INFLUENCE OF COMMON INTEREST GROUP MEMBERSHIP ON PRODUCTIVITY OF SMALLHOLDER INDIGENOUS CHICKEN ENTERPRISE IN KISUMU EAST SUB-COUNTY KISUMU COUNTY KENYA

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DECLARATION AND RECOMMENDATION

Declaration

I hereby declare that this is my original work and has not been presented in this or any other University for the award of a degree.

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Recommendation

This work has been submitted with our approval as University Supervisors.

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DEDICATION

This Thesis is dedicated to my family for their patience and understanding during my stay away from home. It is also dedicated to my parents for educating me and to all my children, brothers and sisters who aspires to learn.

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ABSTRACT

Extension strategies that stimulate commercialization of smallholder farming aim to increase agricultural productivity. The National Agriculture and Livestock Extension Programme (NALEP) working with smallholder farmers introduced Common Interest Groups (CIGs) approach. CIG is a congregation of farmers brought together for the purpose of imparting technologies to increase farm productivity. When farmers come together through indigenous chicken Common Interest Groups, it is expected that this would influence productivity of indigenous chicken. However influence of common interest group membership on productivity of indigenous chicken among smallholder farmers remains unclear despite efforts put in promoting membership. The study determined the influence of CIGs membership on productivity from smallholder indigenous chicken enterprise. This may enhance other stakeholder strategies to use CIGs as avenues to improve indigenous chicken productivity. Study population were the smallholder indigenous chicken famers who belonged to IC CIGs. The study used Cross-Sectional survey design and 135 respondents were randomly selected from 20 active indigenous chicken CIGs. Data was collected using open and closed-ended questionnaire. Validity of the instrument was checked and its content reviewed. Reliability of the intrument was tested using Cronbach's Alpha Coefficient. A reliability coefficient of 0.801 was obtained. Data was analyzed through Statistical Package for Social Sciences. Descriptive statistics used included frequencies, percentages and means. Null hypotheses were tested at 0.05 level of significance. Inferential statistics used were Chi- square (McNemars) test and Simple paired t-test on collected data. The study revealed significant influence of CIGs membership on management practices, quantity of products and income from indigenous chicken ($p<0.001$). In conclusion, membership of Common Interest Groups influences positively the productivity of indigenous chicken enterprise. The study recommends that for improved indigenous chicken productivity, farmers to join and participate in Common Interest Groups. It further recommends other development organizations to use CIG members to enhance indigenous chicken products and income thus support it's commercialization along the value chain.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS ACRONYMS

CIGs	Common Interest Groups
DAO	District Agriculture Officer
DFID	Department for International Development
DIVIT	Divisional Implementing Team
DLPO	District Livestock Production Officer
FA	Focal Areas
FAO	Food and Agriculture Organisation
GDP	Gross Domestic Product
GOK	Government of Kenya
HH	Household
IC	Indigenous Chicken
ICCIGs	Indigenous Chicken Common Interest Groups
ILRI	International Livestock Research Institute
MOA	Ministry of Agriculture
MoARD	Ministry of Agriculture and Rural Development
MOLD	Ministry of Livestock Development
NACOSTI	National Commission for Science, Technology and Innovations
NALEP	National Agriculture and Livestock Extension Programme
NASEP	National Agricultural Sector Extension Policy
NWSCP	National Water and Soil Conservation Programme
ODP	Organizational Development Process
RIU	Research Into Use
SIDA	Swedish International Development Cooperation Agency
SMS	Subject Matter Specialist
SPSS	Statistical Package for Social Sciences
SRA	Strategy for Revitalisation of Agriculture

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Agriculture directly influences economic growth, poverty reduction and environmental sustainability (Wold Bank, 2008). Kenya government not only consider agriculture as a key economic growth driver in achieving Sustainable Development Goals (SDGs), but also as one of the strategies in the economic pillars of Vision 2030. To raise income from agricultural products, Kenya envisaged an innovative commercially oriented Agriculture. One of its strategies involved is to increase agricultural productivity. Agricultural extension is an integral component in agricultural development. In the recent years extension has changed its' role to facilitate food value chain to match the changing demands and expectations of farmers and entrepreneurs. Due to these changes a national agricultural extension strategy that can effectively accommodate the dynamics of production is important to agricultural development (Swanson, Singh & Reddy, 2008). The dynamics of evolving agriculture extension includes: sustainable development, food security, equity and inclusion, commercialization and institutional pluralism on participatory approach. Following the structural adjustment programmes of the mid-1980s in several Sub-Saharan Africa states, governments relinquished support to state controlled co-operatives. As a consequence of this, farmer groups emerged in the policy agenda to fill the institution vacuum (FAO, 2010).

In Kenya, various agricultural extension approaches have been used since 1902 to improve agricultural production. Some of these includes: Farming Systems, Training and Visit (T&V), National Extension Programs I and II and the most recent, the National Agriculture and Livestock Extension Programme (NALEP). NALEP was a National Programme supporting agriculture extension in Kenya, operating in more than 72 districts by then, located in 5 provinces. It was a component of National Agricultural Sector Extension Policy (NASEP). Implementation of NALEP was influenced by several policy documents and frameworks. An example is the Economic Recovery Strategy for Wealth and Employment Creation (ERS) 2006 document (MOA & MOLFD, 2006). NALEP was funded both by Kenyan Government and the Swedish Development Co-Operation (SIDA). It had several

objectives. One of which was to improve economic growth and livelihood of the poor. NALEP directed considerable efforts towards capacity building, empowerment and dissemination of agricultural technologies. One of its implementation frameworks was formation of Common Interest Group (CIGs) to transform subsistence farming into profitable commercial enterprise through increased productivity. Common Interest Group (CIG) is a group of farmers having a common interest that often provides a basis for function. Farmer groups in Kenya like in other parts of the world were formed mainly with a social and economic function (Agarwal, 2010). The importance of these groups were underlined by the fact that the government and development agencies preferred to serve communities through organised groups (NALEP, 2001). The CIGs went through practical trainings so as to improve on management capacities and enable them connect to other input and markets sources.

