

**INFLUENCE OF PUBLIC PRIVATE PARTNERSHIPS ON MAIZE CROP
VALUE ADDITION IN KENYA: A CASE OF KIMILILI SUB-COUNTY**

BY

VINCENT TENGEYE MAKOKHA

**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENT FOR THE AWARD OF DEGREE OF MASTER OF ARTS IN
PROJECT PLANNING AND MANAGEMENT OF THE UNIVERSITY OF NAIROBI**

2015

DECLARATION

This research project is my own original work and has not been presented for award of degree in this or any other university.

Signature.....Date.....

Tengeye Vincent Makokha
L50/70681/2011

This research project has been submitted with my approval as the university supervisor.

Signature.....Date.....

DR. DISMUS BULINDA
Senior lecturer,
Department of Extra-Mural Studies,
University of Nairobi

DEDICATION

I dedicate this work to my parents for their love and commitments towards my basic education, my wife Catherine and children Brian, Laura, Faith, and Cynthia for their support towards my research project writing.

ACKNOWLEDGEMENT

I give many thanks to Dr. Dismus Bulinda for taking his time at short notice to guide and offer technical support and encouragement in my research project process. I also thank Mr. Vincent Marani of Bungoma Extra-Mural Sub-Centre for going through my work and recommending necessary changes. Secondly, my sincere thanks go to lecturers of my Master of Project Planning and Management course, for their basic support, dedication and commitment during course work.

Thirdly, my gratitude goes to non-teaching staff at the Extra –Mural Centre, in the University of Nairobi for their guidance and tireless efforts in providing logistics and administrative support during my course work. I also recognize the entire classmates in the Master of Arts in Project Planning and Management at the University of Nairobi for their participation in contributing to class assignments and discussions.

I also appreciate my family members for their moral and material support during the period of my studies. I am also grateful to all other people, who have not enlisted herewith, whose contributions guidance and advice enabled me complete my research proposal.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
LIST OF TABLES	viii
LIST OF FIGURES	ix
ABBREVIATIONS AND ACCRONYMS	x
ABSTRACT.....	xi
CHAPTER ONE.....	1
INTRODUCTION	1
1.1 Background of the study	1
1.2 Statement of the problem	8
1.3 Purpose of the study	9
1.4 Objectives of the study	9
1.5 Research Questions	9
1.6 Significance of the study	10
1.7 Basic assumptions of the study	10
1.8 Limitations of the study	10
1.9 Delimitations of the study	11
1.10. Definitions of Significant Terms	11
1.11 Organization of the study	12
CHAPTER TWO	13
LITERATURE REVIEW	13
2.1 Introduction	13
2.2. Financing support services and maize crop value addition	13
2.3 Access to market strategies and maize crop value addition	14
2.4. Extension, research and development and maize crop value addition	17
2.5. Infrastructure services and maize value addition	19
2.6 Theoretical Framework	20
2.7 Conceptual Framework	22
	23

2.8 Summary of Literature	24
CHAPTER THREE	25
METHODOLOGY	25
3.1 Introduction	25
3.2 Research Design	25
3.3 Target population	26
3.4 Sampling procedure and sample size determination	26
3.4.1 Sampling Size Determination	26
3.4.2 Sample Procedure	27
3.4 Data Collection Procedures	27
3.5 Data Collection Instruments	28
3.5.1 Pilot Study	28
3.5.2 Validity of the Research Instruments	29
3.5.3 Reliability of the Research Instruments	29
3.6 Data collection procedures	30
3.7 Data Analysis Techniques	30
3.8 Ethical considerations	31
3.9 Operational Definition of Variables	31
CHAPTER FOUR.....	33
DATA ANALYSIS, PRESENTATION AND INTERPRETATION AND DISCUSSIONS	33
4.1 Introduction	33
4.2 Questionnaire Return Rate	33
4.3 Demographic Characteristics of the Respondents	33
4.3.1 Gender of the respondents	33
4.3.2 Age of the Respondents	34
4.3.3 Education Level of Respondents	35
4.4 Financing Support Services by PPPs on Maize Value Addition	35
4.4.1 Value Addition Components for Financing	35
4.4.2 Key Reasons considered by Maize Actors to Seek Financing Support Services	36
4.4.3 High priority Financing Strategies	37
4.4.4 Integration of Training in Access to Financial Services	38

4.5 Access to Market Strategies and Maize Value Addition	39
4.5.1 Potential Markets channels for Maize	39
4.5.2 Main marketing of maize value addition constraints in Kimilili Sub County	40
4.5.3 Farmers preference to store maize for a long time	41
4.5.4 Farmers preference to collectively access maize value addition markets	42
4. 5.5 Partnerships with PPPs in Building Capacity of Farmers on Access to Markets	43
4.6 Extension and Research Services in Maize Value Addition	44
4.6.1 Extension and Research Support Services in Maize Value Addition	44
4.6.2 Service Providers of Extension and Research in Maize Value Addition	45
4.6.3 Critical Stage of Value Addition in Extension and Research	46
4.6.4 Skills offered by PPPs through Extension and Research in Maize Value Addition	47
4.6.5: Partnership in Maize Crop Value Addition	48
4.7 Infrastructure Supports Services and Maize Value Addition	49
4.7.1 Infrastructure Constraints that Limits Value Addition on Maize Crop in Kimilili	49
4.7.2 Infrastructure Facilities in Maize Crop Value Addition in Kimilili	50
4.7.3 Demand factors for small holder irrigation in Maize value addition	51
4.7.4 Infrastructure Facilities that Support of Maize Value Chain Development	52
CHAPTER FIVE	53
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS.....	53
5.1. Introduction	53
5.2 Summary of the Findings	53
5.3 Conclusions	57
5.4 Recommendations	59
5. 5 Suggestions for Further Research	59
REFERENCES	60
APPENDICES	66
APPENDIX 1: LETTER OF TRANSMITAL	66
APPENDIX 2: QUESTIONNAIRES	67
APPENDIX 3: INTERVIEW SCHEDULES	72

LIST OF TABLES

TABLE 3.1: SAMPLE SIZE DISTRIBUTION.....	27
TABLE 3.2: OPERATIONAL DEFINITION OF VARIABLES.....	32
TABLE 4.1: GENDER DISTRIBUTION OF THE RESPONDENTS.....	34
TABLE 4.2: AGE DISTRIBUTION OF THE RESPONDENTS	34
TABLE 4.3: EDUCATION LEVEL OF RESPONDENTS	35
TABLE 4.4 VALUE ADDITION COMPONENTS FOR FINANCING.....	36
TABLE 4.5: KEY REASONS FOR SEEKING FINANCING SUPPORT.....	37
TABLE 4.6: PRIORITIZED FINANCING STRATEGIES	38
TABLE 4.7: INTEGRATION OF TRAINING SERVICE IN ACCESS TO FINANCIAL SERVICES	39
TABLE 4.8 MAIZE MARKET CHANNELS.....	40
TABLE 4.9: MARKETING CONSTRAINT IN MAIZE VALUE ADDITION	41
TABLE 4.10: FARMERS CONCURRENCE WITH STORAGE OF MAIZE FOR LONG PERIOD.....	42
TABLE 4.11: FARMERS CONCURRENCE TO COLLECTIVELY ACCESS MAIZE MARKETS	43
TABLE 4.12: FARMERS CONCURRENCE TO WORK PPPS IN CAPACITY BUILDING OF ACCESS TO MARKETS.....	44
TABLE 4.13: SUPPORT SERVICES RECEIVED BY FARMERS IN THE LAST ONE YEAR PERIOD	45
TABLE 4.14: SERVICE PROVIDERS IN EXTENSION AND RESEARCH.....	45
TABLE 4.15: CRITICAL STAGES FOR EXTENSION AND RESEARCH IN MAIZE VALUE ADDITION	46
TABLE 4.16: SKILLS OFFERED BY PPPS IN EXTENSION AND RESEARCH	47
TABLE 4.17: PARTNERSHIP IN MAIZE VALUE ADDITION.....	48
TABLE 4.18: CONSTRAINTS IN MAIZE VALUE ADDITION	49
TABLE 4.19: CONCURRENCE WITH PROVISION OF INFRASTRUCTURE FACILITIES BY PPPS IN MAIZE VALUE ADDITION	50
TABLE 4.20: CONCURRENCE THAT IRRIGATED MAIZE FARMING IS CAUSED BY DEMAND FOR GREEN MAIZE.....	51
TABLE 4.21: INFRASTRUCTURE FACILITIES THAT SUPPORT MAIZE VALUE ADDITION IN KIMILILI	52

LIST OF FIGURES

Figure 1: Conceptual framework showing relationship between independent and dependent variables.....	23
--	----

ABBREVIATIONS AND ACCRONYMS

ACDI/VOCA	Agricultural Co-operative Development International/ Volunteers in Overseas Cooperative Assistance
APCoAB	Asia-Pacific Consortium on Agricultural Biotechnology
CGAC	Cereal Growers Association of Kenya
ERS	Economic Recovery Strategy
GCCI	Global Corporate Citizenship Initiative
GIZ	German Agency for International Cooperation
GOK	Government of Kenya
KACE	Kenya Agricultural Commodity Exchange
KMDP	Kenya Maize Development Programme
FAO	United Nations Food and Agricultural Organization
FAOSTAT	United Nations Food and Agricultural Organization Statistics
FIPS	Farm Input Promotions Africa Ltd.
MDG	Millennium Development Goals
MDG1	Millennium Development Goal number one
PPP's	Public Private Partnerships
SMS	Short Messaging System
UN	United Nations
USAID	United States Agency for International Development
WEMA	Water Efficient Maize for Africa project

ABSTRACT

Food security and especially maize production and distribution as Kenya's staple food have of late been declining. This has become a pertinent issue for the survival of a country's increasing population and urban settlement population and in particular within the Kimilili Sub-county despite the fact the Kimilili area is well endowed with good climatic conditions. Many maize farmers, in Kimilili sub-county, sell their maize immediately after harvesting them only to purchase it back later in the season when their own saved stocks have been consumed. Maize value addition (production, processing and distribution) in Kimilili sub-county does not only provide food security to the population, it is also a source of livelihood to about 60% of the population in Kimilili sub-county in form of employment generation. This research endeavoured to assess the influence of government engagement with relevant private stakeholders in form of Public private partnership (PPP's) in maize value addition to meet the population food security needs and increase chances of business and livelihood creation among the local people in Kimilili sub-county. The study sought to investigate the influence of PPPs (Financing support services, Market Information and Intelligence, Communication systems, Extension, Research and Development, Infrastructure development, Government policy and Regulations) on maize value chain in Kimilili sub-county. A questionnaire with closed ended questions was prepared and distributed to respondents in all the wards and collected after one week. The return rate was 96%. The study adopted a descriptive survey design and stratified sampling in its research. The Yamane formula was used to get a sample size of 202 respondents. Questionnaires and interview schedules were used to collect data. Descriptive statistics such as mean, frequencies and percentages were used to compute and summarize data, which was then presented in the form of frequency tables and percentage. The findings revealed that financing in maize crop value chain happens at all stages of value addition. The study showed that traders dominate the maize crop market channel right from farm gate. The study also showed that more farmers accessed either research and extension services in maize crop value chain. The findings showed that under-development of key infrastructure facilities has limited value addition of maize crop in Kimilili sub-county. It was concluded that farmers preferred financing at input supply and production stage in maize crop value chain, less effort has been taken by farmers to market their produce directly to consumers and institutions of higher learning, extension and research services provided to farmers in maize crop value addition are more inclined towards input supply services. The green maize was in high demand in Kimilili sub-county during off-peak seasons. The study generated opportunities for sustainable partnership engagement to improve the maize value chain in Kimilili sub-county.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The concept of Public-Private Partnerships (PPP's) is a specific form of privatization that was developed in Europe in 1990's to deal with limitations of public borrowing. The concept involved using private companies to borrow money for building a new social and economic facility like school, road and hospital among other facilities and operate for some time to recoup the investment and profit from payment over a whole period of operation time (Hall, 2008). The concept of partnership in development builds closely to increasing participation of beneficiaries in design, implementation and evaluation of development projects. Literature on participatory development is associated with levels of participation based on contracts, consultation, collaboration and colleagues, (McArthur, 2005). In a survey conducted by the World Economic Forum's- Global Corporate Citizenship Initiative (GCCCI) it was concluded that partnerships between business, government and civil society must play a role in addressing key development challenges facing the world (World Economic Forum, 2005).

In order to fulfil potential partnerships between the public and private sectors, new approaches must be instituted to break down barriers and increase communication and trust. From a policy perspective, strengthening the capacity of policy and research actors so that they could identify ways of building the social capital of local innovation systems would be a useful way of moving this task forward (Andy, 2006). There are a number of ways in which PPPs in agricultural research could arise based on the complementarity of assets and the overlapping of interest and agenda (Byerlee and Fisher, 2002).

To complement many of the developing countries government efforts, private companies for sustainable agriculture have focused on supporting small-scale farmers to advance in their productivity and link them to markets in order to improve incomes and

livelihoods. Their interventions are channelled through on-farm support, technology and services. The company applies two main strategies of agricultural research and technology and: product development and services (Yuan, 2010). Syngenta has explored PPP model in Biotechnology in Asia to overcome disease resistance through development of a collaborative project on Anthracnose resistance in hot pepper where the project was carried out by Syngenta Seeds Korea and two other private companies with Seoul National University (APCoAB, 2007). The initiative was meant to provide an avenue to generate new breeding materials for exchange with the partner companies for use in their respective breeding programs.

According to the UNDP commission on the private sector and development report (UNDP, 2005), emphasis for development is put forward for governments, private companies and civil societies in promotion positive influence of private sector on development through 3 focus areas as follows: Creation of an enabling environment in the public sphere: Formation of innovative partnerships in public-private sphere and: mobilization of capacities and resources in the private sphere. For this to be effective, an effective policy framework is required for plans, implementation and monitoring of PPP's. In Tanzania, the National Development Vision 2025 required Government support and stimulates various actors participating in economic growth, by encouraging the private sector to undertake investments with private capital in socio-economic goods and services to resolve budgetary resource constraints (United Republic of Tanzania, 2009).

