ROLE OF RURAL INSTITUTIONS AND FARMER MARKETING ORGANIZATION IN MARKETING OF INDIGENOUS CHICKEN; A CASE OF KAKAMEGA COUNTY KENYA.

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DECLARATION AND RECOMMENDATION

Declaration

I declare that this thesis is my original work and has never been submitted in any university for the award of a degree.

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Recommendation

This thesis has been submitted with our approval as University supervisors.

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DEDICATION

I dedicate this thesis to my father Elijah Gicheha, my mother Lucy Gicheha and my siblings for their continued support and prayers.

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Foremost, I would like to express my sincere gratitude to the almighty God for the good health, guidance, courage and daily renewal of strength and determination throughout the study period. My heartfelt appreciation goes to Egerton University through the Dean Faculty of Agriculture Prof A. K. Kahi and the Chairman department of agriculture economics and agribusiness management Prof B. K. Mutai for moral guidance, mentorship and the effort in providing a conducive environment and facilities for smooth learning. My sincere thanks to African Economic Research Consortium (AERC) for providing funds for my research and training at the shared facility at the University of Pretoria and the Indigenous Chicken Improvement Programme (INCIP) of Egerton University for offering mentorship, working space and supplementing research fund support. I wish to thank my supervisors Prof. Margaret Ngigi and Dr. Hillary Bett for their support, patience, motivation, enthusiasm and immense input that were of great value and impact to my work. Finally yet importantly, my heartfelt appreciation goes to my father, mother, brothers and sisters for their prayers, moral and emotional support during my entire study period.

May God Bless You Abundantly

ABSTRACT

The poultry sub-sector in Kenya accounts for about fifty five percent of the livestock sector and thirty percent of the agricultural Gross Domestic Product. However, gains from the Indigenous Chicken (IC) enterprises have been challenged by market inefficiencies characterised by high transaction costs and poor accessibility of market information. In response to this, the Kenyan government private sector partnership has in the recent times, been promoting the formation and development of farmer marketing groups to promote the efficiency in marketing of indigenous chicken. The assumption was that when acting collectively, Indigenous Chicken farmers are able to easily access market information, reduce transaction cost and better able to coordinate their marketing activities and ultimately improved incomes. However, Indigenous Chicken markets have remained poor even though the demand for Indigenous Chicken products has tremendously improved. This study used a random sample of 196 farmers in Navakholo and Lurambi divisions in Kakamega County to establish the influence of collective action in marketing of Indigenous chicken. It specifically evaluated the determinants of smallholder farmer's participation in Indigenous Chicken Producer Marketing Groups and the intensity of participation in markets, the effect of farmer marketing groups on market channel choice decision and on farm household incomes from the indigenous chicken enterprise. Data was analysed using descriptive statistics, multinomial logit, heckman two stage and regression models. Heckman two stage model results indicated that the decision by smallholder farmers to participate in collective marketing through farmer marketing groups was significantly influenced by a variety of factors including years of formal education of the household head, accesibility of credit, distance to the extension service and average price per bird. The extent of farmers participation was influenced by age of the household head, size of the farm, decision making in groups, off-farm engagement and years of formal education of the household head. Multinomial logit model results indicate that age of the household head, group membership, farm size, credit access, education, cost of information, attributes of the flock, transport cost and distance to the market influenced the choice of different market channels. A regression model result showed that education, off-farm engagement, distance to the livestock market and extension service significantly influenced income from the indigenous chicken enterprise.

LIST OF ABBREVIATIONS

ASALs	Arid and Semi-Arid areas
CAPRi	Collective Action and Property Rights
DFID	Department for International Development
ERS	Economic Recovery Strategy
FAO	Food and Agriculture Organization
GOV	Government of Kenya
IC	Indigenous Chicken
KACE	Kenya Agricultural Commodity Exchange
KAPP	Kenya Agricultural Productivity Project
MoLD	Ministry of Livestock Development
PMGs	Producer marketing Groups

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CHAPTER ONE
INTRODUCTION

1.1 Background information

Kenya, like other developing countries, has over the years been experiencing a rise in demand and preference for foods of animal origin (Delgado *et al.,* 2001). Poultry was projected to meet much of this demand on condition that production would be intensified (Delgado *et al.,* 2001). As of the year 2000, an estimated 90% of rural families kept indigenous chicken, which accounted for between 40 to 60% of the domestic marketed poultry eggs and meat and over 80% of the poultry population (Upton, 2000). According to KAPP (2006), markets for Indigenous chicken were observed as potential good instruments for poverty reduction and sustainable development (Nyaga, 2007).

There have been challenges with regard to commercial exploitation which mainly stem from poor market efficiency and information where farmers have continuously faced high transaction costs resulting from long market supply chains and ultimately low incomes (Upton, 2000; Mathuva, 2005). Again, farmers have failed to match products with market preferences and standards and therefore missing out on an opportunity in the regional and international markets (Upton, 2000). Other challenges include low inputs and outputs due to the increased management costs i.e cost of feeds and disease management (Okitoi *et al.,* 2007).

The Kenyan government and the private sector initiatives have supported farmer marketing organizations as market-support institutions to enhance Indigenous Chicken market linkages and as an attempt to overcome the above mentioned challenges. They are regarded as effective in performing various functions such as advocacy, collective action and as an effective tool for dissemination of production and market related information (Rondot *et al.,* 1999).

However, Farmers market imperfections coupled with high transaction costs and inaccessibility of market information has hampered gains from the enterprise (Owuor 2009). This study therefore aims at assessing the contribution of farmer production and marketing organizations in marketing of indigenous chicken focusing on the determinants of collective action and market channel choice decision, extent of market participation and the

contribution of collective marketing on household incomes in Kakamega County. Previous studies on indigenous chicken in Western Kenya have focused on description of the local chicken production systems (Olwande *et al.*, 2010) and characterization of the indigenous chicken production systems (Okeno *et al.*, 2011). Though characterization is the first step to be taken if any genetic improvement is to be realised, there has been limited focus on the IC markets.

1.2 Statement of the problem

Individual farm household participation in the IC markets has been poor despite the fact that about ninety percent of the households in Kenya keep indigenous chicken. Farmer marketing groups have for a decade been supported by the government-private sector collaboration to mitigate the problems of poor market access. This initiative was based on the understanding that collective marketing would work to improve information accessibility by the farmers, reduce transaction costs, enhance farmers bargaining power, increase trade volume and ultimately improve household incomes. However, indigenous chicken farmer groups have failed to benefit from the upward trend in preference for indigenous chicken and chicken products. This study seeks an understanding of the role played by Indigenous chicken farmer marketing groups in promoting market accessibility and household incomes from the enterprise.

1.3 Objectives of the study

1.3.1 General objective

The overall objective of the study is to contribute towards attaining food security and poverty reduction in Kakamega County.

1.3.2 Specific objectives

i. To examine constraints and opportunities that IC farmer groups in Kakamega County face in organizing to increase their market shares.
ii. To determine the influence of group marketing on the market outlet choice decision
iii. To evaluate the determinants and intensity of smallholder farmers participation in Indigenous Chicken Producer Marketing Groups.
iv. To determine the influence of smallholder indigenous chicken farmers group marketing on incomes.

1.4 Hypothesis of the study

i. Socio-economic and institutional factors do not constrain efforts by smallholder indigenous chicken farmers to increase their market share.

ii. Group marketing does not influence the farmer's choice of a marketing outlet.

iii. Socioeconomic and institutional factors do not influence participation and intensity of smallholder farmer's participation in Indigenous Chicken Producer Marketing Groups.

iv. Smallholder farmer's participation in Indigenous Chicken Marketing groups has no influence on incomes.

1.5 Justification

The expected contributions of this study was to provide detailed information on the role played by farmer groups as one of the options considered to enhance markets linkages for indigenous chicken and welfare of farm households in Kakamega County.

If the ability of farm households to organize themselves in to groups is an important determinant to a more effective and efficient access to the market, then the government can clearly gain by strengthening the groups. Public private partnerships would work on the constraints to farmer organization to enhance collective action.

Therefore, any research work that is aimed to better understand the strategies that facilitate efficient farmer organization resulting to minimizing the problem of market access are necessary.

1.6 Scope and limitations

This study was carried out in Kakamega County which is one of the counties with the highest population of IC raised in rural households (MOLD, 2009). The groups considered for this study were those involved in indigenous chicken farming business. Three divisions with three locations within each division in Kakamega District were chosen for the study. The study was limited to the impact of group marketing and chicken marketing activities involving farmers, (as opposed to Agribusiness chains) either directly or indirectly through groups. The study looked at impacts on welfare in a broader sense and income (per capita income) was used as a

proxy for the standard of living of farmers. The data collected was limited to the period between April 2013 and July 2013.

1.7 Definition of terms

Collective action*:* Voluntary action taken by a group to achieve common interests. Collective action can exist in absence of farmer organization. This study however considers collective action in the context of group marketing**.**

Farm business enterprise: Farm enterprises that generate income for the farmer and which can be run as businesses. In this study, it is a small-scale indigenous chicken enterprise.

Chicken (Gallus gallus domesticus): A domesticated bird, a sub species of the red jungle fowl kept primarily as a source of food (consuming both their meat and their eggs).

Indigenous chicken: Domesticated birds that are originally African comprised mostly of unimproved genetic stock characteristic of small flock sizes not exceeding 100. Free-range system is the most common management system.

Producer marketing groups: These are the groups of indigenous chicken farmers who have come together to sell their chicken products collectively.

Smallholder: These indigenous chicken farmers keep less than fifty birds at a time; and do not have sophisticated structures and equipment.

Rural: Areas that have relatively poor road and communication infrastructure and markets are still remote.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

In this chapter, theoretical and empirical literature about marketing of indigenous chicken has been presented. The literature deals with methods and concepts advanced to explain the factors that influence farmer's participation in collective marketing of indigenous chicken, the influence of group marketing on incomes, constraints in marketing of indigenous chicken and choice of marketing channels. The literature also uses past studies to provide evidence on the relevance of indigenous chicken enterprises in livelihood support and identify gaps related to the study of collective action in different commodity markets. This chapter also support the identification and selection of models most suited for the analysis of determinants of participation in Indigenous chicken markets, intensity of participation in Indigenous chicken markets, influence of participation on incomes and channel choice decision.

2.2 Importance of indigenous chicken

Many rural households in developing countries keep poultry. Specifically, indigenous chicken is of specific importance. In 2010-2011, Indigenous chicken in Kenya accounted for 70% of 28.6 million chickens, 71% of the poultry meat, and 42% of poultry eggs (FAO, 2011). In addition, estimates from East African region indicate that there were close to 99,886 farmers involved in commercial production of IC in 2007 (GoK, 2009) thus highlighting the potential of this enterprise in providing substantial support to rural economy and livelihoods.

The poultry sub sector industry directly employs about two million through production and marketing and indirectly through linkages with the suppliers of such inputs as feeds and veterinary services (Ng'eno *et al.,* 2009). This means that increased access to IC markets would be key towards the realization of food security and nutrition as outlined in the vision 2030.

Poultry as a key player in food security and nutrition is a major source of animal proteins and is important in the improvement of protein nutrition of the rural human population (Kingori *et al.,* 2010). In addition, poultry plays significant socio-cultural functions especially in western Kenya. For example, they are culturally and socially treated as important presents/gifts to neighbours and relatives as a way of strengthening social relationships (Kimani, 2006) and are also used in exchange and fine payments to settle disputes or debts.

2.3 Constraints in marketing in the face of increased demand

The preference for indigenous chicken products in the past decade has been on an upward trend (Bett *et al.,* 2009). This upward trend is attributed to increasing standards of living, incomes and population pressure (FAO, 2002). As income and urbanization have increased, the demand for food has also changed from a diet mainly based on grains to a more diversified diet that includes meat, poultry products, fruits and vegetables (Tadelle *et al.,* 2003). Preferences and medical recommendations for certain food characteristics such as food safety, quality, convenience, organic and unprocessed food have increased demand for poultry meat and related products. This has increased demand for indigenous chicken meat. (Golleti 2004).

Even with the observed upward trend in preference, commercial exploitation of indigenous chicken is still relatively low when compared to the commercial hybrid poultry (Owuor, 2009). According to a study by the Kenya Agricultural Commodity Exchange (KACE) and commissioned by Food and Agricultural Organization (FAO), small scale farmers in Western Kenya produce mainly for their own use and tend to sell any surplus to informal markets. The low commercial exploitation is attributed to poor market efficiency and information (Mathuva, 2005).

2.4 Structure of indigenous chicken markets in Kenya

The marketing system for indigenous chicken products in Kenya is mostly informal and poorly developed (Gueye, 2001). The markets are typically structured in three levels, and these are the primary or local, secondary or regional and the tertiary or terminal markets (Bett *et al.,* 2009). Indigenous Chicken farmers in Western Kenya do not keep chicken to sell to these local markets unless under emergency or strenuous conditions such as payment of school fees, health care and payment of debts. The primary or the local markets therefore are created by middlemen at the village level who operate in designated places and on particular days of the week in the rural areas. The secondary markets are in towns where a large number of traders are involved in the marketing activities. They act as a link between the local and the tertiary markets. The tertiary markets are found in the large urban towns and cities. In addition, the major channels through which IC farmers sell their chicken in the markets are direct sales to consumers and/or to small retails that take the chicken to large urban centres. The farmer in this case confronts different prices in each of the channel chosen.

According to Bebe, (2009), farmers receive low prices from intermediaries as a compensation for transport costs and losses from theft along the marketing chain. Farmers venture into larger formal markets such as supermarkets is undermined the little knowledge they have on how the markets work and have virtually no information on market conditions (Sonaiya, 2000). It's also undermined by sale volumes per transaction small enough not to offset the transport cost. Sale volumes to local consumers are only sound during the festive seasons and hence unreliable (Tadelle, 2003). However, every family in the western region looks forward to eating indigenous chicken on festive seasons.

2.5 Role of farmer marketing groups

There is increasing evidence from research and practice that organizing smallholder farmers into Marketing Groups is one way to overcome market imperfections and promote effective participation in the market (CAPRi, 2006). Marketing groups have the potential to meet stringent food safety and quality control requirements such as indigenous chicken vaccination and the ability to provide standardized products on continuous bases as is often demanded by buyers (Gulati *et al.,* 2007).

In making markets work for the poor, facilitation of farmer marketing groups is therefore needed to enable producers to diversify and upgrade production and therefore compete more effectively in markets where they have advantages (CAPRi, 2007). Some of the strategies may include building linkages between rural small scale producers, buyers in growing urban markets and suppliers of critical inputs. It also includes making channels of information and other business services accessible, supporting rural producers to collaborate and coordinate to achieve economies of scale in their transactions with input suppliers and buyers (Shiferaw *et al.,* 2011). It also entails enabling rural producers to understand and better satisfy the products, process, or delivery standards required by buyers in the urban markets and making relevant financial services that enable investment and diversification (DFID, 2005).

2.6 Formation of farmer groups

Farmer organizations do not form spontaneously but rather demand certain preconditions. Collective action is likely to happen if the gains in terms of reduced transaction costs, better inputs and/or product prices, empowerment and capacity enhancement outweigh the cost of complying with the collective rules and norms (Shiferaw, 2009). In Kenya, The Producer marketing groups (PMGs) are evolving institutional arrangements for enhancing market

opportunities for smallholder farmers. The farmer groups are formally registered as welfare societies as is permitted under Kenyan law. They have well-defined objectives, by-laws, and an elected body that leads the group on behalf of the members. Their objectives go beyond social welfare and include better access to markets, technologies and inputs at affordable prices; better prices for local produce; and development of business skills for commercialization of production. Interventions required for their establishment include provision of the necessary infrastructure, inputs, access to market information and technology. Interventions must also consider the development of the marketing systems that would give advantage to the poor farmers (CAPRi 2006).