NALEP used a process whereby in a selected district, a District Stakeholder Forum selects a division where few or no development agencies were active. Division Stakeholder Forum was established consisting of male and female farmers, projects and Non-Governmental Organization (NGO) representatives, commercial representatives, and Community Based Organizations (CBOs). The Division extension team, together with Field extension workers, carried situation analysis including poverty mapping and individual farm planning. Relevant opportunities were identified and Common Interest Groups (CIGs) were formed based on farmers' choices. These CIGs were the foundation for NALEP extension service provision. A Focal Area Development Committee (FADC) was democratically elected, trained and acted as coordinators of extension and local development work. It was expected that after a year in a focal area, FADC was to link groups with othe stakeholders (MOA, 2006).

Common Interest Group (CIG) is a group of persons having a common identifying interest as a basis of its function. NALEP provided technical packages to CIGs to enable them engage in agribusiness. It embraced a shifting Focal Area (FA) approach which was locational based and encompassed participatory approach extension. CIGs are 20 to 25 farmers who willingly come together to produce and market a commodity of common interest. CIGS acted also as avenues for technology dissemination,

networking with other service providers, holding farm demonstrations and trainings for other farmers (MOA & MOLD, 2009). The concept of formation of CIGs aimed at empowering the farming communities to take up agri-business opportunities that are market based and driven.

Over the years, indigenous chicken co-existed with mankind as part of the range of domesticated livestock. The importance of indigenous chicken (IC) in the farming systems set-up is said to be increasing due to a number of reasons. Most important being the relatively small space allocation that the enterprise demands as compared to the larger livestock types and crop enterprises (Waithaka, Thornton, Heneto & Gonzale, 2005). The availability of the IC across homesteads and various types of farm families also suggests the level of their popularity based on some desirable factors.

Kisumu East Sub-County indigenous chicken population is estimated at 48,000 and is kept in almost every rural household for family food and income (MOLD, 2011). Majority of the households (87%) still keep these chicken for subsistence and maintain them under various levels in productivity (Teketel, 1986; Tadelle, Kijora & Peters, 2003). Enhanced indigenous chicken productivity is considered a potential pathway out of poverty for the rural household (Upton, 2003). The economic pillar of Kenya Vision 2030 is to promote food security reduce poverty and improve livelihoods. Indigenous chicken contributes towards the fulfillment of this vision and may contribute towards reaching the Millennium Development Goal number one objective (To reduce by half the number of people living in absolute poverty, by 2015), if practiced as agri-business.

Over ten years of NALEP implementation in Kisumu East sub-county, forty (40) indigenous chicken CIGs were formed, registered formally and trained in different focal areas within the sub-county. NALEP's aim was to transform subsistence indigenous chicken productivity into market oriented production through trainings on poultry management practices like housing, feeding, diseases control and breeding. Adoption of these practices would impact on reduced chicken mortality, improved

egg hatchability, healthy and increased flock. This would result into increased market volumes thereby improving the farmers' livelihood.

1.2 Statement of the Problem

Strategies to reduce food insecurity and improve economic status of the rural small scale farmers have been wanting in most developing countries**.** Kenya implemented various agricultural extension progamme in order to improve agricultural productivity so as to reduce poverty. Key to this was the National Agriculture and Livestock Extension Programme (NALEP). NALEP used resources to train small scale farmers within different focal areas in order to transform subsistence farming into market oriented and income driven enterprises. It encouraged the formation of Common Interest Groups (CIGs). The formation of CIGs was to involve the members in joint trainings, production and marketing of various agricultural products. When farmers come together through indigenous chicken Common Interest Groups, it is expected that this would influence productivity of indigenous chicken. However influence of common interest group membership on productivity among smallholder IC farmers remains unclear despite efforts put in promoting membership since 2002, hence the reason for the study.

1.3 Purpose of the Study

The purpose of the study was to determine the influence of Common Interest Group membership on productivity from smallholder indigenous chicken enterprise in Kisumu East sub- county, Kisumu County**.**

1.4 Objectives of the Study

The following specific objectives guided the study**:**

i) To determine changes in indigenous chicken management practices associated with Common Interest Group membership.

ii) To establish the changes in quantity of indigenous chicken products and by-product associated with Common Interest Group membership.

iii) To determine the effects of Common Interest Group membership on income from indigenous chicken production.

1.5 Hypotheses of the Study

The study was guided by hypotheses derived from the objectives:

$H0_1$. Common Interest Group membership has no statistically significant association with indigenous chicken enterprise management practices.

$H0_2$. Common Interest Group membership has no statistically significant association with quantity of products and by-product produced from indigenous chicken enterprise.

$H0_3$. Common Interest Group membership has no statistically significant effect on income from indigenous chicken enterprise.

1.6 Significance of the Study

The study determined the influence of CIGs membership on productivity from smallholder indigenous chicken enterprise in Kisumu East sub-county. Indigenous chicken (*Gallus domesticus*) play important roles in the livelihood of rural households in western Kenya (GOK, 2005). By documenting the influence of Common Interest Group membership on smallholder indigenous chicken productivity, future extension programmes that would transform indigenous chicken from subsistence to commercial would be able to apply and promote the approach to imrove indigenous chicken production. Other extension providers may use the findings to enhance the packaging and delivery of technologies and services. Implementers of participatory extension approach may use the finding to consolidate the benefits of group approach and membership of CIGs to strengthen extension delivery. The study may enable farmers to make informed choices regarding membership, which may help them access technologies, network with other key players in the agricultural sector, improve their income and food security thus reducing poverty levels within the sub-county and other similar parts of the country.

