COUNTY GOVERNMENT STRATEGIES INFLUENCING SUSTAINABLE DOMESTIC FOOD SECURITY IN TRANS-NZOIA COUNTY, KENYA

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DECLARATION

This research project report is my original work and has not been submitted to any University for any academic award.

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This research project report has been submitted for examination with my approval as the University supervisor.

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DEDICATION

This research is dedicated to my late parents Mr. Osanya Wamukota and Selina Nanditi and my dear wife, Mactilda Nanyama, my children Nabalayo, Nanditi, Namubuya and Nanjala and my grandson, Jayden Keya Wamukota.

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ABRERVIATIONS AND ACRONYMS

BA: Beneficiary Assessment

CDF: Constituency Development Fund

CIDP County Integrated Development Plan

DOF: Director of Finance

FDG: Focused Group Discussions

GoK: Government of Kenya

KII: Key Informant Interview

M&E: Monitoring and Evaluation

NACOSTI: National Commission for Science, Technology & Innovation

NDPC: National Development Planning Commission

OECD: Organization of European Co-operation for Development

PRA: Participatory Rural Appraisal

PM&E: Participatory Monitoring and Evaluation

RBB: Results Based Budgeting

RNMES: Results Based Monitoring and Evaluation System

UN: United Nations

UNDP: United Nations Development Program

ABSTRACT

This study sought to examine the strategies taken by County government of Trans-Nzoia towards the achievement of sustainable domestic food security for its populace. The study sought to achieve this through four objectives which included: to determine the extent to which the provision of subsidized farm inputs influence the achievement of sustainable domestic food security, to establish the extent to which farmer group trainings influence sustainable domestic food security, to examine extent to which the farm follow up visits influence sustainable domestic food security and to assess extent to which farmer field days influence sustainable domestic food security. The study sought to test the following four hypothesis: there is a significant correlation between provision of subsidized farm inputs and sustainable domestic food security, there is a significant correlation between farmer group trainings and sustainable domestic food security, there is a significant correlation between farm follow up visits and sustainable domestic food security and finally there is a significant correlation between farmer field days and sustainable domestic food security. The study adopted descriptive survey design with a target population of 1,201 farmers and a study sample of 291 respondents. This survey design was chosen since triangulation of data was required in this study. The study is grounded on the outcomes theory which underpins sustainability aspects desired in the study. The structured (close-ended) questionnaires were used to collect the required data. Data collected was analyzed using Statistical Package for Social Scientists (SPSS). The researcher recruited two competent research assistants to help in the data collection exercise. Proportionate random sampling methodology was utilized to sample the farmers that were interviewed per location which was the unit of analysis. The questionnaires were pilot-tested two weeks prior to actual data collection process using 29 farmers who were eventually excluded from the main study. Pilot testing of the questionnaire was done to refine its content and remove any ambiguities in questions asked. Questionnaire response rate was 82.47%. Content and construct validity were used to measure appropriateness of the questionnaire while Cronbach's Alpha method was used to measure reliability of the questionnaire. The Cronbach's Alpha value obtained was 0.85 meaning all sections of the structured questionnaire were valid.

CHAPTER ONE

INTRODUCTION

1.1 Back ground of the Study

Food insecurity is a subject of concern for many developing nations. Many Countries consider food insecurity is considered a threat to stability and security. Domestic food security is given invariable consideration in most economies of the developed World (FAO, 2016). Food security is a multifaceted phenomenon that touches on almost all aspects of life (Zahir & Amir, 2016). In many Countries in Africa and South Asia, food security has proved hard to achieve hence becoming difficult. In order to evade the trap of insecurity and understanding factors that cause widespread hunger and food vulnerability, governments have to design new approaches to deal with this phenomenon. It had been approximated that 500 million people are in Africa and South Asia have insecurity with regard to food. (FAO, 2016).

The mechanisms available to alleviate the impacts of food insecurity have remained an important area of study by many scholars interested in the welfare of societies (Braunet al., 1993). World Food Programme, Food and Agricultural Organization and the International Fund for Agricultural Development (2013) noted that 842 million people, suffer from the vagaries of hunger globally with Africa being the most affected where one in four people suffer from chronic hunger. In Asia, the home of three-fifths of the world's undernourished people, more than 900 million survive on less than 1.25 dollars per day (Albino, Tine, Jean-Paul, 2016). In India, 230 million undernourished people constituted 21% of the national population in 2005 (FAO, 2009). These statistics indicate

that large populations of the World face food shortages. This sad state of affairs calls for urgent and intermittent measures to stem food insecurity globally.

There has been a steady rise in the number and proportion of undernourished people in the recent past constituting about 31%. In Haiti for instance, an additional 6% rise in the underfed population in the previous decade has been reported making the food insecurity situation comparable to some African Countries (Samuel & Olalekan, 2017).

Similarly, in Africa, the state of food security has been worsening since 1970s and the percentage of the malnourished population still remains within the 35% range in sub-Saharan Africa (Sulser & Valmonte-Santos, 2005). In Northern Africa, the situation of food insecurity is at 4% which is lower than that of Central Africa. Sources in Uganda show that domestics were self-sufficient in food production in the past 30 years but this changed in the 1980s with population growing by about 109%, while total food production at about 17%.

In Kenya, however, over 10 million people are food insecure (Marie *et al.,* 2015). The food security situation in Trans Nzoia County is no better. According to the 2009 Population and Housing Census, 818,757 people were counted in Trans Nzoia County. The inter-censual rate of growth was 3.6 % between 1999 and 2009. The country's population 2018 is expected to be 1,111,686 persons. About 60 per cent of the total population is food insecure (Trans Nzoia CIDP, 2013-2017).

1.2 Statement of the Problem

Domestic food security is determined by myriad factors. Some of these factors range from poor plans, inadequate investments in agriculture by governments and poor farming techniques among others. Many Countries continue to experience food insecurity at the domestic level. Kenya has still not managed to eradicate food insecurity fifty years after independence and periodically suffers from chronic food insecurity (Julien *et al.*, 2015). Despite massive investments in agriculture, the Country has not been able to achieve food security status. Food insecurity is cited as a constant challenge to development in Kenya (Julien *et al.*, 2015).

The government continues to pump billions of shillings to the ailing Agricultural sector. For the last five years alone, the Kenya government has invested 1.7 trillion shillings to modernize agriculture through projects and other interventions (GoK, 2017). The Kenyan government continues to invest in the sector with a single focus of achieving sustainable domestic food security. Despite these massive investments, the performance of the agricultural sector has remained dismal. A lot of studies have been undertaken to examine the influence of various factors on domestic food security. Whereas some authors have examined correlation s between some of this parameter, and demonstrated a substantial empirical evidence, research designs deployed sharply differ with the one adopted in this research.

Odongo, (2015) undertook a study on the influence of capacity building on domestic food security; however, the study did not capture quantitative aspects espoused in this research. Njuki et, al, (2008) undertook a study on influence of participatory approaches on sustainability of communal food security initiatives and found strong correlations,

however, the study did not adopt the descriptive survey design, Aduda, (2015) undertook a study on the influence of devolved funds on performance of food security in Kenya, however his study focused on a limited sample size. This study therefore differs from the previous works done in terms of scope and methodology. Most of the past work tended to adopt correlational survey designs. This study shall adopt descriptive survey design with a focus on testing linear correlation s (Creswell, 2011). Since most of the research done in the area of food security have emphasized on severity and causes. This study shall seek to establish influence of processes rather than outcome parameters. Knowledge to be generated from this study shall contribute to development of appropriate interventions.

1.3 Purpose of the Research

The objective of this study was to determine the policies set by the County government towards sustainable domestic food security in Trans-Nzoia County.

1.4 Objectives of the Study

This research was directed by the objectives below;

i. To establish the influence of subsidized farm inputs on sustainable domestic food security.
ii. To establish the influence of farmer group trainings on sustainable domestic food security.
iii. To examine the influence of farm follow up visits on sustainable domestic food security.
iv. To assess the influence of farmer field days on sustainable domestic food security.

1.5 Research Questions

This study wanted to answer the following research questions,

i. To what extent does the provision of subsidized farm inputs influence sustainable domestic food security?
ii. At what level does farmer group trainings influence sustainable domestic food security?
iii. To what extent does farm follow up visits influence sustainable domestic food security?
iv. How do farmer field days influence sustainable domestic food security?

1.6 Significance of the Study

It is hoped this research would be useful in influencing policy on food security in Kenya. Since food security is an important national matter, this study shall provide a basis for a rethink on this matter. On completion of this study, it is hoped, the study may help the County government officers to understand contribution of some of these measures towards the achievement of sustainable domestic food security and subsequently reinforce what is working and drop what is not.

