

**INFLUENCE OF SOCIAL CAPITAL ON PRODUCER GROUPS' PERFORMANCE AND  
MARKET ACCESS AMONGST SMALLHOLDER FRENCH BEAN FARMERS IN  
KIRINYAGA COUNTY**

**HILLARY CHERUYOT KORIR**

**A Thesis Submitted to Graduate School in Partial Fulfillment for the Requirement of the  
Award of Master of Science Degree in Agricultural and Applied Economics of Egerton  
University**

**EGERTON UNIVERSITY**

**July, 2015**

## DECLARATION AND APPROVAL

### DECLARATION

I declare that this work is wholly my original work and to the best of my knowledge has not been presented for the award of any degree in this or any other university.

Signature: -----

Date-----

Hillary Cheruyot Korir

KM17/3261/12

### APPROVAL

This research thesis has been submitted to graduate school for examination under our approval as university supervisors.

Signature: -----

Date: -----

**Prof. Job K. Lagat, (PhD)**

Department of Agricultural Economics and Agribusiness Management,

Egerton University, Njoro (Kenya).

Signature: -----

Date: -----

**Dr. Mary C. Mutai, (PhD)**

Department of Agricultural Economics and Agribusiness Management,

Egerton University, Njoro (Kenya)

**COPYRIGHT**

©2015, Korir Hillary

No part or whole of this thesis may be reproduced, stored in a retrieval system or transmitted in any form or means such as electronic, mechanical or photocopying without the prior written permission of the author or Egerton University on her behalf.

All rights reserved

## **ACKNOWLEDGEMENT**

I would like to extend my sincere honours and thanks go to Almighty God for his mercy, grace, strength and opening the way for me. The Lord gave me the wisdom, guidance and power to sail through during the entire period of study. Special thanks and appreciation goes to Egerton University for giving me the chance to study at the institution. The conducive learning environment at the institution contributed a lot towards the success of my studies and research. I also acknowledge the entire staff of Department of Agricultural Economics and Business Management, Egerton University for their help and support throughout my studies. I am deeply grateful and indebted to Prof J.K. Lagat, my supervisor, for his scholarly guidance, fruitful suggestions and provision of pertinent and constructive information. Successful accomplishment of this research would have been difficult without his generous time devotion and tireless contribution. I also owe my gratitude to Dr. Mary C. Mutai, my advisor for her useful and valuable comments, which led to considerable improvement and completion of this thesis. I would also like to extend my sincere gratitude to Africa Economic Research Consortium (AERC) for granting me a scholarship covering my tuition and research grant. The scholarship also gave me an opportunity to undergo specialized and rigorous training at the University of Pretoria, South Africa. My special gratitude also goes to my enumerators; Gerald, Esther, Kelvin, John and Lydia who sacrificed a lot in collecting the data used in this study. To all the respondents in Kirinyaga County, who took their precious time and volunteered information making it possible to achieve this research, I am really thankful. I am also grateful to all my friends and especially my classmates, CMAAE 2012 class for their kindness and moral support during the entire period of the study. Finally, I would like to express my sincere appreciation and gratitude to my family for their special strength in standing by my side, besides their words of encouragement and inspiration, which made the study a success.

## **DEDICATION**

To my loving grandmother, Elizabeth Biomdo, my father Kipkorir Sitonik, siblings, Patrick and Winnie, and my loving wife, Josephine, who always prayed and gave me moral support to study.

## **ABSTRACT**

Market access is a major constraint facing agricultural commercialization in Kenya. The pressure on arable land and market changes are mainly felt by the smallholder farmers who are faced with high transaction costs such as information access and transport costs. In addition, these farmers face a number of institutional and technical factors putting their market survival at stake. To curb these challenges, formation of farmer groups and organizations has become important in bringing about collective action whose basis is social capital. However, this capital must be mobilized through group membership and other social dimensions to achieve collective action. The dimensions of the farmer organizations that constitute social capital and how they enhance market access are of great concern. This study therefore, sought to assess the role and influence of social capital on the performance (measured by commercialization) of producer groups amongst smallholder French bean farmers in enhancing market access and improved household incomes. The study was conducted in Mwea sub-county, Kirinyaga County and a multistage sampling method was used to obtain a sample of 174 farmers (95 group members and 79 non-group members) who were interviewed using structured questionnaires. Descriptive statistics was utilized in characterizing socio-economic attributes of the smallholder French beans farmers. Tobit model was used to determine influence of the social capital dimensions and institutional factors on groups' performance while multiple regressions were used to assess the effect of group membership and social capital dimensions on household income. SPSS and STATA computer programs were used to process the data. The results showed that gender, age, education level, French beans yield, farming experience, transport cost, off-farm income, initial social capital, trust index and meeting attendance significantly influenced the extent of commercialization. Further, age, land size, land tenure, ownership of transport means, French beans yield, off-farm income, membership to other organizations, group heterogeneity and trust index significantly influenced household income. The results of this study enhanced a better understanding of social capital dimensions in farmer group performance. Understanding group marketing will help in interventions to increase income among the smallholder farmers.

## TABLE OF CONTENTS

<b>DECLARATION AND APPROVAL.....</b>	<b>ii</b>
<b>COPYRIGHT .....</b>	<b>iii</b>
<b>ACKNOWLEDGEMENT.....</b>	<b>iv</b>
<b>DEDICATION.....</b>	<b>v</b>
<b>ABSTRACT.....</b>	<b>vi</b>
<b>TABLE OF CONTENTS .....</b>	<b>vii</b>
<b>LIST OF TABLES .....</b>	<b>x</b>
<b>LIST OF FIGURES .....</b>	<b>xi</b>
<b>LIST OF ACRONYMS AND ABBREVIATIONS .....</b>	<b>xii</b>
<b>CHAPTER ONE .....</b>	<b>1</b>
<b>INTRODUCTION.....</b>	<b>1</b>
1.1 Background information .....	1
1.2 Statement of the problem .....	3
1.3 Objectives of the study.....	4
1.3.1 General objective.....	4
1.3.2 Specific objectives.....	4
1.4 Research questions .....	4
1.5 Justification of the study .....	4
1.6 Scope and limitations .....	5
1.7 Definition of terms .....	5
<b>CHAPTER TWO .....</b>	<b>7</b>
<b>LITERATURE REVIEW .....</b>	<b>7</b>
2.1 French beans production and marketing in kenya.....	7
2.2 The social capital concept and measurement .....	8
2.3 Importance of farmer participation in markets.....	11

2.4 Factors influencing group performance. ....	12
2.5 Social capital and household income .....	16
2.6 Theoretical framework .....	17
2.7 Conceptual framework .....	19
<b>CHAPTER THREE .....</b>	<b>20</b>
<b>RESEARCH METHODOLOGY .....</b>	<b>20</b>
3.1 The study area .....	20
3.2 Sampling procedure.....	22
3.3 Sampling method.....	22
3.4 Data collection method.....	22
3.5 Methods of data analysis .....	23
3.6 Dimensions of social capital and measurements.....	23
3.7 Analytical framework.....	24
3.7.1 Objective 1: Socio-economic attributes of the smallholder French beans farmers. ....	24
3.7.2 Objective 2: Factors influencing group’s performance in accessing the market.....	25
3.7.3 Objective 3: Effects of group membership and social capital dimensions on household income. ....	28
<b>CHAPTER FOUR.....</b>	<b>30</b>
<b>RESULTS AND DISCUSSIONS.....</b>	<b>30</b>
4.1 Descriptive results .....	30
4.1.1 Socio-economic characteristics of group and non group farmers .....	30
4.2 Factors influencing farmer groups’ performance in French bean commercialization. ....	37
4.3 Effects of group membership and social capital dimensions on household income. ....	41
<b>CHAPTER FIVE .....</b>	<b>45</b>
<b>CONCLUSION AND RECOMMENDATION .....</b>	<b>45</b>



5.1 Conclusion.....	45
5.2 Recommendation.....	46
5.3 Area of further research.....	46
<b>REFERENCES.....</b>	<b>47</b>
<b>APPENDICES.....</b>	<b>58</b>
Appendix 1: Coefficient Results for Tobit Regression .....	58
QUESTIONNAIRE.....	59

## LIST OF TABLES

Table 1: Description of variables and the expected signs to be used in the Tobit model .....	27
Table 2: Description of variables and their expected signs used in the Regression model. ....	29
Table 3: Household characteristics by farmer type (dummy variables) .....	31
Table 4: Household characteristics by farmer type (continuous variables) .....	34
Table 5: Access to extension services, market information and ownership of transport means ..	35
Table 6: Summary statistics of social capital dimensions .....	37
Table 7: Tobit marginal effects ( $\delta y/\delta x$ ) regression outcome on factors influencing French beans commercialization.....	39
Table 8: Multiple Regression (OLS) coefficient results .....	42

## **LIST OF FIGURES**

Figure 1: Conceptual framework .....	19
Figure 2: Map of the study area .....	21
Figure 3: Relationship between grading and membership to a group .....	36

## **LIST OF ACRONYMS AND ABBREVIATIONS**

AERC	African Economic Research Consortium
ECI	Ebony Consulting International
EU	European Union
EUREPGAP	European Retailer Produce Working Group Good Agricultural Practices
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GLOBALGAP	Global Good Agricultural Practices
GoK	Government of Kenya
HCDA	Horticulture Crop Development Authority
KES	Kenya shillings
Kms	Kilometers
OLS	Ordinary Least Square
SPSS	Statistical Package for Social Science
USAID	United States Agency for International Development

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background information

Developing the agriculture sector remains an important factor in the achievement of sustainable food production and thus, the global food security. Although most economies in the sub-Saharan Africa have undergone considerable diversification, over the years, agriculture is still the largest economy. However, there are increased challenges of population pressure, land degradation and declining agricultural productivity, and thus farming in sub-Saharan Africa is increasingly knowledge intensive (Katungi *et al.*, 2008). Furthermore, market access remains the main constraint facing smallholder commercialization of agriculture (Poulton *et al.*, 2006), making them to produce mainly for subsistence.

In Kenya, arable land holding have become smaller due to population pressure and land sub-divisions, hence farmers have transformed from staple crop production to highly market-oriented crops, especially horticulture. Horticulture is labour intensive and thus creates more employment opportunities leading to increased incomes (Mbithi, 2008; Wollni and Brümmer, 2012). For this potential to be realized the smallholder farmers need to operate in a level playing ground (Ondieki-Mwaura *et al.*, 2013) in terms of access to inputs, markets and support services. The efforts towards improving and sustaining the sector's productivity and marketing remain crucial to the nation's economic development and the welfare of the people.

Horticultural crops are gaining popularity among smallholder farmers in Kenya. French bean (*Phaseolus vulgaris*) is among these crops adopted by farmers due to its income generating ability. Apart from international demand, there has been an increasing domestic demand especially in urban areas. French beans are the largest vegetable export in Kenya and are grown in most parts of the country which include Kiambu, Machakos, Nyandarua, Nakuru, and around Mt. Kenya region, that is, Meru, Embu, Nyeri and Kirinyaga Counties (Okado, 2000). The small-scale farmers have a longer history in the production of this crop. It is estimated that 70% of the vegetables exported are grown by smallholder farmers, with almost 50,000 being French beans

farmers (Minot and Ngigi, 2004). In 2011, French beans accounted for 29 per cent (KES 4 billion<sup>1</sup>) of the total fresh vegetable export earnings in Kenya.

Market access being a major constraint in commercialization of agriculture (Poulton *et al.*, 2007; Wambugu *et al.*, 2009); recent studies have identified strategies for overcoming high transaction costs faced by farmers. One of such strategies is collective action in the form of farmer groups. The success of a farmer organizations and collective action in reducing transaction costs depends on social capital (the level of cooperation or networking between its members) among other factors. Social capital is a set of formal values and norms shared among members of a group that permits them to cooperate with one another. Members of a group have an opportunity to exchange experiences, organize trainings and marketing campaigns for their produce. Therefore, smallholder farmers overcome market failures and maintain their market access through the formation of farmer or producer groups (Katungi *et al.*, 2007) and the expectation is that farmers' participation in these producer groups will influence their access to the market.

Fafchamps (2004) highlights that market exchange in Africa is much more costly, cumbersome, time consuming, and unpredictable than elsewhere since the search costs are high because of the large number of participants. Social capital, through farmer groups help to bridge this gap by enhancing cooperation, coordination and collective action making market exchange easier. Since French beans farmers in Kirinyaga have formed marketing groups, this becomes true in their context. The social capital and networks among French bean farmers not only allow them to access the markets, but also acquire information on the disparities existing among several exporter or broker agents' pricing. Membership to social networks generates social capital that members can rely on to access the market (Udry and Conley, 2006). However, farmers with poor social networks often face difficulties in collective action activities that influence the level of market access.

Information exchange is an important dimension in social capital in influencing market accessibility. Early studies show that farmers, particularly those with little financial and social resources or political leverage, often face high costs of accessing information and knowledge (Kirsten *et al.*, 2009). Apart from the information accessed through the mass media, farmers also

---

<sup>1</sup> 1USD=KES 85

get agricultural information from the social networks. For individuals to engage in gainful information exchange, a degree of interpersonal connections between them is required (Granovetter, 1973; Coleman, 2000). Each individual decides whether to exchange agricultural-related information with others, and if so, whether to provide or acquire information, or both (Katungi *et al.*, 2008). Studies have shown that human beings often exchange information with individuals they trust. Trust is therefore an important component of social capital (Coleman, 1990; Halkos and Jones, 2012). In the case of French beans' exporter-farmer relationship, an exporter tends to trust a contract entered with a group than an individual farmer (Ondieki-Mwaura *et al.*, 2013).

Earlier studies have found social capital to be having measurable effects on different human aspects (Putman, 1993). Portes (1998) observes that whereas economic capital is in people's bank accounts and human capital is inside their heads, social capital inheres in the structure of their relationships. Narayan and Pritchett (1997) highlighted different social capital dimensions and aspects including group heterogeneity, membership density, labour contribution, meeting attendance and participation in group decision making. These indicators bind the members together. There is however, limited information about how the various binding interrelationships among the farmers affect groups' performance and hence market accessibility locally, regionally and internationally.

The effectiveness of the social capital dimensions depends on the enabling environment, which includes the relationships among individual farmers, between farmer groups and the market. Groups also face challenges like coordination of the members and their success in accessing the market relies heavily on the social capital, in which its benefits to farmers is little known. This study therefore sought to fill the knowledge gap in identifying the role that social capital play in influencing the participation in producer groups and their performance in enhancing market access among smallholder French beans farmers in Kirinyaga County.

## **1.2 Statement of the problem**

With access to markets becoming a challenge to most smallholder farmers due to the technical and institutional factors, farmer based organizations are increasingly becoming popular in the Country. Group marketing has gained considerable success in French beans and most farmers in Kirinyaga County have shifted the marketing of their produce from individual to

group marketing. The different farmer groups operate and become efficient as long as there is a bond holding the members together enhanced by social capital. This will facilitate coordination and cooperation of individuals and groups within a community to improve their market access ability and increased incomes. Though, there exist a good number of farmer groups in the county, little is documented on the influence of social capital dimensions on small-scale household participation in farmer groups and its contribution towards market access and improved incomes.

### **1.3 Objectives of the study**

#### **1.3.1 General objective**

To assess the role and influence of social capital on the performance of producer groups amongst smallholder French bean farmers in contributing to improved market access and increased incomes in Kirinyaga County, Kenya.

#### **1.3.2 Specific objectives**

- a) To characterize the socio-economic attributes of the smallholder French bean farmers in Kirinyaga County.
- b) To determine influence of the social capital dimensions and institutional factors on groups' performance.
- c) To assess the effect of group membership and social capital dimensions on household income.

