement strategies. Other factors not considered in this study explained 94.8%.

Analysis of variance was used to determine whether the model the model was a good fit for the data in determining the influence of stakeholder's engagement strategies on Performance of hybrid Sweet Potato Projects. The ANOVA results indicated that the model was statistically significant as the F-critical (1.253) was less than the F-calculated (6.146). In addition, the p-value (0.000) was less than the significance level (0.05) and hence the model was a good fit for the data and hence and could be used in predicting the influence of stakeholder's engagement strategies on Performance of hybrid Sweet Potato Projects.

$Y = \beta_0 + \beta_2 X_2 + \epsilon$  can then be substituted as follows;  $Y = 2.745 + 0.180 X_1$

The results in Table 13 indicated that stakeholder's engagement strategies has a positive influence on the performance of hybrid Sweet Potato Projects as shown by regression coefficient (0.180) and a p-value (0.014). Hence based on these findings we reject the null hypothesis that there is no significant relationship between stakeholder's engagement strategies and performance of hybrid sweet potato projects in Njoro Sub-County since p value of 0.014 is less than 0.05. Therefore, there is significant relationship between stakeholder's engagement strategies and performance of hybrid sweet potato projects in Njoro Sub-County. The findings agree with ENRD (2015) indication that stakeholder engagement promotes stability in production, commercialization to add value, sustainability for longevity and diversification for variety of produce and ways.

#### **4.6.5. Correlation analysis on stakeholder's engagement strategies and performance of hybrid sweet potato projects in Njoro Sub-County**

Correlation analysis using Pearson's product moment correlation coefficient was done to determine the relationship between stakeholder's engagement strategies and performance of hybrid sweet potato projects in Njoro Sub-County. Results of the correlation are presented in Table 4.21

**Table 4.21: Correlation analysis results between stakeholder’s engagements on performance of hybrid sweet potato projects**

		<b>Performance of hybrid sweet potato projects</b>	<b>Stakeholder’s Engagement strategies</b>
<b>Performance of hybrid sweet potato projects</b>	Pearson Correlation	1	.467**
	Sig. (2-tailed)		.000
	N	263	263
<b>Stakeholder’s engagement strategies</b>	Pearson Correlation	.467**	1
	Sig. (2-tailed)	.000	
	N	263	263

**\*\*.** Correlation is significant at the 0.01 level (2-tailed).

Results from the Table 4.21 reveal that there is a significant positive relationship between stakeholder’s engagement strategies on performance of hybrid sweet potato projects ( $r = 0.467$ ). This implies that there is a strong relationship at 0.01 correlation level between stakeholder’s engagement strategies on performance of hybrid sweet potato projects.

#### **4.7. Utilization of Extension Services and Performance of Hybrid Sweet Potato Projects**

This section presents findings on utilization of extension services and performance of hybrid sweet potato projects in Njoro Sub-County. The findings are presented in the subsequent sections.

##### **4.7.1 Frequency distribution results on Utilization of Extension Services**

The respondents were requested to indicate the extension approaches that were used when they were being assisted by the extension officers. The findings are shown on Table 4.22

**Table 4. 22: Frequency distribution Table on Utilization of Extension Services**

<b>Utilization Parameter</b>	<b>Frequency</b>	<b>Percent</b>
<b>Extension Approach</b>		
Training and Visit	15	5.77%
Farmer Field Schools	143	54.62%
Commodity Interest Groups	222	84.62%
Demand Driven	242	92.31%
<b>Extension Schedule</b>		
Monthly	6	2.31%
Quarterly	214	81.54%
Annually	253	96.54%
<b>Impact Assessments</b>		
Adoption Level	105	40.38%
Effects	234	90.00%
Gaps Identified	115	44.23%
<b>Extension Methodology</b>		
Instrumentation	36	13.84%
Feedback	154	59.23%
Record Keeping	98	37.69%

From Table 4.22, indicates frequency distribution results from the analysis on utilization of extension services. Frequency distribution on extension approach, 5.77% of the respondents explained that they were being visited by extension workers and trained, 54.62% of the respondents attended farmer field schools, 84.62% of the respondents were in commodity interest groups, while 92.31% based the extension approaches on demand driven. Frequency distribution results on extension schedule, 2.31% of the respondents indicated having been visited by extension workers on a monthly basis, 81.54% of the respondents explained the schedule as quarterly based, while 96.54% of the respondents felt that the extension schedule was annually based. Frequency distribution results on extension methodology used, 13.84% of the respondents explained the use of various instruments during extension work, 59.23% of the respondents explained that feedback mechanisms were in place, while 37.68% of the respondents explained that record keeping was emphasized during extension service delivery.

#### 4.7.2. Composite Mean on Utilization of Extension Services and Performance of Hybrid Sweet Potato projects

The respondents were requested to rate the various statement in relation to hybrid sweet potato performance. The were given various items rated on a five point Likert scale ranging from 5-Strongly Agree; 4-Agree; 3- Neutral; 2- Disagree; and 1- Strongly Disagree (1). The findings were shown in Table 4.23

**Table 4.23: Composite Mean on Utilization of Extension Services and performance of Hybrid Sweet Potato Projects**

<b>Utilization Variable</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>
Extension Approaches	263	3.2016	0.0552
Impact Assessments	263	3.1225	0.0987
Scheduled Contacts	263	3.9860	0.3017
<b>Composite Results</b>	<b>263</b>	<b>3.4367</b>	<b>0.6749</b>

As shown in Table 4.23, the overall composite means (M) for the utilization of extension services and performance of hybrid sweet potato projects is 3.4367 and the standard deviation SD = 0.6749. The implication of this result is that at M = 3.4367, SD = 0.6749, agreed that performance of hybrid potato projects was high as explained by the various factors on utilization of extension services.

#### 4.7.3. Qualitative analysis on Utilization of Extension Services

The respondents were requested to indicate other ways through which hybrid sweet potato farmers utilize extension services to improve performance of hybrid sweet potato projects. Most of the respondent famers responded by saying;

*“We utilize extension services through their on farm scheduled visits, we also look for advice from the agricultural office at Njoro, as well as attending field days and workshops.”*

This response affirmed the findings of this study that utilization of extension services influence performance of hybrid sweet potato projects in Njoro Sub-County.

#### **4.7.4. Inferential Analysis on utilization of extension services and performance of hybrid sweet potato projects**

Objective three of this study was to establish the extent to which utilization of extension services influence the performance of hybrid sweet potato projects in Njoro Sub-County.

The following hypothesis was formulated and tested:

**Hypothesis H<sub>0</sub>** There is no significant relationship between utilization of extension services and performance of hybrid sweet potato projects in Njoro Sub-County.

The hypothesis was tested using the following linear regression model

Performance of Hybrid Sweet Potato Projects = F (Utilization of Extension Services)

$$Y = \beta_0 + \beta_3 X_3 + \varepsilon$$

Where

Y = Performance of Hybrid Sweet Potato Projects

X<sub>3</sub> = Utilization of Extension Services

β<sub>0</sub>: = Constant term

ε = Error term

**Table 4.24: Linear regression Analysis on utilization of extension services on performance of hybrid sweet potato projects**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Change	Square Change	F Change	df1	df2	Sig. Change
1	.341 <sup>a</sup>	.112	.086	.41223	.104	21.482	1	253	.000	

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	3.434	1	3.434	21.482	.000 <sup>b</sup>
1	Residual	41.76	261	.160		
	Total	45.194	262			

**Coefficients**

Model		Unstandardized Coefficients		Standardized Beta	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error				Lower Bound	Upper Bound
		1	(Constant)	2.411	.156		11.211	.000
	Utilization of Extension Services	.350	.079	.342	3.346	.000	.198	.543

a. Dependent Variable: Performance of hybrid Sweet Potato Projects

b. Predictors: (Constant), Utilization of Extension Services

The R-Squared was used to indicate variation in performance of hybrid sweet potato projects that can be explained by utilization of extension services. The results in Table 4.24 shows that  $r = 0.341$  implying a positive slope between the independent variable (utilization of extension services) and the dependent variable (Performance of hybrid Sweet Potato Projects). The R- Squared was 0.112 meaning that 11.2% of the variation in the Performance of hybrid Sweet Potato Projects was explained by variation in the utilization of extension services. Other factors not included in the model explained 88.8%.



Analysis of variance was used to determine whether the model the model was a good fit for the data in determining the influence of utilization of extension services on Performance of hybrid Sweet Potato Projects. The ANOVA results indicated that the model was statistically significant as the F-critical (1.253) was less than the F-calculated (21.482). In addition, the p-value (0.000) was less than the significance level (0.05) and hence the model was a good fit for the data and hence could be used in predicting the influence of utilization of extension services on Performance of hybrid Sweet Potato Projects.

Using the statistical findings, the regression model

$$Y = \beta_0 + \beta_3 X_3 + \varepsilon \text{ can then be substituted as follows; } Y = 2.411 + 0.350X_4$$

The results in Table 4.24 indicated that utilization of extension services has a positive influence on the performance of hybrid Sweet Potato Projects as shown by regression coefficient (0.350) and a p-value (0.000). Hence based on these findings we reject the null hypothesis that there is no significant relationship between utilization of extension services and performance of hybrid sweet potato projects in Njoro Sub-County since p value of 0.000 is less than 0.05. Therefore, there is significant relationship between utilization of extension services and performance of hybrid sweet potato projects in Njoro Sub-County. These findings agree with Patricia and Mbote (2000) findings that the utilization of extension services has an influence on agricultural related projects. However, Akinbile and Oitolaye, (2008) indicate that lack of multi-skilled extension agents has led to piece-meal extension service delivery to clients usually faced with multiple problems.

#### **4.7.5. Correlation Analysis between utilization of extension services and performance of hybrid sweet potato projects**

Correlational analysis using Pearson's product moment technique was done to determine the relationship between utilization of extension services and performance of hybrid sweet potato projects. Results of the correlation are presented on Table 4.25

**Table 4. 25: Correlation between utilization of extension services and performance of hybrid sweet potato projects**

		<b>Performance of hybrid sweet potato</b>	<b>Utilization of extension services</b>
	Pearson Correlation	1	.344**
<b>Performance of hybrid sweet potato projects</b>	Sig. (2- tailed)	0	0
	N	263	263
	Pearson Correlation	.344**	1
<b>Utilization of extension services</b>	Sig. (2- tailed)	0	0
	N	263	263

**\*\*.** Correlation is significant at the 0.01 level (2-tailed).

Results from the Table 4.25 reveal that there is a significant positive relationship between utilization of extension services and performance of hybrid sweet potato projects ( $r = 0.344$ ). This implies that there is a very strong association between utilization of extension services and performance of hybrid sweet potato projects which is significant at 0.01 correlation level.

#### **4.8. Combined Influence of Project Implementation Process and Performance of Hybrid Sweet Potato Projects**

Regression analysis was further carried out to establish the combined influence of project implementation process on performance of hybrid sweet potato projects in Njoro Sub-County in line with objective four.

The following hypothesis was formulated and tested:

#### **Hypothesis Four**

Hypothesis H<sub>0</sub> There is no significant relationship between the combined influence of project implementation process and performance of hybrid sweet potato projects in Njoro Sub-County.

The regression model used to test the alternative hypothesis was as follows:

Performance of Hybrid Sweet Potato Projects = f (combined project implementation process)

$$Y = \beta_0 + \beta_4 X_4 + \varepsilon$$

Data was analyzed and the regression results for the combined influence of project implementation process and performance of hybrid sweet potato projects is presented in Table 4.26

**Table 4. 26: Simple linear regression results for Combined Influence of Project Implementation Process and Performance of Hybrid Sweet Potato Projects**

Model Summary										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change of R Square	Statistics F	df1	df2	Sig.	F Change
1	.225 <sup>a</sup>	.051	.001	.22346	.050	1.192	1	253	.000	
ANOVA <sup>a</sup>										
Model		Sum of Squares	df	Mean Square	F	Sig.				
1	Regression	0.099	1	0.099	1.192	.277 <sup>b</sup>				
	Residual	21.402	261	.082						
	Total	21.501	262							
Coefficients <sup>a</sup>										
Model		Un-standardized Coefficients		Standardized t	Sig.					
		B	Std. Error	Beta						
	(Constant)	2.832	.277		21.546	.001				
1	Combined Influence of Project Implementation Process	0.135	.049	.088	1.112	.298				
Dependent Variable: Performance of Hybrid Sweet Potato Projects										
Predictors: (Constant), Combined Influence of Project Implementation Process										
F (1,253) = 1.192, t=21.546, at level of significance p=0.000<0.05, r= 0.225 and R square=0.051										

The R-Squared was used to indicate variation in performance of hybrid sweet potato projects that can be explained by combined influence of project implementation process. The results in Table 4.26 shows that  $r = 0.341$  implying a positive slope between the independent variable (combined influence of project implementation process) and the

dependent variable (Performance of hybrid Sweet Potato Projects). The R- Squared was 0.051 meaning that 5.1% of the variation in the Performance of hybrid Sweet Potato Projects was explained by variation in the combined influence of project implementation process. Other factors not included in the model explained 94.9%.