The study would also inform agricultural stakeholders on the output of interventions on domestic food security. The study will hopefully provide empirical, research-based evidence on significant role played by parameters under study on achieving food security hence contribute significantly to the government's big Four agenda. The findings from the study will therefore be critical in providing research-based evidence that would support food security.

1.7 Limitations of the Study

The constraint of this study was lack of cooperation from beneficiaries of government subsidy programme as some might not perceive benefits, they would derive from the study. Farmers are generally suspicious and some suspected that the study was meant to unearth unethical practices. To circumvent this, the researcher explained the importance of this study to all respondents well in advance. The researcher also operated through the expansive structure of the Ministry of Agriculture to build confidence among the farmers.

Secondly, getting farmers to respond to a questionnaire during the short rains season was a big challenge since most of them shall were busy in farm preparation, to overcome this, the researcher booked appointments early enough and only met farmers during their free time.

1.8 Delimitations of the Study

The research sought to establish the measures undertaken by the County governments towards sustainable domestic food security. The study was delimited on collecting data from the farmers supported by the fertilizer subsidy programme only. The study was delimited to obtaining data from five variables under study that included subsidized farm inputs, farmer group trainings, follow up visits, farm field days and sustainability of domestic food security. The study was also delimited to the geographical boundaries of Trans-Nzoia County. The study was delimited to data collection using structured questionnaire.

1.9 Basic Assumptions of the Study

In this research, it was assumed that the research variables namely the provision of subsidized farm inputs, farmer group trainings, farm follow-up visits and field days determined sustainable domestic food security, the researcher also assumed that he would get full support from target respondents and that data and information sought by the researcher would be available. The researcher also assumed that target farmers would understand the magnitude of this research and provide accurate data.

1.10 Definition of Significant Terms Used in the Study

Farm Follow up Visits: These are the on-farm support visits made by extension staff to advice farmers on production

Sustainable Domestic Food Security: This is when everybody always has physical and economic access to safe, enough, and nourishing food to meeting their dietary needs and food preferences for an active and healthy life.

Farmer Group Trainings: This refers to training of farmers in common interest groups on various topics that lead to increased and sustainable productivity

Farmer Field Days: These are special days organized for the farming community to showcase their best production skills in farm exhibitions of best agronomic practices so as to learn from exhibited demos.

Provision of Subsidized Farm Inputs: these are cheaper farm inputs given to farmers by the government as an incentive to improve productivity

Government Strategies: plans the Trans Nzoia County Government that has put in place to achieve a long-term sustainable food security.

1.11 Organization of the Study

This study is structured in 5 chapters where the first one discusses the research background that includes problem statement, purpose of the research, objectives, research questions and hypotheses, limitations, implication of the study and delimitations of the research and definitions of significant terms.

Chapter two entails theoretic and experiential literature structured according to the theoretical underpinnings, study themes, theoretical and conceptual frameworks and a matrix on research gap identified after review of literature.

Chapter three covers study methodology that includes research design, the target population, sampling procedure, research instruments, data analysis techniques and operationalization of variables.

Chapter Four entails data analysis, presentation, interpretation and discussion of findings. Data in chapter four was analyzed using Statistical Package for Social Scientists (SPSS) version 20.0 and presented in the cross-tabulation tables with frequencies means,

standard deviations and percentages. Data was interpreted according to the findings of the research.

Chapter Five has summary of results, recommendations and conclusions. The section summarizes findings of the research and helps in drawing conclusions from data analyzed and proposes a number of recommendations in terms of theory, policy and practice. The chapter entails conclusions drawn from the study findings based on the statistical as well as qualitative analysis and gives recommendations on how impact can be achieved with application of study findings in development. The chapter also provides propositions for additional research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This Chapter empathizes on literature obtained from study themes that were developed from the study objectives. The themes of research include; provision of subsidized farm inputs and sustainable domestic food security, farmer group trainings and sustainable domestic food security, farm follow up visits and sustainable domestic food security and farmer field days and sustainable domestic food security. The chapter also has theoretical framework that underpins the study and conceptual framework that shows inter-correlation s between the study variables. The chapter also contains a matrix on research gap identified after the review of literature.

2.2 The Concept of Sustainable Domestic Food Security

According to the 1996 World Food Summit, food security was defined as admission by everybody always to enough and nutritionally appropriate and safe food for a healthy life. The Food and Agriculture Organization (FAO, 1996) and the World Bank, (2006), extensive research has been undertaken focusing on domestic food security, food insecurity and hunger, especially by some experts working in the American Institute of Nutrition (AIN). Subsequently, FAO and World Bank came up with various modifications of the definition of the term ‘food security’ and is now generally agreed that domestic food security is achieved when members of a particular household are able to acquire adequate and nutritious food that meet their dietary requirements (FAO, 2006).

Based on the World Bank (2006), food security focuses on three distinctive but correlated elements, that are vital towards food security achieving: food availability which involves having enough from domestic output, local production, commercial imports or food assistance; food access which entails having adequate resources to get appropriate food for a healthy diet, and depends on the income available, distribution of income in the domestic and food prices and utilization that entails the element of food consumption which further underlines the importance of such processes as storage, processing, marketing, feeding practices and levels of nutrition. The World Bank, (2006) also classified food insecurity in two categories; transitory and chronic. Prolonged food insecurity is a continuous insufficient diet brought by the inability to obtain food, and it affects domestics that persistently lack the ability either to buy enough food or to produce their own. It results from instability in domestic incomes, food production or food prices. Transitory food insecurity is often used to imply mild or moderate food insecurity (Devereux, 2006).

Food insecurity is a perception that can largely be addressed at the international, community, sub-national, regional, national, domestic and individual levels (Smith, 2004). Development of the food security concept was originally done with a relatively clear emphasis on national and international food supply. In the 1970s, food security was mostly related to the national and global food supply, but in the 1980s the focus shifted to questions of access to food at domestic and personal levels (Wiebe and Maxwell, 1998). Domestic food security accounts for the consumption levels of all members of a domestic. Domestic farm production and food security analysis at the domestic level necessitated an understanding of the domestic's ability to either produce enough food or

generate enough income to purchase food. Measures and Policies which have been effected by most countries to ensure food security are been considered inadequate. (Rohrbach *et al*., 1989).

Domestic food security is therefore a critical component of well-being. Domestics are expected to design strategies to ensure food sufficiency. Coping mechanisms should therefore be developed to ensure food sufficiency. Maxwell *et al.* (1992) assumed that many domestics access to food by consuming whatever they produce or by buying food during in the growing season from income earned from their harvest time sales or from off-farm work. Farmers are therefore anticipated to create income from selling their produce which can be used to purchase food apart from consuming what they produce from their farming activity. Income generated can then be used to serve as capital for the production of other supplies, such as livestock, thus allowing for broadening of farm enterprises and improved food base.

2.3 County Government Strategies towards Sustainable Domestic Food Security

This section presents empirical review of literature on strategies undertaken by County governments towards sustainable food security in Kenya.

2.3.1 Provision of Subsidized Farm Inputs

Farm subsidies have been used in many economies of the World to boost productivity. In America, the farm bill was designed to provide for agricultural subsidies which favour industrial agriculture (Mayrand, 2003). Agricultural subsidies in the European Union (EU) are mentioned as the main factors in the drop of the world sugar prices. Established nations spent about a third of their budgets on subsidizing farm inputs. In 2002, US spent

3.9 billion dollars on subsidies while Germany spent almost an equivalent amount in the same year. These subsidies have encouraged overproduction resulting to massive increases in production and increase in food security (UN, 2003).

The Green Revolution in Asia started in the 1960s with the introduction of fertilizer subsidy (Wayne & Walter, 2017). Enhanced access to fertilizer by the state-supported subsidy programme catapulted production thereby massively impacting food security. Asian governments also reinforced acceptance of new technology through extension and research, and intervened in the market through price support (World Bank, 2007). These measures alongside well-structured subsidies encouraged many domestics to invest in agriculture. The provision of subsidies in the field of agriculture has been cited for massive improvement of production in Asia.

In some African Countries, provision of subsidies was transformational to farming communities. In Malawi for instance, fertilizer and seed subsidies by the government and other state agencies has enabled subsistence farmers to increase maize production and realize food security. Malawi leads the way in Africa in presenting the opportunities and challenges of implementing a national input subsidy programme. With the motivation of recent high food prices and softening of donor opposition to subsidies, several of Malawi's neighbors are now building and adapting on this experience to implement and design similar programmes for refining agricultural productivity. Malawi's experience will continue to provide valuable lessons for achieving and sustaining Africa's Green Revolution (Hanli *et al.* (2016). The positive experiences from the Malawi subsidy programme are likely to be adopted in many other food insecure Countries within the sub-Saharan Africa region (Richard & Culas, 2016).