### **1.4 Research questions**

- a) What are the socio-economic characteristics of farmer groups and individual French bean farmers?
- b) What are the social capital and institutional factors that influence smallholder farmer groups' performance?
- c) What is the influence of group membership and social capital dimensions on household income?

### **1.5 Justification of the study**

Since majority of smallholder farmers do not have easy access to high value markets because of high transaction costs, group marketing becomes an important strategy through the formation of farmer groups. Groups help in market access by increasing the bargaining power



and access to knowledge and information. According to Kirsten (2010), market access has been identified as one of the critical factors influencing the performance and commercialization of smallholder agriculture in developing countries. The performance and success of farmer groups and collective action in reducing transaction costs is strengthened by social capital. It is therefore important to understand the influence of social capital dimensions and other factors on the performance of these groups.

Social capital is an important, and so far largely, the missing dimension of income and poverty analysis (Narayan and Pritchett, 1997). It is therefore important to build social capital among the smallholder farmers since it creates collective action and enhances efficiency in accessing information, credit and better markets for the produce. The effectiveness of social capital in enhancing market access has received little recognition. Therefore, this study will give a better insight to enrich the stock of existing but limited in literatures regarding the role of social capital in influencing the participation and performance of farmer groups in enhancing accessibility of the market among smallholder horticultural farmers and can serve as an input for policy makers and researchers who wish to work in this area.

### **1.6 Scope and limitations**

The study was confined to Mwea within Kirinyaga County. This was a case study involving only French beans farmers and producer groups. The study mainly focused on the social capital dimensions among the farmer group members and its implication on markets access and improving the incomes of the farmers. Social capital is however, a broad field and therefore not all issues will be explored. The results can only find limited applications to other French bean farmers especially those with similar socio-economic characteristics as Kirinyaga County.

### **1.7 Definition of terms**

**Collective action** – is defined as a voluntary action taken by a group of individuals, who invest time and energy to pursue shared objectives.

**Horticulture** – is the science or art of growing vegetables, flowers, and fruits. In this case French bean farming is an example of horticultural production.

**Institutional factors** – are formal and informal rules that govern transaction activities between individual or among groups of people.

**Market factors** – any external factors that affects the demand for or the price of a good or service.

**Market participation** - refers to any market related activity which promotes the sale of produce (Key *et al.*, 2000).

**Smallholder farmers** – are French bean farmers who are characterized by land holding less than five acres

**Social capital** – is defined for this study as the formal and informal linkages of rural inhabitants through local organizations/groups in rural areas.

**Social capital dimensions** include: heterogeneity index, membership density, meeting attendance index, decision making index, and the level of trust index, adopted from Grootaert, (1999)

**Socio-economic factors**- factors that influence both the social and economic wellbeing of an individual.

**Transaction cost** – are observable and non-observable cost associated with enforcing and transferring property rights from one person to another (Eggertson, 1990).

.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 French beans production and marketing in kenya**

French bean (*Phaseolus vulgaris* L.) is one of the most important export vegetables in Kenya accounting for over 60 % of the vegetables exported and 21 % of the horticultural exports (Nderitu *et al.*, 2007). Before independence, the horticultural development was still very limited in Kenya. In 1963, fruits and vegetables accounted for only 3 percent of the agricultural exports (Minot and Ngigi, 2004). The Swynnerton Plan however, provided support for the concept of smallholder production of commercial crops including French beans. The horticulture sub-sector was boosted by the establishment of Horticultural Crops Development Agency (HCDA) in 1967 under an Act of Parliament. It is a government parastatal charged with the responsibility of promoting the development of horticultural crops, licensing exporters, and disseminating information on horticultural marketing. It was originally given authority to fix prices, regulate trade, provide relevant information, and operate processing facilities and market horticultural goods (Muendo and Tschirley, 2004).

Several authors including (Shapiro and Wainaina, 1991; Jaffee and Monton, 1995; Dolan and Humphrey, 2000; Murithi *et al.*, 2008), have pointed out the importance of horticulture in poverty reduction and enhancing food security in the developing economies. The success of the Kenyan French beans is also attributed to Kenya's natural advantage in the production of horticultural crops (McCulloh and Ota, 2002). French beans increase farmer's income and thus improve the livelihoods of smallholder farmers in Kenya through enhanced productivity, crop diversification and improved market access (USAID, 2012).

French beans are grown both by large and small-scale farmers. Large farms are mainly owned by exporters or formal contracts with exporters and have 50-100 hectares, small and medium scale contract growers have as little as 0.25 hectares of French beans, while the independent smallholders have 1-5 hectares, but French beans only occupy a small fraction (ECI, 2001). French beans are also known by a variety of names such as kidney beans, flageolets and

haricot beans. Mwea Tebere in Kirinyaga County established as a settlement scheme in the 1950s has been the leader in French beans production (Monda *et al.*, 2003). Farming in Mwea was transformed by the irrigation systems in the 1980s. Furrows have been dug which collect water from River Thiba allowing farmers to grow crops all year round.

French beans take a period of 45 to 50 days to mature and the demand at the export market is usually at its peak between October and May. The beans are picked, chopped, washed, combined into multi-product packs, labeled, bar-coded and shipped (Murithi *et al.*, 2008). The produce for export must comply with the local and international food safety and regulations. Horticultural exports including French beans have standards to be met, that is, the European Retailer Produce Working Group Good Agricultural Practices (EurepGap) and the GlobalGap protocols. It was initiated in 1997 as a condition of entry to the European Union (EU) markets and was as a result of consumer increasing demand for produce that meets specific quality standards and regulation. Murithi *et al.* (2008), highlight that these standards entail high investment costs in terms of inputs (such as the approved pesticides), technology and upgrading.

## **2.2 The social capital concept and measurement**

There is no clear and single definition for social capital. Several earlier studies by Coleman (1990) and Putnam (1993 and 1995) have however, related it to positive outcomes facilitating cooperation and coordination. Pretty and Smith (2004) define social capital as social bonds and norms. Pretty and Ward (2001) highlights four features of social capital, which include: relations of trust; relations of reciprocity and exchanges; common rules, norms and sanctions, and the connectedness in networks and groups. The most important social capital elements are social trust, institutional trust and social norms and networks (Coleman, 1990; Putnam, 2000; Halkos and Jones, 2012). Despite the fact that relations of trust reduce the transaction costs and establish obligations, trust can easily be broken (Pretty and Smith, 2004).

Putman (1995) defines social capital as characteristics of social organisation, such as social networks, norms and social trust, which foster coordination and cooperation among community members, enabling them to act collectively for mutual benefits. Pretty (2003) distinguishes social capital into three dimensions: bonding, bridging and linking. Bonding social capital is the relations between homogenous groups or communities which build social cohesion needed for everyday living, bridging social capital refers to the structural relations and networks

between group and communities involving coordination or collaboration with other groups, external associations, mechanisms of social support or information sharing across communities and groups (Narayan and Pritchett, 1999). Linking social capital however refers to the capacity of groups to gain access to resources, ideas and information from formal institutions beyond the community (Pretty, 2003).

Social capital also exists in two categories that is, structural or cognitive forms. Both arise from the mental rather than the material realm. However, the main difference between the two is that the structural forms of social capital are relatively external and more objectified. It includes roles, rules, procedures and precedents as well as social networks that establish the patterns of social interaction. On the other hand, cognitive social capital includes norms, values, attitudes and beliefs that predispose people to cooperate. The founder scholars of social capital (Bourdieu, 1985; Coleman, 1988; Putman, 1993) refer to it as a resource for action which is developed and accessed through the membership in formal organisations. Producer organizations amplify the voices of smallholder farmers, reduce the transaction costs and create opportunities for producers to get more involved in value addition (World Development Report, 2002). Social capital is therefore built through group membership.

Previous studies have found that, for an entrepreneurial undertaking to be successful, it requires active participation of groups of entrepreneurs and several stakeholders. A positive interaction between social networks and the accumulation of social capital shows that group based approaches are good because of their role in collective action and the positive externalities it creates in strengthening community networking (Huang, 2009). Moreover, the existence of social capital reduces the possibility of opportunistic behaviour like extra contractual marketing (Fafchamps, 2004).

Collective action is considered a contractual form closely related to and reliant on social capital-based exchange (Kirsten *et al.*, 2009), but as information asymmetries increases, problems of collective action arises and social capital among the group is eroded. Under market failure, collective action yields improvements of efficiency in uncoordinated private action (Zusman and Rauser, 1994). Social capital therefore provides the base for collective action; however something must be done to mobilize this capital to achieve collective action (Dorward *et al.*, 2009). Collective action is not found everywhere and is not available for every type of

public good. And even where collective action is found, it is not always inclusive, particularly of the poor. Sabina *et al.* (2013) argue that informal social networks and kinship ties can also be important sources of influence and assistance.

Networks and organizations generate personalized trust and enhance information exchange, which improves the efficiency of social exchange (Durlauf and Fafchamps, 2004). Early studies report that mass media is playing very significant role in making awareness and knowledge amongst farmers and once stimulated or made aware, they may seek additional information from neighbors, friends, extension workers or progressive farmers in the area (Behrens and Evans, 1984). A study by Adong *et al.* (2013) in Uganda found that farmer to farmer interaction was the main source of information regarding pests and disease followed by radio. Social capital thus influences the social learning process and information exchange.

Social capital is based on the understanding that informal and formal structures form around certain human needs. Some networks are heterogeneous and open to a wide range of participants, while other networks are homogenous and accept only people of the same kind (UNESCO, 2002). The heterogeneity in social norms and preferences makes agreements difficult to reach (McCarthy *et al.*, 2004), reduces trust among members and/or lower the direct utility of participation (Alesina and Ferrara, 2002).

Several studies reveal that poor people do not form or participate in the same kind of organizations as the non-poor. The time constraint created by poverty reduces the participation in network organized groups around non-profit activities. The poor are mostly concentrated on the strategies for survival, thereby making them not lasting members of networks despite the efforts by community workers trying to develop and strengthen the networks (UNESCO, 2002). Narayan *et al.* (2000) documents that in more poor communities, women primarily possess the intensive “protection” networks, while men have access to more extensive “innovation” networks.

Katungi *et al.* (2007) argue that people with more social capital learn to trust not only members but also the non-members and thus improving their willingness to participate in organizations and social networks. Initial social capital in groups and organizations increases the expected benefits and provide insurance, thus reducing risk aversion which in turn increases the willingness to join social networks. Trust is viewed as a source of social capital. Kirsten *et al.*

(2009) highlights that the existence of trust makes the transacting parties spend less time and resources on ex-ante contracting and monitoring to see whether the other party is dodging, because they trust that the payoff will be divided fairly. The importance of trust and social relations implies that the concept of social capital is very relevant in understanding the process of institutional change and access to different institutions (Putnam, 2000; Durlauf and Fafchamps, 2005; Cox and Fafchamps, 2007; Dorward, 2009).

Social capital is not what you know, but who you know (UNESCO, 2002). This saying sums up the conventional wisdom regarding social capital which is argued to be the wisdom borne in experiences and gaining membership to any organization. Being a member to an organization usually requires inside contacts. Studies have shown that people spend most of their time talking to their neighbors and friends, sharing meals, and participating in religious gatherings and community volunteering projects. These connections among people therefore create social networks and capital.

### **2.3 Importance of farmer participation in markets**

Market development in rural areas increases income among the rural poor and helps to eradicate hunger and poverty. Improving market access increases productivity and supply of products which leads to increased demand. Transaction cost economics stipulates that information asymmetry is the main reason for poor market performance, thus making the transaction costs to be high. Moreover, the shocks and vulnerability in production (pests, diseases and weather) and market risks such as price fluctuations also leads to imperfect markets and failures in transactions (Doward and Kydd, 2004).

Smallholder farmers face market imperfection challenges in almost all non labour transactions (Poulton *et al.*, 2010). Shiferaw *et al.* (2011) argues that the transaction costs arise from the movement of products along a value chain that is, production, processing and distribution. These costs include searching for information and knowledge, negotiation, monitoring and enforcement. Inadequate market information is mostly due to large number of smallholder farmers, inefficient communication system and low literacy levels (Fenyés and Groenewald, 1985). The provision of market information enhances maintenance of transparency and inclusiveness (Montshwe, 2006) which makes the market to be more accessible and reduces risk (Bailey *et al.*, 1999).

The rural poor benefit from the growth of the market through the existence of an enabling environment that favors them and the development of local capacities that effectively connect with the market structures. The lack of market infrastructure and geographical isolation due to distance, poor roads or poor communication restricts market development (Shiferaw *et al.*, 2006). In addition, the market environment within which the rural poor operate is characterised by unpredictability, uncertainty and risk. Therefore, the smallholder farmers are majorly disadvantaged since most of them are resource poor and do not understand the market well, how it works and why prices keep changing.

There is a common agreement in literature that improved access to market among smallholder farmers raise productivity and living standards. The ability to access to the market therefore, plays a significant role in ensuring increased incomes and welfare for smallholder farmers through various ways. When income increases, the purchasing power improves and in turn, creates demand for consumer goods (Gani, 2011). Overcoming market imperfection effects would therefore necessitate deliberate attempts on making strong the institution that promote market coordination, reducing transaction costs and market integration to facilitate a continual transition to higher level equilibrium (World Bank, 2002b).

#### **2.4 Factors influencing group performance.**

As a strategy of overcoming the high transaction costs in smallholder agriculture and hence encouraging commercialization, there has been the dire need of promoting collective action through producer organizations (Poulton *et al.*, 2005; Okello and Swinton, 2007). These are organizations of farmers who cultivate in a common manner, are geographically close to each other and have a mutual desire to participate in the group's activities including marketing and information exchange. Producer or farmer organizations were defined by (Stockbridge *et al.*, 2003) as the forms of organizations performing different functions such as analysis, advocacy, economic (production and marketing), and local development beneficiaries. This study will however focus on the marketing aspect of the producer organizations. In a producer group, collective action (which builds social capital) occurs when members cooperate as a group and coordinate their actions to solve a common problem, market access in this case.

Early studies have found group membership to have a positive effect on household market participation. Farmer groups reduce the high transaction costs associated with



smallholder agriculture (Fischer and Qaim, 2011). Membership to a group also increases household's access to market information which is necessary for decision making. Schipmann and Qaim (2010) found group membership to significantly increase the adoption of improved germplasm among Thailand sweet pepper farmers. The capacity and competence of farmer groups to build and sustain complex and market oriented networks is very important in linking farmers to the market (Barham, 2007). However, few farmer groups and organizations receive basic marketing skills and training, which limits their ability to focus their investments and innovations in a way that capitalizes on their social strengths.

The main aim of producer groups is access to the market, inputs and credit among other factors. The market access advantage is emphasized by many researchers (Shiferaw *et al.*, 2006; Valentinov, 2007). Markets promote growth and assets accumulation, which in turn, improves the lifestyle of farmers (Altman *et al.*, 2009). The performance of farmer groups influences how the incomes and welfare of the participant households improves. Early literature indicates that social capital dimensions, institutional, technical and the socio-economic factors influence farmer group effectiveness and performance. Such factors include; group structure and size, group composition, cohesion, group standards and norms, leadership styles and the group atmosphere among other factors.

Stringfellow *et al.* (1997) identified three key factors that determine the success of a marketing group: a) a match between the existing and the required skills to undertake joint activities; b) internal cohesion and membership driven agenda; and c) successful, commercially oriented, integration of the organization into the wider economy. Other literature, however, argue that there is no standardized measure or indicators that can be used to determine the level, viability and effectiveness (performance) of collective action in a group. However, Shiferaw *et al.* (2006) counter argues that certain indicators may be identified as proxies for different levels and degree of collective action and social capital depending on the problem under investigation.