The study may help group members to create and sustain working partnership with extension, research and other actors in the poultry sector. Finally policy makers may use the outcome in formulating strategies to facilitate extension programme and implementation. The study also adds value to the pool of knowledge on indigenous

chicken productivity as a way to rural development and a pathway out of poverty in Kisumu County where keeping of indigenous chicken is popular.

1.7 Scope of the Study

The study was confined to NALEP focal areas within Kisumu East sub- county. It focused on changes ealised in management practices, production volumes and income attributed with CIG membership. The independent variables of the study were membership before and as members, intervening variables were National Agricultural Extension Policy and Extension delivery, while dependent variables were the management practices quantity of products and by- product and income.

1.8 Assumptions of the Study

This study was guided by the following assumptions:

i) The farmers who were involved in indigenous chicken Common interest groups were trained in the enterprise and that they gave honest information.

iii) The influence of National Agriculture Sector Extension Policy (NASEP) was significantly uniform among the members in the sub-county.

iii) Social, political and policy environment were common to all farmers.

1.9 Limitation of the Study

The study relied not only on farmers' ability to recall but also on indigenous chicken records kept to capture the needed data. This limitation was addressed by using a larger sample size to minimize the error.

1.10 Definition of Terms

The following definitions of terms were adopted in the study:

Artificial Brooding: To protect (young) by or as if covering with wings. In the study this referred to the use of artificial brooder or other sources to brood the chicks other than the mother hens.

Commercial Feed Supplements: Nutritive Materials which are feed stuffs in their nature and are added to a basic diet to supplement its deficiencies. In the study this referred to any purchased processed or non-processed nutritive materials that were added to basic indigenous chicken diet.

Common Interest Group: Farmers who voluntarily come together to produce and market commodity of common interest (MOA & MOLD, 2006). In the study it referred to groups of 20 to 25 farmers in a focal area who came together to produce and market indigenous chicken.

Empowerment: The process and outcome of possessing the capacity to make effective decisions that translate the choices into desired actions and outcomes. (Danida, 2004). In the study this referred to the ability of the Common Interest Group members to make decisions that translate into increased indigenous chicken productivity.

Income: The monetary payment received for goods or services or other sources. The study looked at this as monetary payments received from sale of chicks, growers, hens, cocks, eggs and manure.

Indigenous Chicken: Produced, growing, living or occurring natural in a particular region or environment KARI, (2006). In the study it referred to chicken produced, grown, live and occur naturally in Kisumu East sub-county.

Management practices: These are the practices used by the CIGs to improve their production and profitability of the enterprise. (Njue et al., 2006). In the context of this study, the indigenous chicken management practices referred to breeding and selection of cocks, indigenous chicken housing, supplementay feeding, vaccination and artificial brooding.

Before Membership: These were smallholder indigenous chicken farmers before joining indigenous chicken common interest groups.

As Members: This refered to smallholder indigenous chicken farmers as members of IC CIGs who participates actively as group members in the production of indigenous chicken (MOA & MOLD, 2006).

Productivity: This is output from unit of input employed in production over a period of time. (Griliches, 1987). In the study indigenous chicken productivity referred to products, by-product and income from chicken enterprise. It included number of Chicks, growers, hens, cocks, eggs, manure and income from indigenous chicken got in a year.

Smallholder farmer: A farmer owning less than 4 acres of land (GoK, 2005). In the study it also refers to farmers keeping 25 and above indigenous chicken.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

The chapter covers the literature related to Common Interest Group concept, capacity building of Common Interest Groups, indigenous chicken productivity (management practices, products and income). It also covers the theoretical framework on productivity from subsistence to commercial and conceptual framework that illustrates the influence of CIG membership on productivity.

2.2 Agriculture Extension

Improvement in general agricultural productivity and sustainability will depend on farmers willingness and access to new technology. Agricultural extension and advisory services play important roles in addressing these challenges. Extension is one of the critical inputs in the growth of a modern agriculture. The role of extension in information dissermination and connecting farmers to other players in the economy is very vital especially to developing countries. During the second half of the twentieth century, most national extension systems primarily focused on transferring agricultural technologies that would increase the productivity of major crop and livestock production systems in achieving national food security (Li, 2008). In addition, because extension's primary focus has been on technology transfer for the major food crops, it also played an instrumental role in building social capital to agricultural development strategy. However inorder to improve rural livelihoods, it is important to organize farmers into different types of producer groups (same as interest groups) and then help link these groups to markets (Swanson et al., 2003).

Extension services are organized and delivered in a variety of forms, with the ultimate aim of increasing farmers' agricultural productivity and income. The question is how can farmers access knowledge, information on improving practices along the value chain to adopt increase yield and income? The success of extension in achieving this will however depend on the extension approach, credits and markets. In Africa farmer groups are important interventions due to the fact that they are being used to reach or communicate to other farmers on agricultural issues. The use of innovative approaches and strategies to increase coverage is therefore a concern for all involved

in agriculture extension and advisory services. Farmer groups in the wold provide farmers with economies of scale, access to information on structural adjustment programmes (SAPs) that were initiated in the eighties (FAC, 2009).