Analysis of variance was used to determine whether the model the model was a good fit for the data in determining the combined influence of project implementation process on Performance of hybrid Sweet Potato Projects. The ANOVA results indicated that the model was statistically significant as the F-critical (1.253) greater than the F-calculated (1.192). In addition, the p-value (0.277) was greater than the significance level (0.05) and hence the model was not a good fit for the data and hence could be used in predicting the combined influence of project implementation process on Performance of hybrid Sweet Potato Projects.

Using the statistical findings, the regression model

$$Y = \beta_0 + \beta_3 X_3 + \varepsilon \text{ can then be substituted as follows; } Y = 2.832 + 0.135X_3$$

The results in Table 4.26 indicated that combined project implementation process has a positive but insignificant influence on the performance of hybrid Sweet Potato Projects as shown by regression coefficient (0.135) and a p-value (0.298). Hence based on these findings we fail to reject the null hypothesis that there is no significant relationship between utilization of extension services and performance of hybrid sweet potato projects in Njoro Sub-County since p value of 0.298 is greater than 0.05. Therefore, there is no significant relationship between combined project implementation process and performance of hybrid sweet potato projects in Njoro Sub-County.

#### **4.9. Analysis on Monitoring and Evaluation Practices and Performance of Hybrid Sweet Potato Projects**

This section presents findings on influence of monitoring and evaluation practices on performance of hybrid sweet potato projects in Njoro Sub County. The findings are presented in the subsequent sections.

#### 4.9.1. Frequency distribution on Monitoring and Evaluation models used

The respondents were requested to indicate ways through ministry of agriculture public extension service conducts monitoring and evaluation exercise. The findings are shown in Table 4.27

**Table 4. 27: Frequency distribution Table on Monitoring and Evaluation models used**

<b>Models Used</b>	<b>Frequency</b>	<b>Percent%</b>
Objective oriented model	82	31.18
Management Oriented	138	52.47
Consumer Oriented	43	16.35
<b>Total</b>	<b>263</b>	<b>100.00</b>

From Table 4.27, 31.18% of the respondents explained that objective oriented monitoring and evaluation model was used, 52.47% of the respondents explained that management oriented model was being used while 16.35% of the respondents explained that the consumer oriented model was being used. These findings affirms the importance of monitoring and evaluation models in moderating the relationship between project implementation process and performance of hybrid sweet potato projects.

#### 4.9.2. Frequency distribution on Monitoring and Evaluation Documentation

The respondents were requested to indicate the various documents that they use during monitoring and evaluation exercise. The findings are shown in Table 4.28

**Table 4.28: Frequency distribution Table on Monitoring and Evaluation Documentation**

<b>Documents Used</b>	<b>Frequency</b>	<b>Percent%</b>
Project Progressive Reports	69	26.23
Financial Reports	54	20.54
Training Reports	74	28.14
Project Completion Reports	66	25.09
<b>Total</b>	<b>263</b>	<b>100.00</b>

From the findings in Table 4.28, 26.23% of the respondents had progressive reports, 20.54% had financial reports, and 28.14% had training reports while 25.09% had project

completion reports. The findings affirms the significant role played by monitoring and evaluation documentation in moderating the relationship between project implementation process and performance of hybrid sweet potato projects.

#### **4.9.3. Frequency distribution on Monitoring and Evaluation Methodology used**

The respondents were requested to indicate the monitoring and evaluation methodology used. The findings were shown in Table 4.29

**Table 4.29: Frequency distribution Table on Monitoring and Evaluation Methodology used.**

<b>Methodology used</b>	<b>Frequency</b>	<b>Percent%</b>
Field Visits	77	29.28
Unstructured Interviews	73	27.76
Community Meetings	113	42.96
<b>Total</b>	<b>263</b>	<b>100.00</b>

From the findings in Table 4.29, 29.28% of the respondents indicated that field visits were used, 27.76% of the respondents indicated that unstructured interviews were being used as a monitoring and evaluation methodology, while 42.96% of the respondents explained that community meetings were being used as a methodology.

#### **4.9.4. Composite Mean Results on Monitoring and Evaluation Practices on Performance of Hybrid Sweet Potato Projects**

The respondents were requested to rate the various items based on monitoring and evaluation practices on performance of hybrid sweet potato projects. They were given items rated on a five point Likert scale ranging from 5-Strongly Agree; 4-Agree; 3- Neutral; 2- Disagree; and 1- Strongly Disagree (1). The findings were shown in Table 4.30.

**Table 4.30: Composite Mean on Monitoring and Evaluation Practices and Performance of Hybrid Sweet Potato Projects**

<b>Monitoring and Evaluation Practices</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>
Monitoring and Evaluation Models	263	3.0277	0.2875
Monitoring and Evaluation Documentation	263	3.7984	0.0549
Monitoring and Evaluation Methodology	263	3.8656	0.0910
<b>Composite Results</b>	<b>263</b>	<b>3.5639</b>	<b>0.3800</b>

As shown in Table 4.30, the overall composite means (M) for the monitoring and evaluation practices and performance of hybrid sweet potato projects is 3.5639 and the standard deviation SD = 0.3800. The implication of this result is that at M = 3.5639, SD = 0.3800, agreed that performance of hybrid potato farming was high as explained by the various factors on monitoring and evaluation practices.

#### **4.9.5. Qualitative analysis on Monitoring and Evaluation practices**

The respondents were requested to indicate other ways through which monitoring and evaluation practices influence performance of hybrid sweet potato projects. According to the majority of respondent farmers, the response was thus;

*“We do monitor and evaluate performance on ourselves, the experts do not involve us they carry their own monitoring and evaluation.”*

The extension service providers said;

*“We do carry monitoring as an on-going process while we also carry out periodic evaluations during the project implementation process, however record keeping should be improved and project objectives and goals should also be improved.”*

These contradictory views from the farmers and extension agents affirms the findings of this study that monitoring and evaluation practices influence performance of hybrid sweet potato projects in Njoro Sub-County.



#### **4.9.6. Inferential Analysis on Monitoring and Evaluation Practices and Performance of Hybrid Sweet Potato Projects**

Objective five of this study was to establish the influence of project monitoring and evaluation practices on performance of hybrid sweet potato projects in Njoro Sub-County.

The following hypothesis was formulated and tested:

**Hypothesis H<sub>0</sub>** There is no significant relationship between monitoring and evaluation practices and performance of hybrid sweet potato projects in Njoro Sub-County.

The hypothesis was tested using the following linear regression model

Performance of Hybrid Sweet Potato Projects = F (Monitoring and Evaluation practices)

$$Y = \beta_0 + \beta_5 X_5 + \varepsilon$$

Where

Y = Performance of Hybrid Sweet Potato Projects

**Table 4.31: Linear regression analysis results for Monitoring and Evaluation Practices and Performance of Hybrid Sweet Potato Projects**

<b>Model Summary</b>									
Model	R	Adjusted R Square	Std. Error of the Estimate	Change in R Square	F Change	df1	df2	Sig.	F
1	.085 <sup>a</sup>	.016	.28791	.050	1.286	1	253	.000	
<b>ANOVA<sup>a</sup></b>									
Model		Sum of Squares	df	Mean Square	F	Sig.			
1	Regression	0.107	1	1.107	1.286	.000 <sup>b</sup>			
	Residual	21.402	261	.082					
	Total	21.509	262						
<b>Coefficients<sup>a</sup></b>									
Model		Unstandardized Coefficients		Standardized Beta	t	Sig.			
		B	Std. Error						
1	(Constant)	2.875	.120		21.231	.000			
	Monitoring and Evaluation Practices	.115	.113	.098	1.156	.234			
Dependent Variable: Performance of Hybrid Sweet Potato Projects									
Predictors: (Constant), Monitoring and Evaluation Practices									
F (1,253) = 1.286, t=21.231, at level of significance p=0.000<0.05, r= 0.085 and R square=0.016									

The R-Squared was used to indicate variation in performance of hybrid sweet potato projects that can be explained by monitoring and evaluation practices. The results in Table 4.31 shows that  $r = 0.085$  implying a positive slope between the independent variable (combined influence of project implementation process) and the dependent variable (Performance of hybrid Sweet Potato Projects). The R- Squared was 0.016 meaning that

1.6% of the variation in the Performance of hybrid Sweet Potato Projects was explained by variation in monitoring and evaluation practices.

Analysis of variance was used to determine whether the model the model was a good fit for the data in determining influence of monitoring and evaluation practices on Performance of hybrid Sweet Potato Projects. The ANOVA results indicated that the model was statistically significant as the F-critical (1.253) less than the F-calculated (1.286). In addition, the p-value (0.000) was less than the significance level (0.05) and hence the model was not a good fit for the data and hence could be used in predicting the combined influence of monitoring and evaluation practices on Performance of hybrid Sweet Potato Projects. Using the statistical findings, the regression model.

$Y = \beta_0 + \beta_5 X_5 + \varepsilon$  can then be substituted as follows;  $Y = 2.875 + 0.115 X_2$

The results in Table 4.26 indicated that monitoring and evaluation practices has a positive but insignificant influence on the performance of hybrid Sweet Potato Projects as shown by regression coefficient (0.115) and a p-value (0.234). Hence based on these findings we fail to reject the null hypothesis that there is no significant relationship between monitoring and evaluation practices and performance of hybrid sweet potato projects in Njoro Sub-County since p value of 0.234 is greater than 0.05. Therefore, there is no significant relationship between monitoring and evaluation practices and performance of hybrid sweet potato projects in Njoro Sub-County.

#### **4.9.7. Correlation between Monitoring and Evaluation Practices and Performance of Hybrid Sweet Potato Projects**

Correlation analysis using Pearson's product moment correlation coefficient was done to determine the relationship between of monitoring and evaluation practices and performance of hybrid sweet potato projects. Results of the correlation are presented in Table 4.32

**Table 4.32: Correlation results for Monitoring and Evaluation Practices on Performance of Hybrid Sweet Potato Projects**

		<b>Performance of Hybrid Sweet Potato Projects</b>	<b>Monitoring and Evaluation Practices</b>
<b>Performance of Hybrid Sweet Potato Projects</b>	Pearson Correlation	1	.094**
	Sig. (2-tailed)		.259
	N	263	263
<b>Monitoring and Evaluation Practices</b>	Pearson Correlation	.094	1
	Sig. (2-tailed)	.259	
	N	263	263

**\*\*.** Correlation is significant at the 0.01 level (2-tailed).

Results from the Table 4.32 reveal that there is a significant positive relationship between monitoring and evaluation practices and performance of hybrid sweet potato projects ( $r = 0.094$ ). This implies that there is a very strong significant relationship between monitoring and evaluation practices and performance of hybrid sweet potato projects.

#### **4.9.8 Linear regression analysis results on monitoring and evaluation practices on the Combined Influence of Project Implementation and Performance of Hybrid Sweet Potato Projects**

Correlational analysis using Pearson's Product Moment technique was done to determine the influence of project monitoring and evaluation practices and the combined influence of project implementation on performance of hybrid sweet potato projects. The following hypothesis was tested:

##### **Hypothesis Six**

**H<sub>06</sub>** There is no significant relationship between project monitoring and evaluation practices and the combined influence of the implementation process and performance of hybrid sweet potato projects in Njoro Sub-County

### Model for Hypothesis Six

The hypothesis was tested using the following linear regression model

Combined Influence of Project Implementation = f (Project Monitoring and Evaluation Practices)

$$Y = \beta_0 + \beta_6 X_6 + \varepsilon$$

Where

Y = Combined Influence of Project Implementation

X<sub>6</sub> = Project Monitoring and Evaluation Practices

β<sub>0</sub>: = Constant term

ε = Error term

This hypothesis was tested using Baron and Kenny (1986) four-step method. Linear regression was used in each step.

**Step 1**, Risk management practice was regressed on combined project implementation factors. If R<sup>2</sup> and beta coefficients are statistically significant, the process would move to step two. If they are not significant, the process terminates and would be concluded that project monitoring and evaluation practices do not moderate the relationship between combined influence of project implementation and performance of hybrid sweet potato projects.

**Step 2**, Involved regressing of combined influence of project implementation on project monitoring and evaluation practices. If the results are significant, the process moves to step 3 because the necessary condition for moderation exist.

**Step 3**, The influence of project monitoring and evaluation practices on performance of hybrid sweet potato projects is tested using a simple linear regression model. A statistically significant effect of project monitoring and evaluation practices on performance of hybrid sweet potato projects is a necessary condition in testing for the moderation. The analysis then moves to step 4.

**Step 4**, Tested the influence of combined influence of project implementation on performance of hybrid sweet potato projects while controlling for the effect of project monitoring and evaluation practices. These tests were done using simple linear regression analysis. The influence of combined influence of project implementation on performance of hybrid sweet potato projects should not be statistically significant when project monitoring and evaluation practices are controlled. This was a necessary condition in testing for moderation.