Experience has shown in other Countries, such as Kenya, Zimbabwe and Malawi that small scale, resource poor farmers can double or triple productivity of maize if subsidy programmes are introduced (Pipi & Teruaki, 2012). It is clear that the yield level portraying success in this for a farmer that pays discounted prices for subsidized fertilizer is still low compared to that of a farmer that pays commercial prices. From this scenario, the farmer that applies sponsored fertilizer might have incentive to over-apply fertilizer and under-apply other inputs such as irrigation, seed, and labour therefore receiving a lower marginal product Chimphango & Görgens, 2015).

In contrast, a farmer seems to be encouraged to use a productive asset as efficiently as possible regardless of how much he pays for it. In this sense one might expect farmers that received subsidized inputs to obtain similar response rates to farmers who purchase commercial inputs (Sibale, 2009). Commodity subsidy increases farmers` options to harmonize their choices with limited resources and changing circumstances hence improving their purchasing power. The biggest challenge facing development of agriculture subsidies is government commitment and availability of farm inputs, given the increased cost of living, agricultural subsidy programmes are the only available solutions to the counties (Ajinkya & Tanksale, 2015).

Many African Countries pursued large scale subsidy programmes from 1960's up through the 1980's (Bamlaku *et al.,* 2015). These programmes were characterized by a government-controlled input and output marketing system, in which farmers were supplied with agricultural inputs at controlled and subsidized prices and often on heavily subsidized credit. They were, however extremely expensive and most subsidies tended to benefit relatively well-off and better-connected farmers, and advances in agricultural

productivity depended on continued government assistance. Further, subsidy programmes were prone to inefficiencies due government controls to high, administrative costs and to a large extent political manipulation and patronage (Bamlaku *et al.,* 2015).

After the the subsidy programmes were stopped and the markets input liberalized part of the organizational modification process in the 1980's, the use of inputs and agricultural output dropped (Zahir & Amir, 2018). After the period of liberalized input markets by the end of the last century, new subsidy programmes began to emerge in several African Countries. The Malawian government then established the return to large-scale subsidies in 1998, when it began distributing subsidized fertilizer to farmers (Bamlaku *et al.,* 2015). Other countries, such as Zambia, Nigeria, Tanzania, Ghana and Kenya followed Malawi's example.

A significant outcome of that summit was the Abuja Declaration on Fertilizer for African Green Revolution, in which AU member states sought to increase fertilizer intensity to an average of 50kg/ha by 2015. One of the instruments in a five-point action plan was to implement smart subsidy programmes to improve access to fertilizers for small-holder farmers. Market-based solution smart subsidy programmes utilizes the further development of existing private input supply networks, rather than supplant them with state-controlled distribution systems. This enhances the efficiency of input delivery as well as increases the likelihood that the programme has a sustained impact after termination.

The agriculture sector is the backbone of Kenya's economy and a means of livelihood for most Kenyans. In an effort to stabilize farm input prices, the government has intervened by availing fertilizer at national cereals and produce board depots country wide through a subsidy programme. The programme seeks to ensure farmers are able to access agricultural inputs at competitive prices so as to boost productivity (Krishna, 2013). This is in recognition to the fact that the cost of living has increased tremendously and has impacted negatively to the farming community. Subsidy programmes have therefore been developed to cushion farmers against high costs associated with acquiring farm inputs. These policies indorsed enormous costs on the national treasuries and contributed to the fiscal crises that most African governments experienced during the 1990s but they policies successfully improved production in many Countries (Smith et al., 1997).

2.3.2 Farmer Group Trainings and Sustainable Domestic Food Security

Farmer group trainings have been cited as being critical to betterment of the agricultural sector. There is a direct link between a farmer's performance and human capital endowment, capacity enhancement which comprises of both inborn and learned abilities and exposure (Krishna, 2013). The foundation for farmer education programme, extension services and various forms of formal and informal training enhances and expand farmers' human capital in many ways. Capacity enhancement at farm level and related initiative are undertaken to acquire knowledge, skills and competences that could be useful to add value and reduce food insecurity. Today, farmers are benefitting greatly from many sources of information such as published media, radio, social media, trainings and field days as well as from their own experiences and experimentation (Mohammed, 2015).

Farmer field schools are a common learning and extension methodology adopted worldwide. These schools apply experiential learning where they apply a group approach that facilitates farmers in decision making, problem solving and learning new technologies. This method is perfected in Taiwan, where a large chunk of extension work is done through local farmers' associations. Under this training model, practical educations is run by representatives employed by the farmers' associations at the township level and are funded by the farmers themselves (Alessandro *et al.,* 2013). As a result of this, there arise institutionalized linkages with research and other agencies critical in improvement of productivity. Group trainings have been hailed as very successful in this context especially at the local level (Alireza *et al.,* 2014).

Agricultural education, extension, and advisory services are better realized when groups are sought instead of individuals. Farmer groups have been cited for obligation to support learning and technology transfer apart from assisting farmers in communal based problem solving and allow them to become more actively embedded in agricultural knowledge and information system (Bibi *et al.,* 2014). Extension services are achieved faster when farmer groups are developed and group dynamics sorted. Groups are better tools in terms of information dissemination, technology transfer, advisory services and empowerment education. Farmer field schools are considered the best farmer group training approach that has been in use for years.

Kenya hosts more than 1,000 such schools where governments, donors, and non-governmental organizations actively promote the farmer field school approach as the best group training methodology (Janandani *et al.,* 2017). There has been minimal efforts to document in a logical way about the influence of group training approach on productivity

and sustainability of agricultural projects. A group comprises of two or more persons who are interacting in a way that everybody inspirers and is influenced by each other person. Farmer groups are characterized by shared values, interaction, beliefs, structure ideology and a common goal. Members of farmer groups influence lives of others because through these groups serious learning takes place. Cooperative societies being groups are made up of members from other groups. Internationally, cooperatives are mechanisms of socio-economic transformation (Nicholas & Yuhan, 2017).

Farmer groups are also critical in collective group marketing where members enjoy some reliable financial agreements and payments, secure reliable orders to ensure flow of market information and communication, enjoy relative availability in terms of quantity, time and place of inputs (Miranda *et al.*, 2016). Marketing groups are critical in transitioning new techniques, skills and new ways of gaining information. Krishna (2013) noted that marketing links between large retailers, agribusiness and farmers develop progressively in these groups. There is a general consensus that if appropriately designed and executed, farmer marketing groups improve agricultural productivity (Bhishna, 2015). Within these groups' farmer access agricultural extension services, important information, crop and livestock prices, new and existing technologies, modern animal husbandry practices and marketing information. Exposure to this kind of information improves a farmer's capacity to optimize the use of the scarce resources available.

Consciousness of prevailing technologies creates effective demand by providing an important signal to input distribution systems. Rural development agencies are constantly seeking new modalities for farmer education and extension systems. It is therefore noted

that group trainings for farmers is still considered one of the best approaches on farmer information dissemination and diffusion of key farming information.

2.3.3 Farm Follow Up Visits and Sustainable Domestic Food Security

Farm follow-up visits, adoption of new technology and sustainability in domestic food security have been considered to have significant correlation s. Follow up visits to farms by extension officers led to massive improvements in productivity in the 1970's. These visits include the arrangement of follow-up visits to farmers after adoption for further education on the technologies and techniques recommended. During such visits, farmers are accorded an opportunity to learn and be given freedom to decide their own individual destiny at farm level (Albino *et al.,* 2016). The practice of farm follows up visits has continued to thrive for thousands of years (Tanksale, 2015). Popularity of participatory approaches in rural development and agricultural extension heavily borrows from this approach.

Farm follow-up visits originated from the concept of participatory approaches in agriculture. Approaches to agricultural extension with regard to farm follow up visits continue evolving because the advent of the Green Revolution in the 1970s and 1980s. Agricultural extension mainly focused on increasing production via, farm follow up and technology transfer has adopted participatory demand-driven and decentralized approach in which accountability is geared towards the farmers (Albino *et al.*, 2016). While there has been a call for demand - driven agricultural extension for many decades, new ways of reaching farmers can have a significant impact, as they better reflect farmers ' local information needs. In this era of demand-driven agriculture, extension approaches should be designed to be both context and situation-specific (Tanksale, 2015).

There is therefore a growing necessity for tougher intermediaries which could assist with information access for diverse smallholders. However, to get the advantage of higher returns from agricultural productivity, there needs to be concerted efforts in providing the farming community with alternative approaches for effective capacity enhancement and backstopping. Since farmers requirement to access a variety of material, not only related to production technologies but also to the post-harvest processes, access to remunerative markets, price information, and business development. All this capacity can be enhanced if effective, regular and sustainable follow up visits are enhanced (Olalekan, 2017). Follow up visits could be assimilated with other amenities that sustenance information use.