In India, private companies have worked to assist some farmers to gain financial independence through the introduction of low cost credit for farmers to purchase biotech maize seed and inputs. The development of a transparent, reliable credit and distribution system has provided farmers with access to low-cost, high-yielding corn hybrids, farm inputs, and crop agronomic knowledge (CropLife International, 2009). Agriculture in Africa is not sustainable because average yields have been stagnating for decades due to underinvestment, especially in the development of agricultural markets, crop improvement and the sustainable management of agricultural systems. Low public sector funding for agricultural research and lack of incentives for the private sector to operate in areas where there is no market largely explain the yield gap in many food-

importing developing countries (Marcoand Castle, 2011). There are effective ways in which the public and the private sector could work together and jointly improve agricultural sustainability in poor countries. The public sector provides a favourable institutional environment for the development of agricultural markets and investment in rural infrastructure facilitates local business development and funds research with local relevance. The private sector, in return, brings its considerable expertise in product development and deployment. This involves not only the development of new technologies but their adaptation and diffusion to local needs and conditions and their effective use by skilled and well-informed farmers. In the context of competing priorities and significant demands on governments to meet different goals, public-private partnerships create a means to build on the complementary capacities of each sector (Marcoand Castle, 2011).

In Ethiopia, the sustainability of partnerships in agriculture at a macro level established that a medium-term strategy was necessary in tackling the dependence on rain-fed agriculture through the expansion of small and large scale irrigation. This was tested through a study based on a policy decision to explore the potential for PPP investment in small and large scale irrigation projects in contribution to achieving MDG1. Agricultural PPP's models tried elsewhere showed key findings for different infrastructure types as follows; Farm-to-market roads, Water for irrigation, Wholesale markets and trading centres Agro-processing, Information and communications technology(Kwame,2011).

Crop Life International and its members have worked in many regions in partnerships with governments and NGOs to provide training on the best agricultural practices and responsible product usage. Several partnerships between NGOs have focused on integrated pest management (IPM) training and responsible product use in Latin America, Southeast Asia, and Africa. Other projects have included educating academia, public and private researchers, and government agencies on how to comply with guidelines for regulated field trials, (Crop Life International, 2009).Crop Life International through not-for-profit organisations has also designed to facilitate and promote public-private partnerships around proprietary agricultural technologies for use

by resource poor smallholder farmers in Sub-Saharan Africa. The organization provides one-stop-shops that provide expertise and know-how that facilitate the identification, access, development, delivery, and utilisation of proprietary agricultural technologies. Crop Life International also facilitates the Water Efficient Maize for Africa (WEMA) project – a partnership between African public sector institutions and several private sector companies and foundations to develop drought-tolerant African maize using conventional breeding, marker-assisted breeding, and biotechnology ,(Crop Life International, 2009).

Lack of access to timely and accurate market information prompted ACDI/VOCA to implement the Kenya Maize Development Program (KMDP) in Kenya from 2002 to 2010 in consortium with the Cereal Growers Association of Kenya (CGA), Farm Input Promotions Africa Ltd. (FIPS) and the Kenya Agricultural Commodity Exchange (KACE). The program focused mainly in the high- and mid-potential maize producing districts of Kenya's Western and Rift Valley provinces. KMDP established a network of market information centres that have served as locations for prices and trade information within local and regional markets. KMDP also strived to provide farmers and agribusinesses with access to new and improved technologies. Kenyan farmers have been able to take advantage of the widespread use of mobile phones to acquire quick and accurate information through the short messaging system (SMS). The system also enables farmers to receive weather alerts and regular extension messages on production practices(ACDI/VOCA, 2012).

To help mitigate financing menace, One Acre fund is currently implementing an Asset Based Financing for Small holder Farmers Project in Western and Nyanza provinces in Kenya. Its work was build on the progress of Kenya Maize Development Program has already made in upgrading the maize value addition in Kenya, and will work to target new areas. The project takes a holistic view of the challenges faced by smallholder farmers in Kenya and offers practical, scalable and sustainable solutions to increase food security in the long term. The project aims to integrate smallholder farmers into the maize value addition by ensuring farmers receive quality seeds and fertilizer, receive their inputs as an in-kind loan with a flexible repayment structure tailored to their

income levels. Local field officers have to provide extensive training to farmers in the fields where they live and work and finally the same field officers must train farmers on household storage practices, to minimize post-harvest crop loss (One Acre Fund, 2012).

According to the United Nations Food and Agriculture Organization (FAO), the global maize production is expected to increase 4.1 percent from 2011, reaching an estimated 916 million tons in 2012 (Nierenberg and Spoden, 2012). It is estimated that by 2050, the demand for maize in developing countries will be double and by 2025 maize will have become the crop with the greatest production globally and in developing countries (CIMMYT and IITA, 2010). Maize is also one of the most important commodities used for food aid. Since maize is cheaper than other cereals such as rice and wheat, it is more affordable to the vast majority of the population, and therefore occupies a prominent position in the agricultural development agenda of several countries in Africa. The United States has maintained its position as the world's most important maize trader, exporting an average of 47 million metric tons of maize annually. After 2005, maize/corn prices have sharply increased in the world market largely due to an increasing demand by ethanol producers, but US exports continue to be strong and may remain relatively stable in the years to come (FAPRI, 2007).

Maize is the second most important cereal crop after rice in Asia. It is the substitute staple for people in the rural areas and mountainous regions, especially during periods of rice shortage. Maize is also the primary source of feed for the poultry and livestock industry as well as a source of raw material for the manufacturing sector, and is therefore an important source of income for many Asian farmers (Pasuquin and Witt, 2007). Asia contributes about one-third to the world's total maize production with China taking the lead both in terms of yield and harvested area. In Southeast Asia, the total harvested area with maize is currently about 8.6 million hectares (FAOSTAT 2007) with the largest areas in Indonesia (41%), the Philippines (29%), Thailand (13%), and Vietnam (12%). The demand for maize in Asia is expected to grow in the years to come largely because of an increasing demand from the livestock and poultry feed industry as more animal protein is incorporated into the Asian diet. The rapid expansion of the bio-fuel industry in recent years driven by new policy developments and high fossil energy

costs is also expected to have an impact on global maize demand and supply. The growing demand in the region cannot be met despite the increase in domestic production and yield of maize in the last 15 years. For example, Indonesia's maize production and yield continue to increase, and yet the country imported more than one million metric tonnes of maize annually in the last five years (FAOSTAT 2007).

Africa remains one of the least contributors to global maize production. FAOSTAT, 2008 showed that, North America recorded the largest production of maize with about 38.8% of the global output. This is followed by Asia (28.5%); South America (11.2%); Europe (11.1%); Africa (6.9%); Central America (3.4%); and Oceania (0.07%). Maize is among the key commodities for food security in West and Central Africa. Maize value addition is also expanding due to demand pull from the poultry sector, brewery and other agro-industrial products. This was derived from a study conducted to examine the constraints and the opportunities facing maize value in Burkina Faso in order to propose actions needed to enhance maize competitiveness (Kaminski *et al.*, 2013). Shahidur *et al.*, (2010) affirms that maize continues to be a significant contributor to the economic and social development of Ethiopia. As the crop with the largest smallholder coverage at 8 million holders (compared to 5.8 million for teff and 4.2 million for wheat), maize is critical to smallholder livelihoods in Ethiopia. In addition, maize is the staple crop with the greatest production at 4.2 million tons in 2007/08, compared to teff at 3.0 million tons and sorghum at 2.7 million tons. Moreover, maize plays a central role in Ethiopia's food security. It is the lowest cost source of cereal calories, providing 1½ times and two times the calories per dollar compared to wheat and *teff* respectively. An effective maize sector could propel Ethiopia's food production to quickly reduce the national food deficit and keep pace with a growing population. While maize already plays a critical role in smallholder livelihood and food security this role can be expanded. It is estimated that, by bridging this yield gap and tapping into latent demand sinks, smallholders could increase their income from approximately USD 60 per hectare today to USD 350 to USD 450.

Maize is the main staple food in Kenya and is an important source of calories to a large proportion of the population in both urban and rural areas. Maize consumption is

estimated at 98 kilograms per person per year, which translates to roughly 30 to 34 million bags (2.7 to 3.1 million metric tones) per year. Maize is also important in Kenya's crop production patterns, accounting for roughly 28 percent of gross farm output from the small-scale farming sector (Jayne et al., 2001). According to Muyanga *et al.*, (2005) food security situation and especially maize production and distribution as Kenya's staple food has of late been declining. Wokabi (2000), argues that there have been no adequate interventions to develop maize crop value chain with at production, processing and distribution.

Value addition exists when all of the actors in the chain operate in a way that maximises the generation of value along the chain, (Kaplinsky and Morris, 2003). Therefore, the concept of value addition encompasses the issues of organisation, coordination, the strategies and the power relationship of the different actors in the chain. Value addition emphasize on relationship between networks of inputs suppliers, producers, traders and processors, (UNCTAD, 2000). An agricultural value addition is defined by a particular finished product or closely related products and includes all firms and their activities engaged in input supply, production and transportation, processing and marketing of product or products. Therefore value addition in maize and any other agricultural product is a result of diverse activities like cultivation, bulking, grading, packaging, transporting, storage and processing among others. Value addition approaches have been used to analyse the dynamics of markets and investigate the interactions and relationships between actors (Ponniah, 2009). Value addition therefore incorporates production, transportation, transformation, processing, marketing, trading, retailing and consumption of a given product or service (Kaplinsky and Morris, 2003).

The concept and analytical tools for analyzing the functioning of value addition on maize are therefore important to understand the impact of development interventions on small holders and the poor. The basic concepts in maize value addition are: the value actors and their linkages, business services that support market operations (supporters) and the business enabling environment or influencers in infrastructure, policies, institutions and processes that shape the market system, (Albu and Griffith, 2005). The Government of Kenya launched vision 2030 in the year 2007 as an economic recovery

strategy (ERS) to accelerate the transformation of the country into a rapidly industrialized middle-income nation. The vision aimed to accelerate development through infrastructure development, research and development, equity in social, economic and political participation and governance reforms. Value addition in agricultural development is one of the economic pillars that may lead to wealth creation and employment with new partnership strategies, (GOK, 2007).

1.2 Statement of the problem

Bungoma County has a population of 1.6 million people and an annual population growth rate of about 4.3% (Kenya Bureau of Statistics, 2009). Despite the fact that Kimilili Sub-county average maize production being 18 bags per acre, 53% of the population are food insecure and live below poverty line and 3% of the maize farmers have access to limited innovation on maize crop agri-business enterprises (County Government of Bungoma, 2014). The World Bank (2006) defines people living under poverty line as those who spend less than one USA dollar per day.

Apart from constraints and shortfall experienced in accessing financing services by most maize crop farmers in western Kenya, there have been limited interventions by public and private partners in maize crop value addition at production, processing and distribution (Wokabi, 2000). In the last decade, various institutional arrangements have emerged in Kimilili Sub-county to support farmers improve yields in maize crop production through business oriented schemes like One acre Fund and Equity Bank through Inter Christian Fellowship Evangelical Mission (ICFEM). These institutions reap high returns on lending to farmers only at the production level at the expense of the last maize cereal value addition processes which have higher profit margins. According to statistics from Ministry Trade and Industrialization (County Government of Bungoma, 2014) there are two large scale maize millers in the entire county located at Webuye and Bungoma towns which are outside Kimilili Sub-county.

Maize crop farmers and other value addition actors in Kimilili sub-county sell their maize immediately after harvesting without adding any incremental value to the

cereal which consumers are prepared to pay at a price. The same farmers purchase maize cereal later in the season when their saved stocks have been consumed (Ministry of Agriculture and Livestock, Kimilili sub-County, 2013). The maize farmers and relevant stakeholders have no pertinent knowledge and skills to create agri-business enterprises which are necessary to meet food security and employment needs of the population in Kimilili sub-county. Therefore, this study determines whether Public Private Partnership mechanisms has any value addition on maize crop production.

1.3 Purpose of the study

The purpose of this study was to determine the influence of public private partnerships on maize crop value addition in Kimilili sub-county.

1.4 Objectives of the study

- i. To determine how support to credit services by PPPs influence maize crop value addition in Kimilili sub-county.
- ii. To assess the extent to which support to access markets by PPPs influence maize value addition in Kimilili sub-county.
- iii. To examine the extent to which support to extension and research services by PPPs influence maize crop value addition in Kimilili sub-county.
- iv. To determine how support to infrastructure services by PPPs influence maize crop value addition in Kimilili sub-county.

1.5 Research Questions

- i. How does support to credit services by PPPs influence maize crop value addition in Kimilili sub-county?
- ii. To what extent does support to access markets by PPPs influence maize value addition in Kimilili sub-county?
- iii. To what extent does support to extension and research services by PPPs influence maize crop value addition in Kimilili sub-county?
- iv. How does support to infrastructure services by PPPs influence maize crop value addition in Kimilili sub-county?

1.6 Significance of the study

The study findings and recommendations filled the following gaps in the field of knowledge: First was documentation of the existing public and private partners (PPPs) operating within Kimilili Sub-County in maize crop value addition and their specific roles. Secondly was documentation of the significant challenges faced by actors in the maize crop value addition within Kimilili Sub-county. Thirdly was compilation of major priority needs for intervention by PPP's in maize crop value addition in Kimilili Sub-County and fourthly was identification of gaps and opportunities for the PPP's interventions in maize crop value addition within Kimilili Sub-county.

The study was of importance in the following thematic areas of intervention: Formulating of PPP's policies and process of engagement in maize crop value addition within Kimilili Sub-County: Engaging stakeholders in partnerships for public development through investing in maize crop value addition within Kimilili Sub-county: Assisting in economic planning and development of the Kimilili Sub-county in maize crop value addition through investment, market system development and employment creation and : Enhancing appropriate and sustainable strategies for food security and value addition in maize crop within Kimilili Sub-County.