**Step one: Test of the influence of combined influence of project implementation process and performance of hybrid sweet potato projects**

The results of the regression analysis are presented in Table 4.33

**Table 4.33: Analysis results for Combined Influence of Project Implementation Process and Performance of Hybrid Sweet Potato Projects**

<b>Model Summary</b>											
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change in R Square	F Change	df1	df2	Sig. Change	F	
1	.225 <sup>a</sup>	.051	.001	.22346	.050	1.192	1	253	.000		
<b>ANOVA<sup>a</sup></b>											
Model		Sum of Squares	df	Mean Square	F	Sig.					
1	Regression	0.099	1	0.099	1.192	.277 <sup>b</sup>					
1	Residual	21.402	261	.082							
	Total	20.501	262								
<b>Coefficients<sup>c</sup></b>											
Model		Un-standardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.					
	(Constant)	2.832	.277		21.546	.001					
1	Combined Influence of Project Implementation Process	0.135	.049	.088	1.112	.298					
Dependent Variable: Performance of Hybrid Sweet Potato Projects											
Predictors: (Constant), Combined Influence of Project Implementation Process											
F (1,253) = 1.192, t=21.546, at level of significance p=0.000<0.05, r= 0.225 and R square=0.051											

The results in Table 4.33 shows that  $r = 0.341$  implying a positive slope between the independent variable (combined influence of project implementation process) and the dependent variable (Performance of hybrid Sweet Potato Projects). The R- Squared was 0.051 meaning that 5.1% of the variation in the Performance of hybrid Sweet Potato Projects was explained by variation in the combined influence of project implementation process. Other factors not included in the model explained 94.9%. The ANOVA results indicated that the model was statistically significant as the F-critical (1.253) greater than the F-calculated (1.192). In addition, the p-value (0.277) was greater than the significance level (0.05) and hence the model was not a good fit for the data and hence could be used in predicting the combined influence of project implementation process on Performance of hybrid Sweet Potato Projects. The results indicated that combined project implementation process has a positive but insignificant influence on the performance of hybrid Sweet Potato Projects as shown by regression coefficient (0.135) and a p-value (0.298).

**Step Two: The Test for the Moderation effect of Project Monitoring and Evaluation Practices on combined influence of the implementation process and performance of hybrid sweet potato projects**

This step involved testing the influence of combined project implementation factors on Project Monitoring and Evaluation Practices. The results of the tests are presented in Table 4.34.

**Table 4. 34: Regression Results from the Test of the Effect of combined influence of the implementation process on Project Monitoring and Evaluation Practices**

<b>(a) Model Summary</b>						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.247	.061	.054	0.45695		
Predictors: (Constant), combined influence of the implementation process						
<b>(b) ANOVA</b>						
Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	1.936	1	1.936	9.271	.003
1	Residual	54.027	261	.207		
	Total	55.963	262			

Dependent Variable: Project Monitoring and Evaluation Practices

Predictors: (Constant), combined influence of the implementation process

<b>(c) Coefficients</b>					
Model	Unstandardized		Standardized	T	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
	(Constant)	2.946	.265		11.112 .000
1	combined project implementation factors	.216	.071	.247	3.045 .003

Dependent Variable: Project Monitoring and Evaluation Practices

Predictors: (Constant), combined influence of the implementation process

The results presented in Table 4.34 indicate that combined influence of the implementation process had a positive and significant effect on Project Monitoring and Evaluation Practices (R= 0.247). The model shows that 6.1 per cent of the variation in project monitoring and evaluation practices could be explained by combined influence of the implementation process. The ANOVA results indicated that the model was statistically significant as the p-value (0.003) was less than the significance level (0.05).

The results, therefore suggest that the second step of testing confirms intervention of project monitoring and evaluation practices in the relationship between combined influence of the implementation process and performance of hybrid sweet potato projects therefore analysis to move to step 3.

**Step 3** It involved testing the influence of project monitoring and evaluation practices on performance of hybrid sweet potato projects. The results for the step 3 are presented in Table 4.35.



**Table 4. 35: Regression Results for monitoring and evaluation practices on the combined influence of the implementation process and performance of hybrid sweet potato projects.**

<b>(a) Model Summary</b>						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
	.091	.008	-.006	.28900		
<b>(b) ANOVA</b>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.100	2	.050	.591	.551
	Residual	21.58	260	.083		
	Total	21.68	262			
<b>(c) Coefficients</b>						
Model		Un-standardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	Constant	3.836	.229	.030	16.761	.000
	Project monitoring and evaluation practices combined influence of the implementation process	.050	.046	.093	1.081	.282
		-.006	.053	-.006	-0.107	.915

Predictors: (Constant), Project monitoring and evaluation practices, combined influence of the implementation process

Dependent Variable: performance of hybrid sweet potato projects.

The results in Table 4.35 indicate that project monitoring and evaluation practices and combined implementation process could explain 0.8% of performance of hybrid sweet potato projects. The model was not a good fit for the data as the p-value (0.551) was greater than the significance level (0.05).

The results were not statistically significant at  $P > 0.05$ . The results therefore did not satisfy condition in the third step in testing for moderation effect of project monitoring and evaluation practices on the relationship between combined influence of the implementation process and performance of hybrid sweet potato projects. The influences of project monitoring and evaluation practices ( $B = .050$ ,  $p\text{-value} = 0.282$ ) and combined influence of the implementation process ( $B = -0.006$ ,  $p\text{-value} = 0.915$ ) were not statistically significant.

The statistical results at step three are not significant and thus did not provide the necessary conditions to progress to step 4 in testing for the moderating effect and did not support the moderating effect of project monitoring and evaluation practices on the relationship between combined influence of the implementation process and performance of hybrid sweet potato projects. Thus, the process terminated at step 3.

The results were indicative of the fact that combined influence of the implementation process interacts with project monitoring and evaluation practices and the interaction has an effect on their influence on performance of hybrid sweet potato projects though the indirect effect was not clear from the results in this study. The study accepts the null hypothesis that there is no significant relationship between project monitoring and evaluation practices on the combined influence of the implementation process and performance of hybrid sweet potato projects in Njoro Sub-County

**Table 4. 36: Summary on Test of Hypothesis Results**

<b>Hypothesis</b>	<b>Results</b>	<b>Decision</b>
<b>H<sub>01</sub>:</b> There is no significant relationship between capacity building interventions and performance of hybrid sweet potato projects in Kenya.	$\beta=0.180$ (p-value=0.002)	<b>Rejected</b>
<b>H<sub>02</sub>:</b> There is no significant relationship between stakeholder's engagement strategies and performance of hybrid sweet potato projects in Kenya.	$\beta=0.157$ (p-value=0.014)	<b>Rejected</b>
<b>H<sub>03</sub>:</b> There is no significant relationship between utilization of extension services and performance of hybrid sweet potato projects in Kenya.	$\beta=0.350$ (p-value=0.000)	<b>Rejected</b>
<b>H<sub>04</sub>:</b> There is no significant relationship between combined influence of project implementation process and performance of hybrid sweet potato projects in Kenya.	$\beta=0.135$ (p-value=0.298)	<b>Failed to reject</b>
<b>H<sub>05</sub>:</b> There is no significant relationship between monitoring and evaluation practices and performance of hybrid sweet potato projects in Kenya.	$\beta=0.115$ (p-value=0.234)	<b>Failed to reject</b>
<b>H<sub>06</sub>:</b> There is no significant relationship between project monitoring and evaluation practices on the combined influence of the implementation process and performance of hybrid sweet potato projects in Kenya.	<b>Step 1</b> $\beta=0.135$ (p-value=0.298)	<b>Failed to reject</b>
	<b>Step 2</b> $\beta=0.216$ (p-value=0.003)	
	<b>Step 3</b> $\beta_1=0.050$ (p-value=0.282) $\beta_2=-0.006$ (p-value=0.915)	

**CHAPTER FIVE**  
**SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND**  
**RECOMMENDATIONS**

**5.1. Introduction**

This chapter presents a summary of the study and its findings, the conclusions and recommendations for future studies. The chapter further provides the implications of the findings to theory, policy and managerial practice. Finally, the chapter discusses the limitations of the study and provides a roadmap that future studies should consider.

**5.2. Summary of Findings**

The study achieved 95.4% questionnaire return rate as out of the total 282 targeted respondents, 269 returned completely filled questionnaires. The significance values for the Shapiro-Wilk tests were found to be 0.689 for performance of hybrid sweet potato projects, 0.529 for capacity building, 0.0611 for stakeholder participation, 0.629 for utilization of extension services, 0.610 for project implementation process and 0.654 for project monitoring and evaluation practices. The normality of the variables was also done and the study determined that all the variables had a fairly good fit in the normal distribution. The study also revealed that there was no problem of multicollinearity. The variance inflation factors for the variables were all below 5 meaning that the variables were not highly correlated.

The purpose of this study was to examine the influence of project implementation process on performance of hybrid sweet potato projects in Njoro Sub-County and how such relationship interacts with project monitoring and evaluation practices. To achieve this, six objectives were set and corresponding hypotheses formulated. In testing of the hypothesis in the study, Pearson's Product Moment correlation, linear, stepwise and multiple regressions were used. A total of six hypotheses were formulated and tested.

**5.2.1 Respondents Demographic information**

This study sought to investigate the demographic information of the respondents including gender, age, level of education, time in which the respondents had been involved in hybrid sweet potato projects, and the respondents size of land.

The study established that on gender, 44.27% of the respondents were males while 55.73% were females. This study therefore established that females were more involved in hybrid sweet potato projects than their male counterparts. On age, the distribution of was categorized on a range in years from 18 to over 50. The age categories were thus; 18-30 years, 31-35 years, 36-40 years, 41-50 years above 50 years of age. On age, the study established that 82% of the respondents who were involved in hybrid sweet potato projects were above 36 years while 18% of the respondents were between 18 and 35 years. The study also sought to establish relationship between level of education and performance of hybrid sweet potato projects. It was found that 43% of the respondents had primary certificate, 40% had secondary school certificate, 16% had college level certificate while less than 1% had a post graduate certificate.

The study further sought to establish the relationship between respondents' age and level of education. The study found that 86% of the respondents who were involved in hybrid sweet potato projects were above 36 years of age while 14% of the respondents were below 35 years of age. It was also established that 88% of the respondents had been involved in hybrid sweet potato projects in less than 6 years, 12% had been involved in hybrid sweet potato projects for more than 6 years but in less than 19 years of time.

On the distribution of the respondents' size of land, the study established that 87.70% of the respondents had less than 0.5 acres of land while 12.3% had between 1 and 5 acres of land. Cross tabulation on respondents' size of land and age, this study established that 85% of the respondents had between 2 and 5 acres of land and were above 40 years of age while 15% of the respondents had between 1 and 1.4 acres of land. This study further established that 42.69% of the respondents had primary level of education, 40.32% had secondary certificate, and 16.20% had a college certificate while 0.79% had a post graduate certificate. From cross tabulation, this study established that majority of the respondents who owned land, (85%), had primary level certificate, 14.5% of the respondents had secondary level certificate while 0.5% had a post graduate certificate.

### **5.2.2. Performance of Hybrid Sweet Potato Projects**

The dependent variable under this study was performance of hybrid sweet potato projects. Frequency distribution on the indicators of performance, this study established that, hybrid

sweet potato projects were available as represented by 52.47% of the respondents, by concluding that hybrid sweet potato projects were available, the results therefore justified the study in moving further to establish the other variables that investigated the performance of these projects. The study also established that hybrid sweet potato projects had economic sustainability as confirmed by 25.48% of the respondents. The study further established that hybrid sweet potato projects had environmental sustainability as confirmed by 13.68% of the respondents. The study also established that hybrid sweet potato projects had technical efficiency as confirmed by 8.37% of the respondents. This confirmed the availability, economic and environmental sustainability and the technical efficiency as indicators of performance of hybrid sweet potato projects. The overall composite means (M) for performance was 3.7909 and the standard deviation  $SD = 0.4817$ . The implication of this result was that at  $M = 3.7909$ ,  $SD = 0.4817$ , agreed that performance of hybrid sweet potato projects was high as explained by the availability, economic and environmental sustainability and the technical efficiency as indicators of performance.

Qualitative results on Performance of hybrid Sweet Potato projects established that the yields are dependent on the variety which had been planted; the crop spacing is also an important consideration and the assistance provided by the agricultural officers, availability of hybrid varieties, and the management of crop also contributes to improved performance of hybrid sweet potato projects.

### **5.2.3 Capacity Building interventions and Performance of Hybrid Sweet Potato Projects**

Objective one of this study was to examine the influence of capacity building interventions on performance of hybrid sweet potato projects in Njoro sub-County. Frequency distribution results on the indicators of capacity building interventions established that, on provision of inputs as a capacity building intervention; 86.31% of the respondents were receiving hybrid sweet potato inputs from Kenya Agricultural research and livestock organization at Njoro, 6.46% were receiving inputs from other farmers including planting vines, 2.28% of the respondents were receiving inputs from non-Governmental organizations while 4.94% of the respondents were receiving inputs from extension service providers. The study also established that on provision of training on agronomic practices; 20.53% of the respondents had received training on crop management practices, 48.29%

had received training on best production practices, 16.35% of the respondents had received training on sourcing of planting materials while 14.83% were aware of alignment of training gaps identified.