2.3.4 Farmer Open Field Days

Farmer field days encompass the original purpose of agricultural extension. Under this model, special days would be set aside on which was farmers would come together and be exposed to new techniques and practices. Exhibitors from agricultural service providers would come to showcase their products and services to farmers. During such days, the use of facilitative methods such as small plot adoption would be used (Olalekan, 2017). It is increasingly acknowledged that extension services in developing Countries rely on field days to disseminate key agricultural information.

It is during such field days where extensive coverage of on-farm demonstrations are adopted and showcased to farmers (Wasiu *et al.,* 2016). During farmer field days, serious knowledge enhancement and capacity building is passed to farmers. A number of development agencies, including the World Bank, have in recent years promoted new approaches to agriculture and agricultural technology through field days. Though

initiated and first endorsed by Food and Agriculture Organization as a practical way of diffusing and passing farming concepts and practices, this approach has since evolved to include a broader coverage of other farm-relevant topics, exhibition of farming tools and modern farming technologies. In farmer field school approach, the trainer considered is as a facilitator, reflecting a paradigm shift in extension services (Julien *et al.,* 2015).

The typical farmer field days conveys to farmers understanding on agro-ecosystems analysis, within an integrated framework of livestock and crop management. A great importance during farmer field days is on practical tools used in farming. With the knowledge gained in field days, farmers are then expected to go and practice whatever they learned during field days to their farms (Wasiu *et al.,* 2016). Participatory and hands-on experimentation are a key principle during these field days. Although agricultural extension services are essential to promote farmers awareness of new and existing technologies, an increase in agricultural productivity is not sufficient in itself due to many factors that influence productivity. Farmer field days are therefore an important component in the agricultural extension architecture (Hanli *et al.,* 2016).

2.4 Theoretical Framework

This research is grounded on the outcome's theory since sustainable household food security may be an outcome of subsidised farm inputs, farmer training, farm follow-up visits and farmer open field days.

2.4.1 The Outcomes Theory

Outcomes theory was developed by Paul Duignan in 2008 as a theoretical foundation for thinking about and working with outcome systems in project interventions (Duignan, 2009). Outcomes theory grounds this study as it concerns itself with project delivery hence sustainability. Outcomes system identifies, measures prioritizes or hold parties to account for results generated by interventions. Outcomes theory systems are related to concepts such as management by results, strategic plans, results chains and results-based management systems. Outcomes theory underpins this study since it focuses on achieving outcomes in known sustainability in accountability systems, food security, evidence-based practice systems and best practices.

Outcomes theory envisages interactions between interventions against sustainability of food security. Outcomes theory therefore indicates a sub-set of interventions within which projects can operate and bring meaningful results (Shenhar, 2001). This theory links interrelated facets desired in performance of projects that include organizational evaluation, development, policy analysis, social science and economics (Duignan, 2009). This inter linkage is expected to increase efficiency in project delivery hence expand performance parameters. The continuous application of this theory means that it is hard for those building systems to gain quick access to generic principles without orienting their functions to existing principles (Williams, 2009).

The Outcomes theory therefore tends to increase the outcomes of system architecture, which include, related systems that deal with outcomes, by giving a clear common technical language, therefore helping stakeholders in project interventions avoid duplication and identify gaps to be filled by project interventions (Duignan, 2009).

Outcomes theory specifies structural features of well-constructed systems that help stakeholders without an important background on results thinking to construct sustainable and sound outcomes. Within outcomes theory exist models that are useful in predicting results of projects hence help stakeholders prepare for eventualities.

2.5 Conceptual Framework

The correlations between the variables under research are conceptualized as shown in Figure 2.1.

Figure 1: Conceptual framework

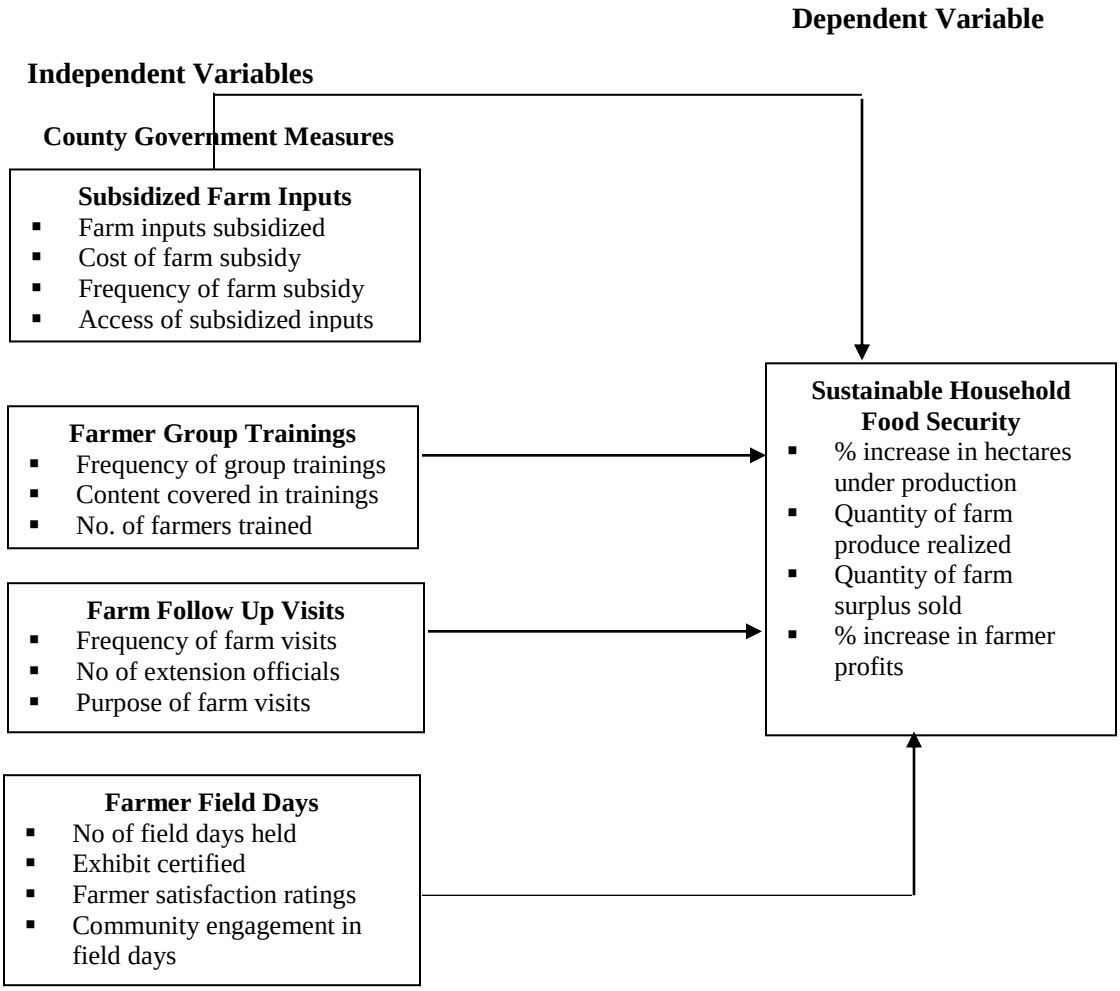

Figure 1 above depicts the measures that the County government of Trans Nzoia has implemented in order to achieve sustainable household food security. This is premised on the fact that access to food security is a right for every Kenyan, Constitution of Kenya 2010.

2.6 Knowledge Gap

Research gap identified after reviewing literature is as shown in Table 2.1.

Table 2.1 Knowledge Gap

Variable	Year and Author	Focus of the Study	Methodology	Findings	Knowledge Gap
Subsidized Farm Inputs and Sustainable Domestic Security	Louise & Jan, (2016)	Subsidized Farm Inputs and Sustainable Domestic Security	Descriptive survey design with proportionate random sampling on all respondents sampled	Found significant existent correlation s between variables	This study focuses on the extent to which Subsidized Farm Inputs influence Sustainable Domestic Security
Farmer Group Trainings and Sustainable Domestic Security	Richard & Culas, (2016)	Farmer group trainings and sustainable Domestic Security	The study adopted a comparative analysis using 200 self-administered questionnaires	Found significant existent correlation s	This study focuses on the extent to which farmer group trainings influence Sustainable Domestic Security
Farm Follow up Visits and Sustainable Domestic Security	Samuel & Olaken, (2017)	Farm follow up visits and Sustainable Domestic Security	Cross-sectional survey design with proportionate random sampling on 500 respondents sampled randomly	The study exemplified significant existent correlation s between the variables under study	This study focuses on the extent to which farm follow up visits influence Sustainable Domestic Security
Farmer Field Days and Sustainable Domestic Security	Wasiu et, al (2016)	Farmer field days and Sustainable Domestic Security	The study adopted a comparative analysis using 500 self-administered questionnaires and key informants	The study found significant existent correlation s between variables	This study focuses on the extent to which farmer field days influence Sustainable Domestic Security

2.7 Summary of Literature Reviewed

In this chapter, literature related to the study is discussed. Literature review focused on what researchers, scholars and other academicians found about the parameters on measures undertaken towards food security. The literature was examined according to the variables under study that include farmer group trainings, farmer follow up visits, farmer's field days and the provision of subsidized farm inputs were examined against the dependent variable which is sustainable domestic food security.