1.7 Basic assumptions of the study

For the purpose of this study the researcher had the following assumptions: First was that the answers given by respondents would reflect factors influencing public private partnerships on maize crop value addition in Kimilili sub-county. Secondly was that the selected sample would be a representative of the target population and the respondents will be able to fill all questionnaires independently.

1.8 Limitations of the study

The researcher encountered the following limitations in the process of conducting the study. First was that some respondents were suspicious about the inquiry and others had inadequate knowledge about other actors in maize crop value addition: The researcher overcame this by ensuring that the study was conducted within the objectives of the study and all information was kept in confidence. Secondly, some respondents

provided wishful responses and personal views to please the researcher. The researcher overcame this above challenge through collection of data that was related to contents and the scope of the study for analysis.. Lastly, the study was only limited to Kimilili sub-county. The researcher overcame this challenge by using the information from the case of Kimilili sub-county to draw inferences in maize crop value addition in Kenya.

1.9 Delimitations of the study

The research scope focused on issues of financing support services, access to markets strategies, extension and research and infrastructure services. The study was conducted in Kimilili Sub-County and only targeted small scale maize farmers, officers from existing PPPs and extension staff from government. The study focussed on Kimilili Sub-county because maize crop is considered as a leading cash crop and a staple food for the local community.

1.10. Definitions of Significant Terms

Access to market: This refers to right of entry points of sell or purchase maize crop. Maize crop can access diverse market points if transformed into high value through changing form from raw to processed product. It can also be through storage during periods of high supply and selling during low supply period. Maize can also be transported from low demand to high demand areas in form of changing the place utility.

Extension and research support services: Is a way of acquiring knowledge from research and experience through training and technology transfer from other actors for income generation purposes in the maize crop value addition.

Financing support services- This refers to financial transaction instruments such as supplier credit, trader credit, warehouse receipts, and in-kind lending: the provision of financial services by actors within value chains (direct value chain finance), or the provision of financial services by a financial institution based on contractual relationships within the value addition (indirect value addition).

Infrastructure development services: Refers to improvement of basic physical systems such as roads for transportation, communication for markets, storage facilities and electricity for value addition.

Public Private Partnerships-Is a contract or agreement between farmers, government and a private party for value addition or development of maize crop through financing in form of access to investment capital, technical assistance in form of extension and research services, facilitating access to markets, and development of infrastructure facilities with the objective of sharing risks and achieving win-win results.

Value addition: This refers to the full range of activities that are required to bring maize crop from production, processing and marketing to consumers.

1.11 Organization of the study

The study has three chapters. Chapter one introduces the study with background of the study, problem statement, purpose and objectives of the study, research questions, significance of study, limitations, delimitations, basic assumptions of the study and definition of terms. Chapter two has reviewed literature organized according to the objectives of the study. A theoretical framework, conceptual framework and summary of literature reviewed is presented at the end of the chapter. Chapter three presents research design, target population, sampling procedure and sample size, research instruments, data collection procedure, techniques of data analysis and operational definitions of the study. Chapter four provides an analysis, presentation, interpretation of study findings and discussions on influence of PPPs to maize crop value addition based on four factors. Chapter five presents a summary of study findings, conclusions, recommendations and suggested areas for further studies on the same topic.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter consists of review of related literature to partnerships on maize crop value addition. The section covers the influence of financing support services on maize crop value addition, influence of access to market strategies on maize crop value chain development, influence of extension and research services on maize value addition and influence of infrastructure development services on maize crop value addition. The chapter also covers theoretical framework, conceptual framework and a summary of literature review.

2.2. Financing support services and maize crop value addition

Value addition in agriculture and specifically in maize crop can be provided for various reasons: secure supply or assure its quality, access to critical inputs, reduce side-selling risks, improve profitability, and so on. Profitability can be increased directly through the interest payments or indirectly by using increased market power to lower the supplier price or increase the sale price. Similarly, value addition financing can be accepted for various reasons: no alternative available, lowest cost option, most trusted option, and other reasons (Marco and Castle, 2011).

Marco and Castle (2011) further argue that value addition financing can be seen as a positive or a negative element. Its positive aspects are that due to the lower screening costs, it may be the only or most risk-tolerant and efficient credit provision format to finance upgrading investments, and that it can be combined with other embedded services such as training (on financial literacy or business management skills), transportation, quality control, and technical assistance, just to mention a few. The negative aspects of financing are that, the intervention may be unsustainable, limited in terms liquidity, efficiency and product range (banking is not the core business), costly (high risk premiums charged), and increasing the dependency of the borrower.

In Northern Uganda, Dalipagic and Elepu (2014) recommended that development of three sustainable strategies in maize value addition financing. First is through building partnerships with financial institutions in order to facilitate farmers' access to credit. Secondly is through promotion of warehouse receipting system by development of collaboration with World Food Program(WFP), Uganda commodity exchange , financial institutions or traders in a system that would enable farmers to store their commodity in a warehouse in exchange of a receipt that allows them to use their commodity as collateral to access credit loans. Lastly, is by strengthening of Village savings and loan schemes through training farmer groups on better management of finance and investments.

Nedelcovych and Shiferaw (2012), in analyzing private sector perspectives for strengthening agribusiness value addition in Africa noted that there was need to develop financing support services through engaging Public private partnerships (PPPs) in transport, milling and storage infrastructure. Nedelcovych and Shiferaw (2012), further noted that in Kenya, the country has well-developed and liberalized financial and telecommunications sectors have enabled ACIDI/VOCA's project in maize value chain to assist farmers use cash credits on phone cards to pay intermediate input suppliers.

In western Kenya, One Acre fund project aims to integrate smallholder farmers into the maize value addition through financing support services by ensuring farmers receive quality seeds and fertilizer, receive their inputs as in-kind loan with a flexible repayment structure tailored to their income levels. The One acre fund local field officers provides extensive training to farmers in the fields where they live and work and finally the same field officers train farmers on household storage practices to minimize post-harvest crop loss (Once Acre Fund, 2012).

2.3 Access to market strategies and maize crop value addition

The market channels of maize are informal and tied to market forces in the globally liberalized markets. Small-scale farmers have a variety of potential markets through which to sell maize. One option is through small-scale assemblers operating at the village level who stand as an important market channel utilized by small-scale farmers. Many traders go into the villages to purchase maize from farmers. These traders

in turn go to sell to either bulk traders who prefer to sell to institutions of learning, millers or NCPB or supply them to deficit areas or store the grain to sell back the community during times of scarcity (Kimenju and Tschirley, 2008).

In analyzing marketing constraints in maize crop addition in Burkina Faso, Kaminski *et al.*, (2013) identified high transport unit costs, poor infrastructures (transport and communication) and market imperfections and incompleteness to be the three factors that limit farmers to access appropriate markets. The identified high transport costs results from short run low supply and demand elasticity which limits further market integration. The high local transport cost is disadvantaged compared to cheap maize imports. Poor road transport and unavailability of appropriate communication equipment to access markets were identified as key infrastructures that limit farmers to access markets. The main factors identified to contribute to market imperfections and incompleteness of farmers to access markets were: deficiencies in extension services to existing market channels, absence of insurance markets and inadequate strong financial framework to enhance access to information services through new communication and technologies.

Kirimi *et al.*, (2011), deduced that the ability of farmers to negotiate for prices and identify buyers plays a significant role in their ability to obtain remunerative prices for maize in Kenya. The findings were in the market study by *Tegemeo* Institute on access to maize markets. It was found that the mean distance travelled by farmers to their initial point of sale was only 1.85 km, with 73.1% of the farmers selling their maize at the farm-gate. The distance from the farmers' farms to the point of sale of maize also suggests an expansion of private sector maize assembly. The variability was as a result of proved evidence of the importance of marketing skills training on farm income at farm level of the value addition through research on ACDI/VOCA's Kenya Maize Development Program (KMDP). Therefore, the majority of the traders transacted with farmers for grain right in the villages, a reflection of increased density of grain traders in rural areas.

Lack of adequate storage infrastructure facilities limits the ability of many small scale maize farmers, bulk traders and processors to store maize grain. Most maize

farmers and traders are discouraged to store due to high risks of holding the grains for long time, constraints on borrowing capital and the prevailing seasonal East Africa market trends. Therefore, the National Cereals and Produce Board (NCPB) appears to play an important role in the market by purchasing large volumes from large-scale farmers and from smallholders in a few major surplus zones such as Trans Nzoia and Uasin Gishu. NCPB tends to increase its purchases in a good production season and reduce its purchases in a poor season to stabilize maize prices (Jayne *et al.*, 2008). The NCPB stores at Kapsokwony and Webuye towns are close to the study area.

Another study (Markelova *et al.*, 2009) concluded that acting collectively for market access can help correct some of the market imperfections, such as high transaction costs and missing credit markets; Farmers are able to obtain information, reach quality standards and operate on a larger scale when they pool financial and labour resources, enabling them to sell to new domestic or international markets previously inaccessible; The study stressed the importance of groups being able to develop their own rules, rather than having rules externally-imposed; Higher value products which involve processing or are perishable require greater technical skills but also offer greater returns to collective marketing; However, the study cautioned that incentives and enabling conditions for farmer groups were needed in order for collective marketing to be profitable or sustainable. This was essential in helping realize the objectives of “pro-poor market development.”

Over the past few years’ changes in the global agricultural economy provided smallholder farmers’ with new challenges and opportunities. Gaining access to new markets often requires farmers to adopt new marketing skills and strategies. In the case of smallholders, collective action is often the route chosen to meet basic market requirements for minimum quantities, quality and frequency of supply which they could not achieve individually (Kaganzi *et al.*, 2009).

One study in Uganda, Kaganzi, *et al.*, (2009) reviewed factors that enable groups of smallholder maize farmers to engage more effectively with dynamic and higher value market opportunities. Their findings confirmed that there is need for “change agents” to impart the skills required to engage with markets and highlight the necessary social and

technical innovations needed for smallholder farmer groups to achieve long-term market linkages. The study concluded that enforcing of marketing strategies combined with collective action can accelerate innovation, streamline interventions, and improve the efficiency of service provision to poor and the loosely organized farming communities.

In a study conducted to assess leading value additions that can be done in partnership with private sector in Zimbabwe, Chiukira, and Sandra (2009) concluded that small holder farmers will gain meaningful economic benefits in maize crop value addition if they engage in sustainable market based partnership with private sector.

2.4. Extension, research and development and maize crop value addition

Partnership support roles in development of agriculture and particularly in maize sector are pertinent at all value addition stages. These support services can be either in extension/business development, research and development services. There are a number of ways in which Public Private Partnerships (PPPs) in agricultural extension and research could arise based on the complementarity of assets and the overlapping of interest and agenda (Byerlee and Fisher, 2002).

Small and medium scale enterprises involved in value addition and domestic and international trade have responsibility for support extension services in maize crop value addition in areas such as input supply, organizing farmers for markets, quality improvement, processing, storage and transportation compliance with sector regulations. It is likely that private agricultural extension services will play an important role in a more commercially based agricultural sector (Rasheed *et al.*, 2005). To achieve the above objectives, a continuous stream of innovations based on transfer of scientific and managerial knowledge will be important to maintain the competitiveness of these organizations and their clients. This reason therefore calls for the need of partnerships with relevant knowledge bases to be formed.

Aldana *et al.*, (2007) found that skills development is necessary for the “market readiness” of producer groups. These skills fall into five categories: group management, financial skills, marketing, experimentation and innovation, and sustainable production and natural resources management. Crop Life International and its members have worked

in many regions in partnerships with governments and NGOs to provide training on the best agricultural practices and responsible product usage. Several partnerships between NGOs have focused on integrated pest management (IPM) training and responsible product use in Latin America, Southeast Asia, and Africa. Other projects have included educating academia, public and private researchers, and government agencies on how to comply with guidelines for regulated field trials, (Crop Life International, 2009).

In Thailand, innovation and technology transfer on maize seeds was conducted in the year 2010 by public private sector players through hybrid breeding and testing program. The program aimed to improve corn productivity and quality. The specific objectives were to introduce into the market new hybrid corns and increase farm yields and incomes. The key public sector involved were National Corn and Sorghum Research Center (NCSRC) with State universities. The private seed players were Bangkok Seed Industry Co., Ltd.; Thai Plant Breeding Research and Development Co., Ltd.; Pacific Seed Co., Ltd.; Seed Asia Co., Ltd.; Syngenta Seeds Co., Ltd.; Monsanto Thailand Co., Ltd.; Northern Seeds Co., Ltd.; and Shriram Bioseed (Thailand) Ltd. The project beneficiaries were Hybrid corn seed breeders in Nakornratchasrima Province, Thailand, (FAO.2013a). A similar case of innovation and technology transfer was undertaken by the Chinese government to research hybrid maize and rice seed varieties in Sanya State, Hainan Province of China for five years from 2004-2009. The main driver in this partnership was the Ministry of agriculture whose role was to build a national base management service centre. The private sector players in the partnership were Beijing Gold Agriculture Seed Industry Science and Technology Company Limited; and Chinese Academy of Agricultural Sciences that were tasked to provide technical assistance to develop new rice and hybrid maize varieties. The project beneficiaries were maize farmers Hainan province with introduction of more than 10 new varieties of seeds that would lead to subsequent increase in grain yields and generation of employment opportunities (FAO. 2013b).

2.5. Infrastructure services and maize value addition

In order to improve maize value addition using infrastructure development, Warner and Kahan (2008) posits that governments must accept the responsibility to provide adequate infrastructure, particularly transport/roads and power. They further argue that lack of infrastructure limits agribusiness growth in developing countries especially through uncertainty and high transactions costs. Infrastructure services cited as major constraints limiting agribusiness growth in different countries include high cost of electricity, under-investment in irrigation development, telecommunication and poor quality of the interior road network and the adequacy of storage for cereals.