The null hypotheses; $(H_0)$  stated that there is no significant relationship between capacity building interventions and performance of hybrid sweet potato projects in Njoro Sub-County. The overall composite means (M) for the capacity building interventions and performance of hybrid sweet potato projects was 3.7183 and the standard deviation  $SD = 0.0989$ . The implication of this result is that  $M = 3.7183$ , and  $SD = 0.0989$ , agreed that performance of hybrid sweet potato projects was high as explained by the various factors on capacity building interventions. On qualitative analysis results, this study established that respondents were being assisted by experts on training but they considered this as rare and thus affect performance of the projects, follow-ups by extension service providers were established as low. Respondents considered training as an important intervention, as well as availability of hybrid varieties.

The linear regression results established that that  $r = 0.254$ , implying a positive slope between the independent variable (capacity building interventions) and the dependent variable (Performance of Hybrid Sweet Potato Projects). The R- Squared was 0.061, meaning that 6.1% of the variation in the Performance of Hybrid Sweet Potato Projects was explained by the factors in the capacity building interventions. The other factors explained 84.9%. The ANOVA results indicated that the model was statistically significant at  $(F(1,253) = 9.850)$ . The results established that the  $p\text{-value} = 0.002 < 0.05$ ,  $r = 0.254$  and  $r\text{ square} = 0.061$ . Overall F statistics was  $F(1,253) = 9.850$ . Hence based on these findings we reject the null hypothesis that there is no significant relationship between capacity building and performance of hybrid sweet potato projects in Njoro Sub-County since p value of 0.002 is less than 0.05 and accept the alternative hypothesis at  $\alpha = 0.05$  level of significance that there is a significant relationship between capacity building and performance of hybrid sweet potato projects in Njoro Sub-County. Correlation analysis results between capacity building interventions and performance of hybrid sweet potato projects reveal that there is a significant positive relationship at  $(r = 0.094)$  and at  $\beta = 0.180$  ( $p\text{-value} = 0.002$ ), we reject the null hypotheses that there is no significant relationship between capacity building interventions and performance of hybrid sweet potato projects in Njoro Sub-County.

#### **5.2.4. Stakeholder's engagement strategies and Performance of Hybrid Sweet Potato Projects**

Objective two of this study was to examine the influence of stakeholder's engagement strategies on performance of hybrid sweet potato projects in Njoro Sub-County.

Frequency distribution results on the indicators of stakeholders' engagement strategies established that, on joint strategic planning as a stakeholder engagement strategy; 17.87% of the respondents were engaged in joint strategic planning, 19.39% were engaged in crop management practices, 22.06% were engaged in resource identification while 40.68% were engaged in sharing of information. The null hypotheses; ( $H_0$ ) stated that there is no significant relationship between stakeholder's engagement strategies and performance of hybrid sweet potato projects in Njoro Sub-County. The overall composite mean (M) for the stakeholders' engagement strategies and performance is 3.5962 and the standard deviation  $SD = 1.6601$ . The implication of this result is that at  $M = 3.5962$ , and  $SD = 0.6601$ , agreed that performance of hybrid potato projects was high as explained by the various factors on stakeholders' engagement strategies. On qualitative results; the respondents were requested to indicate other ways through which stakeholders' engagement strategies influence performance of hybrid sweet potato projects. This study established that a strong link is required between farmers, extension officers, and plant breeders. This study further established that attendance of agricultural field days and National agricultural shows was a valued engagement strategy.

Linear regression results established that  $r = 0.185$ , implying a positive slope between the independent variable (stakeholder's engagement strategies) and the dependent variable (performance of hybrid sweet potato projects). The R-Squared was 0.034 meaning that 3.4% of the variation in the performance of hybrid sweet potato projects was explained by the various factors in the stakeholder's engagement strategies. The other factors explained 96.6%. The ANOVA results indicated that the model was statistically significant at ( $F(1, 1253) = 6.146$ ). The results that the  $p\text{-value} = 0.014 \leq 0.05$ ,  $t = 2.213$ ,  $r = 0.185$  and  $r\text{square} = 0.034$ , the study concludes that the results were statistically significant. Overall F statistics was ( $F(1, 1253) = 6.146$ ) the study also concludes that there exists a positive correlation and the slope of the population regression line is not zero. Hence based on these findings we reject the null hypothesis that there is no significant relationship between



stakeholder's engagement strategies and performance of hybrid sweet potato projects in Njoro Sub-County since p value of 0.014 is less than  $p < 0.05$  we accept the alternative hypothesis at  $\alpha = 0.05$  level of significance. Correlation results established that there is a significant positive relationship between stakeholder's engagement strategies on performance of hybrid sweet potato projects ( $r = 0.467$ ).

### **5.2.5 Utilization of Extension Services and Performance of Hybrid Sweet Potato Projects**

Objective three of this study was to establish the extent to which utilization of extension services influence the performance of hybrid sweet potato projects in Njoro Sub-County. Conclusions made from frequency distribution results on the indicators of utilization of extension services include; that demand driven as an extension approach had the most emphasis in utilization of extension services as 92.31% of the respondents agreed that it was mainly used. This study also concludes that commodity interest groups had been formed as 84.62% were engaged in groups, farmer field schools was being used as an extension approach with 54.62% of the respondents in agreement while training and visit was rarely used as an extension approach with 5.77% of the respondents in agreement. On extension schedules; this study concludes that extension schedules were in place where annual schedules being the most common with 96.54% of the respondents in agreement, quarterly schedules were also used with 81.54% of the respondents in agreement while monthly schedules were rare with 2.31% of the respondents in agreement. The study also concludes that impact assessments were used in utilization of extension services as 90.00% of the respondents agreed that effects of extension services were being felt. The study concludes that gaps identified during extension were being addressed as 44.23% of the respondents were in agreement while adoption level was also used as an impact assessment method with 40.38% of the respondents were in agreement. On extension methodology as an indicator of utilization of extension services, this study concludes that extension feedback mechanisms were in place with 59.23% of the respondents were in agreement, record keeping was practiced in extension as a methodology. This study further concludes that research instruments were being used as an extension methodology as 13.84% of the respondents were in agreement. The overall composite means (M) for the utilization of extension services and performance of hybrid sweet potato projects is 3.4367 and the standard deviation  $SD = 0.6749$ . This study therefore concludes that at  $M = 3.4367$ , and  $SD$

= 0.6749, the performance of hybrid potato projects was high as explained by the various factors on utilization of extension services. Qualitative analysis results on utilization of extension services yields the conclusion that farmers utilize extension services to improve performance of hybrid sweet potato projects by utilizing extension services through commodity interest groups, scheduled visits, and through demand driven approach of extension where they look for advice from agricultural office at Njoro, as well as attending field days and workshops.

Linear regression results that  $r = 0.341$  yields the conclusion that a positive slope between the independent variable (utilization of extension services) and the dependent variable (Performance of hybrid Sweet Potato Projects). The R- Squared was 0.112 meaning that 11.2% of the variation in the performance of hybrid sweet potato Projects was explained by variation in the utilization of extension services. The other factors explained 88.8%. The ANOVA results indicated that the model was statistically significant at ( $F(1,253) = 21.482$ ).

At  $p\text{-value} = 0.000 \leq 0.05$ ,  $t=3.348$ ,  $r = .341$  and  $r\text{ square}=0.112$ , makes the study conclude that the results were statistically significant. The overall F statistics which was ( $F(1,253) = 21.482$ ) brings the conclusion that there exists a positive correlation and the slope of the population regression line is not zero. Hence based on these findings we reject the null hypothesis that there is no significant relationship between utilization of extension services and performance of hybrid sweet potato projects in Njoro Sub-County since p value of 0.000 is less than 0.05 ( $P < 0.05$ ) at  $\alpha=0.05$ . On correlation analysis results ( $r = 0.467$ ) the study concludes that there is a positive significant relationship between utilization of extension services and performance of hybrid sweet potato projects. From the regression model;

$$Y = 2.832 + 0.225 X_4$$

This study also concludes that for a one-unit increase in combined influence of project implementation process, the performance of hybrid sweet potato projects increases by 0.225. This, therefore, confirms that combined influence of project implementation process has a significant influence on the Performance of Hybrid Sweet Potato Projects

### **5.2.6 Combined Influence of Project Implementation Process and Performance of Hybrid Sweet Potato Projects in Njoro Sub-County**

The fourth objective of the study was to establish how the combined influence of project implementation process influenced performance of hybrid sweet potato projects in Njoro Sub-County. Linear regression results that  $r = 0.225$ , the study concludes that there's a positive slope between the independent variable (Combined Influence of Project Implementation Process) and the dependent variable (Performance of Hybrid Sweet Potato Projects). R- Squared was 0.051 implying that 5.1% of the variation in the performance of hybrid sweet potato projects was explained by variation in the combined influence of project implementation process while the other factors explained 94.9%. ANOVA results indicated that the model was statistically significant at ( $F(1,253) = 1.192$ ). The results that the  $p=0.000 < 0.05$ ,  $r = 0.225$  and  $R\text{ square} = 0.051$  and overall F statistics at ( $F(1,253) = 1.192$ ), yields the conclusion that there exists a positive correlation and the slope of the population regression line is not zero. Hence based on these findings we reject the null hypothesis that there is no significant relationship between the combined influence of project implementation process and performance of hybrid sweet potato projects in Njoro Sub-County. Since p-value of 0.000 is less than 0.05. Since p-value of 0.000 is less than 0.05 the researcher rejected the null hypothesis at the  $\alpha = 0.05$  level of significance that there is no significant relationship between the combined influence of project implementation process and performance of hybrid sweet potato projects in Njoro Sub-County.

### **5.2.7 Monitoring and Evaluation Practices and Performance of Hybrid Sweet Potato Projects**

Objective five of this study was to establish the influence of project monitoring and evaluation practices on performance of hybrid sweet potato projects in Njoro Sub-County. This study have made conclusions based on the frequency distribution results on monitoring and evaluation practices which include; monitoring and evaluation models used, monitoring and evaluation documentation done and monitoring and evaluation methodology used. The study therefore concludes that management oriented model was mainly used as represented by 52.47% of the respondents, objective oriented model was also used as 31.18% of the respondents were in agreement and the study also concludes that consumer oriented monitoring and evaluation model though used, was not as popular as management and objective oriented models as represented by 16.35% of the respondents.

On monitoring and evaluation documentation as a practice, the study concludes that training reports were being documented as represented by 28.14% of the respondents, the study also concludes that project progressive reports were being documented as represented by 26.23% of the respondents, project completion reports were also used as represented by 25.09% of the respondents and the study further concludes that project financial reports were also part of the monitoring and evaluation documents used in the monitoring and evaluation practices as represented by 20.54% of the respondents. On monitoring and evaluation methodologies used, the study concludes that community meetings were being used as represented by 42.96% of the respondents, field visits were being done as represented by 29.28% of the respondents and the study further concludes that unstructured interviews were part of the monitoring and evaluation methodology as represented by 27.76% of the respondents. A composite mean (M) of 3.5639 and a standard deviation (SD) of 0.3800 yields the conclusion that performance of hybrid sweet potato projects was high as explained by the various factors on monitoring and evaluation practices.

Linear regression results that  $r = 0.085$  implied that a positive slope exists between the independent variable (Monitoring and Evaluation Practices) and the dependent variable (Performance of Hybrid Sweet Potato Projects). R-Squared of 0.016 implied that 1.6% of the variation in the Performance of Hybrid Sweet Potato Projects was explained by variation in the monitoring and evaluation practices. The other factors explained 98.4%. ANOVA results indicated that the model was statistically significant at ( $F(1,253) = 1.286$ ). The study therefore established that; with  $p=0.000 < 0.05$ ,  $r = 0.085$  and  $R^2 = 0.016$  and an overall F statistics of ( $F(1,253) = 1.286$ ) that there exists a positive correlation because the slope of the population regression line is not zero, hence we reject the null hypothesis that there is no significant relationship between monitoring and evaluation practices and performance of hybrid sweet potato projects in Njoro Sub-County. Correlation results;  $r = 0.094$ , the study further established that there is a significant positive relationship between monitoring and evaluation practices and performance of hybrid sweet potato projects.

### **5.2.8 Monitoring and evaluation practices on the combined influence of project implementation process and performance of hybrid sweet potato projects.**

Objective six under this study sought to establish how the moderating effect of project monitoring and evaluation practices influenced the combined influence of project implementation process and performance of hybrid sweet potato projects in Njoro Sub-County.

Correlation analysis using Pearson's Product Moment technique was done to determine the influence of project monitoring and evaluation practices on the combined influence of project implementation process and performance of hybrid sweet potato projects in Njoro Sub-County. Linear regression leads to the establishment of the following conclusion. This study concluded that project monitoring and evaluation practices had a weak positive relationship with performance of hybrid sweet potato projects ( $R=.091$ ). The model explained 0.8% of the variation in performance of hybrid sweet potato projects. 99.2% of performance of hybrid sweet potato projects is explained by other factors not considered in the model. The results were not statistically significant at  $P \geq 0.05$ . The results therefore did not satisfy condition in the third step in testing for moderation effect of project monitoring and evaluation practices on the relationship between combined influence of the implementation process and performance of hybrid sweet potato projects. The influences of project monitoring and evaluation practices ( $B=.050$ ,  $t= 1.081$ ,  $p>05$ ) and combined influence of the implementation process ( $B=-.006$ ,  $t= -0.107$ ,  $p>05$ ) were not statistically significant. The model was also not statistically significant ( $R^2=.008$ ,  $F=0.591$ ,  $p>05$ ). The statistical results at step three were not significant and thus did not provide the necessary conditions to progress to step 4 in testing for the moderating effect and did not support the moderating effect of project monitoring and evaluation practices on the relationship between combined influence of the implementation process and performance of hybrid sweet potato projects.