Early studies has found that the dimensions of social capital such as homogeneity, network connection, level of trust, collective action and the respect for contract has positive effect on group performance. This study used heterogeneity of the group as one of the social capital dimension and indicator of the factors influencing its performance. Wambugu *et al.* (2009) using Least square regression found that more heterogeneous groups perform better than

the homogenous ones. Grootaert (2001) supports the findings. The diversity in ideas and skills in heterogeneous group therefore influence the level of performance of groups. Nagarajan *et al.*, (1999) however contradicts with the findings and argue that homogenous groups perform better. Shiferaw *et al.* (2011) also argue that even when economic incentive exists, successful organization will depend on group characteristics in terms of size and homogeneity.

Most arguments suggest that individual farmers offer small quantities of produce for sale, they have little bargaining power and often accept any price offered (Robbin, 2011). In contrast, large-scale farmers produce in large quantities with consistent quality, hence, attracting more buyers willing to buy the going market rates. De Janvry *et al.* (1991) argue that households often produce a limited range of products for their own subsistence because social protection for food security is not provided through markets and government interventions.

The role of social learning in technology adoption, production and marketing is well recognized and documented in literature (Foster and Rosenzweig, 1995; Conley and Udry, 2001; Munshi, 2004). Matuschke and Qaim (2009) while analyzing the impact of social capital on adoption of hybrid wheat and pearl millet in India found that group membership had a positively significant impact on the adoption of wheat as opposed to pearl millet. Attendance to meetings has also been found by earlier studies to influence the level of group performance. Attendance to group meetings allows the farmers to acquire knowledge and skills in the crop production and the new marketing strategies.

McCarthy *et al.* (2004), highlight that election is a good indicator that members of group are actively participating in the decisions of the group which are collectively monitored and enforced. The ability of group members to participate in the decision making process, shows the level of democracy in the organization. Grootaert (1999) found that farmer-associations that follow democratic decision making patterns perform better (in terms of welfare of the households) than the undemocratic ones. Shiferaw *et al.* (2006) supports the findings by adding that the extent of participatory group decision making is influenced by the effectiveness of collective action.

The degree of solidarity among the group members also influence how a group participate and performs. Solidarity affects group's performance because higher level of solidarity leads to cooperation among members influencing the extent of market access. In

addition to solidarity, literature has shown that most forms of economic exchange require trust. Individuals who have interacted more often tend to trust one another more. However, Knack (1999) argues that the type of trust that is unambiguously beneficial is that which exists between strangers.

Studies have also shown that access to information has significant influence on the level of market access. Poor access to market information result in information-related problem namely moral hazard and adverse selection which in turn increase transaction cost and hence discourage participation in market by some farmers (Fafchamp and Hill, 2005; Shiferaw *et al.*, 2009). Farmer groups often fill the gap of accessing market information through meetings, training and knowledge dissemination. A study in Honduras by Wolli *et al.* (2010) employed an ordered probit model to analyze the farmers' decision to adopt soil conservation technologies. They found that farmer groups fill an important agricultural information gap caused by privatization of extension services in Honduras.

The role of gender in market access has also gained considerable attention by early authors. Amaya and Alwayng (2011) argue that gender biases may affect market access and networks linking the farmers to the market may be dominated by men or women. They support the arguments by adding that gender biases affect the quality of information received as well as the bargaining power. Mukundi *et al.* (2013) utilized a Probit model to identify the factors that influence the decision of households that grow sweet potatoes to join producer groups. They found out that age and gender of the household head, household's credit access status and proximity to the market had significant effect on marginal probability of participating in farmer groups and hence the effectiveness of groups.

Early studies have also shown that the size of the households influences the participation of the smallholder farmers in the market and the decision to join farmer groups. In addition, the household size determines the number of household members to join the group. The characteristics of these members influence the performance of the farmer groups. A study by Mwema *et al.*, (2012) using the logit model found out that the household size has a positive influence on the decision to participate in the trade of indigenous fruits. They also found out that the distance to the market influence its accessibility.

Studies have also shown that the age of a farmer group and their experience influence the market access and the performance of the group. Gyau (2011) found that the existing groups had more group dynamics and social cohesion than the newly established ones. Most literature has also shown that the age of the household head influences market participation, decision to join producer groups and the extent of participation. Age of the household head has been used by early studies to provide a proxy for experience in agricultural production and marketing. More experienced farmers and groups have more contacts enhancing the ability to acquire and discover more opportunities at lower costs. Age reflects more trust and reputation gained through exchange with the same party (Nkhori, 2004).

The level of education among the leaders of the group and the members is also hypothesized to have a significant influence on the performance of the group. A study by Olwande and Mathenge (2012) using a double hurdle model in assessing the extent of market participation among smallholder farmers in Kenya, found that low literacy levels and limited ability to produce surplus for markets were the characteristics of lower market participation. The structure of an organization has also been found to be having much influence on its performance. Serageldin and Grootaert (2000) argue that the capacity to fulfill the interest of farmer organizations depends on its internal social structures that formulate and enforce rules, and the structures that make and implement the collective decisions and actions. Group marketing therefore is a strategy that makes the linkages and trust among farmers, traders and private sector strong.

## **2.5 Social capital and household income**

Analyzing the contribution of social capital to the wellbeing of households is important in the efforts to understand how to alleviate poverty. Social capital, like the physical and human capital is viewed as an asset which is available to households for generating incomes and making services accessible. Lawal *et al.* (2009) argue that like any asset, social capital is accumulated over time and improves economic performance. It is hypothesized that household with larger social capital are more likely to have used fertilizers, improved seeds or agro-economic input (Narayan and Pritchett, 1997) leading to improved production and thus high incomes.

Previous studies have shown that there is a strong association between social capital and household incomes (Kinuthia *et al.*, 2011; Kirui and Njiraini, 2013). However, (Narayan and Pritchett, 1997) using instrumental variable estimation found that this association is due to the

higher social capital leading to high incomes and not high incomes leading to greater associational life. Their findings also supported the view that social capital is an exogenous determinant of incomes. Kinuthia *et al.* (2011) used multiple regression model (log-log model) to determine the effects of participation in the International Smallholder and Tree Planting Program (TIST) on household income. The results however showed no significant difference between participants and non-participants.

Farmers who participate in collective action activities are hypothesized to increase incomes which in turn are expected to be an incentive for smallholder participation in the market. The benefits of scale economies in terms of reduced transaction costs creates incentives to participate in collective action activities in form of farmer organizations (Shiferaw *et al.*, 2011). It is argued that farmer organizations leads to improved access to technology, information and business services that contributes to increased productivity and commercialization of smallholder agriculture, thereby increasing incomes. The incomes from the farming activities are used as a proxy for household welfare. A study by Kirui and Njiraini (2013) utilizing a propensity score matching (PSM) model found that participation in collective action activities significantly improved household welfare by increasing incomes. Kimaro *et al.* (2013) used a regression model to investigate the effect of women group membership in determining income from dairy farming in Tanzania. They however found it to be not statistically significant.

Studies have shown that group formation contributes to building social capital which in turn improves the income generation and thus positive effects on human welfare (Grootaert, 2001). Kirsten and Vink (2005) found that individuals form groups so as to benefit from collective action which results when people come together because of constraints and to pursue a common action and decision to achieve an outcome. A study by World Bank notes that farmer based organizations provides the farmers with opportunities for income generation (World Bank, 2007). This is consistent with (Kirsten and Vink, 2005) findings which show that collective action helps smallholder farmers to overcome transaction costs, enhance market power and thus improving their household incomes.

## **2.6 Theoretical framework**

This study will utilize the New Institutional Economics (NIE) framework which takes into account the role of institutions in the face of market failure. The theory of Social capital falls

within the NIE framework since it involves the use of institutions (defined as a set of rules of the game, formulated to govern relationships between individuals or groups of people involved in transactional activities) to guide groups or individuals with common objective to achieve a common goal (North, 1990).

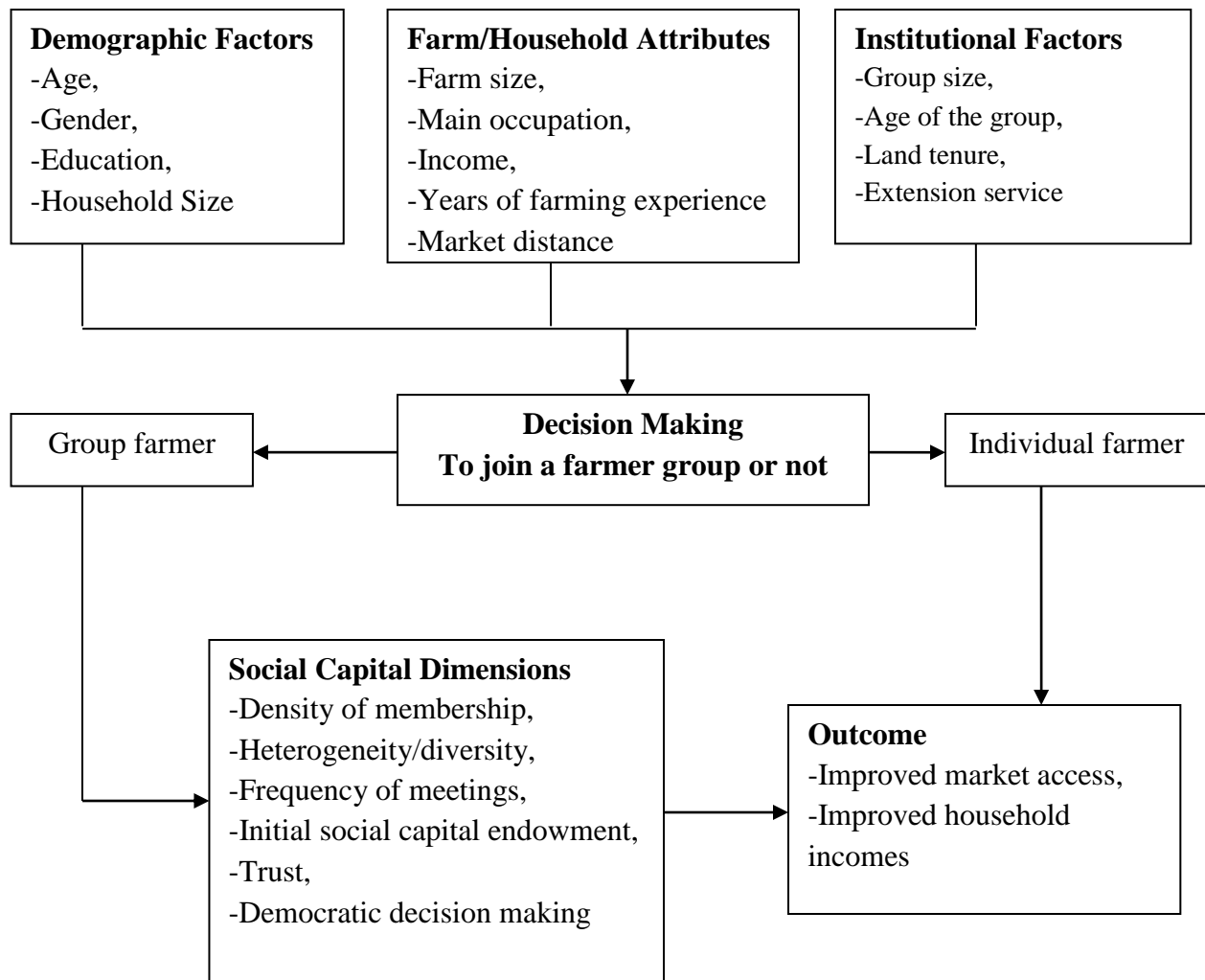
An individual can accumulate social capital by participating in organizations or investing in social networks or both (Katungi *et al.*, 2007). Organizations are finite closed groupings of people with a common interest, whereas social networks are more complex situations in which individual agents are linked to other agents through bilateral relationships. At the household level, the decision to participate in the producer group or market is based on maximization of expected utility (Mukundi *et al.*, 2013). Farmers will participate if  $U_i > U_k$ , where  $U_i$  and  $U_k$  represents a farmer's utility with participation and without participation respectively. The decision that a farmer will choose to participate in a producer group/ market can be expressed as  $P(Y=1|X) = P(U_i > U_k)$ ..... (1)

The expected utility rural households derive from a specific organization/social network is expected to differ based on their characteristics, initial social capital endowment and village level factors (Katungi *et al.*, 2008). Once a household chooses to join producer group, members are faced with a decision to sell their produce, and if they sell, the quantity sold and price received determines the commercialization level.

The expected utility rural households derive from a specific organization/social network is expected to differ based on their characteristics, initial social capital endowment, group size, heterogeneity of the group, frequency of meetings, trust and solidarity, among other factors. The observed decision to participate in an organization is also the outcome of the organization's willingness to accept the member. It is assumed that there are no limitations for joining a farmer group in Kirinyaga as long one is a producer. However, it is expected that households will differ in attributes, which may be desired by organizations (social status and education level). The differences in household attributes affect the willingness of organizations to confer membership status on households and, therefore, may lead to variations in household participation in organizations.

## 2.7 Conceptual framework

This study is built on the idea that joining a farmer group and active participation in it, leads to improved market access and household income. The decision to join a farmer group or not is assumed to be determined by the household demographic factors, farm attributes and the institutional factors. When a farmer becomes a member of a social network, s/he acquires a (meso) level of social capital. The level of performance of a group is influenced additionally by the social capital dimensions. It is assumed that when the group's social capital becomes strong and effective, then the smallholder farmers will rely on it to access the market and thus improve their household incomes. The group's activities which include collective action will make the households have a higher bargaining power and greater access to markets.