2.7 Experiences with Producer Marketing Groups and market channel choice decisions

Experiences with farmer groups over the years have been mixed. In a study of the determinants of commitment to agricultural cooperatives among cashew nuts farmers in Benin, empirical results showed that commitment to membership depends on the assessment of the prices received by the farmers from the sale of their produce. The prices received were dependent on the farmers' preference to specific attributes of a particular marketing channel, total farm size and other socio economic characteristics (Mensah *et al.,* 2012).

In an evaluation of the performance of farmer organizations in agricultural produce markets in Zimbabwe, Masakure and Henson, (2005) found out that farmer groups that were established to access inputs and market outputs had largely collapsed due to considerable mistrust among farmers in regards to conveying useful market information.

Milk producers in Carjamaca in Peru could receive good prices for milk sold to a local dairy factory but the factory only served farmers who had three litres of milk and above. This information was not available to the farmers who instead of pooling their milk to meet the dairy factory requirements, opted to sell the milk to local cheese makers (Garcia and Gomez, 2002).

The study on institutional and technical factors influencing agricultural marketing channels amongst smallholder and emerging farmers in Kat river valley, found that access to market information, existence of extensive social capital, good infrastructure and group participation had an influence on the probability of a farmer to participate in either formal or informal marketing channel (Jari, 2009). The results concurs with that of Martey *et al.* (2012) on the

effect of access to market information on the choice of a marketing channel on smallholder yam farmers in Ghana.

In her study on the participation in agricultural markets, Mathenge *et al.* (2010) found out that participation in the market by the households was influenced by group membership and ownership of communication equipment such as mobile phone. The degree of smallholder commercialization in the crop enterprises among the low-income households was significantly and positively influenced by membership to groups and access to credit by female-headed households. This study reinforces the importance of collective action among smallholder farmers on agricultural commercialization and in improving household incomes.

Kinuthia (2011) used Heckman two-stage model to analyse the participation in groups and the extent of participation in tree planting program measured in acreage allocation in Nyeri district, Kenya. Results indicated that access to credit and awareness of the benefits accrued from participation in the programme influenced participation in group activities. The extent of participation in the programme was influence by program awareness and farm size. The same study also utilized a log-log model to evaluate the effect of participation in a tree planting programme on household incomes. Various socioeconomic, farm specific and institutional factors were analyzed as dependent variables affecting household income. The results showed that all the variables affected household income at varying levels of significance. Group membership had significant influence on household income at 10% level of significance.

Mulindo *et al.* (2010) studied farmer participation in horticultural crops markets in the arid and semi-arid areas of North rift region of Kenya. Results indicated that, farmers producing improved horticultural crops had a higher probability of participating in modern marketing channels. The results also indicated that farmer's participation in traditional market was determined by the price of the produce. The education of the farmer had influence on the participation on modern marketing channels.

A double hurdle model was used to analyse the determinants of the intensity of participation in banana farmer groups in Muranga, Embu, Nyeri and Meru in central Kenya. Using multistage sampling, with 17 groups and 204 respondents, large farm size, group size and

payment timings was identified as the major determinants of the intensity of participation in collective action. The study also found that involvement in group governance has a positive effect on farmers' intensity of participation (Fischer and Qaim 2011).

Kirui *et al.* (2013) utilized propensity score matching technique to assess the effect of collective action initiatives on agricultural commercialization at household level and on household agricultural incomes. Results showed that farmer's participation in collective action significantly increased output and input market participation by about 9% and 8% respectively. It also improved household welfare by increasing incomes.

What this means is that it is not always that the farmers get to benefit when they act collectively. In the strictly economic sense, smallholder farmers when acting individually face diseconomies of scale. Collective action in marketing may not be greatly efficient in widening marketing access for small farmers because small agro enterprises lack the resources and the capacity to make timely and large investment to maintain their place in the market (CAPRi 2006).

2.8: Market channel choice decision by smallholder farmers

Choice for marketing channel can be defined as the farmers' decision on where to or not to sell their farm produce. Farmers receive prices and other benefits that are varied in different marketing channels and the farmer is likely to choose the one which gives higher benefits. The choice of a market channel is likely to determine the price that the farmers will receive for the produce they sell. Using conditional logit analysis, Staal *et al*. (2006) evaluated farmers' choice of milk marketing channels among those available in Gujarat, India. They found that farmers were likely to select formal marketing channels for disposing their farm produce. Choice of formal channels (private traders and cooperatives) was associated with high levels of production which were highly correlated with number of adults in the household, more land and high number of livestock (Mburu *et al.,* 2007).

In a study by Chikazunga *et al.* (2008), farmers chose informal marketing channels because they could not meet threshold quality and quantities levels required for the formal marketing channels. They were constrained by low levels of education, access to land and other production assets such as green houses.

When the farmers market their produce, the mode, time of payment and other financial services are highly considered. When the farmers do not prefer being paid every time they deliver, security of the payments must be guaranteed. In studies by Staal *et al*. (2006), Mburu *et al.* (2007) and Voors and D'Haese (2010), it was observed that farmers preferred channels that paid on monthly basis or had formalized credit terms and payments were secure. This was however not consistent with findings of Shiferaw *et al*. (2008) who, in their study on rural market imperfections and the role of institutions in collective action to improve markets for the poor found that most farmers chose middlemen who dominated rural grain markets. These middlemen could pay cash while farmer groups could not. This led to channel characterized with long and complex and high transaction cost which lowered farmers' share of consumer price.

Social characteristics are specific to a community and they are likely to differently influence the choice of marketing channel among diverse groups. Technology used both in production and handling of agricultural commodity is specific on a given commodity and similar factors are likely to influence choice differently. Multinomial logit model was used instead of binomial logit because it permitted estimation of qualitative choice when more than two alternatives are involved.

2.9 Theoretical framework

The decisions to either participate in producer marketing groups or not in this study is built on utility theory which depends on whether collective action gives the household higher utility than individual marketing. Participation/adoption studies normally involve two stages: The decision to either participate/adopt or not and in the second stage, the level of participation/adoption (Mercer and Pattanayak, 2003). The decision to either participates in producer marketing groups or not is dichotomous and therefore a binary choice model has been identified as appropriate for such estimation. However, this is only possible under the following assumptions: that the households are faced with only two alternatives and that any choice an individual chooses depends on their characteristics.

The expected net utility derived from participation in producer marketing groups or not given household's characteristics is determined as follows:

$$EU_iP = f(W_i) + e_i \quad \text{..... (1)}$$

$$EU_iN = f(X_i) + e_i \quad \text{..... (2)}$$

where;

EU_iP, is the expected net utility of household *i* from participating in PMG

EU_iN, is the expected net utility of household *i* from non-participation in PMG

P denotes participation in PMG while *N* denotes non participation.

X_i and W_i, are independent variables denoting farm, institutional and house hold characteristics and e_i is an error term.

The expected net utility from each of the decisions will then be compared. To compare, $Y_i$will be used as an indicator of whether household *i* participates in PMG or not, so that Y_i=1 if participates andY_i= 0 if not, as indicated in equation (3) below

$$\left.\begin{matrix} Y_i = 1 \; if \; EU_iP - EU_iN > 0 \\ Y_i = 0 \; if \; EU_iP - EU_iN < 0 \end{matrix}\right\} \quad \text{..... (3)}$$

Equation (3) implies that the probability that the household *i* participates in PMG is given by the probability that the expected net utility derived from participation is greater than the expected net utility derived from non-participation. While the probability that the household *i* does not participate is given by the probability that the expected net utility derived from participation is less than the net utility derived from non-participation Pindyck and Rubinfeld, (2008).

3.0 Conceptual framework

In Figure 2, interrelationships in the study and the key variables involved and how they are interrelated have been illustrated. Participation in farmer marketing groups is influenced by, socio-economic, legal and economic factors as well as perceptions based on the experiences of others. These factors have an influence on the decision that the indigenous chicken farmer makes to either participate in farmer marketing groups or not. It is hypothesised that through participation the transaction costs are reduced and the farmer's market bargaining power is increased and hence expected that the farmer's income will improve with participation.

Group marketing (Dependent variable) is influenced by market characteristics (market structure, location), logistics and type of market i.e. formal or informal, product characteristics (Shelf life, Product value, need for intermediate processing, technology, demand driven technology, ability to produce quality products and transaction cost) and farmer characteristics (Social cultural factors that support collective action, degree of previous positive involvement in collective action, amount and quality of other collective

action going on in the group, asset holdings especially key market assets, differences between members and non-members and heterogeneity among members i.e. gender, education and risk aversion.

It's also influenced by group governance (Farmers ownership of the group, shared understanding, expectations and commitment of the group members, group size, presence of a member with external linkages, ability of group to maintain its objectives in terms of market access, transparency and accountability of leaders and group members, Equitable sharing of profits, loss and risks, Ability to provide social and marketing support, adaptability of group initiatives for example to new market opportunities and effective market and management of market information systems.), barriers to entry (Social cultural barriers: extent of social distance that must be traversed to reach a new market, long time lag before accrual of first benefit and high investments costs), Access to services (Supportive government policies and provision of marketing, transport, storage, inputs and credit) and facilitation (market facilitation skills, internal ability to 'chain link' into higher value markets or assume higher levels on the chain, adaptive learning and coordination along the chain).

When incomes improve, other household socio economic elements are also likely to improve such as access to education, healthcare etc. Improved incomes are likely to incentivise non-members to join groups and improve the capacity of the members to access credit.

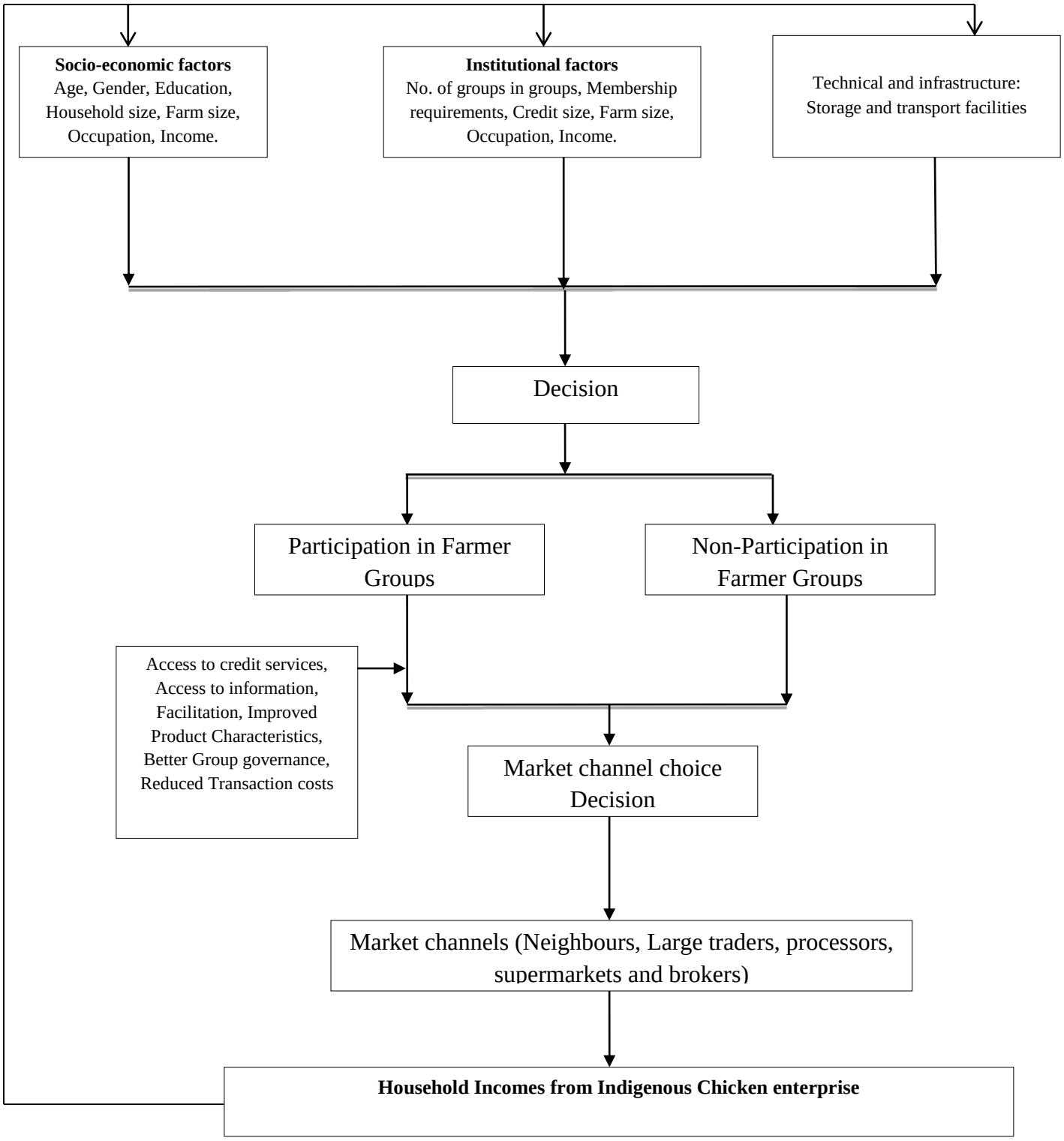

Figure 1: Conceptual framework
Source: Author's conceptualization

CHAPTER THREE
METHODOLOGY

3.1 Study area

The study area was Kakamega County ($0^{o}40'0"N$, $34^{o}40'0"E$) in Western Kenya which had a population of 1,660,651 (GOK, 2009). It was made up of three districts namely Butere-Mumias, Kakamega and Lugari by July 2013. The County is mainly hot and wet most of the year and experiences very heavy rainfall all year round, with the long rains experienced in April and March. The economic activity of the inhabitants of this area is mainly farming. The county has a varying topology with varying altitudes ranging from200m-1250m above sea level.

Kakamega County was purposively selected for the study because of several reasons: first, despite its favourable climate, rural poverty levels are high at 53% according to KNBS (2009). The share of the urban population stands at 15% indicating that majority of the population live in rural areas. Secondly, the population growth to the arable land resource available is high hence the need to diversify income sources. Lastly, almost every household in the County has indigenous chicken whose potential has not been fully reached, due to lack of missing link between producers and the markets (Owuor *et al.*, 2009).

In selecting a sample of IC farmers who are non-participants in farmer marketing groups, two divisions from Kakamega North District were selected purposively based on the prominence in rearing of indigenous chicken. Locations in the two selected Divisions were selected and a sample of non-participating farmers was selected through the simple random technique.

Indigenous chicken producer marketing groups were purposively selected. This selection was based on the criterion that they had been in operation for at least two years by the time the study was conducted. For the purpose of study, members from each group were selected using simple random sampling technique.