The results were indicative of the fact that combined influence of the implementation process interacts with project monitoring and evaluation practices and the interaction has an effect on their influence on performance of hybrid sweet potato projects though the indirect effect was not clear from the results in this study. The study therefore concluded by rejecting the hypothesis that there is no significant relationship between project

monitoring and evaluation practices on the combined influence of the implementation process and performance of hybrid sweet potato projects in Njoro Sub-County.

### **5.3 Conclusions of the study**

The study makes the following conclusions based on the established findings;

#### **5.3.1 Respondents Demographic information**

Findings from the demographic information of the respondents makes this study conclude the following; on gender, majority of the respondents were females while males were less than half of the sampled population. This implied that females were more involved in hybrid sweet potato projects than their male counterparts. On age, this study concludes that majority of the respondents who were involved in hybrid sweet potato projects were mature enough to understand the practices involved in hybrid sweet potato projects as they were above 36 years of age while only a small percentage (18%) of the respondents were between 18 and 35 years. The therefore concludes that hybrid sweet potato projects were not popular among the youth. A study on the relationship between level of education and performance of hybrid sweet potato projects, the study concludes that majority of the respondents (83%) had secondary school certificate of which 43% had primary school certificate indicating the high level of illiteracy among the hybrid sweet potato farmers.

The study further concludes that there exists a great opportunity in community mobilization to undertake these projects as majority of the respondents (88%) indicated having been involved in these projects for less than 6 years and among the minority (12%) of the respondents were involved in less than 19 years of time. On the distribution of the respondents' by their size of land, the study concludes that land was mainly owned by the elderly (87.70%) who had low level of education while the youths who had a higher level of education owned a small percentage of the land area. The study concludes that this factor could have contributed to the small number of youths in hybrid sweet potato projects.

#### **5.3.2 Capacity Building interventions and Performance of Hybrid Sweet Potato Projects**

This study concludes that, majority of the respondents were receiving inputs as a capacity building intervention, from Kenya Agricultural research and livestock organization at

Njoro in form of hybrid sweet potato seeds, some of the respondents (6.46%) were receiving some farm inputs from other farmers including planting vines and a smaller percentage (4.94%) of the respondents were receiving inputs from extension service providers. The study also concludes that there exist some non-Governmental organizations that support farmers in provision of project inputs. The study also concludes that some farmers were receiving training on agronomic practices, a small number of the respondents (20.53%) had received training on crop management practices, less than half of the respondents (48.29%) had received training on best production practices, 16.35% of the respondents had received training on sourcing of planting materials while 14.83% had been involved in alignment of training gaps identified. The overall composite means and standard deviation for the capacity building interventions and performance of hybrid sweet potato projects, agreed that performance of hybrid sweet potato projects was high as explained by the various factors on capacity building interventions. The study concludes by rejecting the null hypothesis that there is no significant relationship between capacity building interventions and performance of hybrid sweet potato projects in Njoro Sub-County. On qualitative analysis results, this study concludes that respondents were ready to be assisted by experts on training as lack of knowledge and skills affected performance of the projects.

This study considered training as an important intervention, as well as making available the various hybrid sweet potato varieties. The R-Squared was 0.061, which implied that 6.1% of the variation in the Performance of Hybrid Sweet Potato Projects was explained by the factors in the capacity building interventions. ANOVA results implied that the model was statistically significant at  $(F(1,253) = 9.850)$ . Capacity building interventions among the farming communities, Alex, et al(2012), asserts that many practitioners equated capacity building with training of farmers in the agricultural training centers in most districts. This study contested that the approach of basing on skills set and competencies to individuals alone limits growth of extension services. Skills ought to be shared on a collegiality basis and inter disciplinary training involving various actors to promote transference of competencies and cross functions. Aker, (2010), in the same thought argues that capacity building is an essential component in development, but it is hardly practiced in line with required principles.

Objective one of this study was to examine how the influence of capacity building on performance of hybrid sweet potato projects in Njoro Sub-County. This study, therefore, concludes that it is critical to consider capacity building when practicing hybrid sweet potato projects.

### **5.3.3. Stakeholder's engagement strategies and Performance of Hybrid Sweet Potato Projects**

Objective two of this study was on examination of how the influence of stakeholder's engagement on performance of hybrid sweet potato projects in Njoro Sub-County.

On frequency distribution results based on the indicators of stakeholders' engagement strategies; this study makes the following conclusions: On joint strategic planning as a stakeholder engagement strategy; majority of the respondents were engaged in information sharing which this study attributes to the high rate of farmer to farmer interactions. Engagements in joint strategic planning, crop management practices and resource identification was low which this study attributes to the more emphasized demand driven model of extension approach. On descriptive analysis, the composite mean and standard deviation agreed that performance of hybrid potato projects was high as explained by the various factors on stakeholders' engagement strategies. Linear regression yielded a positive slope implying a positive relationship between the independent variable (stakeholder's engagement strategies) and the dependent variable (performance of hybrid sweet potato projects). The R- Squared results implied that 3.4% of the variation in the performance of hybrid sweet potato projects was explained by the various factors in the stakeholder's engagement strategies. ANOVA results indicated that the model was statistically significant therefore the study concludes that the results were statistically significant. Further an overall F statistics brings the study to conclude that there exists a positive correlation because the slope of the population regression line is not zero. Hence based on these findings the study rejects the null hypothesis that there is no significant relationship between stakeholder's engagement strategies and performance of hybrid sweet potato projects in Njoro Sub-County. On qualitative results; the study concludes that a strong link is required between farmers, extension officers, and plant breeders. This study further concludes that attendance of agricultural field days and National agricultural shows was a valued engagement strategy.



### **5.3.4 Utilization of Extension Services and Performance of Hybrid Sweet Potato Projects**

Objective three of this study was to establish the extent to which utilization of extension services influence the performance of hybrid sweet potato projects in Njoro Sub-County. Conclusions made from frequency distribution results on the indicators of utilization of extension services include; that demand driven as an extension approach had the most emphasis in utilization of extension services as 92.31% of the respondents agreed that it was mainly used. This study also concludes that commodity interest groups had been formed as 84.62% were engaged in groups, farmer field schools was being used as an extension approach with 54.62% of the respondents in agreement while training and visit was rarely used as an extension approach with 5.77% of the respondents in agreement. On extension schedules; this study concludes that extension schedules were in place where annual schedules were the most common with 96.54% of the respondents in agreement, quarterly schedules were also used with 81.54% of the respondents in agreement while monthly schedules were rare with 2.31% of the respondents in agreement. The study also concludes that impact assessments were used in utilization of extension services as 90.00% of the respondents agreed that effects of extension services were being felt. The study concludes that gaps identified during extension were being addressed as 44.23% of the respondents were in agreement while adoption level was also used as an impact assessment method with 40.38% of the respondents in agreement. On extension methodology as an indicator of utilization of extension services, this study concludes that extension feedback mechanisms were in place with 59.23% of the respondents in agreement, record keeping was also practiced in extension as a methodology. This study further concludes that research instruments were being used as an extension methodology as 13.84% of the respondents were in agreement. The overall composite mean for the utilization of extension services and performance of hybrid sweet potato projects agreed that performance of hybrid potato projects was high as explained by the various factors on utilization of extension services. A linear regression result makes the study conclude that a positive significant relationship exists between the independent variable (utilization of extension services) and the dependent variable (Performance of hybrid Sweet Potato Projects). The R- Squared implied that 11.2% of the variation in the performance of hybrid sweet potato Projects was explained by variation in the utilization of extension services. ANOVA results brings this study to conclude that the model was statistically significant at  $F(1,253) = 21.482$  and that

there exists a positive correlation because the slope of the population regression line is not zero. Hence based on these findings the study rejects the null hypothesis that there is no significant relationship between utilization of extension services and performance of hybrid sweet potato projects in Njoro Sub-County. This study also concludes that for a one-unit increase in combined influence of project implementation process, the performance of hybrid sweet potato projects increases by 0.225. This, therefore, confirms that combined influence of project implementation process has a significant influence on the Performance of Hybrid Sweet Potato Projects in Njoro Sub-County. Qualitative analysis results on utilization of extension services yields the conclusion that farmers utilized extension services to improve performance of hybrid sweet potato projects through formation of commodity interest groups, scheduled visits, and through demand driven approach of extension where they look for advice from agricultural office at Njoro. The study also concluded that, attendance of field days and workshops was also a way of utilizing extension services.

### **5.3.5 Combined Influence of Project Implementation Process and Performance of Hybrid Sweet Potato Projects in Njoro Sub-County**

The fourth objective of the study was to establish how the combined influence of project implementation process influenced performance of hybrid sweet potato projects in Njoro Sub-County. Linear regression results that  $r = 0.225$ , the study concludes that there's a positive significant relationship between the independent variable (Combined Influence of Project Implementation Process) and the dependent variable (Performance of Hybrid Sweet Potato Projects). R- Squared was 0.051 implying that 5.1% of the variation in the performance of hybrid sweet potato projects was explained by variation in the combined influence of project implementation process. ANOVA results yields the conclusion that the model was statistically significant at  $F(1,253)=1.192$ . The results that the  $p=0.000<0.05$ ,  $r= 0.225$  and  $R\ square=0.051$  and overall F statistics at  $F(1,253) = 1.192$ , yields the conclusion that there exists a positive correlation because the slope of the population regression line is not zero. Hence based on these findings the study rejects the null hypothesis that there is no significant relationship between the combined influence of project implementation process and performance of hybrid sweet potato projects in Njoro Sub-County.

### **5.3.6 Monitoring and Evaluation Practices and Performance of Hybrid Sweet Potato Projects**

Objective five of this study was to establish the influence of project monitoring and evaluation practices on performance of hybrid sweet potato projects in Njoro Sub-County. This study have made conclusions based on the frequency distribution results on monitoring and evaluation practices which include; monitoring and evaluation models used, monitoring and evaluation documentation done and monitoring and evaluation methodology used. The study therefore concludes that management oriented model was mainly used as represented by 52.47% of the respondents, objective oriented model was also used as 31.18% of the respondents were in agreement and the study also concludes that consumer oriented monitoring and evaluation model though used, was not as popular as management and objective oriented models as represented by 16.35% of the respondents. On monitoring and evaluation documentation as a practice, the study concludes that training reports were being documented as represented by 28.14% of the respondents, the study also concludes that project progressive reports were being documented as represented by 26.23% of the respondents, project completion reports were also used as represented by 25.09% of the respondents and the study further concludes that project financial reports were also part of the monitoring and evaluation documents used in the monitoring and evaluation practices as represented by 20.54% of the respondents. On monitoring and evaluation methodologies used, the study concludes that community meetings were being used as represented by 42.96% of the respondents, field visits were being done as represented by 29.28% of the respondents and the study further concludes that unstructured interviews were part of the monitoring and evaluation methodology as represented by 27.76% of the respondents. A composite mean (M) of 3.5639 and a standard deviation (SD) of 0.3800 yields the conclusion that performance of hybrid sweet potato projects was high as explained by the various factors on monitoring and evaluation practices.

Linear regression results that  $r = 0.085$  implied that a positive significant relationship exists between the independent variable (Monitoring and Evaluation Practices) and the dependent variable (Performance of Hybrid Sweet Potato Projects). R- Squared of 0.016 implied that 1.6% of the variation in the Performance of Hybrid Sweet Potato Projects was explained by variation in the monitoring and evaluation practices. ANOVA results indicated that the model was statistically significant at  $(F(1,253) = 1.286)$ . The study therefore concludes that

there exists a positive correlation because the slope of the population regression line is not zero, hence this study rejects the null hypothesis that there is no significant relationship between monitoring and evaluation practices and performance of hybrid sweet potato projects in Njoro Sub-County. The study further established that there is a significant positive relationship between monitoring and evaluation practices and performance of hybrid sweet potato projects with a correlation result; at  $r = 0.094$ . This study, therefore, concludes that it is critical to consider project monitoring and evaluation practices when practicing hybrid sweet potato projects.

### **5.3.7 Monitoring and evaluation practices on the combined influence of project implementation process and performance of hybrid sweet potato projects.**

Objective six under this study sought to establish how the moderating effect of project monitoring and evaluation practices influenced the combined influence of project implementation process and performance of hybrid sweet potato projects in Njoro Sub-County.