Many extension approaches have been used in Kenya to disseminate technologies to farmers. The approaches include whole farm integrated agricultural development, Training and Visit (T&V), regulatory advisory educational and participatory extension approaches (MOA & MOLFD, 2005). All extension approaches had different approach towards improving agricultural productivity. Early extension models in Kenya were through State extension service to farmers geared towards agricultural development (McMillan, Hussein & Sanders, 2001). These approaches were top-down where farmers were not involved in the development of technology. State extension had little success in the transfer of technologies to farmers. In response Farming Systems Research and Extension (FSR/E) evolved. This approach was marked by participation at the farm level through farmer inputs, on-farm trials and interdisciplinary linkages and systems approach to extension. The linkages were between Farmers, Researchers and Extension workers.

Word Bank in 1982 funded the Training and Visits (T&V) extension system in Kenya. This system was successful in Turkey and India. The T&V model attempted to reach more farmers through individual contact. Being highly structured, it used top-down extension approach characterized by group discussions, seminars and in-service training courses for extension staff and farmers, on-farm demonstrations and farmer field days . Specific tools were: contact to a determined number of farmer groups, handouts and technical fact sheets. T&V had been designed as a cost-efficient extension system. In 1990, Structural Adjustment Programmes began in Kenya instituted by World Bank and International Monetary Fund (IMF) to kick start the ailing economy. The programme included liberalization of markets, reforms of parastatal organizations, removal of foreign exchange controls and recorgnization in agriculture service delivery MoARD, (2001).

Kenya until 1998 had provided agricultural extension services through the Ministry of Agriculture and Livestock Development (MoALD). National extension Programme

(NEP) I and II were used by the Ministry to implement extension service division. The approach which adopted "top- down" and supply driven failed to meet farmer demands (GOK, 2002). National Soil and Water Conservation Programme (NSWCP) approach as a complementary extension service by Land Development Division used farmer participatory approach to determine the type of extension support farmers demanded. It adopted a shifting catchment Focal Area (FA) approach to reach interested farmers during an intensive one year support period. In 1998 the Ministry of Agriculture and Rural Development (MoARD) decided to adopt the NSWCP approach to advisory services on crops and livestock production. This led to inception of National Agriculture and Livestock Extension Programme (NALEP). NALEP adopted NSWCP shifting focal area approach. This involved deploying specialized skills and resources in one selected focal area with the purpose of solving farmers' specific problems (Taiy, 2009). NALEP's implementation framework encouraged formation of CIGs. The CIGs were meant to handle the production and marketing of commodities of agricultural interest for income generation (MoARD, 2001).

2.3 Farmer Groups

Farmer groups are usually formed to facilitate access to better agricultural technologies, improve access to better earnings, markets for produce, facilitate produce transport to markets, financial security and household investments, access to credit where groups members acts as collateral for each other, (Mbowa et al., 2012). Yang & Liu, (2012) reported that Chinese farmers who were farmer group members had higher incomes compared to non-members. Various development agencies have embraced group based approach over the years as an alternative to attaining increased production and ensure sustainability and replicability of development initiatives. For instance, Food and Agriculture organizations (FAO) Peoples Participation Programme (PPP) implemented small-scale projects in rural communities around the world; in Sierra Leone, Ghana, Kenya, Tanzania, Zimbabwe, Zambia, Swaziland and Lesotho, Thailand, Bangladesh, Nepal, Pakistan and Sri lanka. Through these projects, FAO has refined the small group approach development strategy that mobilizes rural people to increase agricultural production, build up capital assets and manage their natural resources.

According to Martaamidjaja & Rikhana, (1996) in Indonesia, the group based approach has enabled the country to move from a net rice importer to self sufficiency, thereby resulting in a decrease in rural population living below poverty line from 21% in 1984 to 14% in 1990. This approach has been successful due to the traditional spirit of *Gotong royong* that upholds mutual help among members. Historical analysis points to the role that group approach has played in shaping the past, present and future of agricultural sector and rural development. Throughout the developing world and in the transitional economies, farmer groups reflect a diverse history of political and economic organization. In Bangladesh, the same approach has been used under International Food and Agriculture Development (IFAD). IFAD funded Marginal and Small Farm Systems Crop Intensification Project with a lot of success; the only difference is based on formation of different groups for males and females. Impact evaluation survey indicated a positive impact on farm incomes, increased livestock numbers and more importantly improved food security from 15% to 60% (Mallorie, 1996).

2.4 Common Interest Group Concept

Common Interest Groups (CIGs) are collections of interested members who come together to work and share information around a unifying issue. This method has been used in many countries like United States of America to bring changes towards various disciplines. The overall purpose of the CIGs is to build upon the shared knowledge and skills of the members to bring change to the community (MoARD, 2001).

Experience from Vietnam indicates that individual farmer challenge is access to extension services and market in a cost effective way. Farmer Interested Groups approach is considered one of the most successful extension models in Vietnam (Tu Huang, 2006). This has made the formation and management of CIGs a process of social mobilization. The capacity of such CIGs depends on the problem identification, prioritization, planning and utilization of local resources, links with market opportunities and preparation of micro plan. According to NALEP, formation of CIGs was to empower the farming communities through trainings, networking, input sourcing, credit acquisition and product marketing in the focal areas. The empowered

CIGs were to take up agribusiness opportunities that are market oriented and driven. The CIGs were to have a clear ambitions and feasible entrepreneural vision (growth plan) after formation and registration with the Ministry of Gender and Social Services. All these were guided by the Divisional technical staff in the relevant focal areas (Taiy, 2009).

The divisional extension staff and other stakeholders promoted agricultural opportunities for the farmers to pick their opportunities of interest. Farmers with the capacity and interest took up the opportunity and registered members belonging to specific CIG. The CIGs were guided by the extension staff to choose their group leaders and formalize the groups. The CIGs had clear ambitious and feasible entrepreneurship vision (growth plan) once members are registered. Together with the extension staff they developed a framework of activities required for enterprise development so as to achieve their goal (MOA, 2006).