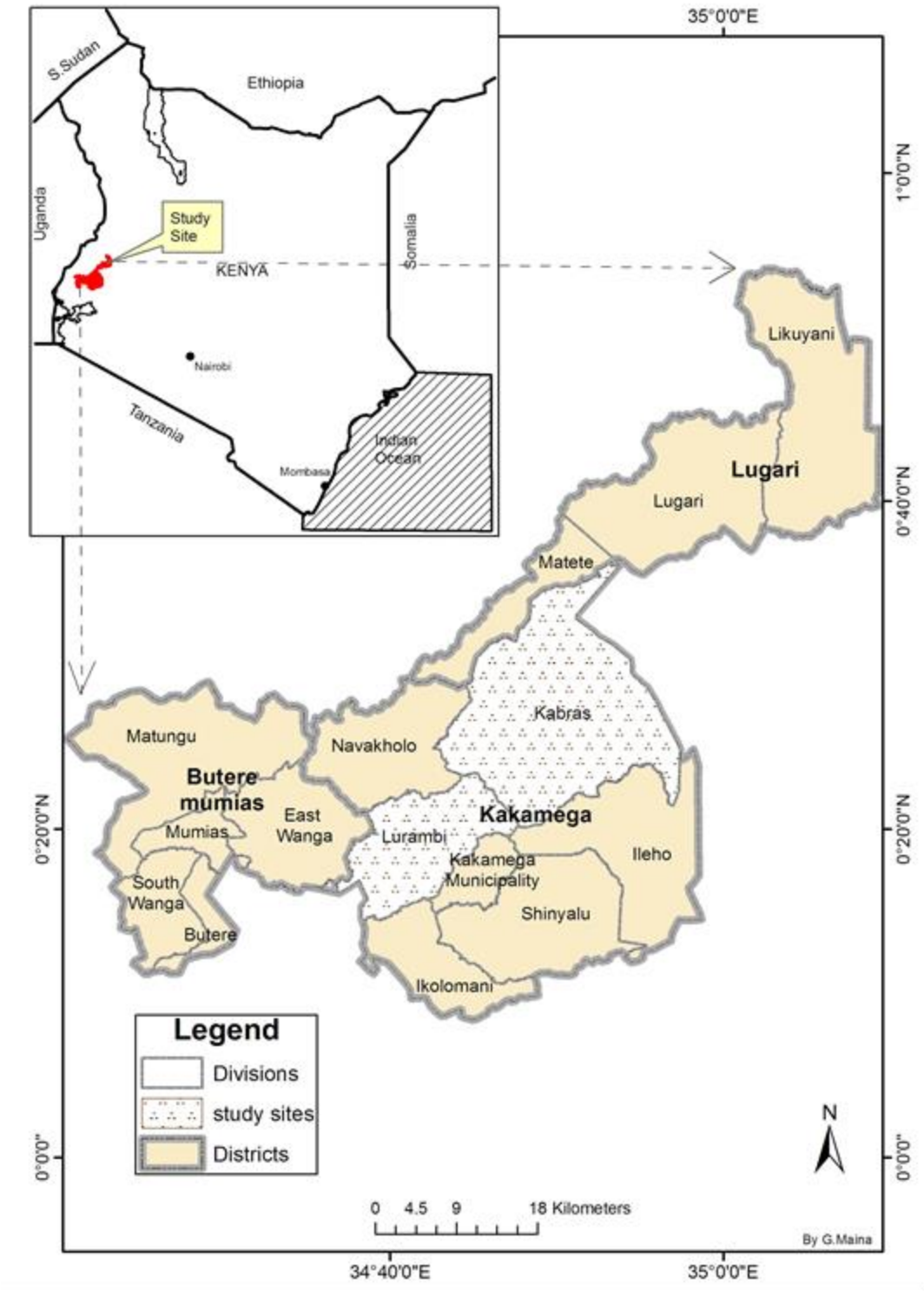

Figure 2: Map of Kakamega County

Source: World Resource Institute (2013)

The sample is determined by the following formula by Kothari (2004):

$$n = \frac{pqZ^2}{E^2} \quad \text{..... (4)}$$

Where **n** = sample size, **p** = proportion of the population containing the major interest, **q** = 1-p, **z**= confidence level (**α** = 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** = 0.07. As shown below, the minimum sample size calculated is 196 respondents

$$196 = \frac{(0.5)(0.5)1.96^2}{0.07^2}$$

3.2 Data collection

Primary data was collected using personally administered structured questionnaires. The household level data included information on household social-economic characteristics, characteristics of indigenous chicken farming operations and issues of group participation, marketing and availability of extension services.

3.3 Data analysis

The variables were summarized using descriptive and inferential statistics. Assessment of factors influencing the decision by Indigenous Chicken farmers to participate in group marketing and the extent to which they participated was analysed using the Heckman two-stage regression model. Multinomial logit model was used to evaluate the factors influencing farmers' preferences for different marketing outlets and multiple regression models was used to evaluate the contribution of marketing through groups on incomes from the indigenous chicken enterprise. SPSS and STATA software packages were used for data management and analysis.

3.4 Description of variables used in the analysis

The following is a description of variables that were used in various econometric regression models. Independent variables chosen were mainly based on literature review findings. A description of these variables is given discussing the likely effects they would have on farmers' decision and choices in the market as well as their effect on the indigenous chicken prices.

H_EDU **(**Education level measured in competed years of formal education of the household head) enhances managerial competencies and implementation of improved production (Barret, 2006). It also determines the ability of the farmer to access and evaluate the information on markets (McBride, 2002). A farmer with more years of education has a higher likelihood of accepting new technologies and initiatives and therefore assigned positive sign. He also has a higher probability of adopting formal marketing channels because of the exposure and ability to synthesize the information on markets he obtains and therefore given a positive sign.

GenderHH (Gender of the household head) is presumed to be an important variable that influence a farmer's decision to participate in collective action. There are differences in male and female households in terms of access to and ownership of assets, education, credit and technology and which may influence market accessibility. Gender is also presumed to be an important variable that influence a farmer's decision to participate in collective action in either way positive or negative.

HOUSEHOLD_SIZE **(**Household size) is an indicator of labour availability. Large household size is likely to increase the amount produced and the capacity of the household to access informal markets for improved margins (Staal *et al.,* 2006). A large household is also linked to increased consumption and trade-off between consumption and sale and therefore likely to have a positive and a negative sign.

GOUP_MEMBERSHIPs **(**Farmer marketing organizations) are conceptualized to operate as profitable indigenous chicken marketing units where smallholder farmers organize themselves in production, value addition and marketing of farm produce (Mburu *et al.,* 2009). Previous studies have indicated unclear direction in regard to group membership as the farmers are observed to form positive or negative attitude towards an initiative through group contacts (Nkamleu, 2007). The choice of a marketing channel by farmers is influenced by membership to a farmer producer and marketing organization (Vinjay *et al.,* 2009) and therefore given a positive sign.

COST_TRANS **(**Transport cost) and *In_Infocost* (aggregated cost of search for market information from different information sources) were considered in this study. The higher the

transaction costs associated with a particular marketing channel, the lesser the interest of a farmer participation in the channel as also observed by Artukoglu *et al.,* (2008). Farmers are more likely to choose informal marketing channels especially if distances to the markets are relatively long. Participation in these markets channels are also likely to be influenced by fact that they play a major role in providing information on markets to the farmers.

FARM_SIZE (Land size) was hypothesised to have a negative and a positive sign. Farmers with large farm size has the capacity to expand their indigenous chicken enterprises due to their ability to access productive resources such as rural credit and secured loans from commercial banks. This allows them to produce more and maintain the flock attributes preferred by the actors in the formal market channels. This therefore means that increase in land size increases the probability of the farmer to participate in formal marketing channels. Again, well managed large tracts of land have a higher likelihood of generating surpluses for the market (Martey *et al.*, 2012). Farmers with a bigger land size are likely to have a higher capacity to diversify their IC production system to for example scavenging which is more cost effective with limited application of management interventions thereby generating market surpluses (Owuor, 2009). The ability of farmers with small land sizes to diversify their IC enterprise is limited by land space and competition from other farm enterprise perceived to be more productive thus limiting surplus for sale (Genius *et al.,* 2006).

CREDIT_ACCESS (accessibility of credit) can translate to increased ability to produce surplus for markets and achievement of quality standards demanded by formal markets. Farmers who access credit are more likely to participate in formal markets as compared to informal markets. Credit access can also enhance accessibility of market information beyond what the informal market channels such as brokers can provide therefore increased probability to participate in formal markets. Higher access to resources and information key in making rational marketing decisions have been observed among households (Kaliba *et al*., 2000) and was therefore assigned a positive sign.

AGE_HOUSEHEAD (Age of the household head) was described in this study as a composition of the effect of farming experience and planning horizon and one that can take either positive or

negative sign. Young farmers may not have adequate experience required to make the right marketing decisions compared to the older farmers (Omiti *et al.*, 2009) and therefore given a priori positive and negative sign.

DIST_MARKET (Distance to the nearest market) is use as a proxy for market accessibility. Longer distances are associated with increased transaction costs (Abdulai and Huffman, 2005).

C_ATTRIBUTE_1 (Flock characteristics) is a categorical variable refering to the flock characteristics desired by the buyers. These characteristic include colour, weight, disease free, pest free and general cleanliness of the poultry house. These characteristics are likely to positively or negatively influence the per unit price of birds.

OFF_FARM_ENGAGEMENT (Engagement in activities outside the farm) is a dummy variable. Farmers engaging in off farm activities are likely to generate additional income which they can invest to expand their indigenous chicken enterprises. This would lead to increased flock size and ultimately increased proceeds from the enterprise therefore given a positive sign.

DIST_EXT (access to agricultural extension service) is a dummy variable introduced to capture effect of extension service on membership to farmer producer and marketing organizations. Ease access of these services enable farmers to get information on IC markets at least costs thus reducing transaction costs. Access to extension service is expected to positively influence group membership.

LAND_TENR

Land tenure has reported inconsistencies in previous studies in terms of its influence on group participation. Progress in groups may require members to adopt investments tied to land (Fernadez-Carnejo, 2002). In such a case, tenants may remain aloof to group membership or quit when such conditions comes in force.

Table 1: Description of variables for the Heckman two stage, Multinomial logit and regression models

Variable	Variable description	Variable type	Unit of measurement	Expd sign	Model
Dependent variable					
GOUP_MEMBERSHIP	Household participates in Marketing groups or otherwise	Dummy	1 = Participates in market 0 = Otherwise		HEC
SSale_prop	Amount of birds sold relative to birds kept	Continuous	Number		HEC
BUYR_TYP	Household choice of different marketing channels	Categorical	1 = Consumer 2 = Wholesaler 3 = Processor 4 = Supermarket 5 = Broker		MNL
AVER_PRIC_UNIT	Average price per bird	Continuous	KES		R
IC_TT_REV	Total income from sale of birds	Continuous	KES		R
Independent variables					
Resource endowment					
C_ATTRIBUTE_1	Flock Characteristic	categotrical	Number	+/-	MNL
FARM_SIZE	Farm size	Continuous	Acre	+/-	HM, MNL, R
LAND_TENR	System of land ownership	Dummy	1=Leased 0=Owned	+/-	
CREDIT_ACCESS	Access to credit	Dummy	1 = Yes 0 = No	+	HM, MNL, R
OFF_FARM_ENGAGNT	Engagement in off farm activities	Dummy	1 = Yes 0 = No	+	R

	Household characteristics				
GenderHH	Gender of household head	Dummy	1= Male 0 = Female	+/-	HM, R
AGE_HOUSEHEAD	Age of household head	Continuous	Number of Years	+	HM, MNL, R
H_EDU	Education level of household head	Continuous	Number of years in school	+	MNL, HM, R
HOUSEHOLD_SIZE	Household size	Continuous	Number of people	+/-	HM MNL
NO_GRP_MEMBR	Number of groups one is a member	Discrete	Number	-	R
	Distance to services and infrastructure and related costs				
DIST_MARKET	Distance to the point of sale	Continuous	Kilometres	+	MNL, R
DIST_EXT	Distance to the nearest extension service	Continuous	Kilometres	+	HM, R
COST_TRANS	Cost of transporting birds to the market	Continuous	Kilometres	+	MNL
COST_BARG	Cost of bargaining	Continuous	KES (Wage rate per hour)	-	MNL
In_Infocost	Aggregate cost of information	Continuous	KES	+/-	MNL

Note: HM= Heckman two stage model, MNL= Multinomial logit model and R= Regression model.

CHAPTER FOUR

CHALLENGES IN MARKETING OF INDIGENOUS CHICKEN AND EFFORTS TOWARDS COLLECTIVE MARKETING.

4.1 Introduction

Efforts to open up new market-led opportunities for economic growth through implementation of poverty reduction strategies has yielded inconsistent results in terms of success and failure in majority of the sub-Saharan African countries (Fafchamps, 2004). This has been attributed to poor infrastructure development characterised by poor road networks (Dorward et al., 2005) whose effect is majorly felt over the rainy season by farmers involved mostly in perishable and high value agricultural products. This has led to high transaction costs which undermine the profit gains. It is also attributed to inadequate and sometimes lack of market support institutions such as contractual arrangement, insurance, rural credit and finance (World Bank, 2002) which can act as a fall back mechanism in terms of indemnifying farmers in times of crop or market failure. This situation has led to market imperfections and coordination failure. Collective marketing through farmer marketing groups is one of the avenues to complement the governments initiatives to promote coordination in agricultural markets and as a basis for enhancing market access. However, the success of famer marketing groups in enhancing market accessibility depends on their ability to devise new and workable solutions to overcome institutional constraints and challenges in a way that paints a different picture from the negative experiences by cooperatives in the past (Kydd and Dorward, 2004). Though there has been increased interest in new farmer organizations to supplement farmer market support institutions, majority of farmers have continued to experience exploitation from middlemen and participation in more organized formal markets is still remote (Poulton et al., 2006). This chapter seek to explore the constraints in collective marketing of indigenous chicken and the role played by farmer organizations in marketing of indigenous chicken.

4.2 Data analysis

Correlations and percentages were used to determine the institutional and organizational constraints that farmers face in marketing of indigenous chicken and in their efforts to organize themselves to improve their effectiveness in addressing market imperfections. Output prices depends on a variety of factors in rural imperfect markets (Fafschamps and Hill, 2005). A regression model was used to determine factors that influence the price of birds in the market with specific interest of identifying the role played by collective action. Variables considered

include the education of the household head which would account for the effect of marketing skills on prices), distance to the extension service to give information on the effect of access to market information on prices, distance to the buyer, transport, information and negotiation costs, buyer type and flock attributes. The model specification is as follows:

$$PUprice\ of\ birds=\beta_0 + \beta_1 BuyerDist + \beta_2 Cons + \beta_3 GroupMe + \beta_4 Wholesaler + \beta_5 localTrdr + \beta_6 YrsEdu + \beta_7 Supermkt + \beta_8 DistMkt + \beta_9 Size + \beta_{10} Color + \beta_{11} DeseasFr + \beta_{12} PestFre + \beta_{13} CostBarg + \beta_{14} TransCost + \beta_{15} InfoCost + \beta_{16} DistExt + \beta_{17} DistExt + \varepsilon_3 \ldots\ldots 1$$

4.3 Results and Discussions

4.3.1 Challenges encountered in collective action

Indigenous chicken producer and marketing groups were observed to face a myriad of challenges despite the potential they are presumed to hold over individual marketing. Concerns include inability of groups to attract members. Though 89.4% of the farmers interviewed were satisfied with the adequacy of services offered in indigenous chicken marketing groups a lack of time for group activities (64.4%) was identified as the major barrier to group membership (Table 2). Another 19.2% indicated that groups are not beneficial. This could be attributed to inadequate communication of clear and observable benefits of collective action to non-members. In addition, groups may be unable to devise and forge new innovations and partnerships that would amplify the benefits and ultimately encourage collective action and sustain interest in the 6.1 and 4.5% dissatisfied and indifferent farmers respectively (Table 3).