The United Nations Food and Agriculture Organization (FAO) commissioned a study to analyse PPP models and model-variants that promote market-orientated agricultural development through case studies in the categories of: farm-to-market roads; water for irrigation; wholesale markets and trading centres; agro-processing facilities; and information and communications technology (Warner and Kahan, 2008). The study concluded that the private sector will not be attracted to investments with too much risk transfer although the private operators may correct inefficiencies arising from public sector provision of agricultural infrastructure services. The best model to adopt was therefore informed by either the source of revenues, commercial scale and growth potential of the investment.

The Government of Guatemala in Latin America initiated value addition development enterprises to promote post-harvest activities in maize value addition sub-sector in December 2010. This was made possible through provision of appropriate infrastructure support like equipment and training services. National Fund for Peace (FONAPAZ) provided equipment and training services, Local Economic Development Agency (LEDA), Ministry of Economy (MINECO) and Economic Development programme (PDER) were responsible for monitoring the implementation of the partnership and United Nations development Fund (UNDP) provided funding support to the project. The private sector actors involved in this project were Agricultural and Business Development Fund (FUNDEA) and Inter-American Development Bank (IDB);

Oiko credit. Their main role was to provide loans. The project benefited 1 738. The project aimed to promote maize value addition in the post-harvest activities. The project created the corn enterprise Ixcán S.A; trained and generated employment for 1 631 farmers (FAO. 2013c).

Small holder irrigation constitutes an important part of total irrigation activities in Kenya. In maize production farmer driven small holder irrigation and development has emerged of recent along river banks in Western Kenya (Sijali and Okumu, 2002). The farming practice is characterized by actions of individuals making use of small pumps and engine systems and gravity fed systems induced by market for green maize during off-peak seasons of rain feed maize production.

In Kenya, the infrastructure development in information and communication technology (ICT) for marketing has already been developed by the private sector involvement. Through established market information centres, buyers and sellers interact through a network for purchase bids and offers respectively using widespread mobile telephone technologies. The system was established in western Kenya by KMDP (ACDI/VOCA, 2012). Although structures are in place, more consolidated efforts needs to be done in building the capacities of maize producers in use of the existing ICT market systems on multi- purposes.

2.6 Theoretical Framework

This section looks into underlying theories, principles and general research findings of value chain models that are closely related to this study. According to Klepper, (1997), the term '*Value addition*' was used by Michael Porter in his book "Competitive Advantage: Creating and Sustaining superior Performance" (1985). The value addition model describes the activities the organization performs and links them to the organizations competitive position. Value addition analysis describes the activities within and around an organization, and relates them to an analysis of the competitive strength of the organization. Therefore, it evaluates which value each particular activity adds to the organizations products or services. This idea was built upon the insight that an

organization is more than a random compilation of machinery, equipment, people and money.

Porter distinguishes between primary activities and support activities. According to Klepper (1997), the primary activities are directly concerned with the creation or delivery of a product or service. Porter therefore grouped primary activities into five main areas: inbound logistics, operations, outbound logistics, marketing and sales, and service. Each of these primary activities is linked to support activities which help to improve their effectiveness or efficiency. The four main areas of support activities include procurement, technology development, human resource management, and infrastructure (systems for planning, finance, quality, information management).

In the Porter's model, the term ,'**Margin**' implies that organizations realize a profit margin that depends on their ability to manage the linkages between all activities in the value addition. In other words, the organization is able to deliver a product / service for which the customer is willing to pay more than the sum of the costs of all activities in the value addition. The linkages are about seamless cooperation and information flow between the value addition activities.

Different methodologies and concepts are available to analyze different aspects of value additions for example, income distribution, environmental impact of chain activities, and distribution of power or the impact barriers to entry (Riahi, 2000). Examples include; Accounting of flows includes different physical (such as life cycle assessment, material flow accounting) and monetary (such as input-output analysis, social accounting matrix) accounting frameworks provide the foundation for programming equilibrium modeling and econometric analysis. Value addition equilibrium models are a meaningful instrument to evaluate complex relationships between actors and the environment including risk assessment and game theoretical approaches. Econometrical value addition analysis is widespread in microeconomic value addition impact assessment. It includes treatment effect and gravity models to assess the impact of food, social, and environmental standards as well as transaction costs on the income of

households or countries. Global commodity chain analysis aims to identify and measure the balance of power between the participating actors.

2.7 Conceptual Framework

The conceptual framework shows that independent variables influencing the private partnership engagements in maize crop value addition development operations in Kimilili Sub-county are financing support services like access to credit product and services financing, access to market strategies used, extension, research and development services and the infrastructure support services. In the framework the intervening variables are natural hazards such as drought, floods and pests infestation and; prevailing market trends on global, regional, national and local level while the government policies and regulations are the mediating variables.

Independent variables

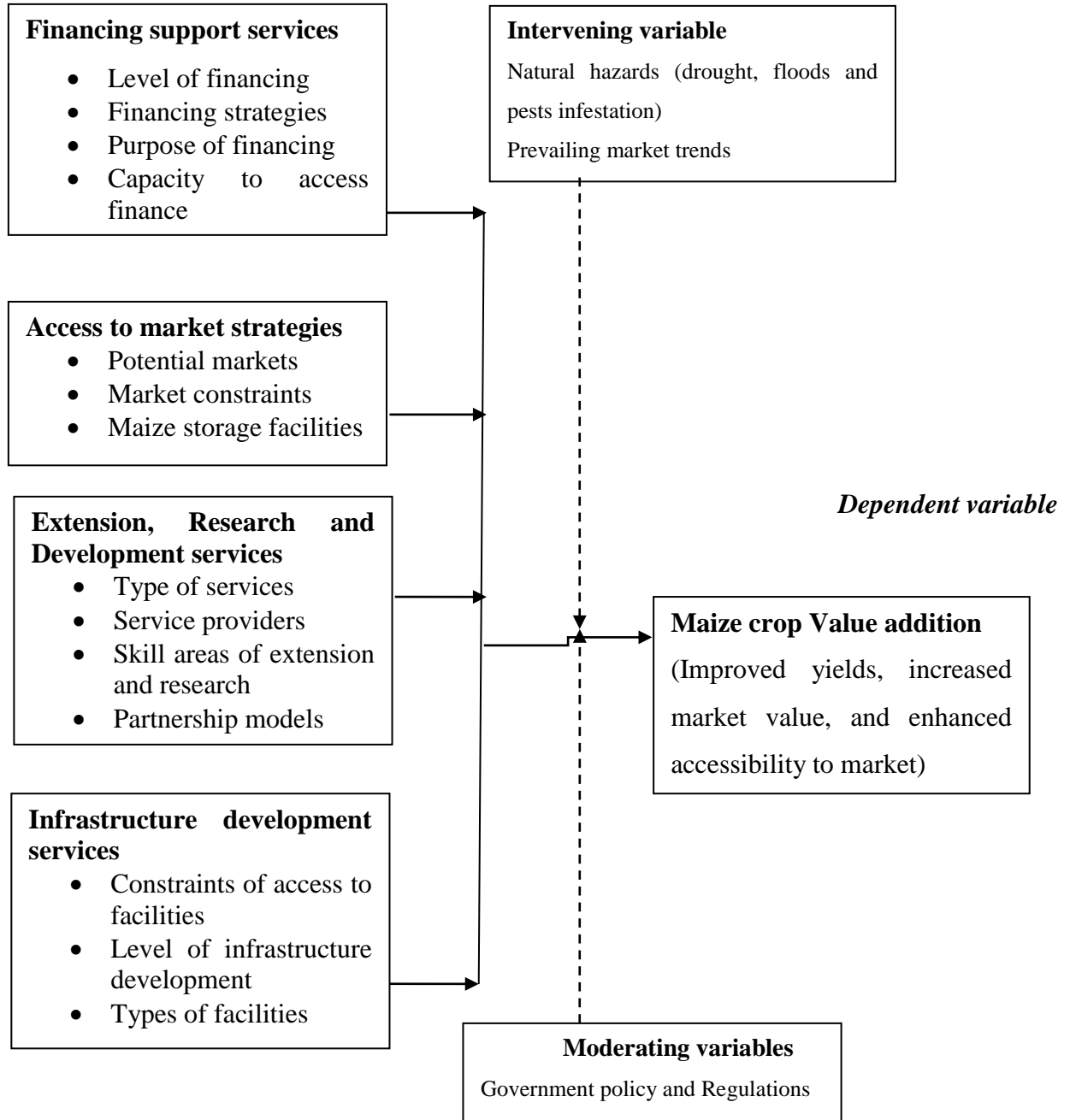


Figure 1: Conceptual Framework Showing Relationship between Independent and Dependent Variables

Source: Researcher (2014)

2.8 Summary of Literature

The above literature explored on the aspects where partnerships in the maize crop value development was undertaken. The experiences of providing financial services in form of technical support and credit for purchase of farm inputs and development of market systems especially in maize crop value addition have been investigated. Sustainable financing options such as building of partnerships with financial institutions, promotion of special financing schemes like warehouse receipting as a form of collateral and strengthening of savings and loan scheme in groups for better management of finance and investments have been explored. Case experiences of asset financing support through a civil society (One Acre fund) intervention programme in production support in form of contracting obligation are outlined. The potential market channels for marketing maize cereal are explored as a system has success. A detailed analysis of market constraints in maize value addition such as high transport costs, poor storage infrastructure, market imperfections and incompleteness are outlined.

Access to extension services and research development in form business development services has been discussed, more so it was found to be carried out by government, private sector and NGOs on subsidized basis. The potential skill and knowledge areas of extension and research development and partnership models in maize value addition that have been tried elsewhere with government and private sector are also discussed. Limited infrastructure development has been identified as an embedment to agro-business growth in developing countries as a result of uncertainties and high transaction costs. Poor road network, under-investment in irrigation, high costs of electricity, inadequate storage facilities and telecommunication infrastructure are regarded as major infrastructure constraints in maize value addition. Infrastructure development in information communication and technology (ICT) has been developed in Kenya with involvement of private sector taking business interests but more needs to be done.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter provides an overview of specific procedures and strategies that were followed by the researcher to conduct the study. It specifically focuses on the research design, the target population, sample and sampling procedure, instruments that were used for data collection. It also mentions the validity and reliability of research instruments and procedures that were used for data collection and analysis.

3.2 Research Design

Kothari (2004) states that research design is a plan of conditions for collection and analysis of data in a manner that aims to combine significance to the research purpose with economy in procedure. The researcher adopted a descriptive survey design in conducting the study. Descriptive surveys are designed to describe some set of variables as they exist at the time of data collection (Badri A. & Burchinal, 2005). A descriptive survey assisted the researcher to collect data from a relatively larger number of cases at a particular time (Kothari, 2014). A survey was conducted on a sample of selected farmers to represent a cross-section of farmers on factors influencing public private partnerships in maize value development in Kimilili sub-county. For the purpose of comparison of results from different data sources, a triangulation method was used to collect survey data using both quantitative and qualitative techniques. *Triangulation* compares the results from two or more different methods (data from interviews and observation), or two or more data sources (interviews with members of different groups) to check for consistency in answers and attitudes. Instead of using triangulation as a stringent test of validity, it might be a more appropriate method for ensuring comprehensive data collection getting all sides of “the story,” for example, or understanding all the shades of meaning in the answer to a question (Mays & Pope, 2000).

3.3 Target population

Mugenda and Mugenda (2003), defines target population as the entire group that a researcher is interested in or which the researcher wishes to draw conclusion on. For the purpose of this study, the researcher generalized the results on the target population from the records derived from the Ministry of agriculture and Livestock development Kimilili Sub-county. According to records derived from the Ministry of Agriculture, Kimilili Sub County has 4 wards with 23,700 registered small scale maize farmers' four agricultural extension workers from each ward and three officials from PPPs within Kimilili Sub-county. Therefore the total target population was 23,707 respondents.

3.4 Sampling procedure and sample size determination

3.4.1 Sampling Size Determination

The researcher used the Yamane (1967) formula to determine the sample size of respondents.

Yamane formula, $n = N / [1 + Ne^2]$

Where n=required responded

N= Total population size

e = level of significance

e² = error limit

The above formula was used to determine the sample size for the 23,707 respondents with a significance level of 93%.

Sample size (n) = $23707 / 1 + 23707 \times 0.07^2 = 202$ respondents

Sample size of 202 will include 4 agricultural extension workers that will be drawn from each of the 4 wards and 3 officers from financing institutions drawn from Kibingei ward(2) and Kimilili ward(1).

Table 3.1: Sample Size Distribution

Ward	Total Population (N)	% of the total population	Target population
Kimilili	5900	25	50
Kibingei	6500	27	55
Kamukuywa	5300	23	46
Maeni	6000	25	51
Total	23707	100	202

The total population that was surveyed included 4 agricultural extension workers that were drawn from each of the 4 wards and 3 officers from public and private institutions drawn from Kibingei ward(2) and Kimilili ward(1).

3.4.2 Sample Procedure

Sampling is a technique that researchers use to represent the population of their studies (Mugenda and Mugenda, 1999). The study employed random sampling because it limits the chances of bias in the process of selecting the sample. Sampling explains how subjects are selected to avoid bias, in other words, ensuring that you are not simply avoiding interviewing people who may disprove the hypothesis or research questions you are testing (Irving, 2011). The researcher subdivided the Kimilili Sub-County into four wards. Proportional allocation was employed to determine the sample size of farmers from the ward level. Systematic random sampling was used to select individual farmers who participated in the study using a list of names for farmers chosen at an interval.

3.4 Data Collection Procedures

Personal interviews were used in this study to provide extensive details on factors influencing public private partnerships on maize crop value addition. The researcher interviewed the sample population, in an effort to acquire personal or concrete

information. Personal interviews, as a survey technique helped the researcher gather a variety of content that were useful in the analysis of the research. Face-to-face interviews aided in acquiring information from the interviewees, with reference to their emotions, thoughts, opinions, and regards to the factors influencing public private partnerships on maize crop value chain development in Kimilili Sub County.