According to NALEP implementation framework 2006, the CIG members were trained on organizational development, networking skills, husbandry practices and other management skills. It also focused on enterprise development including markets and marketing. The CIG farmers were trained from the project funds as reflected in the project plan (MOA, 2010). Trainings were based on technical aspects as identified during micro planning process with a view of solving the problems of the CIG. Group leaders were also trained on organizational development process (ODP). Participating farmers for the training had to be selected through CIG meetings depending on the needs of the CIG. To fully equip the CIGs with relevant skills other cross cutting issues such as gender and development, drug and alcohol abuse, democracy, environmental management, health, legal rights and the rest, were also taken into account (MOA, 2010).

2.5 Indigenous Chicken Production

The most common type of poultry kept in rural households is chicken (*Gallus domesticus*) species (Masuku, 2011). Many farmers keep chickens for meat consumption purposes. In the past chickens were exposed to scavenging systems for feed and had minimal supplementary feed. There was no provision for housing, thus

they were characterized by low input and low output. Globally, IC rearing accounts for 30% of white meat consumed in Sub-Sahara Africa and are produced by small-scale farmers. In Kenya, 50% and 60% of meat and eggs respectively come from IC (Kingori, Wachira & Tuitoek, 2010). Rearing IC is reliable, affordable, easier to manage and act as source of household income. Rearing of IC has many advantages which includes unmet market demand for IC meat and eggs (Agriculture and Rural Development (ARD), 2012). This is due to the desirable characteristics of IC, which include leanness, good flavour, presumed organic product and the changing human feeding habits. Supply deficit for IC products worsens during the festive seasons like Easter and Christmas holidays. Though over 90% of small-scale farmers engage in IC rearing, very few of them consider it a commercial enterprise. Indigenous chicken production represents an important system for supplying the fast growing human population with quality protein and income (Gueye, 2009). Human population pressure, the need for high quality versatile foods especially protein and improved income levels have created a tremendous demand for poultry products (FAO, 2002).

Poultry keeping has many benefits to small-scale farmers. Farmers need not keep chickens just for their own home consumption in terms of eggs and meat. They need to rear them to generate a reasonable income to improve their livelihood (Kenya Agricultural Research Institute (KARI), 2006). Farmers producing chicken for the market believed that one can only keep hybrid or exotic breeds for this purpose. Indigenous chickens, if well selected in terms of breed can bring much more income if not, better than the exotic breeds (KARI, 2006).

One of the factors a farmer should look at when going into poultry production of either indigenous or exotic chickens is the cost of production, the market and including prices of each of the breeds. Indigenous chickens have many advantages over exotic breeds. One advantage is they can be fed on home-made feed rations and they can also be allowed to free range, therefore cutting down the amount of feed that the farmer has to give. Unlike exotic breeds, indigenous are tolerant to many diseases, this reduces the veterinary costs. Although exotic breeds are highly productive in terms of eggs and meat, the cost of keeping them including management pactices is a

big challenge to smallscale farmers. This makes indigenous chickens much more attractive to keep.

Over 70% of the Kenyan population live and derive their livelihoods from livestock related enterprises. Out of this, poultry is the most abundant. Kenya has an estimated poultry population of 42 million birds (M0LFD, 2006). From this population 28 million (75%) consist of indigenous chicken kept by over 80 % of the rural households. These birds are mostly owned and managed by resource poor farmers who are mainly women and children (Gichohi, 1992). Despite their numbers, indigenous chicken have low productivity and only contributes 50% to 60 % of the chicken meat and eggs consumed in the country. This low productivity has been attributed to; frequent disease outbreaks, inadequate feed and poor housing, lack of information, knowledge and skills in poultry production (Njue, Kasiiti, & Gacheru, 2006). Chicken management practices (feeding, disease control, housing and production economics) are of importance especially to farmers who want to increase productivity and commercialize. Resource poor farmers who are generally inexperienced in almost all aspects of modern technology needs the knowledge more (Ochieng, Owuor & Omedo, 2011).

2.6 Management of Indigenous Chicken

Due to growth in human population, urbanization, income and changes in eating habits in Sub-Saharan Africa (SSA), McAish & Kristensen, (2004) projects 3.4% growth annually in poultry consumption. The huge demand cannot be met by subsistence poultry production which is predominant among the poor rural households keeping indigenous chicken. According to Gueye, (2003) the management of rural chicken in Africa is a family affair. Construction of chicken house and major decisions on sale of chicken and eggs and consumption of chicken products is under the control of men, while looking after chicken, controlling and utilizing the earnings from the sale of eggs and chicken belongs to women. Similarly, Tadelle and Ogle, (2001) indicated that in Ethiopia, management of chicken is fully in the domain of women, while decision on control and access to resources varies considerably. The poultry of importance in Kenya is the indigenous chicken (*Gallus domesticus*), which accounts for over 80% of the total national poultry population, and between 40% and

60% of the domestic marketed eggs and meat (Upton, 2000). In order to realize increased employment, food and household income, transforming subsistence farming into a commercially oriented economic activity will be vital. This is possible if management practices comprising of improved housing, feed supplementation, diseases control, breeding and chick rearing is adopted and implemented (Ochieng et al., 2011).