Table 2: Barriers to group membership

	Percentage
No group to join	16.4
Do not have time for group activities	64.4
Groups are not beneficial	19.2

Table 3: Adequacy of services offered by marketing groups

	Percentage
Satisfied	89.4%
Dissatisfied	6.1%
Indifferent	4.5%

These findings are consistent with those of Shiferaw (2009) who noted that the success of farmer organizations involves the ability to provide new and sustainable solutions to farmers' problems. He therefore points out new skills, good leadership, and commitment to develop expertise as the recipe to bring change.

4.3.2 Market accessibility

Majority of the indigenous chicken farmers accessed markets via a network of murram roads Table 4. Some of these roads are not all weather and may raise the cost of transportation of birds to the market during the rainy season. Indigenous chicken producers in poor road network areas may not be adequately served by a variety of traders making rendering them vulnerable to exploitation (Obare, 2006). Sampling area covered by 41% tarmac (Table 4) facilitated farmers to access market outlets such as supermarkets which were never observed to fetch birds at farm gate and mostly located at distances of more than 3 kilometres from the farm gate (Table 5).

Table 4: Type of road to the nearest livestock market

Type of road	Percent
Murram	58.0
Tarmac	41.0
Foot path	1.1

4.3.3 Poultry diseases

Though the average distance to the nearest extension service mostly veterinary services is 3.9 Kilometres, Newcastle disease was the major threat to the IC enterprise with farmers losing an average of 15% of the flock to the disease over a twelve month period compared to an average of 20% the farmers added to their flocks over the same year. This reduced the marketable surplus.

4.3.4 Correlation between transaction costs and traded volumes

The correlation between transaction costs and sale volumes is given in Figure 3. The result indicate that there exist a linear relationship between traded volumes and aggregated cost of market information, cost of transporting birds to the market, cost of negotiation and the distance to the buyer. The negative linear relationship between traded volumes and cost of information, negotiation and distance to the buyer is weak.

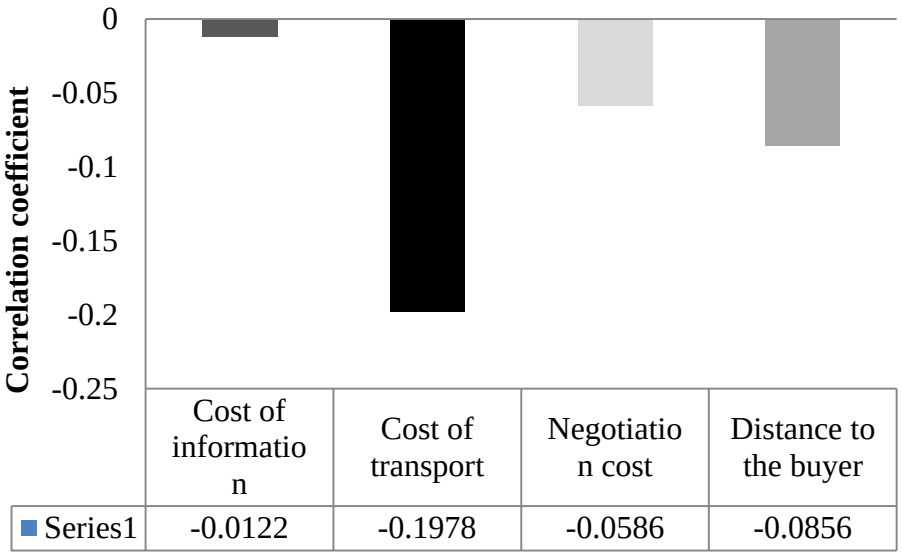

Figure 3: Correlation between traded volumes and transaction costs

Cost of transport has a linear negative relationship with traded volumes. Transport cost reduce as the number of birds sold increased. Result also indicate that membership to farmer marketing groups is positively correlated with the cost of information but negatively correlated with negotiation and transport cost (Figure 4).

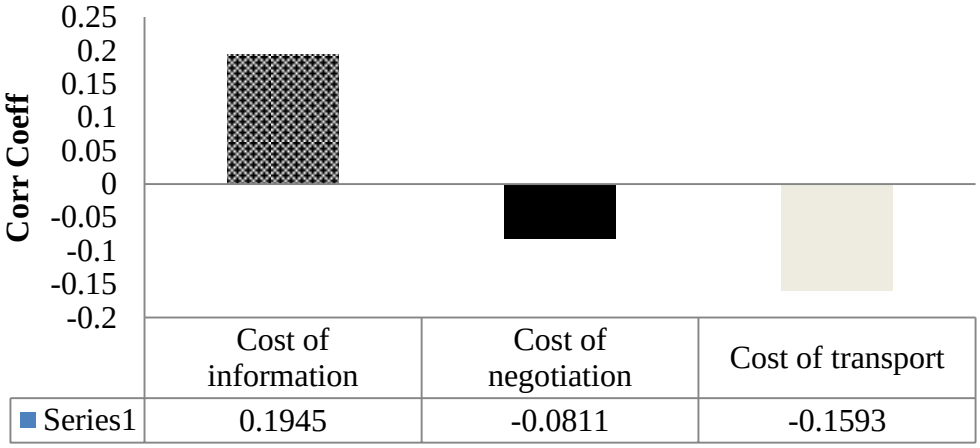

Figure 4: Correlation between group membership and transaction costs

4.3.5 Farmer participation in different market outlets

Table 5 shows farmer participation and the intensity of selling birds in different market outlets. The table also shows the distance covered by farmers to access the different market outlets and the distance from the farmer. The intensity of participation is determined by weighing the Number of birds sold to number of birds kept and consumed by the household over a twelve-month period. Farmers made a choice among five different marketing alternatives: Consumers

wholesalers, processors, supermarkets and middlemen. Results indicate that 37.28% and 30.50% of farmers sold their chicken to wholesalers and consumers respectively. About 50% of the farmers sold the birds to brokers at farm gate compared to 32.43% who sold to consumers at the same point. No farmer sold the birds to brokers at distances more than 3 kilometres which may probably indicate that they (brokers) have more close contact with the farmers compared to other market outlets. Majority of the farmers who sold to supermarkets were located at distances of less than 3 kilometres to the selling point though 33.33% were located at distances more than 3 kilometres but not exceeding 5 kilometres. No sales to supermarkets were recorded at farm gate.

Table 5: Farmer participation in different market outlets

	Consumers	Wholesalers	Processors	Supermarkets	Middlemen
% Farmer Participation in different markets outlets	30.50	37.28	15.25	10.19	6.78
Participation by distance to the buyer					
Farmgate	32.43	23.40	18.18	-	50.00
<3km	43.24	61.70	54.55	50.00	50.00
<5km	10.81	6.38	9.09	33.33	-
>5km	13.51	8.51	18.18	16.67	-

4.3.6 Determinant of prices received by farmers across different market channels

The establishment of farmer producer and marketing groups is mainly aimed at reducing transaction costs and improving the prices the farmers get for their produce by enabling them to access direct markets. A regression model was used to establish the factors that determine the price of birds in different market outlets and specifically determine the role played by farmer groups in influencing prices. Output prices depends on a variety of factors in rural imperfect markets (Fafschamps and Hill, 2005). Variables considered include the education of the household head, distance to the extension service, distance to the buyer, transport, information and negotiation costs, buyer type and flock attributes. Information costs relate to costs incurred by the farmers to obtain relevant information regarding market availability and prices to make informed marketing decisons for example costs of newspapers, pamphlets, phone airtime incurred mainly for the purpose of obtaining information on chicken markets. Negotiation costs

here refer to time taken by the farmer and the buyer to agree on a price. The costs were arrived at by multiplying the time taken to negotiate by the prevailing wage rate per hour at the time of the survey.

Table 6: Determinant of prices received by farmers across different market channels

Variable	Coefficient estimates
Education of the household head	0.030 (0.019)*
Distance to the extension service in Km	0.086 (0.053)
Distance to the buyer in Km	-0.009 (0.019)***
Membership	0.207 (0.433)*
Transaction costs	
Cost of information per farmer	-0.014 (0.100)*
Transport cost per bird	-0.0004 (0.0006)*
Negotiation cost per transaction	0.0006 (0.0012)
Buyer dummies	
Middlemen	-0.495 (0.619)
Supermarkets	1.083 (1.223)
Processors	1.391(1.085)
Wholesalers	1.283 (1.022)*
Retailers	-0.488 (1.008)
Flock attribute dummies	
Size	-0.800 (1.298)***
Disease-free	-3.790 (1.685)*
Pest_free	-0.844 (1.901)***
Cons	1.233 (1.778)
N	200
Adj R^2	80.01

[1] ***Significant at 1%, **5% and *10%

[2] Standard errors in parentheses.

Regression results shows that higher education levels had a significant influence on prices the farmers received from sale of indigenous chicken. This indicates that higher education levels is linked to enhancement of marketing skills which include the ability of the farmers to synthesize market information to make the right marketing decisions and choices as also observed by de

Janvry *et al.* (1991). The longer the distance to the buyer the lower the per unit price of birds the farmer receives. Brokers who have closer trade contact with the farmers at farm gate level as indicated in Table 5 incur additional cost of transportation which they pass backwards to the farmers and forward to traders in the urban markets.

Cost of information had a significant negative influence on prices. When the cost of information is high, it means that its accessibility by farmers is constrained. It then follows that farmers are not likely to make informed marketing decisions regarding the outlets offering the most favourable margins when they fail to access the quality and reliable information. Farmers in a case of high information cost are likely to rely on market information provided by traders for example brokers or neighouring farmers (Figure 5) who are in more close contact with them and which may not be credible. According to Glendening *et al.* (2010), farmers need to access a wider variety of quality adequate information to enhance production and marketing opportunities and the capacity to attract better prices for their produce.

Though most of the information on IC markets was obtained from radios (Figure 5), the reliability may not be necessarily guaranteed. The agricultural programmes are limited on airtime and focus on a variety of topics from general agriculture. A key indepth focus on a particular area such as indigenous chicken in this case may be very limited and therefore fail to adequately provide all the information the farmers require to make informed decisions.

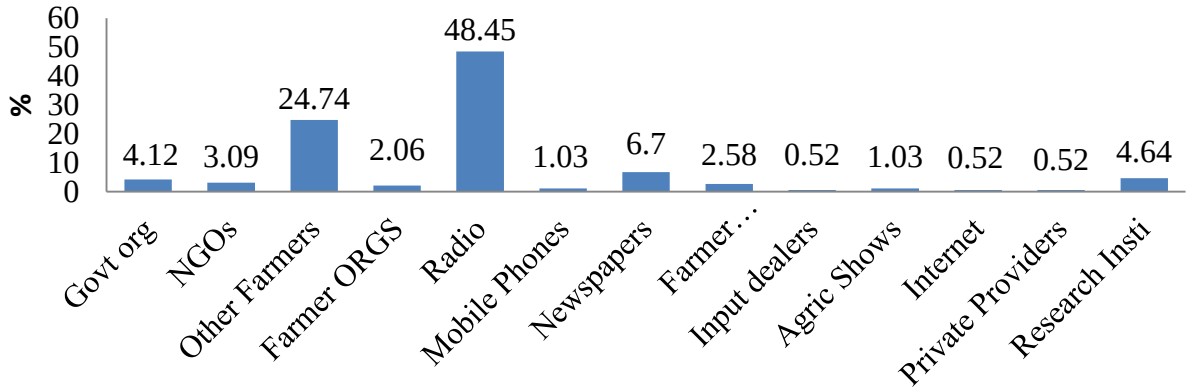

Figure 5: Sources of Information on IC Markets

The per unit price of birds increased if the farmers opted to sell his/ her birds to Wholesalers over consumers. Wholesalers buy in bulk and therefore enjoy the economies of scale in transporting

the birds from the farmers to other markets and therefore able to offer better prices to farmers. Wholesalers also had relatively closer trade contacts with the farmers where about 23% and 61% of the farmers sold their birds to wholesalers at farm gate and distances of less than three kilometres respectively (Table 5), and therefore less demand for transport cost compensation by the farmers as also noted by Owuor *et al.* (2009).

The per unit price of birds goes down if a buyer considers bird size, disease and pest free flocks over colour as an attribute. This indicates that farmers' flock do not adequately meet the desired sizes and weight therefore the buyers pay less. Farmers are forced to compromise the prices they set when they fail to maintain disease and pest free flocks ending up in prices given by buyers.

Poor flock size/weight could result from poor management practices as observed by Njue *et al.* (2006). Farmers in most cases consider improved management practices as costly, risky, inaccessible and labour intensive (Ochieng, 2010). Marenya *et al.* (2006) indicated that maintenance of quality standards in agricultural produce was only observed among farmers with high incomes and ability to access productive resources such as credit.

Membership to groups had a significant positive influence on prices. Farmer marketing groups increase the farmers accessibility to market information and the ability to bargain and obtain fair prices for their produce. Farmer marketing groups were observed to operate as profitable market units where farmers collect, market and add value to their produce for better market prices Mburu *et a.* (2007).

5.0 Summary and Conclusions

This chapter describes the opportunities and constraints in marketing of indigenous chicken and efforts by farmers to organize and market collectively. Descriptive statistics such as percentages and correlations were used to determine constraints in marketing of indigenous chicken. A regression model was used to estimate the role played farmer groups in determining prices. The quality of services offered by groups to the members is not attractive and this has resulted to inadequate commitment by the members to group activities and development of negative perceptions towards groups.

Majority of the road networks are not tarmacked and therefore impassable during the rainy season making the farmers to pay more to deliver birds to the market or render them vulnerable to exploitation by middlemen.

Transaction costs were negatively correlated with the traded volumes as well as membership to groups indicating the role played by farmer organizations in mitigating these costs.

There is no diversified market information source with majority of the farmers accessing the market information from radios and other farmers which may not be reliable.

Majority of the farmers sold their indigenous chicken to wholesalers located at distance of less than 3 kilometres from the farmer and participation in more profitable and organized formal markets was relatively remote.

Prices of indigenous chicken was significantly influenced by education, distance to the buyer, cost of information, transport cost, wholesale and consumer marketing channel, membership to groups, flock attributes such as colour, size, pest and disease free.

CHAPTER FIVE
DETERMINANTS OF CHOICE OF A MARKETING OUTLET IN MARKETING OF INDIGENOUS CHICKEN

5.1 Introduction

Demand and price of poultry products has been on a rising trend as a result of rising income in new emerging developing nations and high population growth (Delgado *et al.,* 2009). This trend has the potential for creating opportunities, as well as threats, for the participation of the poor.

Opportunities are likely to come from the increasing integration of national and world markets. In addition, accessibility of national and world markets would translate to improved incomes and livelihoods of rural households as they would be able to fetch higher margins from their poultry products. This again would also open up avenues through which farmers can have a stronger power to decide and choose where to sell their produce based on best margins offer. Integration and accessibility of national and world markets would help to counter inefficiencies in market price along the market supply chains as discussed by Owuor (2009), by providing opportunities for farmers to acquire the right and adequate information to make the right marketing decisions.

Poor smallholder livestock producers however can only benefit from such opportunities if market accessibility is improved (Holloway *et al*., 2002). Threats are eminent here since accessibility of large markets may demand high quality products meeting certain standards by use of technologies which resource constrained rural farmers may find difficult to access. This maybe the reason why markets for the traditionally processed informal and raw poultry products continue to predominate in majority of developing countries, even when the demand for higher quality increases at the higher market end (Gebremedhin *et al*., 2007).