**Figure 1: Conceptual framework**

*Source: Authors Conceptualization.*

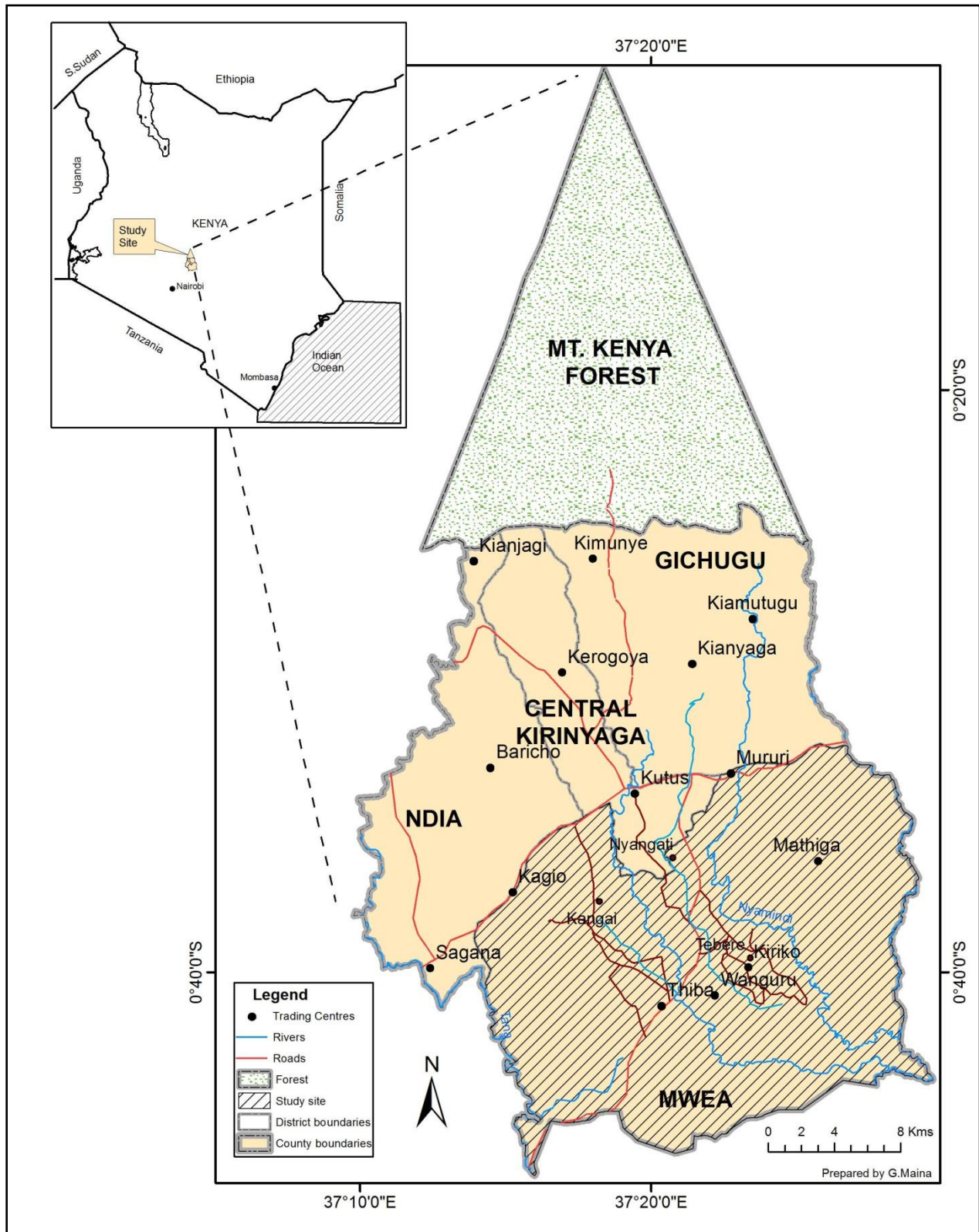
## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 The study area**

The study was conducted in Mwea Sub- County, Kirinyaga County. It is located in the central region of Kenya, sitting at the foothills of Mount Kenya, 112km from Nairobi. The County occupies a total area of 1479.09 km<sup>2</sup>. Kirinyaga County borders Embu County to the East, Nyeri to the West, Machakos to the South and Muranga to the South West. The County has four electoral boundaries: Mwea, Gichugu, Ndia and Kerugoya constituencies. The county lies in the mid-altitude range of 1489 to 2000 metres above the sea level. The county has an estimated population of 528,054 persons with a density of 357 per square kilometers (GoK, 2009). Mwea is divided into three agro-ecological zones depending on the rainfall levels and soil types (red soils, black cotton soils, loam soils and sandy soils). Most of the area is covered by the black cotton soils suitable for rice production which is the main economic activity in the area. The annual temperature is between 12°C and 26°C, averaging 20°C. The annual precipitation is about 1250mm with two rainy seasons- long rains (March to May) and short rains (October to December). Most prevalent crops in the county are tea, coffee, rice, maize, beans, bananas and various types of fruits and vegetables. Mwea Irrigation Scheme produces over 50 percent of all rice in Kenya. The scheme is also well known for its horticultural potential. The main horticulture crops include French beans and tomatoes. French beans are intercropped with maize in the red soils.





**Figure 2: Map of the study area**

**Source: World Resource Institute (2013).**

### 3.2 Sampling procedure

The target population was French bean farmers within Mwea Sub-County, Kirinyaga County. Multi-stage sampling method was used to obtain appropriate sample size. Mwea Sub-County was purposively selected because it is the major French beans producing area in Kenya and has high concentration of farmer groups in the County. Five locations in the sub-county including Mutithi, Kangai, Nyangati, Tebere and Morindoko were also purposely selected. The farmers in the area were then stratified into two groups: those who market their produce through groups and those who sell individually. With the group marketing category, purposive sampling of farmer groups which have been in existence for more than a year was done using a list obtained from the State Department of Agriculture and the Fresh Produce Exporters Association of Kenya (FPEAK). In the five locations selected, proportionate sampling was used to select 16 groups. From each of the group, simple random sampling was used to select households proportionate to the size of the groups, to give a total of 95 group members. Simple random sampling was also used to get 79 non-group members from the five locations. Sample of 174 farmers (95 farmer group participants and 79 non-group members) were therefore selected. Data on socio-economic factors, institutional factors and social capital dimensions were collected.

### 3.3 Sampling method

The required sample size was determined by proportionate to size sampling methodology (Anderson *et al.*, 2007).

$$n = \frac{pqZ^2}{E^2} \dots\dots\dots (2)$$

Where n = sample size, p = proportion of the population containing the major interest, q = 1-p, z= confidence level ( $\alpha = 0.05$ ), E = acceptable/allowable error. Since the proportion of the population is not known, p=0.5, q = 1-0.5= 0.5, Z = 1.96 and E = 0.075. This results to a sample population of 174 respondents (95 farmer group members and 79 individual farmers).

### 3.4 Data collection method

Before data was collected, the questionnaire was pre-tested on selected farmers to evaluate the appropriateness of the design, clarity, and relevance of questions. A cross sectional data set was used collected from a sample of small-scale French bean farmers. The methods for data collection included observations, interviews, and formal questionnaires. Primary data were collected through the administration of semi- structured questionnaire to the 174 respondents in

the study area. The questionnaires were administered to the farmers by team of trained enumerators.

### **3.5 Methods of data analysis**

Data from the field was edited, coded, cleaned to ensure consistency, uniformity, and accuracy, and then entered into computer software for analysis. Both qualitative and quantitative techniques were used to analyze the data collected. Qualitative data for objective one was analyzed using descriptive statistics such as mean, percentage, standard deviation, tabulation, ratio and frequency distribution. Both SPSS and STATA computer program was used to process the data.

### **3.6 Dimensions of social capital and measurements**

The social capital dimensions used in this study was adopted from Grootaert, (1999) and they include: heterogeneity index, membership density, meeting attendance index, decision making index, and the level of trust index. The measurement of each is as described below.

**Heterogeneity index:** This variable is a dimension of structural social capital and was used to measure the degree of diversity in the group. The internal diversity of the groups was measured using several criteria, including; diversity in age group, income group, occupation, level of education, gender, and neighborhood connection. A weighted average score extracted and standardized as a factor score was used as the heterogeneity index. For each factor a Yes response was coded 0 while No response was coded 1. A minimum score of 0 represent the highest level of homogeneity, while a maximum of 6 represent the highest level of heterogeneity. The scores were divided by the maximum score of 6 and the multiplied by hundred to get the index. The index was expected to be positively (+) related to performance of the group in terms of market access and income level of the respondents.

**Meeting attendance:** Membership to an organization is of little value if one does not attend the group meetings (Grootaert, 1999). The frequency of meetings attendance index was measured by the average number of times a member of a household attend group meetings.

**Decision making index (DMI):** This index was measured by asking the members of the group to state how the decisions are made in their groups. Previous studies have shown that organizations that follow a democratic decision making pattern are more effective than those that do not. The members were also be asked to evaluate their level of participation in decision

making, whether they are “very active” or “somewhat active” or “not active”. The response was scaled from 3 to 1 respectively. Each response value was divided by the maximum score of 3 and then multiplied by 100 for each household to get the index

**Density of membership index:** It was measured by the number of organizations that each household belongs to. The households were asked to indicate the groups which had active membership.

**Level of trust index:** Trust is a cognitive social capital dimension and the index was used as a proxy to measure its existence and level in the group. The respondent was asked to rate (on a scale of 0 to 4) their trust on the farmer group, leaders, members, other groups and the export agents or contractors. A maximum score of 20 meant the highest level of trust, while a minimum of 0 represent the lowest trust level. The score was divided by the maximum score of 20 to get the index and the multiplied by 100. The index was expected to be positively (+) related to the performance of the group in terms of the members’ income level and the commercialization level.

### 3.7 Analytical framework

Data regarding objectives outlined were analyzed as follows:

#### 3.7.1 Objective 1: Socio-economic attributes of the smallholder French beans farmers.

The first objective was analyzed using descriptive statistics. This captured the quantitative and qualitative variables that are important in understanding the socioeconomic characteristics of French bean farmers. The graphs, percentages, means, mode, standard deviations and medians of various variables were obtained. The *t-test* and Chi-square tests were used to compare the selected household and farm characteristics between the two categories of farmers (group members and individual farmers). A weighted average score extracted and standardized as a factor score was used as the social capital dimension indices.

The social capital index equation formula is defined as;

$$SCI_i = \frac{\sum X_i}{n} \times 100 \% \dots\dots\dots (3)$$

Where;

SCI<sub>i</sub> = Social Capital Index representing Heterogeneity index (HI), Trust index (TI), Meeting attendance index (MAI) and Decision making index (DMI).

X<sub>i</sub>= weighted factor score

n= total number of factors

**3.7.2 Objective 2: Factors influencing group’s performance in accessing the market.**

The market access variable, commercialization (CMERCLZTN) was used as a dependent variable in the Tobit model which denotes the mean level of commercialization. The group’s mean level of commercialization was calculated as the mean value of produce sold by group members, divided by the mean value of crops produced by the group members. The commercialization level helped to show the extent of market access. Tobit model is based on the maximum likelihood technique (Gujarati, 2004).

The structure of the Tobit model is given as;

$$Y_i^* = \beta'X_i + \varepsilon_i \dots\dots\dots (4)$$

Where; Y<sub>i</sub><sup>\*</sup> is a vector of the latent variable that is not observed for values less than zero and greater than one.

X<sub>i</sub>, represent vector of the independent variables,

β is vector of the unknown parameters,

ε<sub>i</sub> is vector of the error terms that are distribute normally with mean 0 and variance σ<sup>2</sup>

i=1, 2, 3. . .n represents the number of observations.

If Y<sub>i</sub> is the observed variable representing the proportion of produce commercialized, its value is censored from below at L= 0 and from above at U= 1. Thus, giving rise to equation (5)

$$\left\{ \begin{array}{l} Y_i = 0 \text{ if } Y_i^* \leq L \\ = Y_i^* \text{ if } L \leq Y_i^* \leq U \\ = 1 \text{ if } Y_i^* > U \end{array} \right\} \dots\dots\dots (5)$$

The expected value of the latent variable Y<sub>i</sub><sup>\*</sup> is given by equation (6)

$$E \left( Y_i^* / X \right) = \beta'X \dots\dots\dots (6)$$

The change in probability of accessing the market and proportion of crop commercialized through the group as an explanatory variable changes by a unit is given by equation (7)

$$\frac{\partial E(Y_i^*/X)}{\partial X_i} = \beta_i \dots\dots\dots (7)$$

As the values of the proportion of commercialized crop  $Y$  is truncated from below at 0 and from above at 1, its conditional expected value is given by equation (8)

$$E(Y/X, L < Y^* < U) = \beta X + \sigma \frac{\phi(Z_L) - \phi(Z_U)}{\Phi(Z_U) - \Phi(Z_L)} \dots\dots\dots (8)$$

Where,  $Z_L = (L - \beta X)/\sigma$  and  $Z_U = (U - \beta X)/\sigma$ ,

$\phi(\cdot)$  and  $\Phi(\cdot)$  are the density function and cumulative distribution of a standard normal variable respectively. In the absence of the limits,  $Z = (\beta X)/\sigma$ .

The Tobit coefficients however, do not directly give the marginal effects of the independent variables on the dependent variable. But their signs show the direction of change in probability and intensity of commercialization as the respective explanatory variable change (Amemiya, 1984; Maddala, 1985; Goodwin, 1992).

The access to the market and groups' performance of a household could be affected by its socio-economic, social capital and institutional characteristics. The variables are hypothesized to affect the marketing performance of the households and the groups. The null hypothesis is that social capital dimensions and institutional factors do not have an influence on groups' performance.

**Tobit model specification**

The Tobit model was used to determine the influence of social capital and institutional factors on the group's performance in enhancing market access. The Tobit model is specified as,

$$Y_i^* = \alpha + \beta_0 X_1 + \beta_1 X_2 + \beta_2 X_3 + \beta_3 X_4 + \dots\dots\dots + \beta_n X_n + \varepsilon \dots\dots\dots (9)$$

$$\text{Commercialization}(Y_i^*) = \alpha + \beta_1 \text{age} + \beta_2 \text{agesq} + \beta_3 \text{gender} + \beta_4 \text{Educ} + \beta_5 \text{H/Hsize} + \beta_5 \text{Exprnc} + \beta_6 \text{Yield} + \beta_7 \text{Dstncn} + \beta_8 \text{Trnsptcost} + \beta_9 \text{Sellngprc} + \beta_{10} \text{Offincm} + \beta_{11} \text{Previncm} + \beta_{12} \text{Fqcymtngs} + \beta_{13} \text{GrpHetgnty} + \beta_{14} \text{Trstindx} + \beta_{15} \text{Descnmakngindx} + \beta_{16} \text{Grpsize} + \beta_{17} \text{Initialsocialk} + \beta_{18} \text{Dnstyofmrshp} + \varepsilon \dots\dots\dots (10)$$

**Table 1: Description of variables and the expected signs to be used in the Tobit model**

Variable Code	Variable	Measurement of the variable	Sign
Cmerclztn	Commercialization performance	Percentage (continuous)	+
Age	Age of the household head	Years (continuous)	+
Agesq	Age squared	Years (continuous)	-
Gender	Gender of the household head	1 =Male, 0= Female (Dummy)	-
Educ	Education level	Number of years in formal education (continuous)	+
H/Hsize	Household size	Number of members (continuous)	-
Dstnc	Distance to the collection point	Distance to the collection point or market (Km)	-
Trnsprtcost	Transport cost	Cost of transporting the produce in KES (continuous)	-
Yield	Yield of the crop	French bean output on kg (continuous)	+
Exprnc	Experience of the household	Numbers of years in French bean production and marketing (continuous)	+
Sellngpric	Selling price	Selling price of the output	+
Offincm	Off farm income	Proportion of off-farm income to the total household income (continuous)	-
Previncom	Previous income	Income from previous French bean sale(KES)	+
Fqcytmtns	Frequency of meetings	Number of meeting per month (discrete)	+
GrpHtgnty	Heterogeneity of groups	Differences within groups (Dummy 1=Heterogeneous, 0=Homogenous)	+
Descnmakngindx	Decision making in a group	Activeness in group decision making (Dummy)	+
Grpsize	Group size	Number of members in a group (continuous)	-
Dnstyofmrshp	Density of Group membership	Number of groups one is a member (continuous)	+/-
Initialsocialk	Initial social capital endowment	Number of people in the group the household member knew before joining the group(continuous)	+
Trstindx	Trust index of the members	Level of trusts among group members	+

**3.7.3 Objective 3: Effects of group membership and social capital dimensions on household income.**

A multiple regression model was used to determine the effects of group membership, social capital dimensions and other factors on household income. Apart from group membership, there are other factors that influence households' income (Owuor *et al.*, 2007). These factors include social dimensions, socioeconomic, farm specific and institutional factors. The influence of these factors contributes to the success and performance of the group. The regression allow for estimation by OLS procedure where income (Y) is a linear function of regressors X.