In order to ensure food security, sufficient access to food at the individual basis, domestic or population levels must always be met. Inadequate access to food can be caused by a sudden political, economic or climatic change resulting to high food prices resulting to food insecurity. Achieving greater food security is a noble goal and many would argue a moral responsibility. It is therefore prudent to consider all the said parameters in a research context.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter emphases on the study methodology that includes research design, target population, sample size and sampling procedure, reliability of research instruments, pilot-testing validity and data collection instruments data collection procedures, data analysis and presentation and ethical consideration.

3.2 Research Design

This study adopted a descriptive survey design which according to Yin, (2009) cited in Amir & Zahir (2016) the study design is "the logical sequence that connects the empirical data to a study's research questions and conclusions." On their part, Nachmias and Nachmias (1992) considers the study design as a model of proof which assists the researcher in coming up with logical conclusions about relations among the variables during investigation. In other words, it is a guide during the process of collecting, analyzing and interpreting observations. Wayne and Walter (2017) underlines that the main purpose of the design is to help to avoid the situation in which evidence does not address the initial research questions". It has to deal with a logical problem, not a logistical one. Therefore, the study design is much more than an ordinary of work plan.

The chief purpose for this descriptive study design was to get a full explanation of a single phenomenon within its context. This design will help to explain and expand empirical generalizations. Wayne and Walter, (2017) noticed this type of the research is suitable when it comes to description of the social phenomenon of interest such as to

describe demographic characteristics of the population and making predictions based on the main findings.

3.3 Target Population

The population target for this research was 1,201 farmers. This population, according to Annie et al., (2015) is that group to which a researcher wishes to take a broader view in a research. In this research, the target population was all beneficiaries in the fertilizer subsidy programme who are spread in Cherang'any, Kaplamai, Kwanza and Saboti wards of Trans Nzoia County.

3.4 Sample Size

Sample size in this research was gotten using the Krejcie and Morgan Table for sample sizes. In this table a population of 1,201 corresponded to a sample size of 291. The research applied stratified sampling procedure for the selection of the sample size for every category as shown in Table 3.1.

Table 3.1: Target Population and Sample Size

Ward	Target Population	Sample Size
Cherangany	296	72
Kaplamai	267	65
Kwanza	349	85
Saboti	289	69
Total	**1,201**	**291**

3.5 Sampling Procedure

Orodho and Kombo (2002) consider sampling as a procedure of identifying an amount of objects or people from a population where the particular group covers elements which are a representative of the characteristics found within the whole group. Singleton, (1998) further explains is as the process of choosing a few cases out of a large population for studying them and generalizing on the larger populace.

3.6 Research Instrument

To guarantee that the data collected addressed the purposes of the study; an instrument of data collection was selected correctly to avoid collecting of unrelated data (Mohammed 2015). This research, being descriptive in some features, and that it targets a relatively large population geographically spread, the researcher used questionnaires as the only data collection instruments. The questionnaire questions contained close ended questions. Questionnaires allowed greater uniformity in the way questions are asked, ensuring greater compatibility in responses. Questionnaire developed for this study entailed five sections. Section A had questions on demographic characteristics of respondents, section B had questions on subsidized farm inputs, section C had questions on farmer group trainings, section D had questions on farm follow up visits, section E had questions on farmer field days and section F had questions on sustainable food security. These questions were expressed on five-point likert scale on their opinions towards measures taken towards sustainable domestic food security. The five-point Likert scale points were; strongly agree (5), agree (4), undecided (3), disagree (2), strongly disagree (1).

3.6.1 Pilot-Testing of the Research Instrument

A pilot study was conducted to examine the appropriateness, validity and reliability of the questionnaire. The pre-test sample of this study was 10% of the target population (29 respondents). The pilot testing process was undertaken on farmers from Endebess Ward who are exempted from the actual study. Pilot-testing was bone done to identify and rectify errors in the questionnaire. This process was held 2 weeks prior to the main study.

According to Mohammed (2015), piloting is a necessary process as it ensures that the measurements are of acceptable reliability and validity. The questionnaires will be pilot-tested in Endebess division since this division has similar characteristics with the areas chosen for this study. Results from the pilot study will be used to adjust any ambiguities in the questionnaires. Piloting in this study is to provide crucial and valuable insights about the research study.

3.6.2 Validity of the Research Instrument

Content and construct validity were utilized in this research where validity in this study refers to the accuracy of the test measuring instrument with relation to what it was intended to measure (Cozby, 2001). In this study, validity is used to refer to the meaningfulness, usefulness and the suitability of the implications a researcher makes, while reliability on the other hand is a measure of the level to which a research instrument produces consistent results or data after repeated trials. Validity refers to the truthfulness of the research in regards to reality (Ashok & Kate, 2015). Validity indicates how well an instrument measures what is intended to be measured. Content validity which measures the degree to which data collected represents the content of the concept

being measured (Mugenda & Mugenda, 2009 cited in Ashok & Kate, 2015). A detailed literature evaluation was done to ensure content validity by recognizing the necessary items to measure the variables of the research.

3.6.3 Reliability of the Research Instrument

In this research, Cronbach's Alpha of determining reliability was applied. Cozby (2001) explained reliability as the capability of a machine, system or apparatus to steadily perform its intended or required function or mission, on demand and without degradation or failure. Reliability is a measure of the extent at which a research instrument produces consistent results or data after several trials

Reliability is dependability and consistency of data collected through recurrent use of a scientific instrument or data collection procedure under similar conditions (UNDP, 2002). Reliability measures the degree to which an instrument delivers the same score when administered at different times, locations, or populations. Internal consistency reliability of the instrument will be evaluated through calculation of Cronbach's alpha (coefficient alpha). Internal consistency reliability was determined by checking the components of a questionnaire against each other. The value of Cronbach's Alpha for each questionnaire section is as shown in Table 3.1.

Table 3.2: Cronbach's Alpha Values

Questionnaire Section	*Cronbach's Alpha Value*
Section B	*0.85*
Section C	**0.82**
Section D	**0.78**
Section E	**0.84**
Section F	**0.82**
Average Reliability	**0.85**

3.7 Data Collection Procedures

The researcher collected and used primary data which is basically the data originally collected. The use of primary data has been demonstrated by numerous authors who postulated that primary data has revolutionized growth of social science discipline. The unit for data collection was the individual farmer. Two research assistants were recruited to help collect the quantitative data. The research assistants were trained on research ethics, data management and data operations before deployment.

Prior to data collection, letters of transmittal of data collection expressing the desire to undertake research were sent to all study respondents to this research study. A research authorization approving the study was obtained from relevant government agency (NACOSTI) photocopied and given to research assistants. 291 questionnaires were printed and dispersed equally to the research assistants for onward distribution.

3.8 Data Analysis Techniques

This is the procedure of examining, cleaning, transforming, and modeling of data with the purpose of obtaining valuable information, supporting decision-making and suggesting conclusions (Cozby, 2001). The analysis of Data involved the reduction of collected data to a convenient size, looking for patterns, applying statistical techniques and developing summaries to generate information that will be used to answer research questions of the study and present the said results in understandable and convincing way. Data from questionnaires was first to be handled through the process of data management. This involved cleaning, sorting, identification of duplicates and identification of missing data.

Data so collected was analyzed using quantitative method. Quantitative method involved descriptive analysis. Data collected was analyzed for mean, frequencies, variances and results presented in cross tabulation. Quantitative data was analyzed using statistical software; Statistical Package for Social Science (SPSS) to get the statistical mean to determine the overall trend of data set, standard deviation to measure spread of data around mean.

3.9 Ethical Considerations

In this research, privacy was a key concern as the data relevant to the study was of great importance. It is due to this that the names of respondents were never revealed. Secondly, the researcher sought for a research permit from the National Commission for Science, Technology and Innovation so as to authorize this study. Information was not to be made available to anyone. Strict standard of anonymity was undertaken to ensure participants in the study remained anonymous.

The researcher also strived to maintain honesty in reporting data results by ensuring that there was no falsehood, fabrication or any form of data misrepresentation. The researcher also avoided bias in data analysis and interpretation

3.10 Operationalization of Variables

The operational definition of study variables is as shown in Table 3.3.