3.5 Data Collection Instruments

Open-ended and close-ended questions were used on the target respondents. This type of questions allowed the respondents to offer their opinions, suggestions and insights on factors influencing public private partnerships on maize crop value chain development in Kimilili Sub County. This type of questionnaire does not restrict the target population from providing their thoughts on the problem, at hand. For that reason, the researcher assembled massive information and compared the responses which led to an all-inclusive study

According to Creswell (2003), the study instruments are tools used in the collection of data on the phenomenon of the study. The research instruments employed in this study as tools for data collection were questionnaires administered to farmers. A questionnaire is a list of standard questions prepared to fit a certain inquiry (Mugenda and Mugenda, 2003). The use of questionnaire ensured that respondents who were faced with identical stimulus were noted and thus facilitating reliability. The researcher preferred the use of questionnaire because it was a convenient tool to use in a study with a large number of subjects since it facilitates easy and quick deviation of information within a short time. The researcher used interview schedule to solicit vital information from agricultural extension officers from each of the four ward and three officers from financial institutions. According to Mugenda and Mugenda (2003), an interview schedule makes it possible to obtain data required to meet specific objectives of the study.

3.5.1 Pilot Study

A pilot test of the research instruments were administered to about 10% of study sample size in the neighbouring Webuye East Sub-County before the actual study commenced using simple random sampling. According to Mugenda and Mugenda

(2003), a sample equivalent to 10% of the study sample is enough to pilot research instruments. A pilot test helped to establish the quality and effectiveness of research instruments in order to yield required data for the study besides determining field experiences. The researcher made some necessary corrections and adjustments of the instruments after a pilot test in order to increase the reliability of the instruments.

3.5.2 Validity of the Research Instruments

This study was more concerned about content validity. According to Kothari (2004), content validity is the extent to which a measuring instrument provides adequate coverage of the topic under investigation. Validity deals with appropriateness, correctness, and meaningfulness of specific inferences on research results (Frankel and Wallen, 2008). To ensure content validity the researcher sought the input from the research supervisors and experts in the field of research from university of Nairobi who were free to examine and critique the representativeness of the instruments.

3.5.3 Reliability of the Research Instruments

Reliability is the measure to which a research instrument yield the consistent results from data after repeated trials (Mugenda and Mugenda, 2003). Reliability of instruments indicates the stability and the consistency with which the data collection instruments measures the variables in the study. That means that the instrument returns the same measurement when used at different times under same conditions. To ensure that this was achieved, the reliability of instruments was determined through pilot testing using the split-half method. The questionnaire of respondents in a pilot test were assigned arbitrary scores whereby measure of total scores for the odd number questions were correlated the total score of the even number questions (the first half with the second half). The scores obtained were used to calculate correlation coefficient using Spearman rank correlation coefficient for suitability of instruments. If the correlation coefficient of the instruments falls above +0.6, the instruments were taken to be reliable and therefore suitable for data collection (Mbwesa, 2006).

3.6 Data collection procedures

The researcher sought general authorization from the University of Nairobi to carry out the study whereby a cover letter was issued by the University of Nairobi which facilitated the researcher to apply a research permit from National Council of Science and Technology (NACOSTI) and then proceeded to study area for data collection. A total of 202 respondents participated in the study including 195 small scale maize farmers including 4 Agricultural extension officers (AEO) at ward level and 3 officers from financing institutions. Farmers filled the questionnaires and an interview schedule was administered to AEOs and officials from financing institutions by the researcher.

3.7 Data Analysis Techniques

. Data Analysis is defined as the process of systematically utilizing statistical and/or logical tools to describe and illustrate, compress and review, and assess information (Mugenda & Mugenda, 1999). Data analysis involved assembling information and thereafter entering numbers, narratives, and other information into the software (STATA version 12.1), where they were coordinated and/or worked on in several ways.

The study used descriptive statistical techniques to analyze data collected from the respondents. Cross checking of questionnaires was conducted to ensure that all questions were answered. The study coded data into themes before undertaking analysis. The information assessed included ordinal data which respondents provided in the Lickert Scale. The analyzed data was interpreted and presented through descriptive statistics including figures and tables.

The researcher applied frequency and percentages to determine factors influencing public private partnership engagement in maize crop value addition in Kimilili sub-county. Information was presented in tabular form for easiness of interpretation.

3.8 Ethical considerations

The researcher had an introductory letter explaining to the respondents that the research was for academic purposes only. The respondent's consent was first sought to ensure voluntary participation in the study. All respondents were assured of anonymity and confidentiality in all the information given since no respondent was allowed to write his or her name on the questionnaires and the researcher assured them that information given will not be disclosed to anybody else other than the researcher alone.

3.9 Operational Definition of Variables

This section presents the objectives of the study, dependent and independent variables with corresponding indicators and how they were measured.

Table 3.2: operational Definition of Variables

Objective	Variables	Indicators	Measurement scale
To determine how Financing support services influence maize value addition in Kimilili sub-county.	Independent Variable	Level of investment into production, processing and marketing services	Interval
	Dependent variable		Nominal
To determine the extent to which access to markets strategies influence maize value addition in Kimilili sub-county.	Independent Variable	Level of access to market information	Interval
	Dependent variable	Access to markets strategies	Nominal
To determine the extent to which Extension, Research and Development services influence maize value addition in Kimilili sub-county.	Independent Variable	Level of access to information	Ordinal
	Dependent variable	Research and development services	Ordinal
To determine how Infrastructure development services influence maize value addition in Kimilili sub-county.	Independent Variable	Level of adoption of appropriate technologies	Ratio
	Dependent variable	Infrastructure development services	Ratio
To determine how Infrastructure development services influence maize value addition in Kimilili sub-county.	Independent Variable	Level of development of infrastructure support services	Ordinal
	Dependent variable	Conditions of accessing infrastructure services	Nominal

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION AND DISCUSSIONS

4.1 Introduction

This chapter provides an analysis, presentation and interpretation of the research findings for the study on factors influencing public private partnerships on maize crop value addition in Kimilili Sub County. The findings are wholly based on responses obtained from respondents using both quantitative and qualitative methods presented in tables and figures. The main sub headings are: demographic characteristics, PPPs financing support services and maize value addition; access to market strategies by PPPs and maize value addition; extension and research services by PPPs and maize value addition and; infrastructure support services by PPPs and maize value addition.

4.2 Questionnaire Return Rate

The sample size for the study was 195 small scale farmers as respondents. The response rate was 96%. According to Nachmias and Nachmias (2000), this percentage was found to be adequate for analysis and offer adequate information for making conclusions and recommendations.

4.3 Demographic Characteristics of the Respondents

This section sought to establish the demographic information of the respondents (small scale farmers) by focusing on gender, age and education level.

4.3.1 Gender of the respondents

The respondents were asked to indicate their gender details and results were as presented in table 4.1.

Table 4.1: Gender Distribution of the Respondents

Gender	Frequency	Percentage
Male	133	69
Female	60	31
Total	193	100

Table 4.1 revealed that 133(69%) of 193 respondents were male and 60(31%) were female. This means that more men were involved in maize value chain activities.

4.3.2 Age of the Respondents

The study sought to estimate the age brackets of small scale farmers involved in maize value chain development. The findings were shown in table 4.2.

Table 4.2: Age Distribution of the Respondents

Age bracket	Frequency	Percentage
18-20	5	3
21-30	29	15
31-40	66	34
41-50	73	37
51-60	13	7
Above 61	7	4
Total	193	100

Table 4.2 shows that 5(3%) of the respondents were aged between 18-20 years old, 29(15%) were between 21-30 years, 66(34%) were between 31-40 years, 73(37%) were aged between 41-50 years old, 13(7%) were aged between 51-60 years old and

7(4%) were in the age bracket of above 61 years old. The findings showed that majority of maize crop producers were between 31-50 years old.

4.3.3 Education Level of Respondents

The respondents were also asked to indicate the highest level of education they had attained. The findings are shown in table 4.3.

Table 4.3: Education Level of Respondents

Educational Level	Frequency	Percentage
Primary	51	26
Secondary	94	49
Tertiary	37	19
University	11	6
Total	193	100

Table 4.3 shows that 51(26%) of the respondents (small scale farmers) had attained primary school level of education, 94(49%) had attained secondary school education, 37(19%) had attained tertiary level of education and 11(6%) had attained university level of education. The study revealed that majority of farmers engaged in maize crop production had attained above primary level of education.

4.4 Financing Support Services by PPPs on Maize Value Addition

This section shows the responses of respondents regarding financing support services by PPPs on maize crop value addition.

4.4.1 Value Addition Components for Financing

The respondents were asked their preferred stage in maize crop financing. The findings are as presented in Table 4.4.

Table 4.4 Value Addition Components for Financing

Value Addition	Frequency	Percentage
Input supply	69	36
Production	98	51
Access to Markets	20	10
Processing	6	3
Total	193	100

Table 4.4 shows that 98(51%) of the respondents (small scale maize crop farmers) sought financing for production component. They mentioned top dressing and pest control as major items of the production component. 69(36%) of the respondents mentioned that they sought financing support for input supply component. 20 (10%) of the respondents sought financing for the purpose of supporting access to markets. The access to access to market component considered was support for cereal banking item. Other 6(3%) of the respondents mentioned that they sought financing to support processing component in maize crop value addition. The findings show that financing in maize crop value chain happens at all stages, although more respondents (87%) indicated that input supply and production stage were more preferred stages. The findings are similar to Wokabi (2000) that says that there have been interventions to develop maize value chain through enhanced financial support services for input supply, access to markets, extension and research services and enhancing appropriate infrastructure services.

4.4.2 Key Reasons considered by Maize Actors to Seek Financing Support Services

The respondents were asked to give their key reasons of seeking financial support services. The findings are as presented in Table 4.5.

Table 4.5: Key Reasons for Seeking Financing Support

Reasons	Frequency	Percentage
Lack of alternatives	119	62
Low cost	10	5
Trust	64	33
Total	193	100

Table 4.5 shows that 119 (62%) of the respondents sought financing support services because they lacked other alternative mechanisms to support investment in maize crop value addition. 64(33%) of the respondents sought financing support services because they had trust in the institutions that they borrowed from such as Agricultural finance corporation(AFC), Equity bank and one acre fund. 10 (5%) of the respondents revealed that they sought financing support services because it was a low cost option of investment in maize value addition. The findings shows that financing support services is sought by respondents due lack of alternative options for investment capital and trust endowed by the respondents to the financial institutions. These findings are also expressed by Marco and Castle (2011) that value chain financing can be accepted for various reasons like no alternative available, lowest cost option and being the most trusted option.

4.4.3 High priority financing Strategies

The respondents were asked to state their high priority strategy arrangements in financing maize crop value addition. The findings are presented as shown in Table 4.6.

Table 4.6: Prioritized Financing Strategies

Financing strategy	Frequency	Percentage
Partnership with financing institutions	91	47
Promoting specific financial systems	41	21
Strengthening Savings and Loan	61	32
Total	193	100

Table 4.6 shows that 91(47%) of the respondents considered partnership with financing institutions as a high priority financing strategy. 61(41%) preferred strengthening Savings and Loan as a high priority financing strategy. 41 (21%) of the respondents preferred promotion of specific financial systems as the high priority financing option. The findings shows almost a balanced score in responses, although more respondents preferred to partner with financial institutions (47%) while others (32%) preferred to strengthen their savings and loan schemes. These findings relate to Dalipagic and Elepu (2014) that says farmers in Northern Uganda can adapt a three tier sustainable strategies of partnership with financing institutions, promoting specific financial systems like warehousing and strengthening savings and loans scheme in maize crop value chain.

4.4.4 Integration of Training in Access to Financial Services

The respondents were asked their extent of agreement towards integration of training services to financial services. The findings are shown in Table 4.7.

Table 4.7: Integration of Training Service in Access to Financial Services

Options	Frequency	Percentage
Very strongly agree	15	8
Strongly agree	25	13
Agree	109	56
Disagree	17	9
Strongly disagree	27	14
Total	193	100

Table 4.7 shows that 109(56%) of the respondents agreed, 25(13%) strongly agreed and 15(8%) very strongly agreed that integration of training services in access to financial services as a key component in success financing maize crop value addition. 27(14%) of the respondents strongly disagreed and 17(9%) of the respondents disagreed with the statement the integration of training services can influence the access to financial services. The findings show that 77% of the respondents are agreement with integration of training services into access to financial services. These findings are in line with One Acre Fund(2012) in western Kenya that ensures field officers provide extensive training to farmers in production and post-harvest practices apart from receiving quality seeds, fertilizer and other inputs in form of in-kind loans repayable in a flexible structure tailored to beneficiaries income levels.

4.5 Access to Market Strategies and Maize Value Addition

This section attempts to look at the responses of respondents regarding the extent to which access to market strategies in influencing maize crop value addition.

4.5.1 Potential Markets channels for Maize

The respondents were asked to indicate the location that they sold their maize produce. Table 4.8 presents the findings.

Table 4.8 Maize market channels

Market channel	Frequency	Percentage
Traders at farm to gate	64	33
Consumers at farm to gate	11	6
Bulk traders in town	91	47
Institutions of learning	19	10
Millers or NCPB	8	4
Total	193	100

From Table 4.8, 91(47%) of the respondents sell their maize through bulk traders in town and 64(33%) of respondents sell to traders at farm to gate point. 19(10%) of the respondents sold their maize to Institutions of learning, 11(6%) sold to consumers at farm to gate and Only 8(4%) of the respondents sold their maize through National Cereals and Produce Board (NCPB). These findings show that traders dominate the market channel. The findings are similar to Kimenju and Tschirley, (2008) who says that traders have a trend of going to purchase maize from farmers to sell to bulk traders who prefer to sell to institutions of learning, millers or NCPB or supply them to maize deficit areas or store the grain to sell back to the community in times of scarcity.

4.5.2 Main marketing of maize value addition constraints in Kimilili Sub County

The respondents were asked point out major constraints that limit their capacity to access markets for maize crop in Kimilili-Sub-county. The findings are presented in Table 4.9.