Correlation analysis using Pearson's Product Moment technique was done to determine the influence of project monitoring and evaluation practices on the combined influence of project implementation process and performance of hybrid sweet potato projects in Njoro Sub-County. Linear regression leads to the establishment of the following conclusion. This study concluded that project monitoring and evaluation practices had a weak positive relationship with performance of hybrid sweet potato projects ( $R = 0.091$ ). The model explained 0.8% of the variation in performance of hybrid sweet potato projects. 99.2% of performance of hybrid sweet potato projects is explained by other factors not considered in the model. The results were not statistically significant at  $P > 0.05$ . The results therefore did not satisfy condition in the third step in testing for moderation effect of project monitoring and evaluation practices on the relationship between combined influence of the implementation process and performance of hybrid sweet potato projects. The influences of project monitoring and evaluation practices ( $B = 0.050$ ,  $t = 1.081$ ,  $p > 0.05$ ) and combined influence of the implementation process ( $B = -0.006$ ,  $t = -0.107$ ,  $p > 0.05$ ) were not statistically significant. The model was also not statistically significant ( $R^2 = 0.008$ ,  $F = 0.591$ ,  $p > 0.05$ ). The statistical results at step three were not significant and thus did not provide the necessary conditions to progress to step 4 in testing for the moderating effect and did not support the

moderating effect of project monitoring and evaluation practices on the relationship between combined influence of the implementation process and performance of hybrid sweet potato projects.

The results were indicative of the fact that combined influence of the implementation process interacts with project monitoring and evaluation practices and the interaction has an effect on their influence on performance of hybrid sweet potato projects though the indirect effect was not clear from the results in this study. The study therefore concluded by rejecting the hypothesis that there is no significant relationship between project monitoring and evaluation practices on the combined influence of the implementation process and performance of hybrid sweet potato projects in Njoro Sub-County.

#### **5.4. Recommendations of the study**

This section presents the recommendations made based on the conclusions of this study. Recommendations were also made for policy and for methodology.

##### **5.4.1 Respondents Demographic information**

Conclusions from the demographic information of the respondents makes this study that on gender, majority of the respondents were females while males were less than half of the sampled population implied that females were more involved in hybrid sweet potato projects than their male counterparts. These calls for the government to scale up more involvement of males through various mobilization strategies based on the fact that majority of male youths are still unemployed. On age, this study recommends initiation of more enticing measures by mobilizing youth funds to bring on board more youths in these projects. Conclusions based on the relationship between level of education and performance of hybrid sweet potato projects, the study recommends more capacity building interventions involving training as the high level of illiteracy among the farming communities accounted for poor project implementation measures and predisposed the farmers to exploitation by middle men.

The study further recommends a more vibrant capacity building intervention and community mobilization strategies as there exists a great opportunity as majority of the respondents indicated having been involved in these projects for less than 6 years. On the

distribution of the respondents' by their size of land, the study recommends establishment of project scheme methods to pave way for more youthful practitioners in these projects as the land available were mainly owned by the elderly who had low level of education while the youths who had a higher level of education owned a small percentage of the land area.

#### **5.4.2 Capacity Building interventions and Performance of Hybrid Sweet Potato Projects**

This study recommends that, a more elaborate system of input supply and delivery among the farming community be established. The production and breeding of hybrid seed potato by Kenya Agricultural research and livestock organization at Njoro should be strengthened by establishing a potential data base and supply of the materials to would be new entrants to the projects. Documented data base should be established for the farmers to easily identify the hybrid seed potato multipliers and sufficient collaboration between the extension workers and the breeding station. The Non-Governmental organizations in support of farmers in provision of hybrid sweet potato varieties ought to be identified and encouraged to document their clientele data base. The study also recommends recruitment of more extension service providers to ensure that farming community received sufficient training on agronomic practices, crop management practices, best production practices, sourcing of planting materials and alignment of training gaps identified. Capacity building interventions among the farming communities, (Alex, et al 2012), asserts that many practitioners equated capacity building with only training of farmers in the agricultural training centers while this study argues that the approach of basing capacity building on skills set and competencies to individuals alone limits growth of extension services. Skills ought to be shared on a collegiality basis and inter disciplinary training involving various actors to promote transference of competencies and cross functions. Aker, (2010), in the same thought argues that capacity building is an essential component in development, but it is hardly practiced in line with required principles.

#### **5.4.3. Stakeholder's engagement strategies and Performance of Hybrid Sweet Potato Projects**

On stakeholders' engagement strategies; this study makes the following recommendations: On joint strategic planning as a stakeholder engagement strategy, information sharing should be encouraged and promoted through introduction of modern methods of

communication especially on social media since a high rate of information sharing, translates to a higher farmer to farmer interaction and learning that improves the performance of hybrid sweet potato projects. Engagements in joint strategic planning, crop management practices and resource identification were low which this study attributed to the more emphasized demand driven model of extension approach. This study recommends a holistic approach to extension including all the identified approaches; training and visit, farmer field schools, community interest groups and demand driven. The study also recommends the establishment of a strong link between farmers, extension officers, and plant breeders to realize improved performance of hybrid sweet potato projects.

#### **5.4.4 Utilization of Extension Services and Performance of Hybrid Sweet Potato Projects**

On utilization of extension services; this study makes the following conclusions; demand driven as an extension approach as emphasized in utilization of extension services is in itself not sufficient to boost hybrid sweet potato projects though it puts the farmers at liberty to choose among the various other farming projects available. This study recommends a holistic approach to include establishment of more commodity interest groups, farmer field schools and a more emphasis on training and visit by bringing more front line extension service providers on board. On extension schedules; this study recommends that extension schedules be more improved by increasing the monthly and quarterly visits as this promotes more interaction and learning between the extension service providers and the farmers. The study also recommends that impact assessments be more emphasized to identify and document the intended and un-intended effects of hybrid sweet potato projects. The stakeholders should collectively identify gaps during hybrid sweet potato projects implementation process in order to provide a participatory approach in making the necessary adjustments. On extension methodology, this study recommends a more emphasis on extension feedback mechanisms; record keeping and utilization of research instruments. This study also recommends a combined effort between extension service providers and farmers in developing research instruments to ensure ownership and sustainability on the extension methodologies. This study recommends a thorough collective approach on capacity building interventions, stake holders' engagement strategies and utilization of extension services to synergize the combined influence of project implementation process on performance of hybrid sweet potato projects in Kenya.

#### **5.4.5 Monitoring and Evaluation Practices and Performance of Hybrid Sweet Potato Projects**

On monitoring and evaluation practices, the study recommends more use of the consumer oriented monitoring and evaluation models to objective and management oriented models based on the beneficiary preference. The use of consumer oriented models ensures ownership and sustainability of the monitoring and evaluation practices. Identification and establishment of monitoring and evaluation documents for use should be emphasized to achieve an improved monitoring and evaluation exercise. On monitoring and evaluation documentation as a practice, the study recommends that all training reports on the hybrid seed potato, good agronomic and crop management practices, be made easily accessible to the farmers. Other monitoring and evaluation documents such as project progressive reports, project completion reports and financial reports; the study recommends establishment of a repository where all the stakeholders would access for learning purposes and for improved performance of hybrid sweet potato projects. On monitoring and evaluation methodologies used, the study recommends an increase in community meetings and field visits as they were popular among the farming communities as opposed to unstructured interviews. This study, therefore, recommends that it is critical to consider project monitoring and evaluation practices when practicing hybrid sweet potato projects.

#### **5.4.6 Recommendation for Policy**

The National Agricultural Sector Extension Policy should devise stakeholders' engagement strategies that are pluralistic and participatory in nature to encompass players both in the public and private sector such as the Non-Governmental organizations involved in distribution of hybrid sweet potato seed materials to farmers in various parts of the country. Adequate hybrid sweet potato project monitoring and evaluation activities can only be achieved with sufficient front line extension service providers with an achievement of low extension worker to farmer ratio. Engagement should be in both lower and higher level activities and from the initial to the last stage of project development. This will ensure ownership and sustainability of the extension monitoring and evaluation scheme methods to ensure projects are relevant to the beneficiaries needs. Organization leaders should take active part in designing monitoring and evaluation system and offer timely support and guidance to projects' stakeholders' to ensure activities are well executed and results and findings are communicated and used in decision making and planning.



The study has established that different extension providers use diverse methods, therefore numerous techniques such as face-to-face extension, on-farm demonstrations, agricultural shows, field days, film shows, adaptive on-farm trials, and mobile training units should be employed in a mixed mode method. Similarly, there ought to be multi-skilled extension agents to curb the challenge of piece-meal extension service delivery among clients who are usually faced with multiple problems. The use of formal collaboration methods among private and public ESPs could lead to a more vibrant interaction and avoid repetition of project implementation labors. This enhanced partnership and interacting amid extension and other service providers in hybrid sweet potato project implementation process should result in high appreciation of their position, pursuing of usual agenda among some of the service providers, and increase their confidence in a consistent planning agenda. The main trial consequently is to invent modalities for improving collaboration and networking among investors to deliver a mutual pounded for jointly addressing matters in M&E and extension service delivery and other pastoral growth provision facilities.

#### **5.4.7. Recommendation for Methodology**

This study used descriptive cross-sectional survey and correlational research designs. The study adopted a pragmatic paradigm that integrates both positivism and interpretivism or constructivism philosophical foundation. Both research design and the supportive paradigm enhanced the strength of findings and conclusions made from this study. The study also employed a mixed mode approach where both qualitative and quantitative data were collected and analyzed. Descriptive statistical analysis and hypothesis testing were carried out using simple linear regression and multiple regression analysis. A correlation was also done to establish the relationship between variables of the study. Qualitative data analysis for key informant's interviews was done by following a procedural process of sorting, and categorizing responses into themes and making the deduction from the themes. This complementarity capability of mixed mode builds the strength of this study by allowing descriptive explanation of study variables while showing the relationship among variable through inferential analysis as well as doing a triangulation of information from the different sources. Based on these strengths, this methodology is highly recommended.

### **5.5 Suggestions for further studies**

There is need to research more on the best modalities to engage private extension service providers in the public extension service arena. This would possibly generate a vibrant private-public partnership that enhances performance of hybrid sweet potato projects.

Capacity building interventions among stakeholders in agricultural projects cannot be limited to what this study has sought to investigate. There is a dire need to research further and establish the beneficial effects of the daily technological advancement to capacity building interventions among stakeholders engaged in these projects.

Monitoring and evaluation practices of projects in hybrid sweet potato projects could be enhanced by use of a multi-sectoral approach in which a pluralistic engagement of various public departments including health, infrastructure, education among others could be used to synergize the enhanced performance of these projects.

This study was confined to the implementation process on performance of hybrid sweet potato projects, there is need to research more on other project phases like project design so that aspects like value addition in sweet potato projects are well researched and documented.

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## APPENDICES

### Appendix I: Transmittal Letter

14<sup>th</sup> September, 2018

Duncan Taiti

University of Nairobi

Email: [amwaniki09@gmail.com](mailto:amwaniki09@gmail.com)

Phone: 0722269010

#### TO WHOM IT MAY CONCERN

I am a Doctor of Philosophy student at the University of Nairobi.

In order to fulfill the requirements for the award of this degree in Project Planning and Management at the University of Nairobi, am conducting a research study that seeks to establish the sweet potato projects implementation process on their performance in Nakuru County and the moderating effect of the monitoring and evaluation practices on the relationship between the two variables.

The purpose of this letter is to request you to participate as a respondent in this study by completing the attached questionnaire as accurately as possible as your views are considered important in this study. Please note that information given will be treated with utmost confidentiality and will only be used for the purpose of this study and at no time will your name be mentioned anywhere in the report.

Your honest participation will be highly appreciated.

**Yours Faithfully**

**Duncan MwanikiTaiti**

**Reg No. L83/83978/2014**

**University of Nairobi**

**Department of Distant and Open Learning**

## **Appendix II: Questionnaire for hybrid Sweet Potato farmers in Njoro Sub-County**

The purpose for this questionnaire is to collect information on the influence of hybrid sweet potato projects implementation process on performance of these projects in Njoro Sub-County and the moderating effect of monitoring and evaluation practices between the two variables. This questionnaire is structured into six sections. Section A, B, C, D, E and F in order to help generate responses that would address the research objectives. Respond to all items either by ticking or as per the instructions on each question. Kindly, respond to all the items as honestly as possible and for the purposes of this study, do not indicate your name anywhere on this questionnaire. Information collected will be used for academic purposes only and it is expected that the findings from this study will make a significant contribution towards enhancing performance of hybrid sweet potato projects in Njoro Sub-County.

Kindly fill in the information as directed in the various sections provided.

### **Section A: Demographic Information of the Respondents**

1. Name of your Ward in Njoro Sub-County.....
  2. Gender (a) Male ( ) (b) Female ( )
  3. Age Bracket in years 18-30 ( ) 31-35 ( ) 36-40 ( ) 41-50 ( ) above 50years ( )
  4. Highest level of education attained (Please tick one)  
(a) Primary Certificate ( ) (c) College Certificate ( )  
(b) Secondary Certificate ( ) (d) Post graduate ( )
- Others, (specify).....