The model was specified as:

$$Y = \beta_o + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \dots + \beta_nX_n + v \dots \dots \dots (11)$$

$$Income(Y) = \beta_o + \beta_1Age + \beta_2agesq + \beta_3Gender + \beta_4Educ + \beta_5H/Hsize + \beta_6FmSize + \beta_7FmSizesq + \beta_8Offincm + \beta_9Landtunure + \beta_{10}Fqcymtngs + \beta_{11}GrpHetgnty + \beta_{12}Trstindx + \beta_{13}Grpdcsn + \beta_{14}Grpsize + \beta_{15}Dnstyofmrshp + \epsilon \dots \dots \dots (12)$$



**Table 2: Description of variables and their expected signs used in the Regression model.**

<b>Variable Code</b>	<b>Variable</b>	<b>Measurement of the variable</b>	<b>Expected Sign</b>
H/Hincme (Y)	Household income	Income from previous season	
Age	Age in years	Age of the farmer (continuous)	+
Agesq	Age squared	Age of the farmer (continuous)	-
Gender	Gender	Farmer's gender (Dummy 1 =Male, 0= Female)	+/-
Educ	Education of household head	Number of years in school (continuous)	+
H/Hsize	Household size	Size of the household (continuous)	-
FmSize	Farm size	Size in acres (continuous)	+
FmSizesq	Farm size squared	Size of the land in acres (continuous)	+/-
Offincm	Off farm income	Off-farm income, (Dummy 1= have off- farm income, 0= otherwise)	+
LdTenure	Land Tenure	Form of land ownership, (Dummy 1= Owned, 0 = Leased)	+
Fqcyntngs	Meetings Frequency	Number of meeting per month (discrete)	+/-
GrpHetgnty	Heterogeneity of groups	Differences within groups (Dummy 1=Heterogeneous, 0=Homogenous)	+/-
Grpdcsn	Decision making in a group	Who makes decisions in a group (dummy 1=members, 0=officials)	+/-
Grpsize	Group size	Number of members in a group (continuous)	+/-
Dnstyofmrshp	Density of Group membership	Number of groups one is a member (continuous)	+/-
Trstindx	Trust index of the members	Level of trusts among group members	+

## CHAPTER FOUR

### RESULTS AND DISCUSSIONS

This chapter presents results and detailed discussions of the findings of the research. The chapter has been organized into three sections to address the objectives of the study. Appropriate methods of analysis were used and the results presented in tables, and figures. The socio-economic characteristics of the non group farmers were compared with group farmers and tested statistically using the t-test and chi-square statistics.

#### 4.1 Descriptive results

##### 4.1.1 Socio-economic characteristics of group and non group farmers

The results of gender of farmers are presented in Table 3. A large proportion of non group farmers (72%) were males while females constituted 28%. However, females were 37%, while males were 63% among group farmers. The chi square test indicates that gender was statistically significant at 5% implying that male headed households participate in French bean marketing. This is in line with Doss (2001) who observed that men are responsible for providing household income and as a result grow and export cash crops.

The type of occupation revealed that a large proportion (69%) of group members and 68% of non group members derived their livelihoods from farming. The results also indicated that 19% of farmers in groups engaged in business activities compared to 16% of non group farmers. A slightly higher percentage of group farmers (7%) were employed off farm compared to 6% of non group farmers. However, the chi square test reveals that these differences were not significant.

The land tenure system comprised of titled and untitled ownership. The result in Table 3 shows that 87% of group members had titles while 13% were untitled. Among the non group members, 73% had titles while 27% were without. Land ownership right plays an important role in joining farmer organizations and therefore influences the level of productivity and sales amongst the farmers. The chi square results confirmed that the difference between group and non group farmers in terms title deed ownership was significant 5% level.

The marital status of the household head revealed that a higher proportion of the farmers (83%) were married, for group members and 77% for non group farmers. However, majority of

single farmers (15%), were non group members while 7% were group members. A greater percentage of the single farmers in terms of marital status were youths, explaining why majority were non group farmers. There difference in marital status was however not statistically significant.

**Table 3: Household characteristics by farmer type (dummy variables)**

Variables		Group		Non group		Chi <sup>2</sup>
		Frequency	%	Frequency	%	
Gender	Female	35	36.84	22	27.84	5.590**
	Male	60	63.16	57	72.15	
Land tenure	With title	83	87.37	58	73.42	5.462**
	Without title	12	12.63	21	26.58	
Education level	Tertiary education	12	12.63	7	8.86	1.618
	High school	47	49.47	39	49.37	
	Primary school	33	34.74	32	40.51	
	No formal education	3	3.16	1	1.27	
Marital status	Single	7	7.37	12	15.19	3.498
	Married	79	83.16	61	77.22	
	Widowed	7	7.37	6	7.59	
	Divorced	2	2.11	0	0.00	
Occupation	Farming	66	69.47	54	68.35	5.486
	Business	18	18.95	13	16.46	
	Salaried Employee	7	7.37	5	6.33	
	Casual labour	3	3.16	1	1.27	
	Other	1	1.05	6	7.59	

\*, \*\*, \*\*\*: significant at 10%, 5% and 1% level respectively

The result reveals that majority of the farmers had primary and secondary education, with 40% of non group farmers having completed primary school and 49% had completed secondary school. Similarly, 35% and 49% had completed primary and secondary education respectively among the group members. However, both groups had lower aggregate number of those without formal education and those with tertiary level of education as summarized in Table 3 where 3%

and 1% of group and non group farmers respectively had no formal education. The number of group farmers who had tertiary education was higher (12%) than non group farmers (7%). The chi square results revealed that there was no significant difference between group and non group member in terms of education level. According to Makhura (2001), human capital signified by formal education level of the household head improves their understanding of the market.

The results of household characteristics by farmer type are presented in Table 4. The aggregated mean age was 43 years, while the mean age of farmers in groups was 45 years and non group farmers 41 years. The t-test result show that age was significant at 5% revealing that farmers in groups had statistically higher mean age than the non group farmers. The farming households in the county can therefore be regarded as young and who according to a study by Martey *et al.* (2012) belong to economically active group.

The aggregate mean household size was 4 persons. However, the mean household size of non group farmers and group farmers was 4 and 5 persons respectively. The t-test results indicate that there was no significant difference between group and non group members in terms of the mean household size.

Years of experience shows that the aggregate in French bean marketing was 9 years. Farmers in groups had more years of experience at 9.4 years while the non group farmers had experience of 8.6 years. The t-test results however revealed that the difference in years of experience was not significant between the two categories of farmers. The numbers of years the farmers have been living in Mwea sub-county was however found to be statistically significant at 5% level. Group and non group farmers were found to have lived in the area for an average of 32 years and 28 years respectively.

The distance to the market or the nearest collection point shows that farmers in groups covered an average of 0.85 kilometers, and non group farmers covered 0.48 kilometers. This explains why farmers who are further from collection points or market join groups. The t-test result indicates that there was a significant difference between non group and group members at 1% level in terms if distance to market. This implies that as distance to the market increases, the cost of transport increases and the tendency for collective action among farmers increase.

The results of the selling price show that the aggregate French beans' selling price was KES 47. There were differences in prices because group members sold their produce at a higher

price of KES 49, while the non group farmers sold at KES 43. The t-test result at 1% level confirmed that there was strong significant difference between group and non group members' selling price. Higher selling price among farmer group members reveals the importance of collective action through farmer groups which increases the bargaining power of farmers in terms of output price.

The results of household incomes indicate that the aggregated mean annual farm income was KES 140,672. However, the non group farmers had a lower mean annual farm income of KES 136,006 compared to KES 144,552 obtained by farmers in groups. Though not significant, the result shows that farmers in groups had more incomes from their production than the non group members. However, the non group farmers had more off-farm income at KES 78,465 than the farmers in groups who had a mean annual off-farm income of KES 70,671. Off-farm income comprised of annual average income from business, employment and other incomes apart from the farm income. The result reveals the importance of off-farm income in influencing participation in farmer groups which is consistent with (Mathenge and Tschirley, 2007).

The ratio between quantity sold and the quantity harvested are important in measuring the level of commercialization. The results indicate that the aggregate amount of French beans produced and sold were 1371kg and 1189kg respectively. Group farmers harvested 1359kg and sold 1204kg of their produce. Non group farmers on the other hand, had more quantity harvested (1383kg) but sold a smaller quantity (1175kg). The differences in the quantities produced and sold though not significant imply that non group farmers had a lower commercialization level. This therefore means that group farmers sold most of their harvested beans compared to non group farmers.

**Table 4: Household characteristics by farmer type (continuous variables)**

Variable	Group		Non group		Aggregate	T-test
	Mean	Std.dev	Mean	Std.dev	Mean	
Age	43.91	10.02	40.39	9.80	42.31	-2.327**
Household size	4.54	1.62	3.76	1.60	4.18	-3.120
Years in Mwea	32.38	13.87	28.19	13.11	30.48	-2.033**
Experience(years)	9.36	7.45	8.56	6.68	8.96	-0.747
Distance to market(Km)	0.84	0.82	0.48	0.88	0.68	-3.192***
Selling Price (KES)	49.46	6.53	43.34	16.56	46.68	-4.170***
Farm Income	144342.1	126355.8	136006.30	115406.10	140557.50	-0.462
Off-farm Income	70671.58	57110.37	78,465.82	66892.32	70721.84	0.855
Quantity harvested(Kg)	1359.00	1191.35	1382.73	1347.41	1370.87	0.225
Quantity sold(Kg)	1203.79	1125.79	1174.66	1158.96	1189.23	-0.168

\*, \*\*, \*\*\*: significant at 10%, 5% and 1% level respectively

The results of access to extension services, access to market information and ownership of transport means are presented in Table 5. Access to extension services is a source of skills and knowledge to the farmers. From the results in Table 5, it is evident that group members had more chances with 81% accessing extension services while it was 54 % for the non group farmers. Farmers acquired extension services through trainings mostly on GlobalGap standards by exporters, HCDA and government extension officers who mainly focused on farmer groups

because of convenience. Those who did not access extension services while in groups stood at only 19%. The chi square result at 1% level confirms that there was a significant difference in the level of extension services access between group and non group farmers.

Both categories of farmers had higher market information access at 99% for group members and 91% for non group members. The chi square result however, reveals that the difference in market information access between group and non group farmers was statistically significant at 5% level. Farmers in groups, therefore, had higher probability of accessing almost all market related information than non group farmers. Access to market information was in terms of the output price, quality, contractors and exporters.

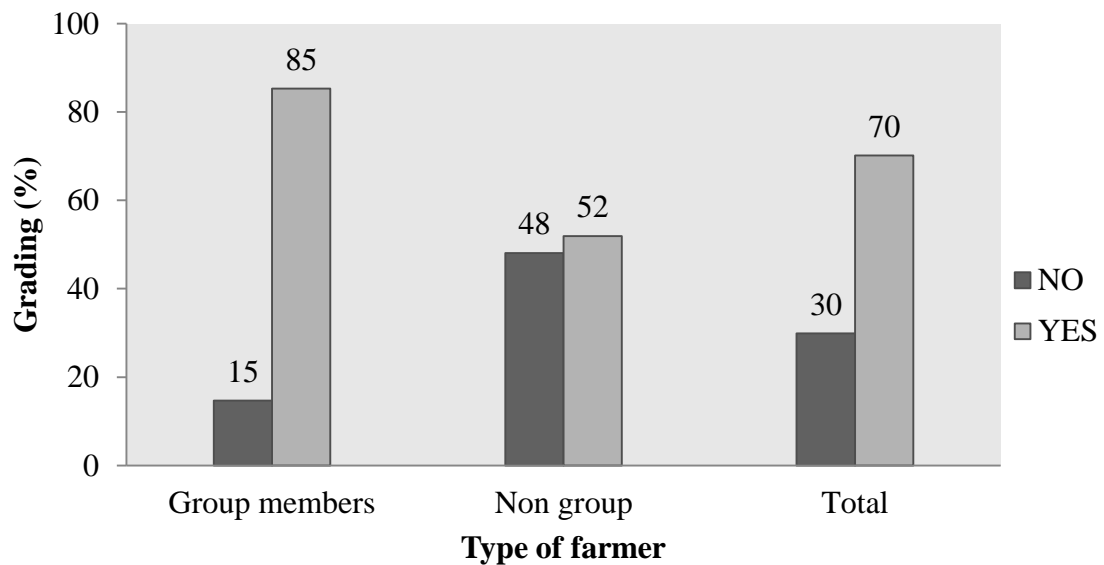
Ownership of transport means is an important factor in marketing. The result in Table 5 reveals that 43% of farmers in group owned a means of transport (motorbike, bicycle, vehicle and carts) which was higher than non group farmers where 24% owned a means of transporting their produce. The difference in terms of ownership of transport was supported by the chi square result which confirmed a significant difference between the two categories of farmers at 5% level. Farmers in groups who owned a means of transport used it to carry their produce to the groups' collection centers. This reflects the influence of collective action in increasing market participation.

**Table 5: Access to extension services, market information and ownership of transport means**

Variables		Group=95		Non group=79		Chi <sup>2</sup>
		Freq	%	Freq	%	
Extension services access	Yes	77	81.05	43	54.43	14.283***
	No	18	18.95	36	45.57	
Market information access	Yes	94	98.95	72	91.14	5.995**
	No	1	1.05	7	8.86	
Ownership of transport means	Yes	41	43.16	19	24.05	6.191**
	No	54	56.84	60	75.95	

\*\*, \*\*\*: significant at 5% and 1% level respectively

The relationship between grading and membership to a farmer group is shown in Figure 3. Grading of the output by farmers is an important factor which affects market access and always positively associated with output level sold. The results indicate that 85% of farmers in groups had their beans graded while 52% of non group farmers graded their output. A small proportion of group farmers (15%) did not grade their output while 48% of non group farmers had their beans not graded. The chi square result reveals that there was a significant difference between the two categories of farmers in terms of grading their produce. As the farmers sort and grade their produce, they reduce the chances of their beans being rejected hence enhancing market opportunities.



**Figure 3: Relationship between grading and membership to a group**

The result of social capital dimensions among farmer group members is presented in Table 6. A weighted average score extracted and standardized as a factor score was used to measure the social capital dimension indices. The level of heterogeneity shows a high level of diversity among the group members with a mean heterogeneity index of 93.33 percent. The farmer groups' members were heterogeneous in terms age, gender, wealth, education level, occupation and neighbourliness. The level of trust among the group members was measured in terms of how much they trust the group, leaders, marketing agents and contractors, fellow farmers and members of other groups. The trust level index was high at 68.95 percent indicating a higher level of trust in the groups.



**Table 6: Summary statistics of social capital dimensions**

<b>Social capital dimensions</b>	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std Dev.</b>
Heterogeneity index	95	0.5	1	0.874	0.143
Meeting attendance index	95	0	1	0.795	0.287
Trust level index	95	0.15	1	0.689	0.223
Density of membership	95	1	3	1.35	0.56
Decision making index	95	0	1	0.674	0.42

Source: Survey data (2014)

The meeting attendance index shows that on average, group members attended scheduled group meetings per month with a 79.47 percent attendance index. According to Grootaert (1999) several activities occur during group meetings, including, training on group operations, farming and marketing skills, importance of group solidarity and the sharing of other important information. The density of membership results show that each household belonged to an average of one (1) farmer group with a maximum membership being three (3) groups and associations. Lastly, the decision making index shows that members' participation in group decision making was above average at 67.36 percent indicating a high level of activity among group members.

#### **4.2 Factors influencing farmer groups' performance in French bean commercialization.**

Tobit regression analysis results in Table 7 were utilized to determine the factors that influence groups' performance in accessing the market, measured in terms of commercialization level. The marginal effects (presented in the table as  $\delta y/\delta x$ ) of the variables were used to interpret and discuss the results. The pseudo R-squared indicates that 20% of the variation in the level of French bean commercialization is explained by independent variables. More variables were included to maximize the outcome likelihood in the Tobit model.

The marginal effects outcome reveals that the extent of commercialization of French beans by smallholder farmers is significantly determined by gender, age of household head, education level, experience of the household head, quantity of the output, transport cost, off-farm income, previous French bean income, trust index and meeting attendance index. The P-values of

these variables were significantly different at 0.1, 0.05 and 0.01 levels of significance. Other variables were, however, not significant but included based on prior theoretical consideration.