Although indigenous chicken are important sources of meat and eggs production, they remain less commercially exploited compared to industrial poultry. The reason being their low productivity. On average cockrels weighs 1.5 kilogram, pullets 1.10 kilograms at 21 weeks of age. Chick survival is 40%, egg laying starts between 24-26 weeks old , an egg weighs 44 grams and a hen produces about 60-80 eggs in a year (Kingo'ri et al.,2010). Organization of individuals into indigenous chicken groups are important to agricultural development (La Ferara, 2002). CIGs as a form of collective group options are faster ways to pass agricultulal technologies to enhance agricultural productivity. The groups are given hands on skills on vaccinations, proper housing, supplementary feeding, genetic improvement and marketing of indigenous chicken (FAO, 2006). Several studies done to improve indigenous chicken productivity have failed to achieve desired outcomes among the smallholder farmers without equipping them with knowledge and skills to enable them commercially exploit the attributes of the chicken (Tadelle et al., 2000). Njue et al. (2006) advices equiping farmers with knowledge and skills for improved productivity. If well managed, indigenous chickens could change the fortunes of many small-scale farmers.

Figure 1: Indigenous Chickens Need Proper Feeding and Housing to be Productive. (Photo TOF)

2.7 Indigenous Chicken Products

Several past efforts to improve indigenous chicken productivity have failed to achieve the desired outcomes. This is when placed with resource- poor farmers without knowledge and skills to enable them commercially exploit the unique attributes of indigenous chicken (Tadelle et al., 2000). To enable the members of CIGs commercialize indigenous chicken production, NALEP equipped CIG members with knowledge and skills on production. Production of indigenous chicken by smallholder farmers is characterized by low levels of inputs and outputs (Okitoi, Ondway, Obali, & Murekefu, 2007) with low productivity. This limits their potential for commercialization. Low productivity contributes to low commercial exploitation of the enterprise despite consumers shift to eggs and meat from indigenous chicken. Increased productivity would attract Commercialization of the enterprise thus increase incomes for the rural households.

Majority of the Kenyan population resides in the rural areas which are characterized by low income, food insecurity and high levels of poverty (GOK, 2007). Indigenous chicken rearing plays a significant role in economic and social life of resource-poor households. It contributes to cheap source of animal proteins and cash income (Kingori et al., 2010). Indigenous chickens are present whenever there are human

settlements and their economic strength lies on their low cost of production (Menge, Kosgey & Kahi, 2010), furthermore, their meat and eggs are in high demand in the market. This is due to the current trends of nutrition management where people mostly in the middle and high classe levels are going back to organic and traditional foods (Kingori et al. 2010). However, their low productivity coupled with farmers' reluctance to take up the enterprise as a commercial venture and a steady source of household income has created a deficit in the market. Low productivity of IC has hindered their exploitation. Indigenous chicken rearing is a hidden treasure that farmers can benefit if only they rear birds in larger numbers. In Kenya IC possesses high genetic diversity and is popular among the consumers. There is potential for improvement of IC production in Kenya given the available genetic and physical resources. Productivity needs to be increased without increased rearing costs or loss of biodiversity.

According to Assefa, (2007), smallholder village chicken owners found in different parts of Africa sell chicken and eggs to purchase food items to cover for school fees, to get cash for grain milling services, purchase improved seeds and to adjust flock size. Eggs from local chicken are often favoured because of their deep yellow coloured yolks. As a result, free ranged local chicken are in higher demand and fetch higher market prices in urban markets International Livestock Research Institute (ILRI), 1995). According to Halima, (2007) the price of chicken is highly related to festive season for the Orthodox Christians, plumage color, comb type, size, age, sex, market site and health status of chicken. The chicken and egg marketing channels are informal and poorly developed. Chicken and eggs are sold to consumers within the villages, on roadsides and in local and urban markets (ILRI, 1995).

2.7.1 Indigenous Chicken By- Product (Manure)

According to Smaling et al. (1997), soil nutrient depletion and declining crop yields are common in Sub-Saharan Africa. Farm income in Kenya is often too low for farmers to purchase enough mineral fertilizers and animal manure to compensate for the outflow of nutrients, (MOA, 2006). Small-scale farmers account for 75% of the country's total agricultural output, decreased agricultural productivity means decreased per capita food production. Poultry manure have become important for crop

production. It enhances the chemical and physical properties of soil, therefore manure is an important asset to poultry (KARI, 2006). The manure contains most essential nutrients required by crop production and its value as an organic fertilizer has been recognisied for centuries. However poultry manure is not used to its maximum potential for several reasons; lack of information on its value as a source of plant nutrients, failure to recorgnize how and when to use it and lack of recorgnition of its economic value (MWPS-18, 1993). Sources of economic losses in poultry business include lack of technical know-how, poor quality feed, poor housing, manure mismanagement and diseases outbreak, (Torimiro et al., 2002)

2.8 Income from Indigenous Chicken

A farm like any other business has to make money to survive. Owuor & Bebe, (2009) in their study found that buyers of indigenous chicken preferred hens followed by cocks and attached preference on weight and high market prices. Their findings recommended training of farmers on market linkages, accessing market information and finally to empower farmers to do selection for improved weight gain through feeding. Indigenous chicken are largely raised by smallholder farmers, the practice provides opportunities for the market growth and health improvement through food provision and income (Ifft, Otte, Nguyen, Roland-Host & Zilberman, 2008). Agricultural productivity is low among smallholder farmers thus gives the farmers low income. Low income reduces re-investment trapping smallholders into a low input low output farming system that leaves smallholder households vulnerable to shocks with low returns (DFID, 2012).