Accessibility of technologies that would enable farmers to add value to their poultry products to enable them to access different market outlets especially the high end may demand a certain level of knowledge and skills related to the principles of operation and management of poultry enterprises. Other social economic characteristics such as structure and the size of the household, age of the household head and size of the farm among other characteristics are likely to determine a poultry farmers' choice of a market outlet.

The objective of this study was to establish socioeconomic characteristics and transaction cost factors that influence the decision by smallholder Indigenous Chicken farmers in Kakamega County Kenya to sell to certain market outlet. It was hypothesized in this study that the decision for a marketing outlet choice is influenced by socioeconomic characteristics such as age, education, incomes, accessibility of credit and information, household size and transaction costs related to access to information on markets, negotiation and transport of birds to the market.

5.2 Methodology

Data on transaction cost and socioeconomic characteristics of the household head such as age, farm size, credit access, education, group membership and distance to the market, cost of bargain and transport cost was collected using a structured questionnaire.

5.3 Model specification and empirical analysis

The multinomial logit model was used determine factors that influence the choice of a marketing outlet. Multinomial logistic regression is used to predict a dependent variable where the unordered response has more than two outcomes. The assumption was that farmers were participating in the market at different levels and they had to make a decision on the market outlet to use. Since there are no market restrictions, the main farmer marketing outlet was considered. The options available to the farmers were selling to the neighbours for consumption purposes, brokers, Retailers, wholesalers and supermarkets. The decision on choice was based on utility maximization and a variety of socio economic factors confronting the farmer. The multinomial logit is model as follows:

$$pr(y = j) = \frac{e^{\beta jXi}}{\sum e^{\beta kXi}},\ j = 0, 1 \ldots j \ldots\ldots\ldots\ldots\ldots\ldots 2$$

The estimated equation 1 above leads to a set of probabilities for j+1 choices for a decision maker with the vector X_i describing each individual transaction characteristics and the vector of the coefficients β_j associated with the j^{th} marketing outlet (Greene, 2002).

$$pr(y = 0) = \frac{1}{1+e \sum e^{\beta kXi}},\ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

Normalization is achieved by setting $\beta = 0$. We therefore obtain vector β_j for each probability except for the first which is the normalized alternative. The empirical model for the study can thus be summarized as follows:

$$M_{ik} = X_i\beta_k + e_{ik} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4$$

Where M_{ik} is a vector of the marketing choices (j=0 for consumers, 1 for retailer, 2 for processors, 3 for supermarkets, 4 for wholesalers and 5 for brokers) of the *i*th farmer, X_i is a vector of socio economic characteristics, β_k are the parameter estimates, and e_{ik} is the disturbance term.

5.4 Results and discussion

Table 7: Variable names, definitions, and descriptive statistics in Multinomial Logit model

Variables	Description	Mean	Standard deviation
Age	Age in years of the household head	37.010	11.557
Household size	Number of people in a household	5.629	2.978
Group membership	Dummy (1=Group member, 2=Non Mems)	0.152	0.361
Size of the farm	Size of the farm in acres	5.248	2.993
Credit access	Dummy (1=Yes, 0=No)	0.257	0.439
Edu	Years of formal educ of the household head	12.838	8.970
Distance	Distance to the nearest market in kilometres	2.573	2.907
InfoCost	Cost of search for information in KES	6.910	1.632
	Flock Attributes (1=Colour, 2=Size, 3=Disease free, 4=Pest free)	2.289	1.984
Cost of bargain	Cost of bargain in KES	153.248	153.652
Cost of transport	Cost of transport in KES	149.238	336.377

5.4.1 Marketing outlet choice by group membership

Research findings indicate that, there was a significant difference in outlet choice between individual farmers and farmers in groups. Farmers in groups mostly sold their chicken and

chicken products to wholesalers (43%) but then participated in all other outlets identified. Very few of the farmers (4%) in groups sold their chicken to brokers (Figure 7).

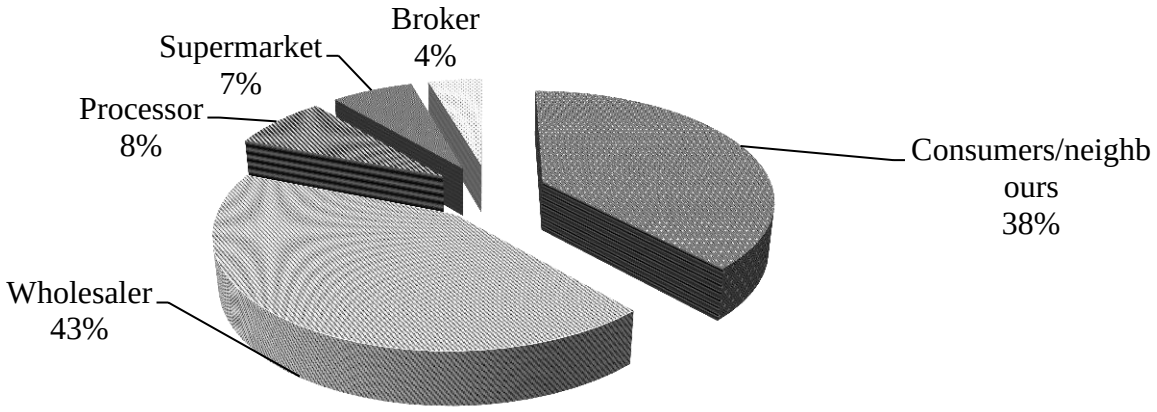

Figure 6: Indigenous Chicken Market outlet choice by farmer marketing groups

Farmers participating in the markets individually sold their chicken to processors, retailers and wholesalers (Figure 8). Majority of them (56%) sold their chicken to wholesalers compared to 19% who sold to consumers. None of the sampled non participant in groups sold their chicken to brokers and supermarkets. Farmer marketing groups enables members to share information, widen market choices, collectively cope with market related constraints and attain bargaining power, reduced transaction costs and economies of scale (Mburu *et al.*, 2007).

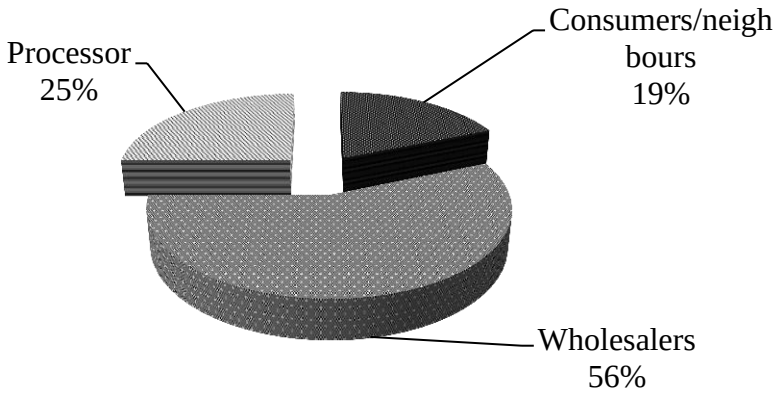

Figure 7: Indigenous Chicken Market outlet choice by farmer marketing groups

5.4.2 Determinants of market outlet choice

Education

Increase in years of education of the household head increased the probability of a farmer choosing wholesalers and processors over consumers/neighbours. Learned farmers are able to

access quality information from such sources as internet and utilise it to diversify to other more profitable market outlets. Processing is a relatively new market outlet and the more the education level achieved the higher the chances of adopting a new marketing outlet consistent with findings by (Vinjay *et al.*, 2009). Education improves managerial competencies and successful implementation of improved production, processing and marketing practices making it possible for farmers to take new agricultural innovations similar to finding by Marenya and Barret (2006).

Transport cost

High costs of transport increased farmer's preference for consumers/neighbours over processors and brokers market outlets. These results are consistent with findings by Manyong *et al.* (2008) who observed significant negative effect of high marketing costs like transport, marketing fees and licensing on farmers market participation. Rarely do processors fetch chicken and chicken products at farm gate (Table 5) and farmers have to deliver to their premises. Brokers on the other hand, have to be compensated by either the farmers or the traders in urban markets for the cost of transport when they buy the birds at farm gate.

Cost of information search

The probability of a farmer's choice for middlemen marketing outlet over consumers/neighbours increased with increased aggregate cost of search for market information (Table 8). Farmers face inadequate exposure to market information and market outlet that have streamlined structure of market information flow to encourage farmer participation (Fuller *et al.*, 2004). Farmers have more contact with brokers as they mostly fetch chicken at the farm gate (Table 7) and therefore the likelihood that much of the market information they harbour on markets is fetched from this outlet. This is consistent with findings by Awudu *et al.* (2009) also observed farmers choosing market outlets depending on the source of market information.

Table 8: Coefficient estimates of multinomial logit regression

Variable	Wholesaler	Processors	Supermarkets	Brokers
Age of the household head	1.002*	0.971	1.110	0.927
	(0.026)	(0.038)	(0.071)	(0.116)
Household size	0.952	0.930	1.184	1.037
	(0.111)	(0.162)	(0.444)	(0.763)
Group membership	0.167*	0.443	0.257*	0.547
	(0.115)	(0.015)	(0.923)	(0.489)
Size of the farm	0.929	0.783*	1.128	1.892
	(0.101)	(0.139)	(0.254)	(1.165)
Credit access	1.671	1.963	1.568**	2.560
	(1.188)	(1.97)	(1.253)	(1.547)
Education of the household	0.932*	0.920*	0.972	0.714
head	(0.033)	(0.042)	(0.078)	(0.182)
Distance to the market	0.922	1.188	1.250	0.191*
	(0.144)	(0.198)	(0.303)	(0.281)
Aggregate cost of information	1.202	0.966	2.410	1.447**
	(0.234)	(0.245)	(1.711)	(1.438)
Flock attributes	1.229*	2.276*	36.134*	209.415
	(0.304)	(1.08)	(68.426)	(123.48)
Cost of bargain	1.002	1.003	1.001	1.012
	(0.002)	(0.003)	(0.004)	(0.010)
Cost of transport	1.004	-1.005*	1.005	-1.005*
	(0.003)	(0.003)	0.004	(0.007)

[1] ***Significant at 1%, **5% and *10% and consumers/neighbours market outlet used as the base category

[2] Standard errors in parentheses and

Distance to the nearest market

Farmers located far away from urban markets and trading centres chose to sell their chicken and chicken products to brokers who mainly fetched products at the farm gate as opposed to consumers/neighbours as a way of mitigating the cost of transportation. This is similar to findings by Otieno *et al.,* (2009) who found out that high transport costs are associated with long distances that farmers travel to sell the birds and which significantly reduce farmer's gross margins. However, they most likely do not achieve the objective of cutting down on such costs as brokers pass backwards to farmers a proportion of the same costs and other costs emerging from loss of birds through theft and deaths as noted by Owuor (2009).

Flock attributes

The more the market preferred attributes a flock has, the higher the probability of a farmer's choice of Wholesalers, processors and supermarkets marketing outlets over consumers/neighbours. These markets are keen on quality yardsticks of the flocks measured in terms of weight and free from pests and diseases. Such attributes are more significant determinants of choice of consumer market outlets during celebrations and festivities (Bebe, 2009).

Membership in farmer marketing organization

Participation in groups increased the probability of a farmer choosing to sell to Wholesalers and supermarkets over neighbours/consumers. Farmer marketing organizations are vital in market participation and adoption of modern markets since they enhance the capacity of the farmers to make necessary investments that enables them to access financial resources, market information to venture in new innovations and attain quality of produce highly demanded by these modern markets consistent with observations by Ndinompuya (2008). Vijay *et al.,* (2009) also found out that membership of farmer groups significantly determines smallholder farmer's decision to participate in modern markets.

5.5 Summary, conclusions

The objective of this study was to establish socioeconomic characteristics and transaction cost factors that influence the decision of a marketing outlet choice by smallholder Indigenous Chicken farmers in Kakamega County Kenya. Multinomial logit model results indicate that age of the household head, group membership, farm size, credit access, education, distance to the

market, cost of information, attributes of the flock and transport cost influenced the choice of different market outlets. High cost of transport discouraged farmers from participating in processors and brokers marketing outlets. Increase in age increased the probability of a farmer participating in a Wholesalers marketing outlet while membership in groups enticed farmers to sell their chicken to Wholesalers and supermarkets. Age of the household head increased with the probability of the farmer selling his produce from the enterprise to Wholesalers and processors similarly as flock attributes which also additionally increased the probability of selling to supermarkets. Increased cost of information increased the probability of farmers participating in informal markets.

It can be concluded that there was a significant difference in the socioeconomic characteristics of participants in different indigenous chicken market outlets. These differences coupled with observable transaction costs guided the decision by households to sell their produce to a certain marketing outlet.

CHAPTER SIX
DETERMINANTS OF FARMER PARTICIPATION IN COLLECTIVE MARKETING OF INDIGENOUS CHICKEN

6.1 Introduction

With increasing globalization, expanding agribusiness and liberalization, there is a danger that smallholder producers may find it difficult to participate effectively in the growing market economy and subsequently become marginalized (Lapar *et al.,* 2009). Smallholder producers need to improve the quality of their competitiveness in order to survive. It is however noted that many constraints stand in their way to realize progress because of inferior technology in the supply chain, high transport and handling costs, insufficient information, and weak institutional arrangement.

The need for smallholder farmers to organise themselves to overcome the constraints is more emphasised since market participation is both a cause and a consequence of development (Boughton *et al.,* 2007). Households net position does not only depend on market prices but also on the ability of the households to access productive technologies and adequate public and private goods (Barrett, 2008). To this moment, macro and trade policy interventions have failed to stimulate market participation by smallholder farmers and also agricultural and rural transformations.

Formation of farmer marketing organizations has been one of the initiatives in Kenya to supplement public and private sector initiatives to promote active involvement of smallholder farmers participation in the markets (Shiferaw, 2009). Farmer marketing organizations are seen as a different way to gain bargaining power in the value chain and a mechanism to improve access to capital and information (Lapar *et al.,* 2010). Participation in collective marketing is more tied to household assets. A study by Obare *et al.* (2009) showed that participation in producer marketing groups decreased with per capita farmland which suggests that households with small land holdings has a higher likelihood of participating in collective marketing. This forms the basis for which collective marketing is a solution tailor made for the resource poor farm households. The test of the effectiveness of a farmer organization is in understanding the extent the rules of conduct and activities are perceived as benefiting its members as an impetus to encourage more farmers to join more beneficial collective marketing. Though a study by Obare

et al. (2009) document the benefits of collective marketing, majority of the smallholder IC farmers in Kakamega County opt to market individually. This study aims at investigating the socioeconomic and institutional factors that influence smallholder IC farmer‘s decision to participate in collective marketing.

6.2 Model specification and empirical analysis

The purpose of the following estimation was to identify factors that drive participation in collective marketing and the extent to which farmers participate in Indigenous Chicken markets. There had to be identified a suitable comparison group of non-participants whose outcomes, on average provide an unbiased estimate of the outcomes that group participants would have had in the absence of collective marketing. Let ∩ be the true impact of household participation. Thus

$$\cap = l_{1i} - l_{01} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 5$$

Where I_{1i} is income from eggs and chicken sales, if household *i* chooses to participate and I_{0i} is income if the household *i*, chooses not to participate.

However since a household cannot be both a participant and non-participant at the same time, we cannot observe the true impact on participants' income. Instead, the observed income of household i is expressed as:

$$l_i = p_i l_{1i} + (1 - p_i) l_{01} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 6$$

Where P_i=1 if the household is a participant and zero if non participant. Given the importance of observing the true impact of participation on income, the goal is to get an unbiased estimate of *n* for the average household. The mean difference between participant and non-participant would be an unbiased estimate of *n* if households are randomly selected. However, this is not the case. This means higher income from indigenous chicken farming may not necessarily be attributed directly to the group participation.