Table 4.9: Marketing Constraint in Maize Value Addition

Market constraint	Frequency	Percentage
High transport unit cost	69	36
Poor Infrastructure	74	38
Market imperfections and incompleteness	50	26
Total	193	100

Table 4.9 shows that 69(36%) of the respondents believed that high transport unit cost and 74(38%) of the respondents believed that poor infrastructure were main marketing constraints in maize crop value addition. 50 (26%) of the respondents believed that market imperfections and incompleteness was the main marketing constraint in maize crop value addition. The findings show that High transport unit cost, poor infrastructure and market imperfections and incompleteness limits farmers' access to markets. This scenario is similar to Kaminski et al., 2013, in analyzing marketing constraints in Burkina Faso where high transport costs limited further market integration, poor infrastructure (transport and communication) to accessing markets , deficiencies in extension services, absence of insurance and inadequate strong financial framework were identified as key bottlenecks to accessing markets for maize.

4.5.3 Farmers preference to store maize for a long time

The respondents were asked to indicate their preference of storing maize for a long period of time and sell when the grain is scarce. The findings are as presented in Table 4.10.

Table 4.10: Farmers Concurrence with Storage of Maize for Long Period

Agreement level to statement	Frequency	Percentage
Very strongly agree	78	40
Strongly agree	60	31
Agree	20	10
Disagree	8	4
Strongly disagree	27	14
Total	193	100

Table 4.10 shows that 78(40%) of respondents very strongly agreed, 60(31%) strongly agreed and 20(10%) agreed with the statement of storage of maize for long period of time as strategy of value addition by selling at high prices when the crop is in low supply to the market. Only 8(4%) of the respondents disagreed and 27(14%) of the respondents strongly disagreed that storage of maize for a longer time as a strategy of value addition on maize crop. The findings shows that 82% of the respondents prefer to store maize for period of time. These findings are similar to Jayne *et al.*, 2008 that NCPB tends to increase purchases during good production season. On the other hand farmers are discouraged to store their maize due to inadequate storage facilities, high risks of holding grains for a long time and constraints of borrowing capital for investment for the subsequent season.

4.5.4 Farmers preference to collectively access maize value addition markets

The respondents were asked their preference to collective access to markets. The findings are as presented in Table 4.11.

Table 4.11: Farmers Concurrence to Collectively Access Maize Markets

Agreement level to statement	Frequency	Percentage
Strongly agree	16	8
Agree	67	35
Disagree	74	38
Strongly disagree	36	19
Total	193	100

From Table 4.11, 67(35%) of the respondents agreed and 16(8%) of the respondents strongly agreed that collective access to markets will add value to maize crop for farmers. 74(38%) of the respondents disagreed and 36(19%) of the respondents strongly disagreed that collective marketing will add value to maize crop for farmers. The finding shows that a large proportion of respondents disagreed with collective marketing strategy of the maize crop. The reasons for disagreement are lack cohesion and trust among farmers and inability to meet high storage and marketing costs. These findings are contrary to Markelova *et al.*, (2009), that acting collectively for market access can correct some market imperfections such as high transaction costs and missing credit markets. It also contradicts Kaganzi *et al.*, (2009) that says collective marketing by smallholder farmers can accelerate innovations, streamline interventions and improve efficiency to the farmers.

4. 5.5 Partnerships with PPPs in Building Capacity of Farmers on Access to Markets

The farmers were asked their preference if they concur with working their working in partnership with the government and other stakeholders (Private companies and NGOs) in building their capacity to access markets. The findings are presented in Table 4.12.

Table 4.12: Farmers Concurrence to Work PPPs in Capacity Building of Access to Markets

Agreement level to statement	Frequency	Percentage
Very strongly agree	96	50
Strongly agree	2	1
Agree	60	31
Disagree	16	8
Strongly disagree	19	10
Total	193	100

From Table 4.12, 96(50%) of the respondents very strongly agreed, 2(1%) of respondents strongly agreed and 60(31%) of respondents agreed that when farmers work with other organizations, it will contribute to building the capacity to access markets. 16(8%) of the respondents disagreed and 19(10%) of the respondents strongly disagreed that if farmers work with other organization, their capacity to access market will improve. These findings indicate that majority (82%) of the respondents preferred working in partnership to build their capacity to access maize crop markets. The findings are in line with Sandra (2009) that says smallholder farmers will gain meaningful economic benefits in maize value chain in Zimbabwe if they engage in sustainable market based partnerships with private sector.

4.6 Extension and Research Services in Maize Value Addition

This section shows the responses of respondents regarding financing support of farmers in extension and research in maize crop value addition process.

4.6.1 Extension and Research Support Services in Maize Value Addition

The respondents were asked to indicate whether they received financing support in form extension or research services for the last one year.

Table 4.13: Support Services Received by Farmers in the last one Year Period

Type of service received	Frequency	Percentage
Extension	60	31
Research	79	41
Both	14	7
None	40	21
Total	193	100

From Table 4.13, 60(31%) of the respondents had received support in form of extension services in the past one year. 79(41%) of the respondents also showed they had received support services in form of research services and 14(7%) indicated that they received support in both extension and research services for the past one year. These findings show that about 79% of the respondents access either research and extension services in maize crop value chain.

4.6.2 Service Providers of Extension and Research in Maize Value Addition

The respondents were also asked to indicate who provided the extension and research services to them in the past one past one year. The findings are as shown in Table 4.14.

Table 4.14: Service Providers in Extension and Research

Services providers of extension and research services	Frequency	Percentage
Government(GoK)	9	6
Researchers from institutions of learning	93	61
Private sector	51	33
Total	153	100

From Table 4.14, 153 out of 193 respondents in Table 4.13 indicated to have received research and extension services in maize crop value addition. Therefore the population of 153 respondents was subjected to analysis as a representative sample. 9(6%) of 153 respondents indicated that they received extension and research services from the Government of Kenya, 93(61%) of the respondents indicated that they got extension and research support services from researchers from higher institutions of learning in the past one year. 51(33%) of the respondents said that they received support in form of extension and research services from private sector players such as Mavuno fertilizer producers. These findings are in line Byerlee and Fisher (2002), that provision of extension and research services through public private partnerships can arise based on complementarily of assets and overlapping of interest and agenda.

4.6.3 Critical Stage of Value Addition in Extension and Research

The respondents were also asked to indicate the critical stage of value chain when extension and research services were often provided to them. The findings are as shown in Table 4.15.

Table4.15: Critical Stages for Extension and Research in Maize Value Addition

Critical stage of value chain	Frequency	Percentage
Input supply	24	16
Production	98	64
Processing	18	12
Access to markets	13	8
Total	153	100

From Table 4.15, 98(64%) of the respondents often received extension and research services during production and 24(16%) of respondents got extension and research support services during input supply stage. 18(12%) of the respondents received extension and research services during processing stage and 13(8%) of the respondents got extension and research services when accessing markets for the maize crop. These findings show that extension and research services are more inclined towards maize crop input supply such as testing of seed varieties and pests control in maize production. This is similar to Rasheed *et al.*, 2005 that says private agricultural extension services will play an important role in a more commercially based agricultural sector.

4.6.4 Skills offered by PPPs through Extension and Research in Maize Value Addition

The respondents were asked to indicate if the major skill area that extension and research services were offered. The findings are as shown in Table 4.16.

Table 4.16: Skills Offered by PPPs in Extension and Research

Skill area	Frequency	Percentage
Group management	4	3
Finance management	2	1
Marketing	11	7
Innovation and technology transfer	34	22
Sustainable production and resource management	102	67
Total	153	100

From Table 4.16, 102(67%) of the respondents indicated that they received extension and research services from sustainable production and resource management area. 34(22%) showed that they got extension and research services in innovation and

technology skill area. Only 17 (11%) of the respondents received extension and research from marketing, group management and finance management skill areas. The findings show that more respondents received research and extension services Sustainable production and resource management and Innovation and technology transfer skill areas which are geared towards improved yields and wellbeing. The findings are in line with Aldana *et al.*, (2007) that found a set of skills development to be necessary for the “market readiness” of producer groups.

4.6.5: Partnership in Maize Crop Value Addition

The respondents were asked to state their level of agreement to whether partnerships of the government with other stakeholders in research and extension services would yield to quality and volumes of the maize crop produce. The findings are as presented in Table 4.17.

Table 4.17: Partnership in Maize Value Addition

Support for partnership of value chain	Frequency	Percentage
Very strongly agree	74	48
Strongly agree	50	33
Agree	21	14
Disagree	8	5
Total	153	100

From table 4.17, 74(48%) of the respondents very strongly agreed that partnership of the government and other stakeholders (research institutions, input suppliers and private agricultural marketing institutions) will yield quality results in quality and volumes of the maize crop produce. 50(33%) strongly agreed, 21(16%) agreed and only 8(5%) disagreed. The results showed that partnerships in extension and research can pull synergies and improve value of maize in quality and volumes. The results similar with Crop Life International, 2009 experience of educating academia, public and private

researchers and government agencies on compliance to guidelines for regulated fields in Latin America, Africa and South Asia.

4.7 Infrastructure Supports Services and Maize Value Addition

This section shows the responses of respondents regarding influence of infrastructure support services in maize crop value addition and development.

4.7.1 Infrastructure Constraints that Limits Value Addition on Maize Crop in Kimili

The respondents were asked to check major constraints that limit their agri-business in maize crop value addition. Table 4.18 highlights the findings.

Table 4.18: Constraints in Maize Value Addition

Maize Value Addition Constraints	Frequency	Percentage
High cost of electricity	52	27
Under-investment in irrigation	8	4
Poor roads and telecommunication networks	88	46
Inadequacy in storage facilities	45	23
Total	193	100

From Table 4.18, 52(27%) of the respondents mentioned high costs of electricity as a major constraint that limits farmers to invest in agro-business development. 8(4%) of the respondents mentioned under-investment in irrigation as a major constraint that limits farmers to invest in agro-business development. 88(46%) of the respondents mentioned poor roads and telecommunications networks and 45(23%) mentioned inadequacy in storage facilities as other major constraints that limits farmers to invest in agro-business development. The findings showed that under-development of key infrastructure facilities

has limited value addition and development of maize crop in Kimilili sub-county. These findings are in agreement with Warner and Kahan (2008) that says the government should accept responsibility to provide adequate infrastructure for development of agri-business growth in developing countries in order reduce high transaction costs and uncertainties’.

4.7.2 Infrastructure Facilities in Maize Crop Value Addition in Kimilili

The respondents were asked to indicate their level of agreement to the statement that infrastructure development should be provided to the community as a strategy towards agri-business enterprises through provision of equipment and trainings in partnerships with the government, NGOs and private sector. Table 4.19 provides the findings of the respondents.

Table 4.19: Concurrence with provision of Infrastructure Facilities by PPS in Maize Value Addition

Level of concurrence	Frequency	Percentage
Very strongly agree	77	40
Strongly agree	33	17
Agree	67	35
Disagree	10	5
Strongly disagree	6	3
Total	193	100

From Table 4.19, 77(40%) of the respondents very strongly agreed with the proposed statement to provide infrastructure to community as a strategy towards agri-business development through equipment and trainings in partnership with the government and other stakeholders. 33(17%) of the respondents strongly agreed, 67(35%) agreed, 10(5%) disagreed and 6(3%) strongly disagreed to the statement. These findings showed that farmers prefer to undertake agri-business development through

consolidated synergies of strategies and partnerships engagements. These findings agree with FAO (2013c), whereby the Government of Guatemala in Latin America initiated provision of equipment and trainings for maize crop value addition through national fund for peace (FONAPAZ) implemented in partnership with UNDP. Other partners involved in provision of loans for the same project were Agricultural and Business Development bank (FUNDEA), Inter-America Development Bank (IDB) and Oiko credit.

4.7.3 Demand factors for small holder irrigation in Maize value addition

The respondents were asked to state their extent of agreement on the statement whether small holder irrigation and development has induced by market for green maize during off-peak seasons. The findings are as presented in Table 4.20.

Table 4.20: Concurrence that Irrigated Maize Farming is Caused by Demand for Green Maize

Concurrence level	Frequency	Percentage
Very strongly agree	94	49
Strongly agree	66	34
Agree	33	17
Total	193	100

From Table 4.20, 94(49%) of the respondents very strongly agreed, 66(34%) strongly agreed and 33(17%) agreed to the statement that Small holder irrigation and development is induced by market for green maize during off-peak seasons. The findings showed that high demand for green maize in Kimilili sub-county is during off-peak seasons. This is in line with Sijali and Okumu, (2002) that says small scale farmer driven irrigation has emerged of recent along river banks in western Kenya.

4.7.4 Infrastructure Facilities that Support of Maize Value Chain Development

The respondents were also asked to indicate their views on the existing infrastructure that mostly support maize crop value addition in Kimilili sub-county. The findings are shown in Table 4.21.

Table 4.21: Infrastructure Facilities that Support Maize Value Addition in Kimilili

Infrastructure facility	Frequency	Percentage
Market information centre	15	8
Telephone SMS system	70	36
Community Radio	108	56
Total	193	100

From Table 4.21, it shows that 108(56%) of the respondents mentioned community radio as a common infrastructure system used by farmers in Kimilili sub-county, 70(36%) of the respondents said that Cell phone SMS system was the second platform commonly used and only 15(8%) of the respondents also said that market information centre infrastructure system exists among farmers in Kimilili sub-county. The results showed that information communication technology has been adopted by farmers in maize crop value addition. These findings are in line with ACIDI/VOCA, (2012) that says ICT for marketing has already been developed by private sector in Kenya and through established market information centers, buyers and sellers interact through a network using widespread mobile telephone technologies.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

This chapter is organized into the following sub-headings: summary of the study, conclusions of the study, recommendations of the study and suggestions for further studies in line with the research questions.