9. Kindly rate the following factors or statements using a scale of;

**SA**-Strongly Agree (5); **A**- Agree (4); **N**- Neutral (3); **D**- Disagree (2); **SD**- Strongly Disagree (1)

<b>Parameters</b>	<b>Strongly Agree (SA)</b>	<b>Agree (A)</b>	<b>Neutral (N)</b>	<b>Disagree (D)</b>	<b>Strongly Disagree (SD)</b>
Hybrid Sweet Potato production in yields in the farms have been increasing over time (Agronomic Efficiency)					
The Production in yield of hybrid Sweet Potatoes has been beneficial in costs and the benefits obtained (Economic sustainability)					
Hybrid sweet potatoes farming can be considered as environmental friendly (minimal pesticides used)					
Sweet potato farming offers the highest return than any other crop (Technical efficiency)					
Sweet potato farming does not require the use of pesticides in control of pests and diseases					
Sweet potato crops are rarely affected by pests and diseases					
Sweet Potatoes assists in controlling soil erosion					

10. In which ways do the farming practices of this crop affect its' performance as an agricultural project?

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**Section C: Capacity building on stakeholders and performance of Hybrid Sweet potato projects in Njoro Sub-County**

This section contains items on the influence of capacity building interventions during hybrid sweet potato projects implementation process in your farm.

11. Hybrid sweet potato farmers obtain the planting materials from the following areas

- a) From Kenya agricultural research and livestock organization based at Njoro
- b) From other farmers
- c) From Non-Governmental organization (Specify).....  
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- d) Other source (Specify).....  
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12. The Ministry of Agriculture has been assisting hybrid sweet potato farmers in the following areas;

- a) They supply planting materials ( )
- b) They do train on crop management ( )
- c) They recruit farmers ( )
- d) They often check on crop management ( )
- e) They advise on best production practices ( )

Any other assistance? (Specify) .....  
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13. Kindly rate the following factors or statements using a scale of;

**SA**-Strongly (5), **A**-Agree(4); **N**-Neutral (3); **D**-Disagree (2); **SD**-Strongly Disagree(1)

<b>Parameters</b>	<b>Strongly Agree (SA)</b>	<b>Agree (A)</b>	<b>Neutral (N)</b>	<b>Disagree (D)</b>	<b>Strongly Disagree (SD)</b>
Hybrid Sweet potato production volumes are heavily dependent on the vines planted					
To produce a high yield on the farm, farmers need to be trained					
High producing sweet potato varieties are bred from the research stations and supplied to farmers					
Our agricultural extension officers supply us with planting materials					
Agricultural extension officers guide us on how to plant the sweet potato vines					
Farmers are normally visited by agricultural extension officers during the crop growing stages					
Farmers are advised on hybrid sweet potato crop management practices like planting, weeding, feeding the crop and pest and disease control by field extension officers					
Farmers are invited for seminars/workshops or field days on how to source, grow and market the sweet potatoes. (Aligning training gaps identified)					

14. In which other ways do capacity building influence the performance of sweet potato projects in Njoro Sub-County?

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**Section D: Stakeholders engagement and Performance of hybrid Sweet Potato Projects in Njoro Sub-County**

This section contains items on the influence of stakeholder’s participation on performance of sweet potato projects in Njoro sub County

15. Production of Hybrid Sweet Potatoes is a combined effort of various stakeholders who include;

- a) Farmers ( )
- b) Extension Agents ( )
- c) Plant breeders at Njoro research station ( )

Others (Specify)

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16. Kindly rate the following factors or statements using a scale of;

**SA**-Strongly (5), **A**-Agree (4); **N**-Neutral (3); **D**-Disagree (2); **SD**-Strongly Disagree(1)

<b>Parameters</b>	<b>Strongly Agree (SA)</b>	<b>Agree (A)</b>	<b>Neutral (N)</b>	<b>Disagree (D)</b>	<b>Strongly Disagree (SD)</b>
We have been approached by extension workers to grow hybrid sweet potatoes					
We are advised on hybrid sweet potato crop management by extension workers on our farms					
We do report progress to extension agents as the vines grow on our farms					
Our agricultural officers trains us on how to produce sweet potatoes					
Our Agricultural extension officers guide us on how to plant the hybrid sweet potato vines					
We are encouraged to share information and communicate any challenges to extension agents					

17. In which other ways do stakeholder’s engagement strategies influence performance of hybrid sweet potato projects in your Sub County?

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**Section E: Utilization of Extension services and Performance of hybrid Sweet Potato Projects in Njoro Sub-County**

This section contains items on the influence of utilization of extension services on performance of hybrid sweet potato projects in Njoro Sub-County

18. Hybrid sweet potato farmers are assisted by the following groups of people;

- a) Other farmers ( )
- b) Agricultural Extension agents ( )
- c) Private consultants ( )
- d) Others (Specify)

.....,

19. Hybrid Sweet Potato farmers are assisted by extension service providers in the following areas;

- a) In sourcing of planting materials ( )
- b) Supervising the distribution of planting materials ( )
- c) They advise on spacing ( )
- d) They advise on management practices (feeding and pest and disease control) ( )
- e) They hold workshops and seminars on crop production ( )
- f) They send emails; make calls, and visit farmers one on one ( )
- g) Others (Specify)

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20. Kindly rate the following factors or statements using a scale of;

**SA**-Strongly (5), **A**-Agree (4); **N**-Neutral (3); **D**-Disagree (2); and **SD**-Strongly Disagree (1)

<b>Parameters</b>	<b>Strongly Agree (SA)</b>	<b>Agree (A)</b>	<b>Neutral (N)</b>	<b>Disagree (D)</b>	<b>Strongly Disagree (SD)</b>
Majority of farmers in our sub county who grow sweet potatoes have been advised by agricultural field officers					
Farmers enjoy various types of extension services including checkups on project impact					
Farmers in our sub county utilize extension services by visiting agricultural sub county offices for advise on control of diseases on sweet potatoes					
Our agricultural officers often trains us on how to apply manure and fertilizers on sweet potatoes					
Our Agricultural extension officers guide us on how to grow the sweet potatoes through various ways including emails, telephone and a sub county website					
Farmers are assisted through extension support services such as record keeping					

21. In which other ways do hybrid sweet potato farmers utilize extension services to improve performance of hybrid sweet potato projects?

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**Section F: Monitoring and Evaluation practices and Performance of hybrid Sweet Potato Projects in Njoro Sub-County**

This section contains items on the influence of monitoring and evaluation practices on performance of hybrid sweet potato projects in Njoro Sub County

22. Monitoring and Evaluation of hybrid sweet potato farming is done by the Ministry of Agriculture in the following ways;

- a) They visit the farmers to check and record progress ( )
- b) They train farmers on record keeping ( )
- c) They monitor the supply of planting materials ( )
- d) They monitor the planting procedures ( )
- e) They monitor the crop growing cycle ( )
- f) They evaluate the project after crop harvest ( )
- g) They help farmers to evaluate the cost benefit analysis ( )

23. The objective and the goal of farming hybrid sweet potato crops is explained by the extension agents

- a) Yes
- b) No

24. The indicators of performance such as profits, sustainability, agronomic and technical efficiencies are explained to the farmers

- a) Yes
- b) No

25. Kindly rate the following factors or statements using a scale of;

**SA**-Strongly Agree(5); **A**-Agree(4); **N**-Neutral(3); **D**-Disagree(2); **SD**-Strongly Disagree(1)

<b>Parameters</b>	<b>Strongly Agree (SA)</b>	<b>Agree (A)</b>	<b>Neutral (N)</b>	<b>Disagree (D)</b>	<b>Strongly Disagree (SD)</b>
Extension officers visit the farmers in order to monitor and evaluate hybrid sweet potato projects					
Farmers are involved in the various data collection methods used by extension service providers					
Farmers are advised by extension service providers on how to keep farm records on the varieties and other production aspects					
Agricultural officers visit farms to check on how farmers are producing hybrid sweet potatoes					
Agricultural extension officers guide on how to calculate profits from our farming activities					
Farmers are invited to learn on production challenges and advised on how to keep improving					
Hybrid sweet potato farmers communicate the project results through a laid out reporting system					

26. In which other ways do monitoring and evaluation influence performance of hybrid sweet potato projects?

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**Appendix III: Questionnaire for Extension Service Providers in hybrid Sweet Potato Projects in Njoro Sub-County**

The purpose for this questionnaire is to collect information on the influence of hybrid sweet potato projects implementation process on performance of these projects in Njoro Sub-County and the moderating effect of monitoring and evaluation practices between the two variables. This questionnaire is structured into six sections. Section A, B, C, D, E and F in order to help generate responses that would address the research objectives. Respond to all items either by ticking or as per the instructions on each question.

Kindly, respond to all the items as honestly as possible and for the purposes of this study, do not indicate your name anywhere on this questionnaire. Information collected will be used for academic purposes only and it is expected that the findings from this study will make a significant contribution towards enhancing performance of hybrid sweet potato projects in Njoro Sub-County.

Kindly fill in the information as directed in the various sections provided.

**Section A: Demographic Information**

1. Your Ward of jurisdiction in Njoro Sub-County

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2. Gender (a) Male ( ) (b) Female ( )

3. Age Bracket in years 18-30 ( ) 31-35 ( ) 36-40 ( ) 41-50 ( ) above 50years ( )

4. Highest level of education attained (Please tick one)

(a) Primary Certificate ( ) (c) College Certificate ( )

(b) Secondary Certificate ( ) (d) Post graduate ( )

Others, (specify)

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5. How long have you been involved in hybrid sweet potato projects in this sub-County?

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**Section B: Performance of hybrid Sweet Potato Projects in Njoro Sub-County**

This section contains items on performance of hybrid sweet potato project

6. Famers in this sub-county engage in hybrid sweet potato farming

- a) Yes
- b) No

7. Hybrid Sweet potato farming is beneficial in the following ways; (Tick as appropriate)

- a) Consumed at home as a household food ( )
- b) Sold at the market ( )
- c) For soil conservation to prevent soil erosion ( )
- d) Livestock fodder ( )

Other benefits (Please specify)

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8. Kindly rate the following factors or statements using a scale of;

**SA**-Strongly Agree (5); **A**- Agree (4); **N**- Neutral (3); **D**- Disagree (2); **SD**- Strongly Disagree (1)

<b>Parameters</b>	<b>Strongly Agree (SA)</b>	<b>Agree (A)</b>	<b>Neutral (N)</b>	<b>Disagree (D)</b>	<b>Strongly Disagree (SD)</b>
Hybrid Sweet Potato production in yields in the farms have been increasing over time (Agronomic Efficiency)					
The Production in yield of hybrid Sweet Potatoes has been beneficial in costs and the benefits obtained (Economic sustainability)					
Hybrid sweet potatoes farming can be considered as environmental friendly (minimal pesticides used)					
Sweet potato farming offers the highest return than any other crop (Technical efficiency)					
Sweet potato farming is a profitable farming activity					
Sweet potato farming does not require the use of pesticides in control of pests and diseases					
Sweet potato crops are rarely affected by pests and diseases					
Sweet Potatoes assists in controlling soil erosion					

9. In which ways do the farming practices of this crop affect its' performance as an agricultural project?

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**Section C: Capacity building on stakeholders and performance of Hybrid Sweet potato projects in Njoro Sub-County**

This section contains items on the influence of capacity building interventions during hybrid sweet potato projects implementation process in your farm.

10. Hybrid sweet potato farmers obtain the planting materials from the following areas

- a) From Kenya agricultural research and livestock organization based at Njoro
- b) From other farmers
- c) From Non-Governmental organization (Specify)

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d) Other source (Specify)

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11. The Ministry of Agriculture has been assisting hybrid sweet potato farmers in the following areas;

- a) They supply planting materials ( )
- b) They do train on crop management ( )
- c) They recruit farmers ( )

d) They often check on crop management ( )

e) They advise on best production practices ( )

Any other assistance? (Specify)

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12. Kindly rate the following factors or statements using a scale of;

**SA**-Strongly (5), **A**-Agree (4); **N**-Neutral (3); **D**-Disagree (2); **SD**-Strongly Disagree (1)

<b>Parameters</b>	<b>Strongly Agree (SA)</b>	<b>Agree (A)</b>	<b>Neutral (N)</b>	<b>Disagree (D)</b>	<b>Strongly Disagree (SD)</b>
Hybrid Sweet potato production volumes are heavily dependent on the vines planted					
To produce a high yield on the farm, farmers need to be trained					
High producing sweet potato varieties are bred from the research stations and supplied to farmers					
Our agricultural extension officers supply us with planting materials					
Agricultural extension officers guide us on how to plant the sweet potato vines					
Farmers are normally visited by agricultural extension officers during the crop growing stages					

Farmers are advised on hybrid sweet potato crop management practices like planting, weeding, feeding the crop and pest and disease control by field extension officers					
Farmers are invited for seminars/workshops or field days on how to source, grow and market the sweet potatoes. (Aligning training gaps identified)					

13. In which other ways do capacity building influence the performance of sweet potato projects in Njoro Sub-County?

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**Section D: Stakeholders engagement and Performance of hybrid Sweet Potato Projects in Njoro Sub-County**

This section contains items on the influence of stakeholder’s participation on performance of sweet potato projects in Njoro sub County

14. Production of Hybrid Sweet Potatoes is a combined effort of various stakeholders who include;

- a) Farmers ( )
- b) Extension Agents ( )
- c) Plant breeders at Njoro research station ( )

Others (Specify).....