Some of the factors that influence a household decision to participate may also determine the level of participation in markets. This might result in an overstatement of the estimator of the dummy of group participation in a linear dummy variable regression (Greene, 2000). Therefore, it is necessary to check for self-selectivity bias in the estimation of the effect of membership of the local association on gross margin.

Originally, such models were estimated using the Tobit model that accounts for the clustering of zeros due to non-participation. However, a major limitation with the Tobit model is that it assumes that the same set of parameters and variables determine both the probability of market participation and the level of transactions.

A two-step model however relaxes these assumptions by allowing different mechanisms to determine the discrete probability of participation and the level of participation. These models allow for a separation between the initial decision to participate and the decision of how much given. In this case, it was assumed that some right hand side variables would affect differently the decision to participate at all and the decision on the level of participation. In order to control for selectivity bias of households when participation is not random, a Heckman's two stage regression model was estimated. Firstly, the participation decision was modelled as a binary choice problem. Secondly, gross income from eggs and chicken sales was linearly regressed on explanatory variables including the Inverse of Mill's Ratio, which originates from the binary dependent variable model (Heckman, 1979). This approach follows Maddala (1983) and Greene (2000) and has been widely applied in other empirical studies on institutional arrangements (Masten *et al.,* 1991; Warning *et al.,* 2000; D' Haese *et al.,* 2010).

In the first step, a Probit model was estimated (selection equation) to identify factors driving participation. Assuming that the probability of choosing a market channel depends on a set of factors that affect the behaviour of chicken farmers, then a Probit model was developed as follows:

$$PART\ N = \beta iXni + Vi \quad \text{..... 7}$$

Where X_{ni} = i^{th} attribute of the n^{th} respondent

βi =the parameter vector to be estimated; and

Vi = random error or disturbance term

The estimation of the Probit model allowed for calculation of a household specific selectivity variable (inverse of mills ratio, λ) which measures probability of the household being a participant. The λ was used to address self-selection bias that may result from participation being a voluntary choice exercised by the household.

$$\lambda = \frac{\theta(\beta`K)}{(1-\emptyset(\beta`K)} \text{.....} 8$$

Where *K* is set of variables explaining participation decision; θ and ∅ are the probability density and cumulative distribution of the error term respectively; while λ and $\beta$are the parameter vectors.

In the second stage, the outcome equations are estimated by ordinary least squares, where the outcome equations include both the original *X* whose coefficients are the parameters of the population selection equation and the constructed value of the inverse of mill's ratio, λ. The regressions or observations are estimated as:

$$Y_1 = \beta\chi_{i1} + \beta\lambda_{i1} + \varepsilon_{i1} \text{..... 9}$$

$$Y_2 = \beta\chi + \beta\lambda_{i1} + \varepsilon_{i1} \text{..... 10}$$

Where, λ and β are as earlier defined. While Y_1 is the outcome equation for the participants and Y_2 is the outcome equation for the non-participants sub-sample. Sample selection bias has been corrected by the selection equation, which determines whether an observation makes it into the non-random sample. This estimator is consistent and asymptotically normal. The sign of the inverse of mill's ratio is often substantively useful information as it indicates the correlation between the unobservable in the selection and outcome equations.

The standard *t*-test of the null hypothesis that $\beta = 0$ is the test of the null that there is no selection bias, conditional on the assumption of the model. The sign of λ indicates the correlation between the unobservable in the selection and outcome equations.

The Heckman's two-stage switching regression describing group participation choice by a sample of indigenous chicken farmers was then divided into selection and outcome equations. The selection equation of evaluating drivers of group participation was modelled as:

$$Pi(0\ 1) = B_0\,\chi_0 + B_1\,\chi_1 + B_2\,\chi_2 + B_3\,\chi_3 + B_4\,\chi_4 + B_5\,\chi_5 \ldots\ldots\ldots\ldots\ldots B_n\,\chi_n + \varepsilon$$

$$Pi(0\ 1) = B_0\,\chi_0 + B_1\,\chi_{\text{FARM\_SIZE}} + B_2\,\chi_{\text{CREDIT\_ACC\sim S}} + B_3\,\chi_{\text{H\_EDU}} + B_4\,\chi_{\text{OFF\_FARM\_E\sim T}} +$$

$$B_5\,\chi_{\text{DIST\_EXT}} + B_5\,\chi_{\text{GenderHH}} + B_5\,\chi_{\text{AGE\_HOUSEHD}} + B_5\,\chi_{\text{HOUSEHOLD\_SZ}} + \varepsilon \text{ .....11}$$

Regression or outcome equation of extent of participation is modelled as:

$$Proportion\ of\ chicken\ sold\ (Yi) = B_0\,\chi_0 + B_1\,\chi_{\text{OFF\_FARM\_E\sim T}} + B_2\,\chi_{\text{GenderHH}} + B_3\,\chi_{\text{AGE\_HOUSEH\sim D}} + B_4\,\chi_{\text{FARM\_SIZE}} + B_5\,\chi_{\text{CREDIT\_ACC\sim S}} + B_5\,\chi_{\text{H\_EDU}} + B_5\,\chi_{\text{HOUSEHOLD\_SZ}} + B_5\,\chi_{\text{DIST\_EXT}} + \varepsilon \quad \ldots\ldots..12$$

6.3 Results and discussions

Step one of the Heckman two-stage regression was used to determine the factors influencing farmers participation in groups.

The decision by the farmers to participate in group marketing is influenced by education level of the household head, credit access, access to extension services and average price per bird as shown in Table 9.

Table 9: Descriptive statistics of variables used in Heckman two stage regressions

Variable	Observations	Mean	Standard Deviation
Gender of the household head	149	0.765	0.425
Size of the farm	149	5.23	3.160
Education of the household head	149	13.470	6.118
Access to credit	149	0.295	0.458
Off-farm engagement	149	0.658	0.476
Household size	149	5.906	3.243
Distance to the extension service	149	3.383	2.986
Average price per bird	149	317.987	391.226
Distance to the market	132	2.932	5.315
Land tenure	149	0.785	0.412
Decision making on sale	149	0.060	0.239
Cost of production	139	11785.04	15562.49

Multi-collinearity among the variables was tested before the model was estimated and therefore the Variable Inflation Factor was computed. All the variables in the model had a VIF of less than ten hence a confirmation that multi-collinearity was not observed. The results of heckman first stage regression are presented in Table 10. The significance of the inverse mills ratio confirmed

that participation and extent of participation in Indigenous Chicken Farmer groups could be attributed to covariate fitted.

6.3.1 Estimating factors influencing farmer participation in indigenous chicken markets.

Step one of the Heckman two stage regression was used to determine the factors influencing farmers participation in groups (Table 10). The decision by the farmers to participate in group marketing is influenced by education level of the household head, credit access, access to extension services and average price per bird.

Table 10: Heckman maximum likelihood estimates for factors that influence participation in collective marketing

Variable	Coefficients	Standard error	P>|Z|
Gender of the household head	0.361	0.280	0.198
Age of the household head	-0.009	0.010	0.393
Size of the farm	-0.020	0.035	0.557
Education of the household head	0.035*	0.014	0.014
Credit access	0.471*	0.248	0.058
Off-farm engagement	-0.016	0.244	0.949
Size of the household	-0.043	0.037	0.242
Distance to extension	0.089*	0.047	0.06
Average price per bird	0.0004*	0.0002	0.037
Distance to the market	0.018	0.012	0.124
Wald chi2 (10)	118		
Prob chi(2)			0.000**
Lambda			0.077**
N	146		

[1] ***Significant at 1%, **5% and *10%

The intensity of participation in the market increased with age, off-farm engagement and the decision to sell but reduced with increased farm size, and years of formal education of the household head.

Age of the household head was a highly significant determinant of the extent of farmer participation in collective IC Marketing. Older farmers have more experience and networks that helps them gather reliable information on better market in terms of prices compared to young farmers. This is consistent with the findings by Omiti et al. (2009) who found out that older and experienced farmers are more likely to make better marketing decisions and develop better contacts thus allowing trading opportunities to be discovered. Better contacts are more realised at collective level than at a group level and therefore more preferred in terms of attracting better prices.

Education was found to have a negative effect on the extent of farmer participation in the market at 10% significance level. Education places a farmer in a more better position with regard to access and synthesis of market information translating to more marketing options with better prices. These results are consistent with findings by Martey *et al*. (2012) who found education as an essential requirement for utilization of market information resulting to enhanced understanding of market dynamics and informed market participation decisions.

Engagement of the farmer in off-farm activities had a significant positive effect on the extent of participation in the market. This means that farmers engaged in off farm activities invested income earned from the activities in the IC enterprise hence higher production enabling them to participating more in the market. These results coincide with findings by Lubungu *et al.* (2012) that off-farm income is likely to increase marketable surplus and market participation if invested in farm technology to improve production volume.

The results showed that participation in IC marketing groups increases with reduction in farm size. An increase in the size of the farm by one acre reduced the intensity of participation in IC marketing groups. This contradicts findings by Mathenge *et al.* (2010) who observed a higher potential of large farms to increase market participation. This inverse relationship can be explained from the fact that farmers with small land sizes are likely to depend more on income from IC enterprise compared to those with large land sizes who are likely to diversify their investment to other forms of livestock and crop enterprise. This is consistent with the findings by Olwande and Mathenge (2011) who observed small land sizes as coupled with limited assets and

inability to access credit due to lack of collaterals (inaccessibility of inputs) and therefore unable to generate surpluses for the market. They therefore opt to market collectively to cost share and reduce on transaction costs and ultimately manage to generate higher revenue from the little they offer in the market.

Increased distance to the nearest market was observed to insignificantly increase the likelihood of farmers joining farmer IC marketing groups as shown in the table below. This is attributed to the increased need to reduce on the transport cost through collective marketing in the face of poor road networks as observed in chapter four. Sindi (2008) indicated that selling at the farmgate was less profitable and therefore farmers preferred selling directly in the livestock market. To achieve this, farmers therefore opt to market collectively to benefit from reduced costs of transportation to the market.

Distance to the extension service had a significant positive influence on participation. Longer distances to the extension service translates to poor accessibility to information on output demand and prices to make informed marketing decisions. This results to the increased need by farmers to join groups to widen their opportunities to access quality information on markets. These results are consistent with findings by Olwande and Mathenge (2010) who found that distance to the extension service captured the travel time and associated costs that influence market participation.

Credit access had a positive influence on participation. This means that household heads who accessed financial credit over the period 2012/2013 were more likely to participate in collective marketing. Households that are poor face challenges with regard to compliance with group membership demands and therefore improved access to credit puts them in a more better financial capacity to participate in collective action. This result coincide with findings by Lerman (2004) who observed that credit plays a crucial role in enhancing and linking farmers to networks that facilitate access to information, modern technology and essential inputs in production.

6.3.2 Estimation of factors influencing the extent of farmer participation in IC markets.

Step two of the Heckman two stage regression was used to determine the factors influencing the extent of farmers participation in groups.

The extent of farmer participation in group marketing is influenced by age and level of education of the household head, size of the farm, off-farm engagement, and decision making regarding sale at household level.

Table 11: Heckman OLS estimates of factors influencing the extent of farmer participation in IC markets

Variable	Coefficients	Standard error	p>|Z|
Age of the household head	0.01**	0.003	0.002
Size of the farm	-0.053***	0.010	0.001
Education of the household head	0.007*	0.004	0.081
Off-farm engagement	0.129*	0.064	0.043
Distance to the nearest extension service	-0.005	0.009	0.614
Gender of the household head	0.015	0.071	0.837
Size of the household	0.015	0.011	0.157
Land tenure	-0.067	0.066	0.309
Decision making on sale	0.599***	0.132	0.0001
Cost of production	0.454	0.121	0.972
Wald chi2 (10)	118		
Prob chi(2)			0.000**
Lambda			0.077**
N	146		

[1] ***Significant at 1%, **5% and *10%

Years of experience in the enterprise was positively significant at 1%. This result implies that as the age of the farmer increases, the probability for increased intensity increases. Advanced in age results in increased knowledge and techniques involved in the enterprise as also observed by Agwu (2009). The farmer accumulates more networks with advance in age that helps him to fetch more markets for his produce.

Decision making with regard to sale of birds positively influenced the intensity of participation in the IC markets. Majority of the decisions at 93.96% were made by the group officials who are more networked and have more information on markets. Olwande (2010) observed that groups have relatively higher potential of increased access to information that is important in making informed marketing decisions leading to increased intensity of participation by the members.

Off-farm engagement positively influenced the extent of farmer participation in IC markets at at 10% significant level. This is consistent with findings by Agwu and Ibeabuchi (2011) who observed off-farm income increasing with expansion of farm enterprises and quantity traded. Enete and Igbokwe (2009) also observed increased commercialization probabilities with increased incomes.

Size of the farm was negatively significant at 1% level. This means that as farm size increases, the probability of increased intensity of participation reduces. This contradicts findings by Martey *et al.* (2012) who observed increased levels of commercialization with increased land size. Farmers with large farm size have the capacity to diversify to other farm enterprises reducing dependence on IC enterprise.

Education of the household head positively and significantly increased the intensity of farmer participation in the market. More years of formal education translates to opportunities for utilization of market information to realise more market opportunities for farm produce. These results are consistent with those of Lubungu *et al.* (2012) who observed education as a factor that improves understanding of market dynamics resulting into informed market participation decisions.

6.4 Summary and Conclusion

In this chapter, Heckman two stage regression model was used to estimate the determinants of farmer participation in farmer marketing groups and the extent of participation. The decision by smallholder farmers to participate in collective marketing through farmer marketing groups was significantly influenced by a variety of factors including years of formal education of the

household head, accessibility of credit, distance to the extension service and average price per bird.

The extent of farmers' participation was influenced by age of the household head, size of the farm, decision making in groups, off-farm engagement, and years of formal education of the household head. Land size had an inverse relationship with the decision to participate in farmer marketing groups though the influence was insignificant. It therefore imply the desire of majority of the farmers who owns small land sizes to increase their accessibility of productive resources that would assist them to improve their market participation through collective means. There is therefore need to promote the capacity of groups to deliver benefits to farmers in terms of improved housing and better management practices within their small land sizes to improve their stock of birds and ultimately manage to produce surplus for the markets. This would work as an incentive for other individual smallholder farmers to participate in more beneficial collective marketing. Age of the households positively influenced the decision to participate in group marketing. This indicate the need to motivate young farmers (the youth) to market collectively. Evidence show that years of experience is linked to making of rational marketing decisions indicating how the youth stand to benefit from group marketing.

CHAPTER SEVEN
INFLUENCE OF IC GROUP MARKETING ON INCOMES FROM INDIGENOUS CHICKEN ENTREPRISE.

7.1 Introduction

Although there is a general agreement that improvement of market accessability can help induce greater investment, income and productivity, there are observed numerous challenges (Golleti, 2005). Commercialization alone has rarely failed to register adverse consequences on household incomes coupled with failures of institutional policies (Von braun, 1995). Policies has for example failed to address the issue of farmer exploitation by middle men and little efforts has been put in place to shorten the marketing chain. Banerjee (2004) suggested that the probability of an individual to participate in social activities, to cooperate in various forms of collective action or the provision of public goods and services was negatively related to inequalty measured in terms of wealth. Therefore, a stronger incentive to organize by collective members will arise if they are unable to bear the costs of transactions and the perception that collective action can effectively reduce the costs of commodity transactions (Swallow, 2000). This study evaluates the impacts of group marketing on incomes of smallholder IC farmers in Kakamega County.