Table 3.3: Operational Definition of Variables

Variable	Type of variable	Indicators	Measurement Scale	Tools of analysis
Subsidized Farm Inputs and Sustainable Domestic Security	Independent	• Farm inputs subsidized • Cost of farm subsidy • Frequency of farm subsidy • Access of subsidized inputs	Interval	Linear regression
Farmer Group trainings and Sustainable Domestic Security	Independent	• Frequency of group trainings • Content covered in trainings • No. of farmers trained	Interval	Linear regression
Farm Follow up Visits and Sustainable Domestic Security	Independent	• Frequency of farm visits • No of extension officials • Purpose of farm visits	Interval	Linear regression
Farmer Field days and Sustainable Domestic Security	Independent	• No of field days held • Exhibit certified • Farmer satisfaction ratings • Community engagement in field days	Interval	Linear regression
Sustainable Domestic Security	Dependent	▪ % increase in hectares under production ▪ Quantity of farm produce realized ▪ Quantity of farm surplus sold ▪ % increase in farmer profits	Interval	Linear regression

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION

4.1 Introduction

This part entails data collected presented and interpreted in a manner that gives logical interpretation of research findings. The data that was collected was analyzed based on the themes of study that were developed from the objectives of the study. Data was analyzed using Statistical Package for Social Scientists (SPSS) version 20 and presented in the cross-tabulation tables with frequencies means, standard deviations and percentages. Data was interpreted based on the findings of study. These findings were compared with qualitative and empirical assertions contained in numerous literatures. Thorough analysis, descriptive and inferential statistics were employed.

4.2 Questionnaire Response Rate

Out of 291 questionnaires administered, a total of 240 were correctly filled and returned. They represent a questionnaire response rate of 82.47%. The response rate obtained in this study was considered very ideal for analysis. Mugenda and Mugenda (2003), states that a response rate of 50% is adequate, whereas a response rate of more than 70% is very good, the response rate in this study was considered sufficient to be used for making sound inferences.

Creswell, (2011) also ascribes to this assertion and confirms that response rates of 70% and above is good for sound analysis especially in quantitative studies. The response rate obtained in this research is therefore depicted as indicated in Table 4.1.

Table 4.1: Questionnaire Response Rate

Ward	Sample Size	Responses	Response Rate (%)
Cherangany	72	52	72.22
Kaplamai	65	55	84.61
Kwanza	85	70	82.35
Saboti	69	63	91.30
Total	**291**	**240**	**82.47**

4.3 Demographic Characteristics of Respondents

This study sought to gather information on demographic characteristics of respondents that were thought influential on the variables under study. The demographic characteristics examined included gender of respondents, age of respondents, highest level of education, and literacy level of respondents, average income and number of years supported by the project. The demographic characteristics of respondents obtained are tabulated as follows:

4.3.1 Distribution of Respondents by Gender

The distribution of respondents by gender was important in this study as it would help show if the projects being examined satisfied the constitutional threshold of 30% either gender in development undertakings. Gender distribution in development is therefore an important parameter. This distribution was obtained as shown in Table 4.2.

Table 4.2: Distribution of Respondents by Gender

Gender	Frequency	Percentage
Female	126	52.5
Male	114	47.5
Total	**240**	**100**

From Table 4.2 it is evident that gender distribution in this project was almost even with 52.5% being female and 47.5% being male. This means farmer distribution in the study area satisfies the constitutional threshold on gender.

4.3.2 Distribution of Respondents by Age

The study population was further analyzed on distribution by age to examine if the farmers supported were at a productive age span. Age as a parameter is important in this research since maximum productivity is usually realized by farmers in a productive age. Table 4.3 therefore indicates cross tabulation on distribution by age where majority of respondents (36.67%) were found to be between 36-40 years, followed by (29.16%) who were between 40-45 years. Respondents between the ages of 20-25 years were the least at 6.25% of the sampled population. This distribution is as shown in Table 4.3.

Table 4.3: Distribution of Respondents by Age

Age Bracket	Frequency	Percentage
20-25 Years	15	6.25
31-35 Years	45	18.75
36-40 Years	88	36.67
40-45 Years	70	29.16
Over 45 Years	22	9.16
Total	**240**	**100**

The distribution of respondents by age is significant in this study since it would be useful in indicating levels of farming experience; a parameter that would have a direct impact on reliability of data obtained. It was assumed that more reliable data would be obtained from more experienced (aged) respondents. The farmers within the ages 36-40 years and 40-45 years comprised the majority of respondents to this study.

4.3.3 Distribution of Respondents by Highest Level of Education

The level of education was important in this study as it would indicate the level of understanding of parameters being tested in the questionnaire. Higher levels of education are desirable research since more educated respondents would not only understand the study parameters but also articulate questionnaire items more effectively. As shown on Table 4.4, this study obtained data from well informed farmers.

Table 4.4: Distribution of Respondents by Highest Level of Education

Highest Level of Education	Frequency	Percentage
Primary School Level	34	14.16
Secondary School Level	98	40.83
Certificate Level	84	35
Diploma Level	24	10
Total	**240**	**100**

From Table 4.4, it is imperative that most of the respondents in this study (40.83%) had secondary school level qualification while 45% had a post-secondary school qualification. The researcher was therefore satisfied that data was obtained from educated and competent respondents. High levels of literacy can be attributed to their levels of education.

Combination of the education and literacy levels of study respondents is an indication of more reliability of the results under this study. Better educated farmers are ideally more aware and better informed. Literacy and levels of education were desirable in this study since enlightened farmers would understand what was being investigated more easily and respond.

4.3.4 Distribution of Respondents by Number of Years Supported by the Project

This parameter was considered important in this study since farmers supported by the project for longer periods would be more enlightened about the project hence hold wide understanding and provide better details in terms of responses. Farmers supported by the

project for longer periods would ideally be more aware and be better informed. Such farmers would understand what was being investigated more easily and respond more appropriately. Table 4.5 shows this distribution.

Table 4.5: Distribution of Farmers by Number of Years Supported

Number of Years	Frequency	Percentage
Less than 1 Year	25	10.41
2- 5 Years	95	39.58
6-10 Years	78	32.5
11- 15 Years	28	11.67
Above 16 Years	14	5.8
Total	**240**	**100**

From Table 4.5, it is evident that majority of the respondents (39.58%) had been supported for 2-5 years and 32.5% had been supported by the project for between 6-10 years meaning that most respondents had been supported for much shorter periods. This is a requirement in the project design.

4.4 Descriptive Statistics

Under this component, descriptive statistics of the analysis, distribution of responses is presented in terms of means, standard deviations and average mean. Average response of each question is reported under the mean, while how far the responses are from the average response is reported under the standard deviation. In all the cases of descriptive analysis, study population (N) represents the total number of respondents who gave a

response to a particular question, while the sample (n) is the number of respondents who responded to a particular category. These responses were from strongly disagree (SD) to strongly agree (SA) in terms of likert scale. Descriptive statistics on each of the study parameters follows:

4.4.1 Descriptive Statistics for Subsidized Farm Inputs

A total number of eight questions aimed at capturing the variable 'subsidized farm inputs' were included in the structured questionnaire. The descriptive analyses of eight indicators under this variable were measured and are reported in Table 4.6.

Table 4.6: Descriptive Statistics for Subsided Farm Inputs

Statement	n	Min	Max	M	SD
Majority of our farmers rely on farm subsidies for survival	240	3	4	4.12	0.61
All the subsidized farm inputs are cost effective	240	2	5	2.16	0.42
Subsided farm inputs are easily accessible by farmers	240	1	5	3.15	0.67
The county has put in place effective farm subsidy distribution	240	1	3	2.57	0.42
Required farm subsidies are done on regular basis	240	2	4	3.57	0.72
Government farm subsidies are regular throughout the year	240	2	4	4.04	0.78
There is too much corroboration in the farm subsidy service	240	1	4	2.57	0.45
Only politically connected farmers access farm subsidy inputs	240	1	5	3.56	0.45
Mean	**240**	**1.6**	**4.2**	**3.21**	**0.57**

The research findings on subsidized farm inputs in Table 4.6 showed using a mean score of eight statements measured was 3.21 and standard deviation of 0.57. From the individual item means and standard deviations, responses agreed strongly that majority of farmers relied on farm subsidies (M=4.12, SD=0.61), subsidized farm inputs are easily

accessible (M=3.15 SD=0.67) and government subsidies are regular throughout the year (M=4.04, SD=0.78). Respondents agreed to a lesser extent that there is too much collaboration in the farm subsidy service (M=2.57, SD=0.45) and that the County has put in place an effective subsidy distribution program (M=2.57, SD=0.42). The overall mean and standard deviation (M=3.21 and SD=0.57) implied that the responses in this study were not scattered but concentrated around the neutral responses. This showed that responses were similar and tended towards neutral.