The change of status from male to female headed households may occur due to death, separation or divorce. As hypothesized, gender of the household head was significant and influenced the commercialization level negatively at 10% level. The result implies that change from male headed to female-headed household decreases the probability of a higher commercialization rate in the French beans market by 28%. This finding suggest that male-headed households are more market oriented than female and thus participate more in cash crop production and marketing like French beans. The findings concurs with Sigei *et al.* (2013) that men are more mobile and have networks that enhance market information sharing while women are more engaged in household chores and production of subsistence crops. Jaleta *et al.* (2009) also indicated that though females were actively involved in cash crop production labour, income from these activities were usually controlled by male.

Age as expected had a positive influence on the commercialization level. The regression result indicates that age squared is negatively significant. The quadratic term, age squared which captures the nonlinearity between the age and commercialization was significant at 1% level, implying that French bean commercialization increases with an increase in age of the household head up to a point where a further increase in age by one year reduces the household commercialization by 2%. This implies that older household heads are less likely to increase the sales for French beans. This result agrees with the findings of Arega *et al.* (2007); Anete *et al.* (2009) and Sigei *et al.* (2013) that market participation increases with age up to a point at which it starts declining with increase in age of the household head. Akinlade *et al.* (2013) argues that at intermediate ages, market participation increases with age but declines as the age of the household head advances.

The cost of transport was significant at 10% and carried a negative sign. As hypothesized, this result implies that the higher the cost of transport, the lower the commercialization level. A unit increase in the transport cost leads to a 0.5% decrease in commercialization level. High transportation costs imply increased transaction costs that limit households' involvement in French bean production, and encourage them to give priority to subsistence crops, thus reducing commercialization (Govereh and Jayne, 2003; Pingali *et al.*, 2005).

**Table 7: Tobit marginal effects ( $\delta y/\delta x$ ) regression outcome on factors influencing French beans commercialization.**

Variables	$\delta y/\delta x$	Std. Error	Z	P>/z/
Gender(*)	-0.281*	0.158	-1.78	0.074
Age	1.921**	0.798	2.41	0.016
Age squared	-0.022***	0.008	-2.62	0.009
Household size	-0.489	0.598	-0.82	0.414
Education level squared	0.049***	0.016	3.15	0.002
Experience	0.303**	0.140	2.16	0.031
Yield	0.043***	0.003	14.01	0.000
Ln Distance to market	-0.129	1.093	-0.12	0.906
Transport cost	-0.005*	0.003	-1.80	0.072
Selling price	0.192	0.155	1.24	0.215
Off-farm income	-0.263**	0.105	-2.55	0.011
Previous income	0.200***	0.055	3.66	0.000
Group size	-0.002	0.006	-0.28	0.782
Initial social capital	0.081**	0.033	2.44	0.015
Heterogeneity Index	0.044	0.060	0.74	0.460
Trust Index	0.082**	0.037	2.20	0.028
Meeting Attendance Index (MAI)	0.065**	0.032	2.03	0.042
Decision making Index (DMI)	0.015	0.020	0.72	0.473
Density of membership	-1.400	1.241	-1.13	0.259
Number of observations	174	Wald $\chi^2(20)$	136.80	
Log likelihood	-249.6343	Prob> $\chi^2$	0.0000	
		Pseudo R <sup>2</sup>	0.2019	

(\*)  $\delta y/\delta x$  is for discrete change of dummy variable from 0 to 1

\*, \*\*, \*\*\*: significant at 10%, 5% and 1% level respectively.

Years of education positively influenced French beans commercialization. A unit increase in the year of education of the household heads leads to increased commercialization of their French bean produce by 4.9%. French beans being a high value export crop, education is

important among farmers to understand the GlobalGap requirements in production and marketing. These findings confirm those of Gebremedhin and Jaleta (2010) who stated that education level increases human capital and their managerial skills which promote commercialization. Simonyan *et al.* (2009) also found education to be significant in augmenting farmers' ability in making important decisions.

Households with higher proportion of off-farm income are less probable to increase the sale of French beans. The level of French bean commercialization decreases by 26% for each additional unit of off-farm income as a proportion of the total household income. The result implies that households that have higher off-farm income may not engage much in French beans. This finding corroborates with the argument of Martey *et al.* (2012) that income earned from off-farm engagement is not invested in farm technology and other farm developments but often diversified. The result is also consistent with the findings by Alene *et al.* (2008) and Omiti *et al.* (2009). This is however contrary to Agwu and Ibeabuchi (2011) who stated that high income leads to increased amount of produce traded and expansion of enterprise because of reduced dependence on agricultural produce.

Experience of the household head in French bean production and marketing was positively significant at 5% level with the French bean sales. For each additional year of farming experience by the household head, the proportion of French bean sold increases by 30%. French bean production is labour intensive and requires a lot of technical skills; therefore, experience of the household head ensures better production and marketing decisions. This finding is in line with Martey *et al.* (2012) that experienced household heads have greater contacts which allow trading opportunities to be discovered at a lower cost, thus reducing the transaction costs.

The regression results show that the quantity of French beans produced is associated with a higher extent of French bean sales. An additional kilogram of French beans produced leads to a 4% increase in the extent of commercialization. According to Martey *et al.* (2012), household with surplus of crops produced sell a higher proportion of the output. The findings of Barrett (2007); Omiti *et al.* (2009) and Astewel (2010) are also supported by these results. The findings of Tadesse (2011), that avocado and mango quantities had significant and positive effect on marketable supply in Gomma Woreda, Ethiopia also confirm these results.

The results in Table 7 above also indicate that trust level index positively influence the mean level of commercialization. A unit increase in the level of trust level increased the commercialization by 8.2%. Pretty and Smith (2004) state that trust reduces transaction cost between actors and therefore releases resources (time and money). When farmers enter into contracts with export agents they trust, the cost of bargaining and risk factor are reduced and thus creating trustworthy arrangements. Increase in trust index therefore leads to increased market participation which in turn increases the commercialization level. This finding is however in contrast to those of Wambugu (2009) who found a negative relationship between organization's trust index and the commercialization level.

Initial social capital endowment had a positive significant influence on the level of commercialization. The result indicates that an increase in the initial social capital endowment by one person leads to an increase in the level of commercialization by 8%. This variable was measured in terms the number of people who are in the farmer group that the household was interacting with before joining the group. According to Katungi *et al.* (2007), farmers' aversion to risk reduces as the number of friends and relatives increases and thus enhancing the household's willingness to participate in organizations. Initial social capital endowment therefore increases the chance of information access and trust among the group members.

#### **4.3 Effects of group membership and social capital dimensions on household income.**

Multiple regression model was used to determine the effects of group membership and social capital dimensions on the changes in household income. Participation in the farmer groups together with socioeconomic, farm specific, social capital indicators and institutional factors was analyzed to determine their effects on household income. The null hypothesis was that social capital dimensions do not have significant influence on household income. Most variables showed expected signs and the model was significant, with an adjusted R squared value of 0.67. Eleven of the variables were found to be significant given their low p-values. This is as shown in Table 8.

Age of the household head was used as a proxy of farming experience, and was found to be significant at 5%. With a coefficient of 0.096, age had a positive influence on the household income. Older household heads are more endowed with social capital which allows them to trade easier at lower transactional costs (Martey *et al.* 2012). However age increases up to a certain

level where it negatively influences the household income. This is due to the fact that older people have reduced ability to work in the farms and lower human capital in their households.

**Table 8: Multiple Regression (OLS) coefficient results**

<b>Variables</b>	<b>Coefficient</b>	<b>Std error</b>	<b>p&gt;/z/</b>
Constant	8.846	0.889	0.000
Gender	-0.035	0.084	0.678
Age	0.096**	0.037	0.012
Age squared	-0.001**	0.000	0.017
Household size	-0.035	0.033	0.288
Education level	0.081	0.055	0.141
Land size	0.318***	0.052	0.000
Land size squared	-0.017***	0.004	0.000
Land tenure	-0.253**	0.117	0.034
Membership to other groups	-0.215**	0.090	0.020
Access to extension	0.134	0.102	0.195
Transport ownership	0.149*	0.087	0.091
Yield of French beans (Kgs)	0.0002***	0.000	0.000
Off farm income	0.011***	0.003	0.000
Heterogeneity Index	0.006**	0.003	0.026
Trust level Index	0.004**	0.002	0.032
Meeting Attendance Index (MAI)	-0.002	0.002	0.146
Decision Making Index (DMI)	0.001	0.001	0.502
No. of Observations	174		
R <sup>2</sup>	0.7524		
Adjusted R <sup>2</sup>	0.6722		

\*: significant at 10% level; \*\*: significant at 5% level; \*\*\*: significant at 1% level.

Farm size is significantly associated with a higher household income as shown in Table 8 above. The size of the land shows the potential to produce surplus for the market implying more income. The results indicate that at 1% significance level, land size had a positive coefficient of 0.318 and thus positively influencing household income. However, the quadratic term, land

squared (-0.017) which captures the nonlinearity between the farm size and household income was significant at 1% level, implying that more land size negatively influenced household total income. This mainly due to the fact that most household in Mwea rely on irrigation and excess land size implies a higher cost of production. This finding agrees with those of Sebaso and Tol (2005) who found out that income increases initially and thereafter decreases as the land size increases.

The yield of French beans as expected is associated with a higher level of sales and thus more income. At 1% significance level, the result confirms a strong significance influence of French beans yield on increasing household income. The result of French beans yield revealed a positive influence on income with a coefficient of 0.0002. This implies that households that had more output sold a greater percentage of it and thus, higher incomes.

Ownership of transport means (0.149) also had a significant positive relationship with household incomes. Households owned transport means in the form of motorbikes, bicycles and carts that they use in the transportation of their produce. This reduces the cost of transport and enhances convenience among the farmers. The results indicate that households that owned a means of transport increased their household incomes. Transport means ownership helps in reducing the long distance constraints and aids in offering the greater depth in marketing choices. The result is in line with the findings of Chalwe (2011) who argued that the availability of on-farm transport increases the chances of transporting produce to the market.

Engagement in off-farm activities showed a positive relationship and was significant at 1% in contributing to household income. Off-farm income (0.011), showed a positive influence on income implying that off-farm engagement helps to supplement agricultural income during off-peak season ensuring constant income. This result agrees with those of Kinuthia *et al.* (2011) that farmers who engage in off-farm activities had higher incomes than those who do not.

Heterogeneity in the farmer groups was found to be statistically significant in influencing the level of household income. Heterogeneity index had a positive coefficient of 0.006 in influencing household income. Diversity in the group such as age group, gender, education level, occupation, neighbourliness and economic status brings collective action in the group and people are able to assist one another in times of need, that is, the spillover effect is strongest in groups

that are diverse. This finding corroborates that of Grootaert (2001) that heterogeneity of a group has a positive impact on household welfare.

Trust is an important social capital dimension which determines the decision of a farmer to join a group and the market outlet to sell. As expected, trust index has a positive influence on the household income. The results indicate that at 5% significance level with a positive coefficient of 0.004. The result corroborated with those of Kirsten *et al.* (2009) who highlighted that trust makes transacting parties spend less time and resources on ex-ante contracting and monitoring and thus increasing their market participation leading to improved incomes. However, to the contrary, Haddad and Maluccio (2002) found a negative relationship between the income and the sum of contemporaneous trust with or without group membership.

With regard to membership to other groups and organizations (density of membership), the result revealed that membership to more groups was significant at 5%. With a coefficient of -0.215, membership to additional groups negatively influenced household income. Membership to more organizations implies that there are increased commitments, more membership fees paid, and less time dedicated to own farm and off-farm activities. The result is however contrary to that of Grootaert (1999).



## CHAPTER FIVE

### CONCLUSION AND RECOMMENDATION

#### 5.1 Conclusion

The socioeconomic attributes among the group members and non-group farmers revealed that gender, land tenure, age, Years in Mwea, Market distance and selling price were statistically different among the groups. Access to extension services, market information access and ownership of transport means also were statistically different between the group and non-group members. Group members had more access to extension and information. The results also showed that group farmers graded their produce than non-group farmers.

The findings of the study revealed that household socio-economic characteristics, institutional factors and the social capital dimensions influence the performance of farmer groups in terms of extent of French beans commercialization. Specifically, the findings indicated that age, years of education, farming experience, yield, previous French bean income, initial social capital, trust index and meeting attendance index had a positive influence on the level of commercialization among the French bean farming households. The positive influence of social capital indicators gives the importance of these variables in commercialization of French beans. As the frequency of meeting attendance and trust level among group members increases, the extent of French beans marketing increases because of increased accumulated social capital. This implies that an increase in any of these variables leads to increased commercialization of French beans. Gender, age squared, transport cost and off-farm income negatively influence the extent of commercialization.

Twelve socio-economic factors and social capital dimensions factors were found to be significant in influencing household income. Land size and land size squared were also found to be positively and negatively significant respectively. Ownership of transport means, yield of French beans and off-farm income was also found to be positively significant in influencing income. Social capital indicators were also found to significantly influence household income. The results indicated that heterogeneity of the farmer group and the trust index positively influenced income. However, membership to more organizations was also found to negatively influence income. The study therefore, has shown that producer organizations play important roles in improving market access and the extent of commercialization among smallholder

farmers and thus increased incomes. Social capital in groups helps the members to reduce the transaction costs and access better prices by improving the bargaining power.

## **5.2 Recommendation**

Based on the results of the study, social capital dimensions and group marketing were found to have a greater potential in increasing commercialization and increased household income through collective action. The study therefore, recommends that the government and other policy makers should take a pro-active role in facilitating the formation of farmer groups and training them on marketing related activities in addition to good agricultural practices. The government and other stakeholders should increase the French bean farmers' marketing knowledge and skills through capacity building, extension services and mass media.

Further, the study recommends that for a holistic French bean commercialization to be realized, proper market infrastructure and well defined institutional issues must be put in place. To improve the French bean commercialization among farmers there is a need to focus on facilitating female head participation in the market since they are more willing to join and actively participate in groups. Provision of information regarding the market and training especially on GlobalGap standards enhances more productivity of farmers especially the less commercialized female farmers

## **5.3 Area of further research**

The main intention of the study was to determine the influence of the social capital dimensions and institutional factors on farmer group's performance in terms of commercialization among smallholder French bean farmers. The study also determined the effect of group membership and social capital dimensions on household income. However, the study proposes further research on the interaction and integration of farmers groups and other groups and farmer organizations such as ROSCAS. Further, there is need for an in-depth evaluation of the market integration to establish the efficiency of existing marketing channels and the extent of smallholder farmer groups' participation in these channels so as to attain a successful commercialized French bean sector.

## REFERENCES

- Adong, A., Mwaura, F. and Okoboi, G. (2013). What Factors Determine Membership to Farmer Groups in Uganda? Evidence from the Uganda Census of Agriculture 2008/9. *Journal of Sustainable Development*, 6(4): 1913-1932.
- Agbola, P., Adenaike, T. and Babalola, D. (2010). Determinants of Farmer's Access to Output Markets and the Effects on Income. A Case Study of Ikenne Local Government area, Nigeria. *Journal of Life and Physical Sciences*, 3(2): 33–39.
- Agwu, N. and Ibeabuchi, J. (2011). Socio-Economic Analysis of Wholesale Rice Marketers in Abia State, Nigeria. *International Journal of Social Science and Humanity*, 1(4): 285-288.
- Agwu, N., Anyanwu, C. and Mendie, E. (2012). Determinants of Commercialization among Small Holder Farmers in Abia State, Nigeria. *Greener Journal of Agricultural Sciences*, 2(8): 392-397.
- Akinlade, R., Balogun, O. and Obisesan, A. (2013). Commercialization of urban farming: the case of vegetable farmers in southwest Nigeria. Paper presented at the 4th International Conference of the African Association of Agricultural Economists, September 22-25, 2013, Hammamet, Tunisia.
- Alemayehu, G., Jong, N., Kimenyi, G. and Mwabu, G. (2005). Determinants of Household Poverty in Kenya: A Household Level Analysis. University of Connecticut.
- Alene, A., Manyong, V., Omany, G., Mignouna, H., Bokanga, M. and Odhiambo G. (2008). Smallholder market participation under transactions costs: Maize supply and fertilizer demand in Kenya. *Food Policy*, 33(4): 318-328.
- Alesina, A. and La Ferrara, E. (2002). Who trusts others? *Journal of Public Economics*, 85: 207–234.
- Altman, M., Hart, Tim, G. B., Jacobs and Peter, T. (2009). Household Food Security Status in South Africa. *Agricultural Economics Association of South Africa (AEASA)*, 48(4).