15. Kindly rate the following factors or statements using a scale of;

**SA**-Strongly (5), **A**-Agree (4); **N**- Neutral (3); **D**-Disagree (2); **SD**-Strongly Disagree (1)

<b>Parameters</b>	<b>Strongly Agree (SA)</b>	<b>Agree (A)</b>	<b>Neutral (N)</b>	<b>Disagree (D)</b>	<b>Strongly Disagree (SD)</b>
We have been approached by extension workers to grow hybrid sweet potatoes					
We are advised on hybrid sweet potato crop management by extension workers on our farms					
We do report progress to extension agents as the vines grow on our farms					
Our agricultural officers trains us on how to produce sweet potatoes					
Our Agricultural extension officers guide us on how to plant the hybrid sweet potato vines					
We are encouraged to share information and communicate any challenges to extension agents					

16. In which other ways do stakeholder’s engagement strategies influence performance of hybrid sweet potato projects in your Sub County?

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**Section E: Utilization of Extension services and Performance of hybrid Sweet Potato Projects in Njoro Sub-County**

This section contains items on the influence of utilization of extension services on performance of hybrid sweet potato projects in Njoro Sub-County

17. Hybrid sweet potato farmers are assisted by the following groups of people;

- a) Other farmers ( )
- b) Agricultural Extension agents ( )
- c) Private consultants ( )
- d) Others (Specify)

.....  
.....  
.....

18. Hybrid Sweet Potato farmers are assisted by extension service providers in the following areas;

- a) In sourcing of planting materials ( )
- b) Supervising the distribution of planting materials ( )
- c) They advise on spacing ( )
- d) They advise on management practices (feeding and pest and disease control) ( )
- e) They hold workshops and seminars on crop production ( )
- f) They send emails; make calls, and visit farmers one on one ( )
- g) Others (Specify)

.....  
.....  
.....

19. Kindly rate the following factors or statements using a scale of;

**SA**-Strongly (5), **A**-Agree (4); **N**-Neutral(3); **D**-Disagree(2); and **SD**-Strongly Disagree(1)

<b>Parameters</b>	<b>Strongly Agree (SA)</b>	<b>Agree (A)</b>	<b>Neutral (N)</b>	<b>Disagree (D)</b>	<b>Strongly Disagree (SD)</b>
Majority of farmers in our sub county who grow sweet potatoes have been advised by agricultural field officers					
Farmers enjoy various types of extension services including checkups on project impact					
Farmers in our sub county utilize extension services by visiting agricultural sub county offices for advise on control of diseases on sweet potatoes					
Our agricultural officers often trains us on how to apply manure and fertilizers on sweet potatoes					
Our Agricultural extension officers guide us on how to grow the sweet potatoes through various ways including emails, telephone and a sub county website					
Farmers are assisted through extension support services such as record keeping					

20. In which other ways do hybrid sweet potato farmers utilize extension services to improve performance of hybrid sweet potato projects?

.....  
 .....



## **Section F: Monitoring and Evaluation practices and Performance of hybrid Sweet Potato Projects in Njoro Sub-County**

This section contains items on the influence of monitoring and evaluation practices on performance of hybrid sweet potato projects in Njoro Sub County

21. Monitoring and Evaluation of hybrid sweet potato farming is done by the Ministry of Agriculture in the following ways;

- a) They visit the farmers to check and record progress ( )
- b) They train farmers on record keeping ( )
- c) They monitor the supply of planting materials ( )
- d) They monitor the planting procedures ( )
- e) They monitor the crop growing cycle ( )
- f) They evaluate the project after crop harvest ( )
- g) They help farmers to evaluate the cost benefit analysis ( )

22. The objective and the goal of farming hybrid sweet potato crops is explained by the extension agents

- a) Yes
- b) No

23. The indicators of performance such as profits, sustainability, agronomic and technical efficiencies are explained to the farmers

- a) Yes
- b) No

24. Kindly rate the following factors or statements using a scale of;

SA-Strongly agree(5); A-Agree(4); N-Neutral(3); D-Disagree(2); SD-Strongly Disagree(1)

Parameters	Strongly Agree (SA)	Agree (A)	Neutral (N)	Disagree (D)	Strongly Disagree (SD)
Extension officers visit the farmers in order to monitor and evaluate hybrid sweet potato projects					
Farmers are involved in the various data collection methods used by extension service providers					
Farmers are advised by extension service providers on how to keep farm records on the varieties and other production aspects					
Agricultural officers visit farms to check on how farmers are producing hybrid sweet potatoes					
Agricultural extension officers guide on how to calculate profits from our farming activities					
Farmers are invited to learn on production challenges and advised on how to keep improving					
Hybrid sweet potato farmers communicate the project results through a laid out reporting system					

25. In which other ways do monitoring and evaluation practices influence performance of hybrid sweet potato projects?

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 .....

Other benefits (Please specify)

.....

**Appendix IV: Interview Guide for hybrid Sweet Potato breeders at Njoro Research Station**

The purpose for this interview is to collect information on the influence of hybrid sweet potato projects implementation process on performance of these projects in Njoro Sub-County and the moderating effect of monitoring and evaluation practices between the two variables.

The schedule is structured into six parts in order to generate information for each of the objectives for this study. Section A generates information on demographic information of the respondent while section B, seeks to generate information on performance of the hybrid sweet potato projects, implementation process including capacity building, stakeholders’ participation, utilization of extension services and the moderating effect of Monitoring and Evaluation.

For the purpose of this study, the respondents name shall remain anonymous and shall not be included on this interview guide.

**Section A: Demographic Information**

1. Your professional qualifications

.....

2. How long have you worked in this research station on hybrid sweet potatoes? (Please tick as appropriate)

1 to 5years ( ); 6 to 10 years ( ); 11 to 15years ( ); 16 to 20years ( ); over 20years ( )

3. In which ward do you assist farmers within Njoro sub-County?

.....

**Section B: Performance of hybrid Sweet Potato Projects in Njoro Sub-County**

4. How would you rate the performance of your research institute in meeting the needs of hybrid sweet potato farmers in Njoro Sub-County?

Very effective (5) ( )

Effective (4) ( )

Somewhat effective (3) ( )

Neither (2) ( )

Not effective (1) ( )

5. In your own opinion, what are the indicators of performance of hybrid sweet potato projects among farmers?

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.....

6. In which ways do you involve hybrid sweet potato farmers in assisting them realize increased yields?

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7. In which ways have you been involved in training hybrid sweet potato farmers' on documentation and record keeping?

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8. How does hybrid sweet potato projects implementation process influence performance of these projects?

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9. As a member of the crop breeding team, in which ways do the institute carry out capacity building among hybrid sweet potato farmers?

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10. How does your institute assist farmers in capacity building for good performance of their sweet potato projects?

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11. In which ways do you assist hybrid sweet potato farmers in sourcing of planting materials?

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.....

12. In which ways do your research institute train farmers on best production practices?

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.....

13. In which ways are the farmers involved through a participatory process towards improved performance of sweet potato projects?

.....  
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14. In which ways do you carry out monitoring and evaluation to ensure farmers follow the research guidelines?

.....  
.....

15. Which factors influence your ability for monitoring and evaluation?

.....  
.....

16. In which ways do you assist the hybrid sweet potato farmers in cost benefit analysis of their projects?

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17. Any other comment on the institutions' link and interaction with hybrid sweet potato farmers?

.....  
.....

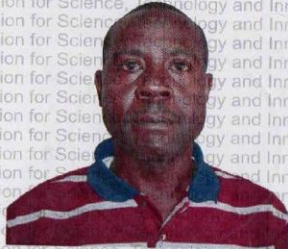
Thank you for your participation.

**Appendix V: Research Permit**

**THIS IS TO CERTIFY THAT:**

**MR. DUNCAN MWANIKI TAITI**  
**of UNIVERSITY OF NAIROBI, 0-20100**  
**NAKURU, has been permitted to conduct**  
**research in Nakuru County**  
**on the topic: PROJECT**  
**IMPLEMENTATION PROCESS,**  
**MONITORING AND EVALUATION**  
**PRACTICES AND PERFORMANCE OF**  
**HYBRID SWEET POTATO PROJECTS IN**  
**KENYA: A CASE OF NJORO SUB-COUNTY,**  
**NAKURU COUNTY,**  
**for the period ending:**  
**12th December, 2019**

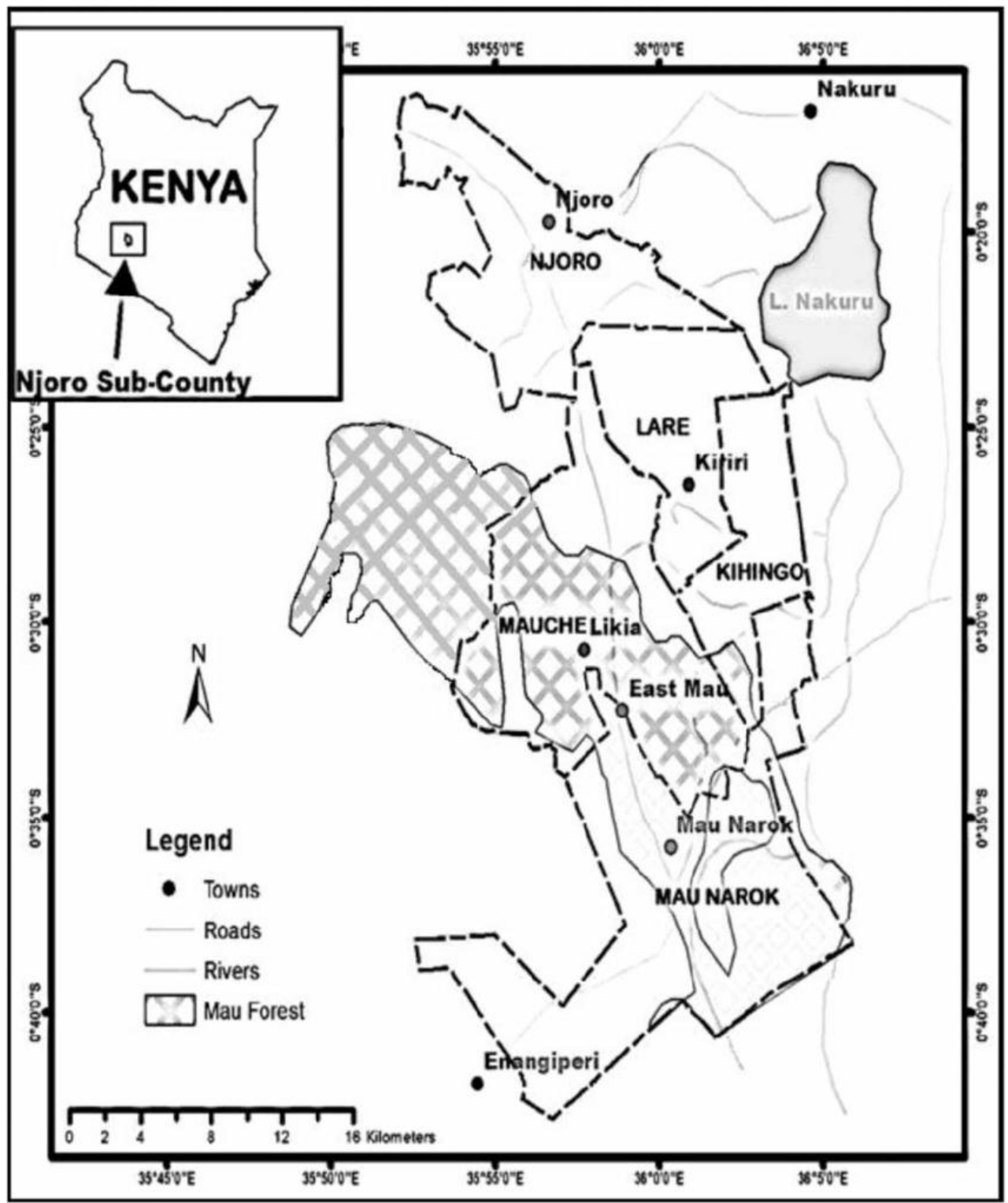
**Permit No: NACOSTI/P/18/20679/27240**  
**Date Of Issue : 12th December, 2018**  
**Fee Received :Ksh 2000**



*[Handwritten Signature]*  
**Applicant's Signature**

*[Handwritten Signature]*  
**Director General**  
**National Commission for Science,**  
**Technology & Innovation**

Appendix VI: Map of Njoro



## Appendix VII: Declaration of Originality

This form must be completed and signed for all works submitted to the University for examination.

Name of Student \_\_\_\_\_

Registration Number \_\_\_\_\_

College \_\_\_\_\_

Faculty/School/Institute \_\_\_\_\_

Department \_\_\_\_\_

Course Name \_\_\_\_\_

Title of the work \_\_\_\_\_

### DECLARATION

1. I understand what Plagiarism is and I am aware of the University's policy in this regard
2. I declare that this \_\_\_\_\_ (Thesis) is my original work and has not been submitted elsewhere for examination, award of a degree or publication. Where other people's work or my own work has been used, this has properly been acknowledged and referenced in accordance with the University of Nairobi's requirements.
3. I have not sought or used the services of any professional agencies to produce this work
4. I have not allowed, and shall not allow anyone to copy my work with the intention of passing it off as his/her own work
5. I understand that any false claim in respect of this work shall result in disciplinary action, in accordance with University Plagiarism Policy

Signature \_\_\_\_\_

Date \_\_\_\_\_