4.4.2 Descriptive Statistics for Farmer Group Trainings

Eight questions were developed to examine the parameter group trainings, the questions included; attended numerous farmer group trainings in the past one year, group trainings were so informative, group trainings were well structured, group trainings helped improve my performance, recommend similar training to other farmers, such trainings should be held regularly and most of my farming friends were pleased with these trainings. Findings from descriptive statistics of this indicator are shown in Table 4.7.

Table 4.7: Descriptive Statistics for Farmer Group Trainings

Statement	n	Min	Max	M	SD
I attended numerous group trainings	240	3	4	4.12	0.58
Group trainings were so informative	240	2	5	4.16	0.42
Group trainings were well structured	240	1	5	3.15	0.66
Group trainings helped improve my performance	240	1	3	2.57	0.31
I recommend similar trainings to others	240	2	4	2.54	0.44
Regular trainings recommended	240	2	4	4.45	0.35
Friends pleased with these trainings	240	1	4	2.51	0.21
Training mode not practical	240	1	5	3.56	0.51
Mean	**240**	**1**	**4.2**	**3.38**	**0.44**

Research findings on the parameter farmer group trainings in Table 4.7 obtained using a mean score of eight statements was 3.38 and standard deviation of 0.44. From individual item means and standard deviations, responses agreed strongly that majority of farmers attended numerous group trainings (M=4.12, SD=0.58), group trainings were informative (M=4.16 SD=0.42) and that regular trainings were recommended (M=4.45, SD=0.35). Respondents agreed to a lesser extent that group trainings attended were well structured (M=3.15, SD=0.66), respondents would recommend similar trainings to others (M=2.54, SD=0.44) and training mode wasn't practical (M= 3.56, SD=0.51). The overall mean and standard deviation (M=3.38 and SD=0.44) implied that the responses in this study were not scattered but concentrated around the neutral responses. This showed that responses were similar and tended towards neutral.

4.4.3 Descriptive Statistics on Farmer Follow-up Visits

Questions developed to measure the parameter farmer follow up visits, been visited many times by the County extension team, the farm visits were informative, farm visits need to be expanded, farm visits helped improve my performance, recommend similar visits to others, farm visits should be regularly, I recommend such visits to my friends, farm visit approach be expanded the findings from descriptive statistics of this indicator is shown in Table 4.8.

Table 4.8: Descriptive Statistics for Farmer Follow-up Visits

Statement	n	Min	Max	M	SD
Been visited many times	240	3	4	3.02	0.14
Farm visits were so informative	240	2	5	2.16	0.32
Farm visits need to be expanded	240	1	5	3.15	0.16
Farm visits helped improve my performance	240	1	3	2.52	0.23
I recommend similar visits to other farmers	240	2	4	4.54	0.16
Regular farm visits recommended	240	2	4	4.45	0.30
These visits should be regular	240	1	4	4.51	0.44
This approach needs expansion	240	1	5	3.56	0.62
Mean	**240**	**2**	**4.2**	**4.18**	**0.55**

Research findings on the parameter farmer follow up visits in Table 4.8 obtained using a mean score of eight statements was 4.18 and standard deviation of 0.55. Individual item means and standard deviations responses agreed strongly that farmers were willing to recommend similar visits to others (M=4.54, SD=0.16), keen to recommend similar visits (M=4.45 SD=0.30), wanted such visits to be regular (M=4.51, SD=0.44). Respondents agreed to a lesser extent that such visiting approach needed expansion (M=3.56, SD=0.62), visits were informative (M=2.164, SD=0.32), improved performance (M= 2.52, SD=0.23). The overall mean and standard deviation (M=4.18 and SD=0.55) implied that the responses in this study were not scattered but concentrated around the agreed responses. This showed that responses were similar and tended to agree with most of the questions.

4.4.4 Descriptive Statistics for Farmer Field days

Questions were developed to examine the parameter farmer field days, these questions included; attended numerous farmer group trainings in the past one year, group trainings were so informative, group trainings were well structured, group trainings helped

improve my performance, recommend similar training to other farmers, such trainings should be held regularly and most of my farming friends were pleased with these trainings. Findings from descriptive statistics of this indicator are presented in Table 4.9.

Table 4.9: Descriptive Statistics for Farmer Field days

Statement	n	Min	Max	M	SD
I like the farmer field days	240	3	4	3.57	0.15
The farm visits are a powerful tool	240	2	5	4.41	0.42
Farming information is shared in field days	240	1	5	3.01	0.64
More field days should be held	240	1	3	3.27	0.23
I recommend similar field days	240	2	4	3.44	0.54
Field days should be regular	240	2	4	4.45	0.12
Content during field days relevant	240	1	4	2.54	0.27
Field days effective medium	240	1	5	3.56	0.44
Mean	**240**	**1.6**	**4.25**	**3.53**	**0.35**

Research findings on the parameter farmer field days trainings in Table 4.9 obtained using a mean score of eight statements were 3.53 and standard deviation of 0.35. From individual item means and standard deviations, responses agreed strongly that farm visits are powerful tools for disseminating information (M=4.41, SD=0.27), Respondents also agreed to a lesser extent that content of field days is relevant (M=2.54, SD=0.66), farmers liked field days (M=3.57 SD=0.15), would recommend similar field days (M=3.44, SD=0.54), most farming information is shared M= 3.01, SD=0.64) and more field days should be held (M= 3.27, SD=0.23).

The overall mean and standard deviation (M=3.53 and SD=0.35) implied that the responses in this study were not scattered but concentrated around the neutral responses. This showed that responses were similar and tended towards neutral.

4.4.5 Descriptive Statistics for Sustainable Domestic Food Security

Questions were developed to examine the parameter sustainable domestic food security, which was the dependent variable of this research. The findings from the descriptive statistics on this indicator are described in Table 4.10.

Table 4.10: Descriptive Statistics for Sustainable Domestic Food Security

Statement	n	Min	Max	M	SD
Realized increased production at farm level	240	2	4	3.04	0.47
Realized increased profit	240	1	5	4.21	0.41
More informed farmer with competences	240	2	5	3.11	0.16
I can comfortably train others	240	2	3	2.57	0.31
Consider myself a more exposed	240	2	4	2.54	0.44
Can encourage others	240	2	4	4.50	0.35
Farming now enjoyable	240	2	4	2.51	0.21
Doubled productivity	240	1	5	3.56	0.51
Mean	**240**	**1**	**4.2**	**3.21**	**0.33**

From the research findings on the dependent variable-sustainable domestic food insecurity as portrayed in Table 4.10 obtained using a mean score of eight statements was 3.21 and standard deviation of 0.33. From individual item means and standard deviations, responses agreed strongly that majority of farmers realized increased profit (M=4.21, SD=0.41), and can encourage others (M=4.50 SD=0.35). Respondents agreed to a lesser extent that project helped increase production at farm level (M=3.04, SD=0.47), could comfortably train others (M=2.57, SD=0.31), considered themselves exposed (M= 2.54,

SD=0.44), farming now enjoyable (M= 2.51, SD=0.21), and doubled productivity (M= 3.56, SD=0.51). The overall mean and standard deviation M=3.21 and SD=0.33 implied that the responses on the dependent variable of this study were not scattered but concentrated around the neutral responses. This showed that responses were similar and tended towards neutral.

4.5 Discussion of Findings

The study was undertaken to respond to four research questions and objectives which were later formulated into hypotheses that were tested using various test statistics. Prior to data analysis, data was scrutinized to guarantee variables of interest were computed appropriately and coded. No errors were found during the process of data computation. The quantitative phase of this study began, first by establishing the response rate. Establishing the response rate was necessary as a measure to enhance external validity. Accordingly, Sivo et al., (2006) high response rate is one of the factors that enhance the external validity. A response rate of more than 70% is considered very good (Babbie, 1990). The response rate of 82.47% that was obtained in this study was adjudged to be very appropriate. Quantitative data was further explored for different assumptions to conclude the appropriateness of the test statistics.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This section summarizes the study findings and helps in drawing assumptions from data analyzed and proposes a number of recommendations in terms of theory, policy and practice for the growth of the project monitoring and evaluation discipline. The findings of the study have been summarized according to research questions objectives and hypothesis of the study. The chapter entails conclusions drawn from the study findings based on the statistical as well as qualitative analysis. The chapter also gives recommendations on how greater impact can be achieved with application of study findings in development programs as well as implications of the study findings on policy, theory and practice of project management discipline. The chapter also provides the suggestions for future research.