5.2 Summary of the Findings

The study sought to determine the influence of public private partnerships on maize crop value addition in Kimilili sub-county with the aim of determining how support to credit, access market, extension and research and infrastructure services influence maize crop value addition in Kimilili sub-county. In this subsection the researcher outlines summary of the findings based on the objectives of the study.

The researcher sought to determine the extent to which support to credit financing services influence maize crop value addition in Kimilili sub-county. As it pertains the components of maize crop financing, 51% of the respondents sought financing for maize production component: Followed by 36% of the respondents who sought financing support for input supply component. 10% of the respondents sought financing to support access to markets. Other 63% of the respondents mentioned that they sought financing to support processing component in maize crop value addition. The findings show that financing in maize crop value chain happens at all stages, although more respondents 87% indicated that input supply and production stage were more preferred stages. 62% of the respondents sought financing support services because they lacked other alternative mechanisms to support investment in maize crop value addition: 33% of the respondents sought financing support services because of the trust that they had in the institutions that they borrowed from such as Agricultural finance corporation (AFC), Equity bank and one acre fund. 5% of the respondents revealed that they sought financing support services because it was a low cost option of investment in maize value addition. The findings show that financing support services is sought by respondents due

lack of alternative options for investment capital and trust endowed by the respondents to the financial institutions. 47% of the respondents considered partnership with financing institutions as a high priority financing strategy: This was followed by 41% of the respondents who preferred strengthening savings and loan as a high priority financing strategy: 21% of the respondents preferred promotion of specific financial systems as the high priority financing option. The findings shows almost a balanced score in responses, although more respondents preferred to partner with financial institutions 47% while others 32% preferred to strengthen their savings and loan schemes. 56% of the respondents agreed that integration of training service in access to financial services: it was followed by 13% of respondents who strongly agreed and 8% of the respondents that very strongly agreed that integration of training services in access to financial services as a key component in success financing maize crop value addition. 14% of the respondents strongly disagreed and 9% of the respondents disagreed with the statement the integration of training services can influence the access to financial services. The findings show that 77% of the respondents are agreement with integration of training services into access to financial services.

Concerning the extent to which support to access markets influence maize value addition in Kimilili sub-county, 47% of the respondents sold their maize through bulk traders in town and 33% of respondents sell to traders at farm to gate point: 10% of the respondents sold their maize to Institutions of learning while 6% sold to consumers at farm to gate and only 4% of the respondents sold their maize through National Cereals and Produce Board (NCPB). These findings show that traders dominate the market channel. 38% of the respondents believed that poor infrastructure and 36% of the respondents believed that high transport unit cost were main marketing constraints in maize crop value addition: 26% of the respondents believed that market imperfections and incompleteness was the main marketing constraint in maize crop value addition. The findings show that High transport unit cost, poor infrastructure and market imperfections and incompleteness limits farmers' access to markets. 40% of respondents very strongly agreed, 31% strongly agreed and 10% agreed with the statement of storage of maize for long period of time as strategy of value addition by selling at high prices when the crop is in low supply to the market. Only 4% of the respondents disagreed and 14% of the

respondents strongly disagreed that storage of maize for a longer time as a strategy of value addition on maize crop. The findings shows that 82% of the respondents prefer to store maize for period of time. 35% of the respondents agreed and 8% of the respondents strongly agreed that collective access to markets will add value to maize crop for farmers. 38% of the respondents disagreed and 19% of the respondents strongly disagreed that collective marketing will add value to maize crop for farmers. The finding shows that a large proportion of respondents disagreed with collective marketing strategy of the maize crop. The reasons for disagreement are lack cohesion and trust among farmers and inability to meet high storage and marketing costs. 50% of the respondents very strongly agreed, 1% of respondents strongly agreed and 31% of respondents agreed that when farmers work with other organizations, it will contribute to building the capacity to access markets. 8% of the respondents disagreed and 10% of the respondents strongly disagreed that if farmers work with other organization, their capacity to access market will improve. These findings indicate that majority 82% of the respondents preferred working in partnership to build their capacity to access maize crop markets.

To determine the extent to which support to extension and research services influence maize crop value addition in Kimilili sub-county. 31% of the respondents had received support in form of extension services in the past one year: 41% of the respondents also showed they had received support services in form of research services and 7% indicated that they received support in both extension and research services for the past one year. These findings show that about 79% of the respondents access either research and extension services in maize crop value chain. 6% of the respondents indicated that they received extension and research services from the Government of Kenya, 61% of the respondents indicated that they got extension and research support services from researchers from higher institutions of learning in the past one year. 33% of the respondents said that they received support in form of extension and research services from private sector players such as Mavuno fertilizer producers. 64% of the respondents received extension and research services during production and 16% of respondents got extension and research support services during input supply stage. 12% of the respondents received extension and research services during processing stage and 8% of

the respondents got extension and research services when accessing markets for the maize crop. These findings show that extension and research services are more inclined towards maize crop input supply such as testing of seed varieties and pests control in maize production. 67% of the respondents indicated that they received extension and research services from sustainable production and resource management area. 22% showed that they got extension and research services in innovation and technology skill area. Only 11% of the respondents received extension and research from marketing, group management and finance management skill areas. The findings show that more respondents received research and extension services Sustainable production and resource management and Innovation and technology transfer skill areas which are geared towards improved yields and wellbeing. 46% of the respondents very strongly agreed that partnership of the government and other stakeholders (research institutions, input suppliers and private agricultural marketing institutions) will yield quality results in quality and volumes of the maize crop produce. 34%) strongly agreed, 16% agreed and only 5% disagreed. The results showed that partnerships in extension and research can pull synergies and improve value of maize in quality and volumes.

In regard to determining how support to infrastructure services influence maize crop value addition in Kimilili sub-county. 27% of the respondents mentioned high costs of electricity as a major constraint that limits farmers to invest in agro-business development. 4% of the respondents mentioned under-investment in irrigation as a major constraint that limits farmers to invest in agro-business development. 46% of the respondents mentioned poor roads and telecommunications networks and 23% mentioned inadequacy in storage facilities as other major constraints that limits farmers to invest in agro-business development. The findings showed that under-development of key infrastructure facilities has limited value addition and development of maize crop in Kimilili sub-county. 40% of the respondents very strongly agreed with the proposed statement to provide infrastructure to community as a strategy towards agri-business development through equipments and trainings in partnership with the government and other stakeholders. 17% of the respondents strongly agreed, 35% agreed, 5% disagreed and 3% strongly disagreed to the statement. These findings showed that farmers prefer to undertake agri-business development through consolidated synergies of strategies and

partnerships engagements. 49% of the respondents very strongly agreed, 34% strongly agreed and 17% agreed to the statement that small holder irrigation and development is induced by market for green maize during off-peak seasons. The findings showed that high demand for green maize in Kimilili sub-county is during off-peak seasons. 56% of the respondents mentioned community radio as a common infrastructure system used by farmers in Kimilili sub-county: 36% of the respondents said that cell phone SMS system was the second platform commonly used and only 8% of the respondents also said that market information center infrastructure system exists among farmers in Kimilili sub-county. The results showed that information communication technology has been adopted by farmers in maize crop value addition.

5.3 Conclusions

The researcher sought to determine the influence of public private partnerships on financing maize crop value addition in Kimilili sub-county with the aim of determining how support to credit, access market, extension and research and infrastructure services influence maize crop value addition in Kimilili sub-county.

The researcher sought to investigate the extent to credit financing influence maize crop value addition. The study showed that financing in maize crop value chain happens at all stages. It was concluded that farmers preferred financing at input supply and production stage in maize crop value chain. Most farmers sought financing support services because they lacked alternative options for investment capital, trust endowed to financing institutions and low costs on loans. Therefore it was concluded that lack of alternative options to investment drives farmers to seek financing for maize crop value addition. In regard to partnership strategies to adopt in financing maize crop value chain, promotion of specific financial services was lowly followed by strengthening of savings and loan schemes. It was concluded that partnership with financial institutions was more preferred strategy of partnership. More farmers were in agreement of integrating training services into access to financial services.

The study showed that traders dominate the maize crop market channel right from farm gate. Less effort has been taken by farmers to market their produce directly to consumers and institutions of higher learning. Although the study showed that high transport unit cost, poor infrastructure and market imperfections and incompleteness limits farmers' access to markets. It was concluded that poor road network and high communication costs significant factors that limit farmer's access to markets. It was also established that a significant number of farmers prefer to store maize for a long period of time. The finding shows that a large proportion of respondents disagreed with collective marketing strategy of the maize crop. The reasons for disagreement are lack cohesion and trust among farmers and inability to meet high storage and marketing costs. A significant number of farmers preferred working in partnership with more partners to build their capacity in order to access maize crop markets.

The study also showed that more farmers accessed either research and extension services in maize crop value addition. The extension and research services that are provided to farmers in maize crop value addition are more inclined towards input supply services such as testing of seed varieties and pests control in maize production. The study also showed that farmers received research and extension services on sustainable production and resource management and Innovation and technology transfer skill areas which are geared towards improved yields. The results showed that partnerships in extension and research can pull synergies and improve value of maize in quality and volumes.

The findings showed that under-development of key infrastructure facilities has limited value addition of maize crop in Kimilili sub-county. The study also established that that farmers prefer to undertake agri-business development through consolidated synergies of strategies and partnerships engagements. The study also showed that green maize was with high demand in Kimilili sub-county during off-peak seasons. The results showed that information communication technology has been adopted by farmers in maize crop value addition.

5.4 Recommendations

Farmers should consider exploration of marketing maize directly to public institution and consumers at farm gate.

Farmers should be assisted to set up improved community and private storage facilities that will assist them to collectively aggregate and store maize for a long time. This will assist them to sell their maize produce during low seasons.

Farmers should be encouraged to set collective marketing groups and centres that will aggregate maize grain products in order to meet market demand and meet storage and marketing costs.

The farmers should also be encouraged to adopt modern technologies that will be less dependent on rain-fed water and yield more profits like production of green maize using irrigation.

5.5 Suggestions for Further Research

The following areas are recommended for further research:

Since the study was limited to Kimilili Sub-county, there is need to replicate the same study in other sub-counties that have different situations which may elicit different responses.

A study should be undertaken on promoting other financial systems in maize crop value addition like warehousing, savings and loaning schemes in Kimilili sub-county.

REFERENCES

- ACDI/VOCA. Kenya (2012). *Boosting Household Incomes, Raising Productivity*. Kenya Maize Development Program (KMDP). www.acdivoca.org/site/ID/position-statements.. Accessed on 5th April 5, 2013.
- Albu, M. and Griffith, A. (2005). ‘*Mapping the Market: A framework for rural enterprise development policy and practice*’, www.bdsknowledge.org.
- Aldana, M., Burpee, G., Heinrich, G., Remington, T., Wilson, K., Ashby, J. Quiros, C. (2007). *The organization and development of farmer groups for agro-enterprise: Conclusions from a CRS & RII-CIAT study tour in Asia, Africa and Latin America* (A CRS Internal Working Paper). Retrieved from <http://eltianguis.files.wordpress.com/2009/05/organization-and-development-of-farmer-groups-study-tourconclusions.pdf>.
- Andy H. (2006). “Public private sector partnerships in an agricultural system of innovation: concepts and challenges” Working Paper series. United Nations University - Maastricht Economic and social Research and training centre on Innovation and Technology.
- APCoAB (2007). *Brainstorming Session on Models of Public-Private Partnership in Agricultural Biotechnology -Highlights and Recommendations*. Asia-Pacific Consortium on Agricultural Biotechnology (Page 6), New Delhi and Trust for Advancement of Agricultural Sciences, New Delhi. p 24+viii.
- Ariga, J. and T. S. Jayne. 2009. *Private Sector Responses to Public Investments and Policy Reforms. The Case of Fertilizer and Maize Market Development in Kenya*. IFPRI Discussion Paper No. 00921. Washington, D.C. International Food Policy Research Institute (IFPRI).
- Byerlee D, and K. Fischer (2002). “*Assessing modern science: policy and institutional options for agricultural biotechnology in developing countries,*” World Development 30:6, pp. 931-948.
- Chiukira G., and J. Sandra, (2009). *Maize and Soya Bean Value Chain Analysis*. In Agriculture Value Chain Analysis.

- CIMMYT and IITA, 2010. MAIZE – *Global alliance for improving food security and the livelihoods of the resource-poor in the developing world*. Draft proposal submitted by CIMMYT and IITA to the CGIAR Consortium Board. El Batan, Mexico. 91 pp. CIMMYT and IITA. Supporting African farmers to face drought: The Drought Tolerant Maize for Africa Initiative (DTMA). Website: <http://dtma.cimmyt.org>.
- County Government of Bungoma (2014). *Economy of Bungoma County*. <http://www.bungoma.go.ke>
- Creswell J.W. (2003). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. Sage Publications.
- CropLife International (2009). *Advancing Agricultural Innovations through Public-Private Partnerships*. www.croplife.org. Accessed in February 2014.
- Dalipagic I, G. Elepu, (2014). *Agricultural Value Chain Analysis in Northern Uganda: Maize, Rice, Groundnuts, Sunflower and Sesame*. (Action Against Hunger | ACF-International).
- FAO Statistics (2008). Website: <http://www.faostat.fao.org>.
- FAO. 2013a. *Agribusiness public-private partnerships – A country report of Thailand*. Country case studies – Asia. Rome
- FAO. 2013b. *Agribusiness public-private partnerships – A country report of China*. Country case studies – Asia. Rome
- FAO. 2007. FAOSTAT agriculture data [online]. In: www.fao.org. Available at <http://faostat.fao.org> (last update 2007; accessed 19 Nov. 2007). Rome, Italy: Food and Agriculture Organization (FAO).
- FAPRI. 2007. *US and World Agricultural Outlook*. January 2007. FAPRI Staff Report 07-FSR 1. Ames, Iowa, USA: Food and Agricultural Policy Research Institute, Iowa State University and University of Missouri-Columbia. p 1-395.