7.2 Data

Data collected was on socioeconomic characteristics of the household head such as off-farm engagement, gender, age, farm size, credit access, education, group membership and distance to the market and extension service using a structured questionnaire.

Model specification and data analysis

Multiple regression model

A multiple regression model was used to determine the effect of group marketing of Indigenous Chicken on specific incomes from Indigenous chicken enterprise. Other than group membership, there are other factors that influence IC enterprise (Owuor *et al.*, 2007) and were therefore included in the analysis. These include farm specific, institutional and socioeconomic factors. This method was suitable for the model as the regressand was a continuous variable. The model is as specified below.

$$IcIncome=\beta_0 + \beta_1 Gender + \beta_2 Age + \beta_3 GroupMe + \beta_4 FarmSZ + \beta_5 AccessCrd + \beta_6 YrsEdu + \beta_7 Off_{Far} + \beta_8 DistMkt + \beta_9 NoGroups + \beta_{10} DistExt + \varepsilon_3 \quad \ldots\ldots 13$$

7.3 Results and Discussions

Table 12: Descriptive statistics for variables used in the OLS regression.

Variables	Description	Mean
Gender of the household head	Dummy (1=Male, 0=No)	0.714 (0.454)
Age of the household head	Age in years	37.010 (11.557)
Group membership	Dummy (1=Group Member, 0=No)	0.152 (0.361)
Size of the farm	Land size in acres	5.248 (2.993)
Credit access	Dummy (1=Yes, 0=No)	0.257 (0.439)
Education of the household head	Education in completed years	12.838 (8.970)
Off-farm engagement	Dummy (1=Yes, 0=No)	0.629 (0.486)
Distance to the market	Distance in Kilometres	2.573 (2.907)
Membership in other Groups	Dummy (1=Yes, 0=No)	1.621 (0.820)
Distance to extension	Distance in Kilometres	3.464 (3.439)

Standard errors in parenthesis

Multiple regression results shows that education measured in years of schooling, distance to the extension service, distance to the nearest livestock market and off-farm engagement significantly influenced the income from the IC entreprise.

An extra year of education, increased the IC income by 7.0%. This is due to the increased capacity of learned farmers to effectively manage the enterprise for better returns. More learned farmers are better able to acquire and effectively utilise the available market information. Education is used as a proxy for the ability of the farmers to acquire and effectively use information (Gervais *et al*., 2001).

Table 13: A multiple regression result of the influence of group membership on income from indigenous Chicken entreprise.

Incomes from Indigenous chicken enterprise	**Coef.**	**t-stat**	**P>z**
Gender (Male=1)	-0.253	-0.47	0.648
	(0.520)		
Age of the Household (Years)	-0.029	-1.34	0.209
	(0.021)		
Group Membership	0.609	0.50	0.628
	(1.222)		
Farm Size (Acres)	0.029	0.35	0.734
	(0.089)		
Access to credit (Yes=1,No=0)	0.509	0.74	0.473
	(0.685)		
Education (Yrs of Schooling)	0.071**	2.07	0.062
	(0.034)		
Off-farm engagement (Yes=1, No=0)	0.602**	2.41	0.035
	(0.250)		
Distanc to the Mkt (Kms)	0.218**	2.76	0.019
	(0.079)		
Number of groups one is a member	0.160	0.44	0.667
	(0.363)		
Distance to the extension service (Kms)	0.223**	2.37	0.035
	(0.094)		

[1] ***Significant at 1%, **5% and *10%
[2] Standard errors in parentheses.

A unit increase in the probability of the farmers to engage in off farm enterprises increased the IC income by 60%. This indicate the tendency of the farmers to invest the extra income from off farm engagement in IC enterprises. Members in a household involved in off farm activities, earn income vital in improvement of other beneficial farm enterprises (Yirga, 2007).

Further, an increase in the distance to the extension service by one kilometre increased the IC income by 22.3%. As the distance to the extension service increases the farmers tend to cost share the costs through the group arrangement. It means that farmers in groups and in close proximity with the extension service will opt to cover the costs on their own even with the knowledge that doing so within the group arrangement would cost them less. This observation highlight the inadequacy and ineffectivenss of the group coordination mechanism within the cost sharing arrangement which disourages farmers. This has to do with the time taken to process a farmers request which is closely attributed to internal group politics. Groups have been observed to be more effective in terms of sourcing and disemination of market information to the farmers.

As the distance to the nearest livestock market increases, Income from the IC enterprise was observed to increase as well. Longer distances are linked to increase in transaction costs consistent with findings by (Abdulai and Huffman, 2005). Farmers far away from market points are observed to benefit more from the shared cost of transportation highlighting the critical importance of group marketing. Farmers in group closer to the market may not emphasise the need for group marketing due to affordable transport and therefore costs are borne by the individual farmer. Eventually, they incured higher costs than farmers far away from the markets but marketing collectively. This improves the revenues they obtain from the enterprise. Suprisingly, membership to groups was not observed to influence the IC income. Nkamleu (2007) observed that groups may form a positive or a negative attitude towards an innovation through group contacts and this may positively or negatively affect the quality of the collective good. IC farmer were observed to have a negative attitude towards group marketing of indigenous chicken as indicated in figure 8 and this may have undermined the collective gains.

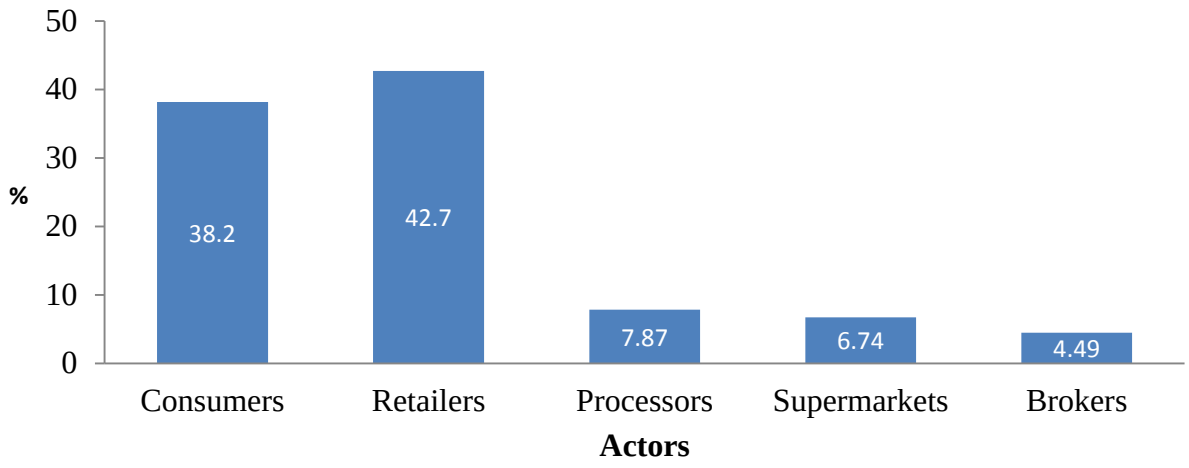

Figure 8: Perception towards group marketing

7.4 Summary conclusion

This chapter evaluates the impact of marketing of IC through farmer marketing groups on incomes from the enterprise. A semi log multiple regression was used to generate probabilities. Marketing of Indigenous Chicken through Smallholder farmer groups assist in leveraging revenues from the enterprise. Sharing of transport costs by farmers far away from livestock market have led to reduction in transaction costs and ultimately improved incomes from the enterprise. Reduced costs of accessing extension service is also greatly reduced. Despite this observation, the perception by the members towards group marketing remain poor.

Again, membership in groups only have not shown any significant influence on incomes from the enterprise. The gains from group marketing is overshadowed by poor organization and coordination within the groups resulting to members from groups in close proximity to the markets and extension service to transact individually when costs appear bearable. Eventually, they incur higher costs on aggregate compared to farmer groups far away from the market. Farmers in groups far away from the markets would also behave the same way only that covering these costs individually may not be feasible.

CHAPTER EIGHT
CONCLUSIONS AND POLICY IMPLICATIONS

8.1 Aim of the study

The motivation behind this study is the observed failure of indigenous chicken markets characterised by high transaction costs and poor participation and intensity of participation by farmers. This comes against the collective action efforts by the governments and the private sector to overcome challenges in marketing of agricultural produce in the past one decade. The study used three objectives to determine the contribution of these collective efforts in providing solutions to imperfect indigenous chicken markets.

First, the establishment of the constraints in marketing of indigenous chicken and challenges in group marketing. Secondly, to determine the influence of collective marketing on farmers market channel choice decision. Thirdly, to determine the socioeconomic factors influencing farmers decision to participate in collective marketing and the intensity of farmer participation in indigenous chicken markets. Lastly, the study established the influence of collective marketing on the farmer's income from the indigenous chicken enterprise.

8.2 Constraints in collective action and marketing of indigenous chicken farmer groups.

The results of efforts to expand and open up new market led opportunities for farmers in Sub Saharan Africa has been inconsistent Fafchamps, (2004). Dorward *et al.*, (2005) attribute this to factors such as poor infrustructure development that has led to high transaction costs which undermine the profit gains.

Collective marketing through farmer marketing groups is observed to complement the governments initiatives to promote coordination in agricultural markets as a basis for enhancing market access. However, the success of famer marketing groups in enhancing market accesability depends on their ability to devise new and workable solutions to overcome institutional constraints and challenges in a way that paints a different picture from the negative experiences by cooperatives in the past (Kydd and Dorward, 2004).

Failure of marketing groups to deliver workable solutions to problems of market access can be attributed to inadequate and sometimes lack of market support institutions such as contractual arrangement, insurance, rural credit and finance (World Bank, 2002) which can act as a fallback

mechanism in terms of idemnifying farmers in times of crop or market failure. This situation has led to market imperfections and coordination failure.

Results indicate that there is inadequate commitment by the members to group activities related to the poor quality of services offered by groups to the members. Majority of the road networks are not tarmacked and therefore impassable during the rainy season making the farmers to pay more to deliver birds to the market. Transaction costs were negatively correlated with the traded volumes as well as membership to groups indicating the role played by farmer organizations in mitigating these costs.

There is no diversified market information sources with majority of the farmers accessing the market information from radios and other farmers which may not be reliable. Majority of the farmers sold their indigenous chicken to wholesalers located at distance of less than 3 kilometres from the farmer and participation in more profitable and organized formal markets was relatively remote. Prices of indigenous chicken was significantly influenced by education, distance to the buyer, cost of information, transport cost, wholesale and consumer marketing channel, membership to groups, flock attributes such as colour, size, pest and disease free.

8.3 Determinants of choice of a marketing channel in marketing of indigenous chicken

Poultry markets that are rapidly growing and changing provides both real opportunities and significant threats to the participation of the poor mostly due to the increasing integration of national and world markets. Due to the demand, markets for the traditionally processed informal and raw products continue to predominate in majority of developing countries, even when the demand for higher quality increases at the higher market end (Gebremedhin *et al*., 2007).

The expected demand for poultry products presents expanding market opportunities for poor smallholder livestock producers if only improved accessibility to markets by the poor smallholder livestock producers can be enhanced (Holloway *et al*., 2002).

Proponents of liberalization of agricultural markets hold the argument that state marketing agencies tend to cripple the operation of marketing mechanism through restriction of competition

resulting to inefficiency of state marketing agencies and unrealistic prices to producers (Chirwa, 2009). Liberalization of agricultural markets however has to be coupled with a concern for institutional and infrastructure constraints in order to achieve the intended benefits of private markets (Kydd *et al.,* 2011). This emerges over concerns as to whether the private market system can efficiently address and assure food security for the poor populations. Evidence also show that private markets are dominated by financial and capacity constrained actors and interregional and inter-seasonal arbitrage is not part of the activities of this class of traders.

Agricultural market liberalization in Kenya has widened the choice of market channels by smallholder farmers. These channels include relatives and neighbours, brokers and vendors at local markets, processors, supermarkets and exporters to some extent.

Results show that there was a significant difference in the socioeconomic characteristics of participants in different indigenous chicken market channels. These differences coupled with observable transaction costs guided the decision by households to sell their produce to a particular marketing channel.

8.4 Determinants of farmer participation in collective marketing of indigenous chicken and intensity of participation in markets.

With increasing globalization, expanding agribusiness and liberalization, there is a danger that smallholder producers may find it difficult to participate effectively in the growing market economy and subsequently become marginalized (Lapar *et al.,* 2009). Smallholder producers need to improve the quality of their competitiveness in order to survive. Its however noted that many constraints stand in their way to realize progress as a result of inferior technology in the supply chain, high transport and handling costs, insufficient information, and weak institutional arrangement.

The need for smallholder farmers to organise themselves to overcome the constraints is more emphasised since market participation is both a cause and a consequence of development (Boughton *et al.,* 2007). Households net position does not only depend on market prices but also on the ability of the households to access productive technologies and adequate public and private goods (Barrett, 2008). To this moment, macro and trade policy interventions have failed

to stimulate market participation by smallholder farmers and also agricultural and rural transformations.

Formation of farmer marketing organizations has been one of the initiatives in Kenya to supplement public and private sector initiatives to promote active involvement of smallholder farmers participation in the markets (Shiferaw, 2009). Farmer marketing organizations are seen as a different way to gain bargaining power in the value chain and a mechanism to improve access to capital and information (Lapar *et al.,* 2010). Participation in collective marketing is more tied to household assets. A study by Obare *et al.* (2009) showed that participation in producer marketing groups decreased with per capita farmland which suggests that households with small land holdings has a higher likelihood of participating in collective marketing. This forms the basis for which collective marketing is a solution tailor made for the resource poor farm households. The test of the effectiveness of a farmer organization is in understanding the extent the rules of conduct and activities are perceived as benefiting its members as an impetus to encourage more farmers to join more beneficial collective marketing.

Results indicate that the decision by smallholder farmers to participate in collective marketing through farmer marketing groups was significantly influenced by a variety of factors including years of formal education of the household head, accesibility of credit, distance to the extension service and average price per bird. The extent of farmers participation was influenced by age of the household head, size of the farm, decision making in groups, off-farm engagement and years of formal education of the household head. Land size had an inverse relationship with the decision to participate in farmer marketing groups though the influence was insignificant.

8.5 Influence of indigenous chicken group marketing on incomes from indigenous chicken enterprise.

Although there is a general agreement that improvement of market accessability can help induce greater investment, income and productivity, there are observed numerous challenges (Golleti, 2005). Commercialization alone has rarely failed to register adverse consequences on household incomes coupled with failures of institutional policies (Von braun, 1995). Policies has for

example failed to address the issue of farmer exploitation by middle men and little efforts has been put in place to shorten the marketing chain.

Banerjee (2004) suggested that the probability of an individual to participate in social activities, to cooperate in various forms of collective action or the provision of public goods and services was negatively related to inequalty measured in terms of wealth. Therefore, a stronger incentive to organize by collective members will arise if they are unable to bear the costs of transactions and the perception that collective action can effectively reduce the costs of commodity transactions (Swallow, 2000). This study evaluates the impacts of group marketing on incomes of smallholder IC farmers in Kakamega County.

Marketing of Indigenous Chicken through Smallholder farmer groups assist in leveraging revenues from the enterprise. Sharing of transport costs by farmers far away from livestock market have led to reduction in transaction costs and ultimately improved incomes from the enterprise. Reduced costs of accessing extension service is also greatly reduced. Despite this observation, the perception by the members towards group marketing remain poor.