5.2 Summary of Findings

The questionnaire response rate was found to be 82.47%; a figure adjudged too sufficient for competent analysis. Quantitative data was explored for assumptions to determine if the preferred test statistics would be appropriate

In conclusion, findings from this study show the widely held view by many commentators such as; Pollack and Singer (2007); Crawford (2003), Sullivan, (2011) and Kramach, (2006) that some of these agricultural models and approaches are very helpful in improving the performance of projects including sustainability dynamics. The summary of the hypotheses test results are shown in Table 5.1.

5.3 Conclusions

This study responded to the need to validate or refute knowledge claims on the measures taken by the County government of Trans-Nzoia on sustainable domestic food security. The conclusions deduced from this study are organized according to the objectives of the study. From the study findings it is safe to conclude that there exists strong positive significant correlation between the provision of subsidized farm inputs and sustainable domestic food security, there exists a positive significant correlation between farmer group trainings and sustainable domestic food security, there exists no any correlation between the farm follow up visits and sustainable domestic food security and that there is little correlation between farmer field days and sustainable domestic food security.

The findings from this study therefore give credence and empirical evidence to the adoption and utilization of agricultural-based interventions as utilized by the government of trans-Nzoia County.

5.4 Recommendations

The findings of this study have significant implications on theory, policy and practice of project management especially in the application of project management approaches in tracking progress and ensuring effective results measurement. These findings therefore have massive implications for project practitioners, consultants and general development practitioners among others.

5.4.1 Recommendations for Theory

The study provides a documented analysis and answers questions critical for the credibility and utilization of various project management approaches. The study also gives much credence to the principle of stakeholder engagement in project management process, which has been under scrutiny by many commentators for lack of documented evidence such as (Burton et al., 2006; Fraser et al., 2006; Jones, 2001 and Abbot and Guijt, 1998). This lack of a documented study undermines utilization of stakeholder-based approaches across the development spectrum.

5.4.2 Recommendations for Practice

Results from this study have shown that whenever primary stakeholders and project stakeholders are involved in projects, then desirable interventions and better performances are achievable. It is therefore imperative that participation in tracking project progress by beneficiaries be promoted at all costs. Both this study and other literature reviewed have shown that inviting participation in all the aspects of project cycle, including more technical data collection and analysis phases is critical. Accordingly, this study emphasizes the need to engage stakeholders and project beneficiaries in all stages of the project cycle. This implies project management teams should engage stakeholders using many methods for continuing communication and participation, establishing mutual trust and openness in communication during projects.

5.4.2.1 Subsidized farm inputs

Since the study showed that farm subsidies improved household food security, there is need for the governments to provide the subsidies, especially to the poor farmers. The inputs should availed on time and without undue influence by the politicians.

5.4.2.2 Agricultural Extension Services

Provision of agricultural extension services were proven in this study as imperative to enhanced food production. It is essential these services are availed as farmers need them. Therefore, the County governments should ensure that adequate extension personnel are hired to capacity build farmers to improve food security.

5.5 Contribution to Knowledge

The findings of this study may have relevance to and become a critical repository for project management knowledge for the industry and academia. The study findings could also become a key reference material for the government of Kenya, County governments and in particular, Trans Nzoia and NGO's keen on development programmes. Evidence attributed to this research will be useful for researchers and educationists keen to advance the project management as a discipline. The findings and empirical literature developed within this research will become a reference material for project management students around the World. Knowledge claims affirmed in this study will also form a basis of further research by researchers and practitioners.

5.6 Suggestions for Further Research

Although the purposes of the study were achieved, in future, it may be valuable to consider the following areas for further research:

1) This study was based on descriptive survey design, perhaps in future a similar study could be undertaken along other designs such as longitudinal or mixed mode.

2) A similar study could also be carried out on other programmes in other fields such as health, water and sanitation, public health among others.

3) Declining extension service providers should also be investigated to determine whether it affects food security.

4) The contribution of small medium and large-scale farmers should be studied to ascertain their contribution to sustainable household food security.

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APPENDICES

APPENDIX I: LETTER OF TRANSMITTAL OF DATA COLLECTION INSTRUMENTS

Edward Osanya
Nairobi University,
P.O. Box 45240 - 00100,
Nairobi, Kenya

1st October, 2018

Dear Sir/Madam,

RE: REQUEST FOR DATA

I am a Masters of Arts degree student in Project Planning and Management from the University of Nairobi. I am undertaking a research entitled "Measures Undertaken by County Government towards Sustainable Domestic Food Security in Trans-Nzoia County, Kenya". You have been identified to participate in this study as one of the respondents. You are therefore requested to voluntarily fill the attached questionnaire.

I guarantee you that any information you provide will be held in confidence and shall only be utilized for the academic purposes only.

For any queries or clarification kindly contact the undersigned

Yours Faithfully,

Edward W. Osanya

Mobile; 0724105644

APPENDIX II: QUESTIONNAIRE FOR FARMERS

This questionnaire is designed to gather information regarding "measures undertaken by County government towards sustainable domestic food security in Trans-Nzoia County, Kenya". Kindly respond as appropriate.

Date……Interviewer…….....

Section A: Demographic Characteristics of Respondents

Questions	**Codes**	**Response**
Gender of Respondent	1=Female; 2= Male	
Age of Respondent	Below 20 1=20-25 2=26-30 3=31-35 4=36-40 5=Above 40	
Highest Level of Education	1= No Formal Education 2=Primary School Level 3=Secondary School Level 4= Certificate Level 5=Diploma Level 6=Degree Level 7= Master degree Others (Specify)	
Number of years you were supported by this project	1= Below 1 year 2=Between 2-5 years 3=Between 5-8 years 4=Above 8 years	

Section B: Subsidized Farm Inputs

To what extent do you agree or disagree with the following? Select one option using the following measurement scale: 5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree and 1= Strongly Disagree

	Statement	**5**	**4**	**3**	**2**	**1**
1	Majority of our farmers rely on farm subsidies for survival					
2	All the subsidized farm inputs are cost effective					
3	Subsided farm inputs are easily accessible by farmers					
4	The county government has put in place effective farm subsidy distribution services					
5	Required farm subsidies are done on regular basis					
6	Government farm subsidies are regular throughout the year					
7	There is too much corroboration in the farm subsidy service					
8	Only politically connected farmers access farm subsidy inputs					
	Summary					

Section C: Farmer Group Training

To what extent do you agree or disagree with the following? Select one option:

5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1= Strongly Disagree

	Statement	**5**	**4**	**3**	**2**	**1**
1	I have over five numerous farmer group trainings in the past one year					
2	The group training, I attended were so informative					
3	The group trainings I attended were well structured					
4	The group trainings I attended have helped improve my performance as a farmer					
5	I recommend similar training to other farmers					
6	I propose that such trainings should be held regularly					
7	Majority of my farming friends were pleased with these trainings					
8	The training mode used should be changed to be more practical					
	Summary					

Section D: Farmer Follow-up Visits

To what extent do you agree or disagree with the following? Select one option using the following measurement scale: 5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree 1= Strongly Disagree

	Statement	**5**	**4**	**3**	**2**	**1**
1	I have been visited many times by the County extension team					
2	The farm visits that were held at my farm were informative					
3	The farm visit programme should be expanded to capture more information					
4	The farm visits that have been undertaken on my farm have improve my performance					
5	I recommend similar and more farm visits to other farmers					
6	I recommend that such visits should be held regularly					
7	Majority of my farming friends have well recommended these visits					
8	The farm visit approach should cover more ground					
	Summary					

Section E: Farmer Field Days

To what extent do you agree or disagree with the following? Select one option using the following measurement scale: 5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree 1= Strongly Disagree

	Statement	**5**	**4**	**3**	**2**	**1**
1	I like the farmer field days held					
2	The farm visits are a powerful tool to pass farming information					
3	Majority of the farming information is shared through field days					
4	More field days should be held so as to boost production					
5	I recommend similar and more farm field days to other farmers					
6	I recommend that farm field days should be held regularly					
7	The content shared during the farmer field days is irrelevant					
8	The farmer field days are an effective information dissemination medium					
	Summary					

Section F: Sustainable Domestic Food Security

To what extent do you agree or disagree with the following? Select one option using the following measurement scale: 5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree 1= Strongly Disagree

	Statement	**5**	**4**	**3**	**2**	**1**
1	I have realized increased production at farm level					
2	I have realized increase profit from my farming activity					
3	I am now a more informed farmer with competent skills					
4	As a farmer I can comfortably train and teach other farmers					
5	I consider myself a more exposed farmer than my peers in this area					
6	I can now confidently encourage other people to join farming					
7	Farming has become a very enjoyable income generating activity					
8	I am going to double the area under production so as to boost my capacity					
	Summary					

APPENDIX III: TABLE FOR DETERMINING SAMPLE SIZES

Table for Determining Sample Size for a Given Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size
"S" is sample size.

Source: Krejcie & Morgan, 1970