- Amaya, N. and Alwayng, J. (2011). Access to information and farmer's market choice: The case of potato in highland Bolivia. *Journal of Agriculture, Food Systems, and Community Development*, 1(4): 35–53.
- Amemiya, T. (1984). Tobit model: a survey. *Journal of Econometrics*, 24: 3–63.
- Anderson, D., Sweeny, J., Williams, T., Freeman, J. and Shoesmith, E. (2007). *Statistics for Business and Economics*. Thomson Learning. *Cengage Learning EMEA, London*.
- Anete, A. and Igbokwe, E. (2009). Cassava Market Participation Decision of Households in Africa. *Tropicultura*, 27(3): 129-136.
- Arega, D. A., Manyong, V., Omany, G., Mignouna, H., Bokanga, M. and Odhiambo, G. (2007). Smallholder Market Participation under Transactions Cost: Maize Supply and Fertilizer Demand in Kenya. *Journal on Food Policy*, 33: 318-328.
- Astewel, T. (2010). Analysis of Rice Profitability and Market chain: The Case of Fogera Woreda, South Gondar Zone, Amhara National Regional State, Ethiopia. A Masters Thesis Presented to School of Graduate Studies of Haramaya University.
- Bailey, D., Barrett, C. B., Little, P. D. and Chabari, F. (1999). *Livestock markets and risk management among East African pastoralists: A review and research agenda*. Department of Economics, Utah University. USA.
- Barham, J. G. (2007). Linking farmers to markets: Assessing planned change initiatives to improve the marketing performance of smallholder farmer groups in Northern Tanzania (Doctoral dissertation, University of Florida).
- Barrett, C. (2007). Smallholder market participation: Concepts and evidence from eastern and southern Africa. *Food Policy*, 33(4): 299–317.
- Behrens, J. H., and Evans, J. F. (1984). Using mass media for extension teaching. In B. E. Swanson(Ed.), *Agricultural Extension: A Reference Manual* (pp. 144-155). Rome, Italy: FAO.
- Bourdieu, P. (1985). The forms of capital. *Handbook of Theory and Research for the Sociology of Education*. J. G. Richardson. New York, Greenwood.

- Chalwe, S. (2011). Factors Influencing Bean Producers' Choice of Marketing Channels in Zambia. An Msc. Thesis Presented to the School of Graduate Studies of Zambia University.
- Coleman, J. S. (1988). Social Capital in the Creations of Human Capital. *American Journal of Sociology*, 94: 95-121.
- Coleman, J. S. (1990). *Foundations of Social Theory*. Harvard University press.
- Coleman, J. (2000). Young people in Britain at the beginning of a new century. *Children and Society*, 14: 230-242.
- De Janvry, A., Fafchamps, M. and Sadoulet, E. (1991). Peasant household behaviour with missing markets: some paradoxes explained. *The Economic Journal*, 101: 1400-1417.
- Dolan, C. and Humphrey, J. (2000). Governance and Trade in Fresh Vegetables: The Impact of UK Supermarkets on the African Horticulture Industry. *Journal of Development Studies*, 37(2): 147-176.
- Dorward, A. and Kydd, J. (2004). The Malawi 2002 food crisis: The rural development challenge. *Journal of Modern African Studies*, 42(3): 343-361.
- Durlauf, S. N. and Fafchamps, M. (2004). *Social Capital. The Centre for the Study of African Economies* (No. 214). Working Paper series.
- Eggertson, T. (1990). *Economic Behaviour and Institutions: Principles of Neoinstitutional Economics*. Cambridge University Press.
- Fafchamps, M. (2004). Market institutions in sub-Saharan Africa: Theory and evidence. Cambridge, Massachusetts: *MIT Press Books, 1*.
- Fafchamps, M. and Hill, R. V. (2005). Selling at the farmgate or traveling to the market. *American Journal of Agricultural Economics*, 87(3): 717-734.
- Fenyés, T. I. and Groenewald, J. A. (1985). Aspects of agricultural marketing in Lebowa. *Development Southern Africa*, 2(3): 398-410.
- Foster, A. and Rosenzweig, M. (1995) Learning by doing and learning from others: Human capital and technological change in agriculture. *Journal of Political Economy*, 103: 1176-1209.

- Gani, B. S. and Adeoti, A. I. (2011). Analysis of Market Participation and Rural Poverty among farmers in Northern Part of Taraba State Nigeria. *Journal of Economics*, 2(1): 23-36.
- Gebremedhin, G. and Jaleta, M. (2010). Commercialization of smallholders: Does market orientation translate into market participation? (No. 22). ILRI (aka ILCA and ILRAD).
- Goodwin, B. K. (1992). An analysis of factors associated with consumers' use of grocery coupons. *Journal of Agricultural and Resource Economics*, 17: 110–120.
- Government of Kenya (GoK) (2009). *Population and Housing Census*. Kenya National Bureau of Statistics, 2009.
- Granovetter, M. S. (1973). The strength of weak ties. *The American Journal of Sociology*, 78(6): 1360–1380.
- Grootaert, C. (1999). Social Capital, Household Welfare and Poverty in Indonesia. *World Bank Policy Research Working Paper*, (2148).
- Gujarati, N. (2004). *Basic Econometrics* (4th Edition). New York: Mc-Graw Hill Publishing Company.
- Gyau, A., Mbosso, C., Tchoundjeu, Z., Foundjem, T., Assah, E. and Franzel, S. (2011). Antecedents and effects of group sales on supply chain performance: The case of kola production and marketing in Cameroon. *Journal of Development and Agricultural Economics*, 3(13): 621-626.
- Halkos, G. E. and Jones, N. (2012). Modeling the effect of social factors on improving biodiversity protection. *Ecological Economics*, 78: 90-99.
- Huang, J., Wu, Y. and Rozelle, S. (2009). Moving off the farm and intensifying agricultural production in Shandong: a case study of rural labor market linkages in China. *Agricultural Economics*, 40: 203–218.
- Jaffee, S. and Morton, J. (1995). *Marketing Africa's High-Value Foods: Comparative Experiences of an Emergent Private Sector*: Kendall/Hunt Publishing Company.
- Jaleta, M., Gebremedhin, B. and Hoekstra, D. (2009). Smallholder commercialization: Processes, determinants and impact. Improving Productivity and Market Success (IPMS) of Ethiopian Farmers Project (*Discussion Paper No. 18*).

- Jayne, T., Govereh, J., Wanzala, M. and Demeke, M. (2003). Fertiliser Market Development: A Comparative Analysis of Ethiopia, Kenya, and Zambia. *Food Policy*, 28(4), 293-316.
- Katungi, E., Machethe, C. and Smale, M. (2007). Determinants of Social Capital formation in Rural Uganda: Implications for group-based agricultural extension approaches. *African Journal of Agricultural and Resource Economics*, 1(2): 167-190.
- Katungi, E., Edmeades, S. and Smale, M. (2008). Gender, Social Capital and Information Exchange in Rural Uganda. *Journal of International Development*, 20(1): 35-52.
- Key, N., Sadoulet, E. and De Janvry, A. (2000). Transactions Costs and Agricultural Household Supply Response. *American Journal of Agricultural Economics*, 82(2): 245-259.
- Kimaro, E. G., Lyimo-Macha, J. and Jeckoniah, J. N. (2013). Gender roles in smallholder dairy farming resources in Arumeru, Tanzania. *Livestock Research for Rural Development*, 25(82).
- Kinuthia, K., Owuor, G., Nguyo, W., Kalio, A. and Kinambuga, D. (2011). Factors Influencing Participation and Acreage Allocation in Tree Planting Program: A Case of Nyeri District. *Kenya Agricultural Science Research Journal*, 1(6): 129-133.
- Kirsten, J. F., Karaan, A. S. and Dorward, A. R. (2009). Introduction to the economics of institutions. In J. F. Kirsten, A. R. Dorward, C. Poulton, and N. Vink, *Institutional economics perspectives on African agricultural development*, ed. Washington, D.C.: International Food Policy Research Institute.
- Kirsten, J. (2010). The new landscape of global agriculture. *Agricultural Economics*, 41(1): 5-9.
- Kirsten, J. and Vink, N. (2005). The Economics of Institutions: Theory and Application to African Agriculture. Course Study Material, Department of Agricultural Economics Extension and Rural Development, University of Pretoria.
- Kirui, O. K. and Njiraini, G. W. (2013). Impact of Collective Action on the smallholder agricultural commercialization and incomes: Experiences from Kenya. A Paper prepared for the 4th Conference of AAAE. Diar Lemdina Hotel on September 22-25, 2013.

- Knack, S. (2002). Social Capital, Growth and Poverty: A Survey of Cross-country Evidence. In Grootaert, C., Bastelaer, T Van (eds): *The role of social capital in development. An empirical assessment*, Cambridge University Press, Cambridge, 42-82.
- Lawal, O., Omonona, T., Ajani, Y. and Oni, A. (2009). Effects of Social Capital on Credit Access Among Cocoa Farming Households in Osun State, Nigeria. *Agriculture Journal*, 4(4): 184-191. <http://www.medwelljournals.com/fulltext/?doi=aj.2009.184.191>
- Maddala, G. S. (1985). *Limited-Dependent and Qualitative Variables in Econometrics* (No. 3). Cambridge University Press.
- Makhura, M. (2001). Transaction costs and smallholder participation in the maize market in the northern province of South Africa. *International Food Policy Research Institute*, 39: 228-320.
- Maluccio, J. and Haddad, L. (2000). Social capital and household welfare in South Africa 1993–1998. *Journal of Development Studies*, 36(6): 54–81.
- Martey, E., Al-Hassan, R. and Kuwornu, J. (2012). Commercialization of Smallholder Agriculture in Ghana: A Tobit regression analysis. *African Journal of Agricultural Research*, 7(14): 2131-2141.
- Matuschke, I. and Qaim, M. (2009). The impact of social networks on hybrid seed adoption in India. *Agricultural Economics*, 40(5): 493–505.
- Mbithi, I. (2008). African experience with strategic export development: The success story of Kenya's horticultural industry. World Bank workshop, University of Pretoria.
- McCarthy, N., Dutilly-Diané, C. and Drabo, B. (2004). Cooperation, collective action and natural resources management in Burkina Faso. *Agricultural Systems*, 82(3): 233–55.
- McCulloch, N. and Ota, M. (2002). Export horticulture and poverty in Kenya. IDS Working Paper 174
- Minot, N. and Ngigi, M. (2004). *Are horticultural Exports a Replicable Success Story? Evidence from Kenya and Cote'deivoire*. International Food Policy and Research Institute .



- Monda, E. O., Munene, S. and Ndegua, A. (2003). French beans production constraints in Kenya. In Proceedings of African Crop Science Conference, (6): 683-687. <http://www.acss.ws/Upload/XML/Research/92.pdf>
- Montshwe, B. D., Jooste, A. and Alemu, Z. G. (2005). An econometric analysis of the determinants of market participation within the South African Small-scale Cattle Sub-sector. In A paper presented at the 42rd annual conference of the Agricultural Economics Association of South Africa, Limpompo, Polokoane.
- Munshi, K. (2004). Social learning in a heterogeneous population: technology diffusion in the Indian Green Revolution. *Journal of Development Economics*, 73: 185–213.
- Muriithi, B. W. (2008). Compliance with EUREPGAP standards: Determinants, Costs and Implications of Profitability among smallholder French Beans Exporters in Kirinyaga District, Kenya. Published Masters Thesis, Egerton University. <http://ageconsearch.umn.edu/bitstream/117712/2/Beatrice%20Muriithi%20Thesis.pdf>
- Mwema, C. M., Lagat, J. K. and Mutai, B. K. (2013). Economics of harvesting and marketing selected indigenous fruits in Mwingi district, Kenya. In A paper presented at the 4th International Conference of the African Association of Agricultural Economists, Hammamet, Tunisia.
- Nagarajan, G., Meyer, L. and Graham, H. (1999). Does Membership Homogeneity Matter For Group Based Financial Services? Evidence from Gambia. *African Development Review*, 11(1): 87-102.
- Narayan, D. and Pritchett, L. (1999). Cents and Sociability: Household Income and Social Capital in Rural Tanzania, *Economic Development and Cultural Change*, 47(4): 871-897.
- Narayan, D. and Pritchett, L. (2000). Social Capital: evidence and implications. In P. Dasgupta and I. Serageldin, *Social Capital: A Multifaceted Perspective* (pp. 269-295). Washington, DC: The World Bank.
- Nderitu, J., Wambua, E., Olubayo, F., Kasina, J. and Waturu, C. (2007). Evaluation of French bean (*Phaseolus vulgaris* L.) cultivars and breeding lines for resistance to thrips (Thysanoptera: Thripidae) pests in Kenya. *Journal of Entomology*, 4(3): 202-209.

- North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge University Press .
- Okado, M. (2000). Background Paper on Kenya Off-Season and Speciality Fresh Vegetables and Fruits: Lessons of Experience from the Kenyan Horticultural Industry. United Nations Conference in Trade and Development.
- Okello, J. J. and Swinton, S. M. (2009). From Circle of Poison to Circle of Virtue: Pesticides, Export Standards and Kenya's Green Bean Farmers. *Journal of Agricultural Economics*, 61(2): 209-224.
- Olwande, J. and Mathenge, M. (2010). Market participation among poor rural households in Kenya. Tegemeo Institute of Agricultural Policy and Development.
- Omiti, J., Otieno, D., Nyanamba, T. and McCullough, E. (2009). Factors influencing the intensity of market participation by smallholder farmers: A case study of rural and peri-urban areas of Kenya. *African Journal of Agricultural and Resource Economics*, 3(1): 57-82.
- Ondieki-Mwaura, F. N., Njoroge, L. M., Okello, J. J. and Bahemuka, J. M. (2013). Determinants of participation in identified institutional arrangements in Kenya's export French bean sector. In A paper presented at the 4th International Conference of the African Association of Agricultural Economists, Hammamet, Tunisia.
- Owuor, G., Ngigi, M., Ouma, A. S. and Birachi, E. A. (2007). Determinants of Rural Poverty in Kenya: The Case of Small Holder Farmers in Kenya. *Journal of Applied Sciences*, 7(17): 2539-2543.
- Pingali, P., Khwaja, Y. and Meijer, M. (2005). Commercializing small farmers: Reducing transaction costs. FAO/ESA Working Paper No. 05-08. FAO (Food and Agricultural Organization of the United Nations), Rome, Italy.
- Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, 24:1-24.
- Poulton, C., Kydd, J. and Doward, A. (2006). Overcoming market constraints on pro-poor Agricultural growth in sub-saharan Africa. *Development Policy Review*, 24(3): 243-327.