Market growth can be achieved through a well facilitated marketing structure that complements the rural production. Access to markets affects the price and transaction costs and is influenced by access to infrastructure and information (Aklilu, Almekinders, Udo & Vander Zijpp, 2007). Market information to decide what to produce and to negotiate with buyers on when to market and the type of market to supply is important for smallholder farmer for positive returns from indigenous chicken. Attributes such as body weight, size, plumage colors and body condition significantly influence price. Other factors like transport costs, number of traders and presence of market information are all important to the farmers in

making their production and marketing decisions (Aklilu et al., 2007). A well facilitated market structure that complements production to the rural areas can step up market growth. However, Bett, Peters, Kahi, Lagat & Bokenlmann, (2009) report that marketing of indigenous chicken by smallholder sectors is informal and done locally just between farming households who mostly depend on exploitative middlemen buying for the urban markets. This leave farmers with low returns from indigenous chicken. The market failures coupled with nature of trade have enticed producers to rely on subsistence production and poor markeing practices, inspite indigenous chicken fetching higher prices compared to exotic breeds (Bett et al., 2009; Heft-Neal, Kahrl, Otte & Roland-Host, 2009).

2.9 Theoretical Framework

Theoretical Framework for this study was based on Lewis theory of Development, (1984). This is a structural change theory that explains the mechanism of changing structure of underdeveloped economies from subsistence to commercial in rural areas. Lewis postulated that in the rural economy, growth is triggered by the initiation of trade. Farmers are producing not just for consumption but also for the demand in other communities. Intensive intervention will be needed to push the farmers initially to cross the threshold for growth. Growth will naturally push economic activities towards diversity at the community level and possibly (but not necessarily) specialization at the household level.

The Theory was backed up by analytical framework for understanding farmer empowerment by Danida, (2004). Farmer empowerment must result in changes both with regard to the capability of the farmers in groups or individually and the opportunity structures. The CIG membership is an improvement of opportunity structures to enabling environment for agricultural growth and rural development. Common Interest Group extension trainings are specific and relevant to the group. Aspects of trainings are identified during the mobilization and sensitization stages of the CIG formation.

Common Interest Groups have the potential as the platform for joint action and decisions. These actions can change the position of the farmer in relation to the

opportunity structures. The changes can thereby influence the business environment of the farming community. The small-scale farmers through CIG can gain economies of scale in accessing services, markets and farm inputs thus increase their income from their production.

2.10 Conceptual Framework

The Conceptual framework guiding the study is a reflection of Lewis theory of Development, (1984). This is a structural change theory that explains the mechanism of changing structure of underdeveloped economies from subsistence to commercial in rural areas. Analytical framework for understanding farmer empowerment by Danida, (2004) supports CIG membership as an improvement opportunity structures to enabling environment for agricultural growth and rural development. Figure 1: illustrates the envisaged interactions between the independent and dependent variables with intevening variables included. The independent variables were the Common Interest Group membership defined as before and as a member. Before CIG membership was operationalized as the individual small scale indigenous chicken farmer before joining indigenous chicken group. As CIG member was operationalized as the influence of the same small scale indigenous chicken farmer after joining CIG. The dependent variables were operationalize as indigenous chicken management practices, products and by-product produced and income. The intervening variables for the study were National Agriculture Extension Policy and Extension services. National Agricultural Extension Policy supports extension services irrespective of membership in IC CIGs. These variables were studied as intervening variables influencing the dependent variable. Figure 2. The conceptual framework on the influence of CIGs membersip on IC productivity.