Again, membership in groups only have not shown any significant influence on incomes from the enterprise. The gains from group marketing is overshadowed by poor organization and coordination within the groups resulting to members from groups in close proximity to the markets and extension service to transact individually when costs appear bearable. Eventually, they incur higher costs on aggregate compared to farmer groups far away from the market. Farmers in groups far away from the markets would also behave the same way only that covering these costs individually may not be feasible.

8.6 Policy implications

There is need to upscale institutional support to farmer marketing groups for them to realise their potential. This includes capacity building on leadership and management and also on new emerging markets and market requirements to take advantage. This involves for example exploring avenues where farmers opportunities to access better prices can be widened. Contract farming which was missing in IC markets can be explored to see how it can help to ameliorate the problem.

In connection to this and with key importance is the need to develop skills and knowledge on value addition which has the potential to increase farm gate prices by up to 40% (GOK, 2009). This can be done through support to farmers to establish local processing units. Support can be in form of increased accessibility of services such as extension and credit to enable groups to march towards larger markets through acquisition of value addition technologies and improvement of management practices to march the standards demanded by formal markets.

Strengthening of research extension farmer linkage and the quality in delivery of extension service is also required. This can be enhanced through public private partnership (PPP) that would ease the burden of extension service on the government.

In the long run, farmer science centres should be introduced. This is a single window concept where the farmers can get all round agricultural information from subject matter specialists when they visit the centres.

The quality of the extension message delivered through vernacular radio stations should be enriched by giving agricultural programmes more airtime and a wide range of rich extension messages that goes beyond production to include markets.

Smallholder farmers who continue to participate in informal market outlets are most likely to participate in more lucrative and organized formal outlets if their capacity to access credit, market information and the capacity to synthesize this information is enhanced. This should be done through capacity building and creating opportunities for farmer linkage and awareness of other more profitable market opportunities for which he can take advantage.

The market incentives provided by farmer marketing groups should be made clearer to the farmers. More attention should be channelled to efforts to promote these farmer organizations to change the negative perceptions farmers have stemming from their experiences with cooperatives in the 1990s.

In addition, road infrastructure should be improved as an incentive for farmers to participate in formal outlets. It would also open opportunities for farmers to access valuable information apart

from the unreliable one they obtain from informal outlets and that would facilitate informed decision making on outlet choice.

Incentives such as involvement of youth in group leadership and improvement of group management practices through capacity building and training should be more aggressively addressed. It should also involve county level policies in exploring opportunities for young farmers within the devolved systems of governance on issues such as improved accessibility of credit which also influenced group participation. The positive relationship between rural credit and group participation indicate the need to avail information and awareness among the youth on such government funded financial packages such as the Uwezo Fund for women and youth and how they can manage the fund to improve the effectiveness of groups in addressing market accessibility and participation.

Road networks need to be improved as an impetus for improved efficiency of farmer marketing groups in promoting market participation. The high transaction costs incurred and that forms a major determinant of group participation can greatly reduce with improved road networks to facilitate accessibility of markets especially during the rainy season.

The failure of gender to influence participation in group marketing is an indication of improved accessibility of productive resources by women and female headed households and also their voice in making marketing decisions.

There is need to build the capacity of the farmer groups inorder to realise their full potential. The key focus should be on improvement of the organization and coordination of group activities especially marketing inorder to improve the perceptions by the members.

8.7 Suggestions for further research

This study looked at the influence of marketing indigenous chicken through groups on the incomes from the enterprise before the full implementation of the new constitution dispensation. Further research therefore can be done to look into how interventions both at policy or implementation level by new county government of Kakamega and other counties where indigenous chicken enterprise is prominent are impacting on the enterprise inorder to arrive at the most appropriate model.

The study was only undertaken in Kakamega County but indigenous chicken are widely kept in other regions of Kenya. Further research could be carried out in those other counties where indigenous chicken enterprise is prominent to validate the results from this study.

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QUESTIONNAIRE

This study focuses on "*Participation in indigenous chicken Markets for Smallholder Farmers in Kakamega County*. Your participation in the study is voluntary, and all information will be treated as confidential and will be combined together with responses from other 196 households for analysis.

Household Number **HHID**_____

Date: (dd /mm /yy) **SURDATE**_____

Household Name **HHNAME**_____

Respondent(s) **RESPNAME**_____ **MEM**_____

(Instruction: Record the member number of the Respondent from the Demography table on page 3 after the survey is completed)

Respondent(s) **RESPONDENTS PHONE NUMBER**_____

Identifier Variables:

Supervisor:	_____	**SNUM**	_____
Enumerator:	_____	**ENUM**	_____
Province:	_____	**PROV**	_____
County:	_____	**COUNT**	_____
District:	_____	**DIST**	_____
Division:	_____	**DIV**	_____
Location:	_____	**LOC**	_____
Sub-Location:	_____	**SUBLOC**	_____
Village:	_____	**VIL**	_____

Sample : *1=Group member* *0=Non- member* **SAMPLE** _____

Group Name**:** **Group**_____

GPS Coordinates

(North=1, South=2) **NS**_____ **HH1**_____._____ **dd**

East **HH2**_____ ._____**dd**

Altitude MT. a.s.l **MASL**_____

Q1. DEMOGRAPHIC CHARACTERISTICS OF HOUSEHOLD MEMBERS (as at the time of the interview)

Demography.sav *(Key variables: hhidmem)*

Member ID	Name of HH member	What is the **sex** of member? ***1=male*** ***2=female***	Marital Status ***See codes below***	**Relationship** to **current** head ***See code below***	What is the **highest** level of education completed? ***See codes below***
mem	**name**	**gender**	**mstatus**	**rshead**	**heduc**
1 (head)					
2 (spouse)					
3					
4					

Relation to head (rshead)

1= head
2= spouse
3= own child
4= Others

Marital Status (mstatus)

1 = single
2 = married
3 = divorced
4 = widowed
5 = separated
6 = other (specify)

Education levels (heduc)

-9=None	0=pre school	13=form 5	14=form 6
1=std 1	2=std 2	15= college 1	16= college 2
3=std 3	4=std 4	17= college 3	18= college 4
5=std 5	6=std 6	19=univ 1	20=univ 2
7=std 7	8=std 8	21=univ 3	22=univ 4
9= form 1	10 = form 2	23=univ 5 & above	
11=form 3	12=form 4		

INDIGENOUS CHICKEN PRODUCTION AND SALES

Q2a. Over the past one year, did anyone in your household own indigenous chicken? *1=Yes 0= No (If No, go to Q3)* CHICKEN_____

Q2b. Please complete the following table on the household's indigenous chicken over the past 12 months *(*May 2012-April 2013*)*

Chicken.sav (*Key variables: hhid) Reference period:* May 2012 to April 2013

Current average value (Kshs) per unit	Number **purchased** and average purchase **price per** unit ***May 2012- April 2013***		Number died ***May 2012-April 2013***	Number consumed ***May 2012-April 2013***	Number sold and average unit price when sold (Ksh) ***May 2012- April2013***		**Mode of sale** 1=Through farmer group 2=Individually	**Buyer type** 1=Small trader 2= Wholesalers 3=Exporter 4=Processor 5=Supermarket 6=NGO 7=Consumer 8=Broker 9=Other (specify)	**Why did you sell to this buyer?** 1=Only available 2=Better prices 3=Nearest 4=Contractual arrangement 4= Other (specify)	**Distance (KM) to this buyer**	**Mode of transport to point of sale** 1=Human 2=Bicycle 3=Motor cycle 4=Car 5=Donkey 6=Cart 7=Other (specify)
	Number	Price			Number	Price					
Curval	**npurch**	**price**	**died**	**consume**	**sold**	**sprice**	**slmode**	**buyer**	**whybuyer**	**Buydist**	**tmode**

Q2c. Over the past 12 months (**May2012-April 2013**), how much money (Ksh) did **you** spend on the following inputs and services on indigenous chicken?

Purchased feeds **PUCHFEED_____**

Home produced feed (if you were to purchase) **HOMFEED_____**

Veterinary services & vaccination **VETSERV_____**

Deworming **DEWORM_____**

Pest control **PEST_____**

Natural fertilization **COCKSERV_____**

Water **WATER_____**

Other input/service (specify) **OTHCOST_____**

Q2.d. What attributes do buyers of indigenous chicken look for in the bird?

CATTRIBUTE1_____ CATTRIBUTE2_____ CATTRIBUTE3_____ CATTRIBUTE4_____
1=Colour 2=Size 3=Disease-free 4=Pest-free 5=Cleanliness 6=other (specify) _____

Q2.e What constraints, if any, do you face in marketing indigenous chicken (***Rank in order of importance***)?

CMKTCONST1_____ CMKTCONST2_____ CMKTCONST3_____ CMKTCONST4_____
1=Lack of demand 2=Low prices 3=High cost of transport 4=Unfavorable contractual arrangement 5=Other (specify)_____

PARTICIPATION IN FARMER GROUPS

Q3 a. Do **you** or **any member** of this household belong to **any group or organization?** *1=Yes 0=No [**skip toQ3.c**]* **GROUP_____**

Q3 b. List all the names and ID of members of the household who belong to any group and answer subsequent questions
Group.sav

Name & ID of household member who belongs to a group *(May have multiple lines with the same ID number, if that person belongs to multiple groups.*		Which activity/ enterprise(s) does this group deal with? i.e. Group type		How much (Ksh) is membership fee	What services does the person get from the group? 1=credit/loan 2= marketing 3= input purchases 4=savings 5=joint extension services 6=market information 7=water catchment 6=other (specify)	Are you **satisfied** with the services received from the group? 1=Satisfied 2=Dissatisfied 3=Indifferent (Neutral)	If you are **dissatisfied** with the services received from the group why? 1=lack of skilled leadership 2=mismanagement of resources 3=lack of commitment by members 4=lack of democracy 5=Other (specify)_		What benefits does the person derive from participating in the group? 0=None 1= information 2=higher prices 3= credit/loan 4=ready market 5=other (specify)				In your experience, what are the three most important capacity building needs of this group? 0=None 1=record keeping 2=market linkages 3=lobby & advocacy 4=organizational skills 5=group dynamics 6=management skills 7=fundraising skills 8=other specify		
name	**mem**	**grpent1**	**grpent2**	**fee**	**service**	**stfac**	**distfc**	**distfc**	**befit1**	**befit2**	**befit3**	**befit4**	**capned1**	**capned2**	**capned3**

Q3 c.If you or any member of this household do/does not belong to any group or organization, why?

NOGROUP1_____ NOGROUP2_____ NOGROUP3_____ NOGROUP4_____

1=No group to join 2=Do not have time for group activities 3=Groups are not beneficial 4=Other (specify)_____

TRANSACTION COSTS

Q4a. What are your main sources of information on agricultural production and marketing? **FINFO1____ FINFO2_____ FINFO3_____**

1=Government organizations
2=Non-governmental extension agents
3=Other farmers
4=Farmers organizations / Cooperatives
5=Radio
6=Mobile phone
7=Newspapers
8=Farmers' magazines /newsletters
9=Input dealers
10=Field days /demonstrations
11=Extension leaflets
12=Agricultural shows (ASK)
13=Internet
14=Private service providers
15=Research institutions
16=Commodity traders
17=Other (specify) _____

Q4b. How much does it cost you to access information from any of the above sources in the past three months? Use the table below.

Information Source	**Cost incurred in Ksh**
Government organizations	
Non-governmental extension agents	
Other farmers	
Farmers organizations / Cooperatives	
Radio	
Mobile phone	
Newspapers	
Farmers' magazines /newsletters	
Field days /demonstrations	
Extension leaflets	
Agricultural shows (ASK)	
Internet	
Private service providers	
Research institutions	
Commodity traders	
Other (specify)	

Q4c. How much does it cost you to transport chicken products to the point of sale (Ksh) ……..?

Q4d. How much time does it take you to bargain and agree on the price.....?

HOUSEHOLD INCOME

Crop income

Q5a. How much income did the household receive from **crop** enterprises in the 2012/2013 cropping year? (**Enumerator: Fill in either quantity & prices or approximate value of production**)

Crop income.sav

Enterprise		Quantity produced and unit		Price for largest sale/Prevailing price	Approximate value of production
		PRODQTY	UNIT	CPRICE	PRODVAL
Cereals					
Maize	**1**				
Wheat	**2**				
Rice	**3**				
Other cereals	**6**				
Pulses& oil crops					
Beans	**7**				
Cowpeas	**8**				
Green grams	**9**				
Pigeon peas	**10**				
Ground nuts	**11**				
Other pulses & oil crops	**12**				
Roots & tubers					
Irish potatoes	**13**				
Sweet potatoes	**14**				
Cassava	**15**				
Other roots & tubers	**17**				
Vegetables					
Sukuma wiki	**18**				
Tomatoes	**19**				
Cabbages	**20**				
Other vegetables	**21**				
Fruits					
Bananas	**22**				
Avocado	**23**				
Mango	**24**				
Passion fruit	**25**				
Other fruits	**26**				
Cash crops					
Tea	**27**				
Coffee	**28**				
Sugarcane	**29**				
Other cash crops	**30**				

Unit codes: 1=90kg bag 2=kg 3=crate 5=number 6=bunches 9=gorogoro 10=ton 11=50kg bag 12=debe

Livestock income

Q5b. How much income did the household receive from **sales of livestock** between May 2012 and April 2013? (**Enumerator: Fill in either number & average price or total revenue**)

Livestock sales.sav

Livestock species		**Number sold and average price per animal price**		**Total revenue (Ksh)**
		NSOLD	**ANIMPRICE**	**LSTREV**
Cattle	**1**			
Goats	**2**			
Sheep	**3**			
Chicken - Indigenous	**4**			
Chicken – Improved	**5**			
Other livestock	**6**			

Q5c. How much income did the household receive from **livestock products** between May 2012 and April 2013? (**Enumerator: Fill in either quantity & prices or approximate value of production**)

Livestock products.sav

Enterprise		**Quantity produced and unit**		**Price for largest sale/Prevailing price**	**Approximate value of production**
		LPRODQTY	**LUNIT**	**LPRICE**	**LPRODVAL**
Cow milk	**1**				
Goat milk	**2**				
Eggs	**3**				
Honey	**4**				
Fish	**5**				
Other products	**6**				

Off-farm income

Q5d. List all off-farm income (including remittances, dividends and pension) earned by all household members May 2012 and April 2013.

Off farm income.sav

Person name (*As in demography table)*	Person ID (*As in demography table)*	Which **Income earning activity (ies)?** *(See activity codes below)*	Months involved in the activity in the last 12 months	What was the monthly estimate of income (Kshs) from this activity
NAME	**MEM**	**ACTIVITY**	**ACTMONTH**	**INCMONTH**

Infrastructure

Q6. Distances (km) from your homestead *(-7=service not available).*

What is the distance from your homestead to the **nearest agricultural extension service provider**? **DEXTN_____**

What is the distance from your homestead to the **nearest animal health service provider**? **DVET_____**

What is the distance from your homestead to the **nearest market place** for **farm produce**? **MKTKM_____**

What is the **type of the road** from your homestead to the **nearest farm produce market**? (***use codes below***) **RDAGMKT_____**

What is the distance from your homestead to the **nearest livestock market place**? **ANIMKT_____**

What is the **type of the road** from your homestead to the **nearest livestock market place**? (***use codes below***) **RDLSTMKT _____**

Road type codes: *1=murrum /all weather 2=tarmac 3=dry weather 4=foot path.*

Thank you