- Poulton, C., Dorward, A. and Kydd, J. (2010). The future of small farms: New directions for services, institutions, and intermediation. *World Development*, 38(10): 1413–1428.
- Pretty, J. (2003). Social capital and the collective management of resources. *Science*, 302(5652): 1912-1914.
- Pretty, J. and Smith, D. (2004). Social capital in biodiversity conservation and management. *Conservation Biology*, 18: 631-638.
- Pretty, J. and Ward, H. (2001). Social capital and the environment. *World Development*, 29: 209-227.
- Putnam, R. D. (1995). Bowling alone: America's declining social capital. *The Journal of Democracy*, 6(1): 65-78.
- Putnam, R. (1993). The prosperous community: Social capital and public life. *American Prospect*, 13: 35–43.
- Sabina, A., Meinzen-Dick, R., Amber, P., Quisumbing, A., Greg, S. and Vaz, A. (2013). The Women's Empowerment in Agriculture Index. *World Development*, 52(C): 71-91.
- Schipmann, C. and Qaim, M. (2010). Spillovers from modern supply chains to traditional markets: product innovations and adoption by smallholders. *Agricultural Economics*, 41: 361–371.
- Serageldin, I. and Grootaert, C. (2010). Defining social capital: an integrating view. In P. Dasgupta and I. Serageldin, *Social Capital: A Multifaceted Perspective* (pp. 40-58). Washington, DC: The World Bank, 2000.
- Shapiro, M. O. and Wainaina, S. (1991). Kenya's Export of Horticultural Commodities. *Journal of Public Administration and Development*, II: 257-261.
- Shiferaw, B., Hellin, J. and Muricho, G. (2011). Improving Market Access and Agricultural Productivity Growth in Africa: What Role for Producer Organizations and Collective Action Institutions? *Food Security*, 3(4): 475–489.
- Shiferaw, B., Obare, G. and Moricho, G. (2006). Rural institutions and producer organizations in imperfect markets: Experiences from producer marketing groups in semi-arid Eastern Kenya. *Journal of SAT Agricultural Research*, 2(1): 1-41.

- Shiferaw, B., Obare, G., Muricho, G. and Silim, S. (2009). Leveraging institutions for collective action to improve markets for smallholder producers in less-favored areas. *African Journal of Agricultural and Resource Economics*, 3(1): 1-18.
- Sigei, G., Bett, H., Kibet, K. and Mutai, C. (2013). Determinants of market participation among small-scale pineapple farmers in Kericho County, Kenya. *Journal of Economics and Sustainable Development*, 4(19): 59-66.
- Simonyan, J., Olukosi, J. and Omolehin, R. (2010). Socio-economic determinants of farmer's participation in Fadama II project in Kaduna state, Nigeria. *Journal of food and Fiber Production*, 3(1): 592-601.
- Stockbridge, M., Dorward, A. and Kydd, J. (2003). Farmer organizations for market access. A briefing paper presented at Stakeholders Meeting on Farmer Organizations in Lilongwe, Malawi. [http://r4d.dfid.gov.uk/pdf/outputs/r8275\\_040516\\_bfg\\_paper\\_fo\\_for\\_market\\_access.pdf](http://r4d.dfid.gov.uk/pdf/outputs/r8275_040516_bfg_paper_fo_for_market_access.pdf)
- Stringfellow, R., Coulter, J., Lucey, T., McKone, C. and Hussain, A. (1997). Improving the access of smallholders to agricultural services in sub-Saharan Africa: Farmer cooperation and the role of the donor community. Natural Resource Perspectives No.20, London: Overseas Development Institute.
- Tadesse, A. (2011). Market Chain Analysis of Fruit for Gomma Woreda, Jimma Zone, Oromia Regional State Msc thesis in Agriculture (Agricultural Economics). Haramaya, Ethiopia: Haramaya University. <https://cgspace.cgiar.org/handle/10568/12603>
- Udry, C. and Conley, T. G. (2006). Social Networks in Ghana. Discussion Paper No. 33, ISSER (Institute of Statistical, Social and Economic Research), University of Ghana, Legon.
- UNESCO (2002). Social capital and poverty reduction: Which role for civil society organizations and the state? United Nations Educational, Scientific and Cultural Organization.
- USAID (2012). Kenya Horticulture Competitiveness Project. Issue No. 24. United States Agency for International Development.
- Valentinov, V. (2007). Why are cooperatives important in agriculture? An organizational economics perspective. *Journal of Institutional Economics*, 3(1): 55-69.

- Wambugu, K., Okello, J. and Nyikal, A. (2009). Effect of social capital on performance of smallholder producer organizations: the case of groundnut growers in Western Kenya. In A contributed paper prepared for presentation at the International Association of Agricultural Economists Conference, Beijing, China.
- Wollni, M. and Brümmer, B. (2012). Productive efficiency of specialty and conventional coffee farmers in Costa Rica: accounting for technological heterogeneity and self-selection. *Food Policy*, 37(1): 67-76.
- Wollni, M., Lee, A. R. and Thies, E. J. (2010). Conservation agriculture, organic marketing, and collective action in the Honduran Hillsides. *Agricultural Economics*, 41: 373–384.
- World Bank. (2007). *World Development Report 2008. Agriculture for development..* Washington, DC: World Bank.
- World Bank. (2002b). From action to impact: the Africa region's rural strategy. *Rural Development Operations, the Africa Region*. The World Bank
- World Development Report. (2002). *Building Institutions for Markets*. World Bank.
- World Resource Institute (2013). Retrieved on 20<sup>th</sup> March 2014 from <http://www.wri.com>
- Zusman, P. and Rausser, G. C. (1994). Interorganizational influence and optimality of collective action. *Journal of Economic Behavior and Organization*, 24: 1-17.

## APPENDICES

### Appendix 1: Coefficient Results for Tobit Regression

Variables	Coefficient	Std. error	Z	P> z/
Constant	30.2369	22.5544	1.34	0.186
Gender	-0.2812	0.1576	-1.78	0.080
Age	1.9208	0.7978	2.41	0.020
Age squared	-0.0216	0.0082	-2.62	0.011
Household size	-0.4886	0.5980	0.82	0.418
Education level squared	0.04928	0.0156	3.15	0.003
Experience	0.3027	0.1402	2.16	0.035
Yield	-0.0433	0.0031	-14.01	0.000
Group size	-0.0019	0.0064	-0.28	0.783
Initial social capital	0.0807	0.0331	2.44	0.018
Ln Distance market	-0.1291	1.0925	-0.12	0.906
Transport cost	-0.0049	0.0027	-1.80	0.078
Selling price	0.1920	0.1548	1.24	0.220
Off-farm income	-0.2671	0.1049	-2.55	0.014
Previous income	0.2004	0.0547	3.66	0.001
Heterogeneity Index	0.0441	0.0597	0.74	0.463
Trust Index	0.0816	0.0372	2.20	0.032
Meeting Attendance Index (MAI)	-0.0655	0.0322	-2.03	0.047
Decision making Index (DMI)	0.0145	0.0203	0.72	0.476
Density of membership	-1.3995	1.2405	-1.13	0.264
Number of observations	174	Wald chi <sup>2</sup> (25)	136.80	
Log likelihood	-249.6343	Prob>chi <sup>2</sup>	0.0000	
		Pseudo R <sup>2</sup>	0.2151	

## QUESTIONNAIRE

This study intends to assess the influence of social capital on farmer groups' participation and performance in accessing the market and improving household incomes among French bean farmers Kirinyaga County. The objectives of the study are; a) To characterize the socio-economic attributes of the smallholder French beans farmers in Kirinyaga County, b) to determine influence of the social capital dimensions and institutional factors on group's performance in enhancing access to the market, and c) to assess the effect of group membership and social capital dimensions on household income. Your response to the questions herein will be used to assess the current position and help to formulate viable policies and strategies that will contribute to increased participation and performance in group marketing scheme thus leading to improved access market and household incomes. The information you provide will be treated with the confidentiality it deserves and will be used only for the purpose of this study.

### Instructions for the enumerators

1. Introduce yourself and tell the purpose of the study before starting the interview
2. Tick the box on the closed questions as indicated
3. Write interview questions clearly

Name of enumerator.....

Name of the farmer (optional).....

Name of the village.....

Relation to the household head.....

Date .....

## PART I

### 1. SOCIO-ECONOMIC CHARATERISTICS OF THE RESPONDENT

<b>1.1.</b> Gender		<b>1.2.</b> Age (Years)						<b>1.3.</b> Marital Status			
M	F	<18	19-29	30-39	40-49	50-59	>60	Single	Married	Widowed	Divorced

1.4. Household size (*number of people living and eating together*) .....

1.5. What is your highest educational or professional qualification?

- 1. University
- 2. College
- 3. High school
- 4. Primary school
- 5. No formal education

1.6. Years of education .....

1.7. What is your occupation?

- 1. Farming
- 2. Business person (kiosk)
- 3. Salaried employee
- 4. Casual laborer
- 5. Others, Specify.....

1.8. What was the estimated amount of income for the year (*in KES*)?

- 1. From farm production KES .....
- 2. From off-farm KES .....
- 3. Total income (1+ 2) KES .....

1.9. What is the size of your household farm land? .....

1.10. What is the size of the land under French beans?

- 1. Less than 1 acres
- 2. Between 1-3 acres
- 3. Between 3-5 acres
- 4. More than 5 acres



1.11. Indicate the land tenure system on the land in use and how you acquired it?

Land tenure system			How you acquire the land?			
Communal	Rent/Lease	Privately Owned	Bought	Inherited	Resettled	Other(Specify)

1.12. Apart from French bean farming, what other farming activity are you engaged in?

1. ....
2. ....

1.13. How long have you been living in Mwea Sub-County (in years)? .....

1.14. Of the years you have been living in Mwea, how long have you been doing French bean farming (in years)? .....

1.15. Do you belong to the ethnic majority group in the district?

1. Yes
2. No

1.16. Do you have access to extension services?

1. Yes
2. No

## 2. GROUP PARTICIPATION

2.1 Do you belong to a farmer group/organization in the community?

1. Yes
2. No

2.2 If yes, how many groups do you belong to.....?

2.3 Give the names of the farmer group(s)

1. ....
2. ....

2.4 Are there any requirements before one joins a farmer group?

1. Yes
2. No

2.5 If Yes, what are the requirements?

- 1. Pay membership fee
- 2. Minimum farm size requirement
- 3. Minimum French bean quantity delivery
- 4. Quality of the output
- 5. Declare your property
- 6. Be from the same village
- 7. Other, specify.....

2.6 What kind of relationship exists between the members of your group?

- 1. Relatives
- 2. Friends
- 3. Neighbors
- 4. Farmers

2.9 How did you get first information about the farmer groups?

- 1. Fellow farmers
- 2. Export agents
- 3. Media advertisement
- 4. Self-initiative
- 5. Friends
- 6. Other (specify) .....

2.10 If **NOT** a group member, give reasons

.....

.....

.....

2.11 Would you like to be a member?

- 1. Yes
- 2. No

2.12 If Yes, what stops you from being a member?

- 1. Lack of trust with members

- 2. Don't meet the quality standards
- 3. Don't meet the minimum quantity delivery
- 4. High membership fee
- 5. Lack of time to attend meetings
- 6. Distance with group members

**3. PERCEPTION**

**Rate the following statements from (1. Strongly agree to 5. Strongly disagree)**

3.1 In your opinion does group marketing help in accessing lucrative markets?

- 1. strongly agree
- 2. Agree
- 3. Neutral / Undecided
- 4. Disagree
- 5. strongly disagree

3.3 In your opinion does the group lead to collective action?

- 1. Strongly agree
- 2. Agree
- 3. Neutral / Undecided
- 4. Disagree
- 5. strongly disagree

**PART II**

**SOCIAL CAPITAL DIMENSIONS (Frequency of Meetings, Heterogeneity of Groups, Solidarity Index, Level of Trust, Group Decision Making and Group Size)**

**4. HETEROGENEITY OF THE GROUP**

4.1 Are the members of your farmer group around the same age?

- 1. Yes
- 2. No

4.2 Are all group members the same sex?

1. Yes                       2. No

4.3 Are all the members of the group from the same neighborhood?

1. Yes                       2. No

4.4 Do the members of your group have the same level of education?

1. Yes                       2. No

4.5 Did the members of your credit group have the same occupation before starting the group?

1. Yes                       2. No

4.6 Do the group members have roughly the same level of wealth?

1. Yes                       2. No

## 5. GROUP MEETINGS

5.1 Do you have a specific meeting place?

1. Yes                       2. No

5.2 If Yes, what is the distance in Kilometers from your home and you meeting place? .....

5.3 If No, where do you meet? .....

5.4 How often do you meet your group partners?

1. Once a every 3 months   
2. Once a month   
3. Two times a fortnight   
4. Once a week   
5. Only during the growing season   
6. Other (Specify) .....

5.5 What is usually the main agenda when you meet as a group? .....

5.6 How often do your partners discuss their farming and marketing problems within the group?

- 1. Regularly
- 2. Quite often
- 3. Occasionally
- 4. Very seldom
- 5. Never

**6. TRUST INDEX**

6.1 Can most people of the group be trusted?

- 1. Yes
- 2. No

6.2 On a scale from 1 to 5, where 1 means ‘to a very small extent’ and 5 means ‘to a very large extent’, how much do you feel you can trust the following;

	1	2	3	4	5
Farmer group					
Leaders of the group					
Members of the group					
People from different farmer groups					
Marketing agents					

1= to a very small extent/not at all, 2= to a small extent, 3= neither to a small or great extent, 4= to a great extent, 5= to a very great extent

**7. RESPECT INDEX**

7.1 Do you respect and adhere to the rules and regulations of the group?

- 1. Yes
- 2. No

7.2 Have you ever been suspended from your group?

- 2. Yes
- 2. No

7.3 Have you ever been evicted from the group?

- 1. Yes
- 2. No



--	--	--

10.5 Is your produce graded before trading? Yes  No

10.6 Does your grading corresponds with the one being used (EurepGAP)?

Yes  No

10.7 How do you decide the sale price of your produce? (*Tick where appropriate*)

- a) It depends on the price of other local farmers
- b) It depends on the price of international market
- c) It depends on the price negotiated by the group
- d) It depends on the market we sell to
- e) It depends on the production costs
- f) It depends on the transaction costs

10.7 How is your produce moved to the marketing point?

	Type of transport				
	Motor bike	Truck	Bicycle	Bus	Other (Specify)
Own transport					
Hired (individual)					
Hired (group)					
Public transport					
Buyers transport					

10.7 Do you own a means of transport? No  Yes

10.8 Approximately, how much produce did you sell in the previous season? .....Kg

10.9 If you do not sell all the harvested produce, what happens to the unsold?

Loss through spoilage	Eat (family and friends)	Sell at low prices	Feed to animals	Other (Specify)

10.10 How far are the marketing or collection points? .....Km.

10.11 How much do you pay for a single trip to the market? KES.....

10.12 What general problem do you experience in moving your produce?

Lack of transport	High cost of transport	Small size of transport	Other (Specify)

10.12 What is the selling price of your produce per Kg? KES.....

10.13 How much income did you receive in the previous season? KES.....

10.14 How important is the group in improving market access

1. Very important
2. Important
3. Neutral
4. Unimportant
5. Very unimportant

10.15 How do you consider the general performance of your group?

1. Very bad
2. Bad
3. Moderate
4. Good
5. Excellent

10.16 How well does the income from the sale cover your needs? (*Rate from 1 to 5*)

1. Doesn't fit at all
2. Not quite well
3. Well;
4. Quite well
5. Extremely well

10.17 Has your economic activities improved since you first sold your produce through the group?



1. Yes                       2. No

10.18 Has your group ever had a problem in accessing the market?

1. Yes                       2. No

10.19 If Yes, what was the problem? .....

10.20 If Yes, What consequences did your group face?

- 1. The group received lower price for the output.
- 2. The members who did not meet the quality standards were kicked out of the group.
- 3. The group officials were kicked out.
- 4. The group was dissolved.
- 5. All group members are excluded from the program.

10.22 List (if any) what you consider to be the major problems you face in marketing your goods

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

*Your participation in this study is greatly appreciated.*

*Thank you for your time!*

*Once again, I assure you that your identity will remain **STRICTLY CONFIDENTIAL**.*