- Frankel, J.R., and Walen, E. (2004) *How to design and Evaluate Research in Education*. 7th edition.. Mc Graw-Hill international Edition.
- Government of Kenya (GOK), (2007). *Vision 2030. A Globally Competitive and Prosperous Kenya*.
- Hall D. (2008). Public Private Partnerships (PPP's). Summary paper. A report commissioned by the European Federation on Public Service Unions (CEPSU). www.epsu.org
- Info Resources (2005). *Development through Public-Private Partnerships (PPPs)*. Focus No 1/05, InfoAgrar. www.inforesources.ch Accessed on March 2013.
- Jayne, T.S., R.J. Myers, and J. Nyoro. (2008). The Effects of Government Maize Marketing Policies on Maize Prices in Kenya. *Agricultural Economics* 38.3: 313–25.
- Jayne, T.S., T. Yamano, J. Nyoro, and T. Awuor. (2001). *Do Farmers Really Benefit From High Food Prices? Balancing Rural Interests in Kenya's Maize Pricing and Marketing Policy*. Working Paper 2b, Tegemeo Institute, Nairobi, Kenya. On-line at: <http://www.aec.msu.edu/agecon/fs2/kenya/index.htm>
- Kaganzi, E., S. Ferris, J. Barham, A. Abenakyo, P. Sanginga and J. Njuki. (2009). *Sustaining linkages to high value markets through collective action in Uganda*. *Food Policy* , 23-30.
- Kaminski, J., A. Elbehri, and J-P. Zoma (2013). *An analysis of Maize value chain and competitiveness in Burkina Faso: Implications for smallholder-inclusive policies and initiatives*, In: *Rebuilding West Africa's Food Potential*, A. Elbehri (ed.), FAO/IFAD.
- Kaplinsky, R. and M. Morris (2003). *A Handbook for Value Chain Research*. Brighton, United Kingdom, Institute of Development Studies, University of Sussex.
- Kirimi L., N. Sitko, T.S. Jayne, F. Karin, M. Muyanga, M. Sheahan, J. Flock, and G. Bor. (2011). *A farm gate-to-consumer value chain analysis of kenya's maize marketing system*. MSU International Development Working Paper No. 111.
- Kimenju, S. and D. Tschirley. 2008. *Agriculture and Livelihood Diversification in Kenyan Rural*

Households. Tegemeo Working Paper No. 29. Nairobi: Tegemeo Institute of Agricultural Policy and Development, Egerton University. Online at: www.tegemeo.org.

- Klepper, S., (1997); "Industry life-cycles", *Industrial and Corporate Change*, **6**: 145–182.
- Kothari, C.R.(2004). *Research Methodology. Methods and techniques*. 3rd edition. New Age International,New Delhi.
- Kwame A. A. (2011). *Public Private Partnership Planning and Implementation*. Consultant in Capacity Building in Public Private Partnership.
- Marco F. and Castle P. (2011) Public-Private Partnerships and Sustainable Agricultural Development. *Sustainability*, 3, 1064-1073; doc: 10.3390/su3071064.
- Mays, N., and Pope, C.(2000). Qualitative research in health care: *Assessing quality in qualitative research*. *BMJ*, 320, 50-52.
- Mbwesa J. (2006). *Introduction to Management Research. Methods and Techniques*. (3rd Edition): Gupta K.K.New Delhi.
- Markelova, H., R. Meinzen-Dick, J. Hellin and S. Dohrn (2009). Collective action for smallholder market access. *Food Policy*, 1-7.
- McArthurH. J., (2005).*Public-Private Partnerships: A Promising Approach for International.Agricultural Development or One's Worst Nightmare*, University of Hawaii. In *Food, Agriculture, and Rural Development Policies in a Globalizing World (GLO 2005)*.
- Ministry of Agriculture, Kimilili Sub County. 2013. *Sub-County Annual Report*.
- Muchara Binganidzo(2011). Analysis of food value chains in smallholder crop and livestock enterprises in Eastern CapeProvince of South Africa.
- Muganga A.K. (2011). The structure, conduct, and performance of agricultural market information systems in sub-Saharan Africa.Unpublished PhD. Thesis. Michigan State University.
- Mugenda, O.M and Mugenda, A.G. (2003). *Qualitative and quantitative approaches. Research methods*. Africa Center for Technology Studies(Acts) Press. Nairobi Kenya.
- Nachmias -Frankfort, Chava and David Nachmias. 2000. *Research Methods in the Social Sciences*. 6th edition. New York: Worth Publishers.

- Nedelcovych M, and D. Shiferaw (2012). *Private Sector Perspectives For Strengthening Agribusiness Value Chains In Africa*. Case Studies from Ethiopia, Ghana, Kenya, and Mali
- Nierenberg D, and K. Spoden. (2012). *Global Grain Production at Record High Despite Extreme Climatic Events*, World Watch institute (www.worldwatch.org).
- One Acre Fund (2012). *Asset Based Financing for Smallholder Farmers Project*. Funded by USAID/Kenya Agriculture, Business and Environment Office. www.oneacrefund.org. Accessed on 5th April, 2013.
- Ong'olo David .O, (2006). *Public Private Partnerships (PPP). Practice and Regulatory Policy in Kenya*. The Institute of Economic affairs in Kenya (IEA, Kenya).
- Pasuquin, J.M.C.A., and C. Witt. 2007. *Maize in Asia and the global demand for maize*. IPNI-IPI Southeast Asia Program, Singapore. www.Ipipotash.org/eng/eifc/2007/14. Accessed March 2013.
- Ponniah A (2009). *Integrating Innovation Systems Perspective and Value Chain* [International Livestock Research Institute, Addis Ababa \(Ethiopia\), Berhanu Gebremedhin](http://www.international-livestock-research-institute.org).
- Rasheed S., V, Hall, A.J. and Suresh N (2005). “*Effectiveness of private sector agricultural extension in India: lessons for the new extension policy agenda,*” ODI Agricultural Research and Extension Network (AgREN) Paper No. 117 January 2005.
- Riahi Belkaoui, A. (2000): *Accounting Theory*. Fourth Edition, ISBN 1-86152-520-6, Business Press.
- Saunders, M., P. Lewis et al. (2007). *Research methods for Business students*. Fourth Harlow, England, FT Prentice Hal, Pearson Education.
- Scheltema, W., B. Snellen; and C. M. Osoro. (1992). *Nairobi, Kenya: The evolution of an irrigation development program for smallholders in Kenya*. ILRI Annual Report.
- Shahidur R., Kindie G., and Solomon L. (2010). *Maize Value Chain Potential in Ethiopia. Constraints and opportunities for Enhancing the System*. International Food Policy Research Institute (IFPRI). Working paper July 2010.
- Sijali I, and R. Okumu (2002). *New irrigation Technologies. The changing the Face of Irrigation in Kenya: Opportunities for Anticipating Changes in Eastern and Southern Africa*. International Water Management Institute (IWMI) page 55

- Singh, Y.M., (2006). *Fundamentals of Research Methodology and Statistics*. New Age International (P) Limited Publishers, New Delhi. ISBN : 978-81-224-2418-8.
- UN (2009). *World Population Prospects: The 2008 Revision*, United Nations, New York. USDA,
1999. *Sustainable Agriculture: Definitions and Terms*. Special Reference Briefs Series No. SRB 99-02.
- United Nations Conference on Trade and Development (2000). *Strategies for diversification and adding value to food exports*. UNCTAD/DITZ/COM/TM/1.14. UNCTAD, Geneva, Switzerland.
- United Nations Development Programme (2005). *Commission on the Private Sector and Development*. Unleashing Entrepreneurship – Making Business Work for the Poor. 58p www.undp.org/cpsd/documents/report/english/fullreport.pdf.
- UN MDG's (2000). United Nations Development Programme. *Millennium Development Goals*.
www.undp.org. Accessed April 2013
- The United Republic of Tanzania, (2009). *National Public Private Partnership (PPP) Policy*.
Accessed April 2013.
- Warner M., and Kahan D., (2008). *Market-oriented agricultural infrastructure: Appraisal of public-private partnerships* Project Briefing No.9.
- Wokabi M, (2000). *Maize consumption patterns in Kenya*. Accessed April 2014.
- World Bank (2006). *Poverty and Hunger Issues and Options for Food Security in Developing Countries*. Washington D.C. The International Bank for Reconstruction and development: The world Bank.
- World Economic Forum,(2005).*Development challenges cannot be met without public-private partnerships, according to CEO survey.* World Economic Forum website (www.weforum.org/site/homepublic.nsf/Content/Development).
- Yuan Zhou(2010).*Smallholder Agriculture, Sustainability and the Syngenta Foundation*. Syngenta Foundation for Sustainable Agriculture. IFPRI.

APPENDICES

APPENDIX 1: LETTER OF TRANSMITAL

VINCENT T. MAKOKHA
P.O. BOX 738, KIMILILI
DATE.....

Dear Respondent,

RE: FILLING OF THE QUESTIONNAIRE

I am a student at the University of Nairobi undertaking a Master of Arts Degree in Project Planning and Management. I have identified you as a respondent to a questionnaire to gather information on factors influencing maize crop value addition in Kimilili Sub-county. Kindly fill in the questionnaire with honest. All the responses will be handled in confidence and will only be used for academic purposes. Thank you in advance for your cooperation.

Yours faithfully,

Vincent Makokha

APPENDIX2: QUESTIONNAIRES

FARMERS QUESTIONNAIRE

SECTION A: DEMOGRAPHIC CHARACTERISTICS (PERSONAL DETAILS)

Tick (✓) or fill the appropriate responses

1. Gender: Male Female
2. Age
 - 18-20
 - 21-30
 - 31-40
 - 41-50
 - 51-60
 - Above 61
3. What is your highest level of education
 - Primary
 - Secondary
 - Tertiary
 - University

SECTION B: ACCESS TO CREDIT SUPPORT SERVICES

1. At which stage of maize crop value addition do you seek financing

Input supply Production Access to markets Others.....specify

2. Which of the following reason do you consider as key in seeking financing options for your activities in maize crop value addition?

Lack of alternatives Low cost Trust Others/ specify

3. Which financing strategy would you consider as priority in the following options?

Building partnership with financial institutions

Promotion of specific financial system with agencies to allow commodity collateral

Strengthening of savings and loan systems through capacity building

4. “Farmers capacity in access to financial services should be build accompanied by training services in strategies to access inputs, production methodologies, post-harvest handling and access to maize markets”. To what extent do you agree with the following statement?

strongly agree Slightly agree A little Disagree Strongly disagree

SECTION C: FINANCING ACCESS TO MARKETS SUPPORT STRATEGIES

1. Which potential markets do you **mostly** sell your maize to?

- Traders at farm-gate Cooperatives at farm gate Buyers in town
 Institutions of learning Sellers or NCPB

Others/specify

2. What do you consider as the **main** marketing constraints in maize value chain in your local area?

- High transport unit costs Poor infrastructure
 Market imperfections and incompleteness Others. Specify

3. “I prefer to store maize for a long period of time”.

- Very strongly agree Strongly agree Agree Disagree
 Strongly disagree

4. “I prefer to collectively to access market in the maize value chain”

- Very strongly agree Strongly agree Agree Disagree
 Strongly disagree

5. As a farmer I prefer working with an organization in building my capacity to access maize markets?

- Very strongly agree Strongly agree Agree Disagree
 Strongly disagree

SECTION D: FINANCING EXTENSION AND RESEARCH DEVELOPMENT SERVICES

1. Which support service have you mainly received in maize value chain development in the past one year?

Extension services Research services Both None

2. Who mostly provides the extension and research services in your area?

GoK officers Researchers from institutions of learning Private

sector officials

Others/ specify

3. At what stage of maize value chain do you mainly receive the above support services?

Input supply Production Value addition Access to

markets

4. Which major skill area did you receive as capacity support for maize value chain?

Group management Managing finance Marketing

Experimentation and innovation

Sustainable production and resources management Others. Specify

5. Extension and research support to small scale maize farmers should be conducted in partnership with Government and other stakeholders (like research institutions, input suppliers and private marketing entrepreneurs) in the value chain for improvement quality and quantities of produce. To what extent do you agree with this statement?

Very strongly agree Strongly agree Agree Disagree Strongly

disagree

SECTION E: FINANCING INFRASTRUCTURE SUPPORT SERVICES

1. What major infrastructure constraints can you cite that limits maize agribusiness growth in Kimilili Sub-county?

High cost of electricity Under-investment in irrigation,
 Poor road network and telecommunicatio Inadequacy storage

facilitates

Others. Specify

2. “Infrastructure development should be provided to maize farmers in Kimilili Sub-county towards community agro-business enterprises through equipments and trainings in partnership of government, private investors and NGO’s to benefit the farmers in maize value chain”. To what extent do you agree with this statement?

Very strongly agree Strongl Agree
Disagree

Strongly disagree

3. “Small holder irrigation and development is induced by market for green maize during off-peak seasons”. To what extent do you agree with this statement?

Very strongly agree Stro agree Agree
Disagree

Strongly disagree

4. What infrastructure facility mostly exists in Kimilili Sub-county that supports the maize value chain?

Private irrigation systems Market information centers Telephone

SMS

Community Radio Traders association others.

Specify

APPENDIX 3: INTERVIEW SCHEDULES

INTERVIEW FOR AGRICULTURAL EXTENSION OFFICERS

1. What types of extension services do you provide to stakeholders in maize farming?
2. Which major skills do provide to stakeholders to enhance financial investment and management?
3. What type/s of capacity building support services do you provide to stakeholders in maize marketing business?
4. What type/s of capacity building support services do you offer to stakeholders to enhance uptake of appropriate technologies in maize farming?

INTERVIEW FOR OFFICERS FROM FINANCIAL INSTITUTIONS

1. Which type of loan products do you offer to maize crop value chain actors?
2. What do you consider as collateral in your loan products?
3. What do you consider as the best strategy to partner with stakeholders in financing maize farming?
4. What extension services do you provide to your clients?
5. What plans do you have in financing clients in financing marketing in maize farming?
6. What financial services do you have that supports maize farming infrastructure support services?