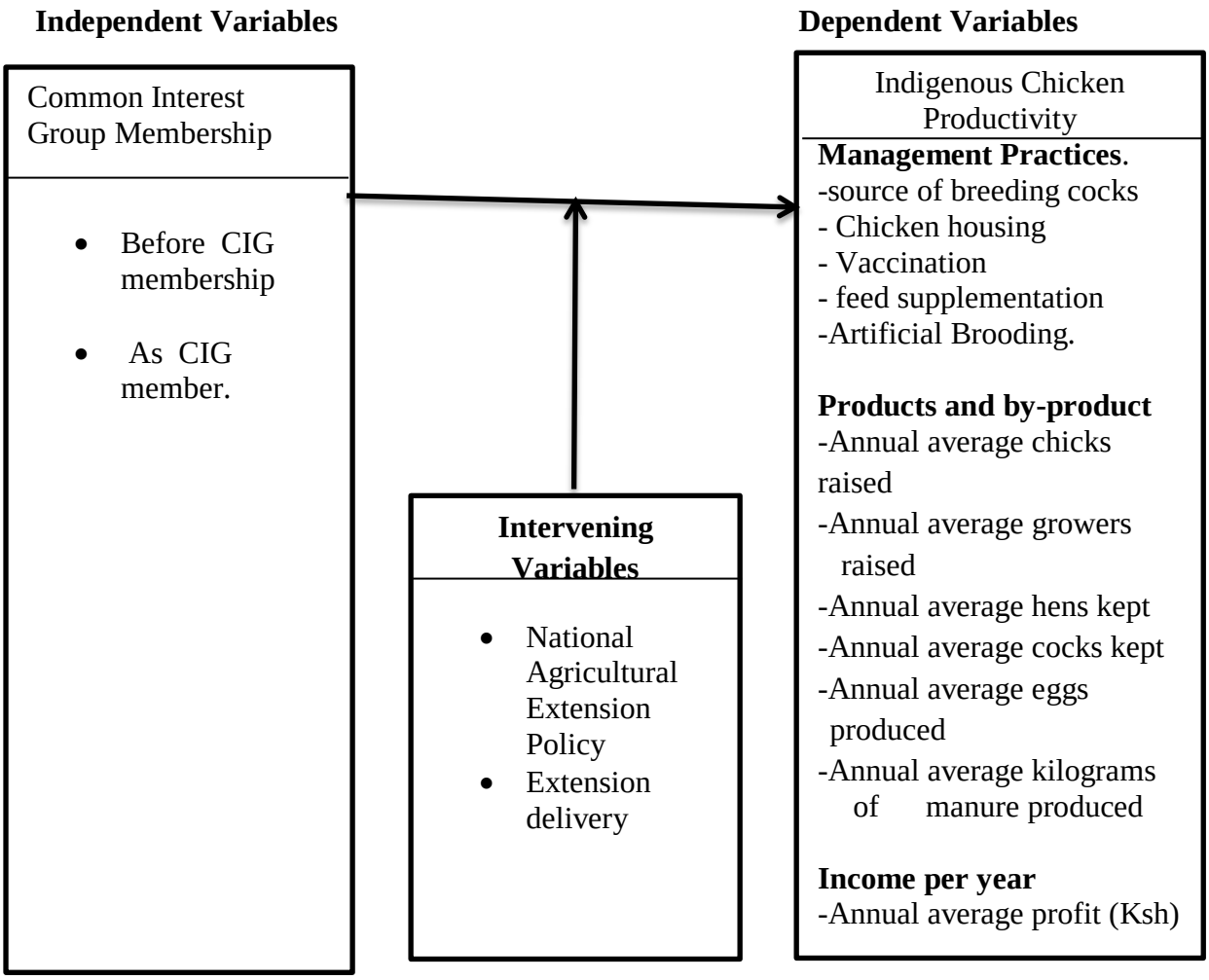


Figure 2: The influence of common interest group membership on productivity of indigenous chicken.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter was presented in five distinct sections; the research design, description of the study area, population, sampling design and technique, data collection and statistical analysis.

3.2 Research Design

The study used cross-sectional survey research design. A cross-sectional survey collects data to make inferences about a population of interest at one point in time (Kombo & Tromp, 2007). The design provides self-reported facts about respondents, and their inner feelings, influence, attitudes, opinions and habits. Cross-sectional Surveys are descriptive and can provide information that is observable and involve data collection at only one point in time (Casely & Kumar, 1988). The design can collect data relevant for assessing the outcomes changed over time without forward and backward timing (Wiersma, 1995). Application of cross sectional survey in social research is adequate for describing the characteristics of a population under study (Kathuri & Pals, 1993; Fraenkel & Wallen, 2000). It is cost effective and explanatory, thereby enabling the researcher to make inferences though not of the level of cause and effect relationships (O'Connor, 2002).

3.3 Study Location

This study was carried out in Kisumu East sub -county which is one of the sub-counties in Kisumu County. The sub- county has two administrative divisions namely; Winam and Kadibo with twenty locations and fifty five sub- locations. The Sub-county borders Kisumu West and Nyando sub- counties in Kisumu County and Vihiga County. Kisumu East sub-county was chosen because most of the households predominantly keep indigenous chicken as a source of food and income. It was also one of the sub-counties that implemented NALEP programme from the year 2000 to 2011.

Kisumu East sub-county covers an area of 557.7km^2, supports estimated population of 653,593 ((Kenya 2009 populaton census). The sub-county lies at an altitude range

of 1100m to 1800m above sea level and experience an average temperature range between 20°$_c$ to 38°$_c$. The mean annual rainfall varies with the altitude and proximity to the highlands along the Nandi escarpment and Tinderet. The sub-county receives mean annual rainfall of 1200mm. The lowland areas receives annual rainfall between 1000mm and 1800mm. The reliability of the rains is low and poorly distributed over a long period (GOK, 2010). The economy of the sub- county is mainly agrarian, as agriculture is the main occupation of the people. Food crops such as cassava, sweet potatoes, maize, rice, vegetables are grown in the area. Livestock produced and kept includes cattle, sheep, goats, poultry and fish. The major challenges to agricultural productivity in the study area are impact of HIV/AIDS, Malaria, water-borne diseases and the fluctuating climate.

3.4 Target Population

Population refers to all members of a particular group or objects with information relevant for the study (Joan, 2009). The target population for the study were smallholder indigenous chicken farmers in Kisumu East sub-county that were trained by NALEP on indigenous chicken improvement between the years 2006 and 2011. Forty (40) smallholder indigenous chicken CIGs were formed and trained on indigenous chicken production from both divisions in Kisumu East (MOA, 2010). However by the time of this study, agricultural extention staff identified twenty (20) ICCIGs who were still active in indigenous chicken enterprise. The accessible population was 400 members drawn from 20 active CIGs. Thirteen (13) CIGs were drawn from Kadibo division while seven (7) were from Winam division.

3.5 Sampling Procedure and Sample Size

The two divisions (Kadibo and Winam) in Kisumu East sub county were purposively selected. The reasons being they were the only two divisions in the sub- county and had implemented indigenous chicken CIGs formation with smallholder farmers during NALEP implementation. Active ICCIGs were selected within the two divisions by the local livestock extension staff. The extension staff identified twenty (20) active indigenous chicken CIGs. Using Yamane's formula for calculating sample size, a sample size of 135 respondent was derived from the sample frame of 400 members.

The required sample size was determined by using simplified formula for proportions by Yamane (1967), at 95% confidence level and Precision level = 0.07 were assumed for the equation.

$$n = \frac{N}{1 + N(e)^2}$$

Where n was the sample size, N was the population size, and (e) was the level of precision. The study adopted precision level of $\pm$7%. The sample size was calculated as below.

n=400/ 1+ $400(0.07)^2$ =135 respondents.

Kathuri & Pals (1993) recommends 100 minimal sample size in research surveys therefore 135 respondents was ideal for this type of study. Precision level (e) of $\pm$7% was set based on previous studies (Upton, 2000) that approximately over 80% of the households keep indigenous chicken in Western Kenya. A list of all the group members was obtained from the Ministry of Agriculture and Livestock offfices. The number needed from each CIG was then obtained through random sampling from the list of members. The simple random sampling involved picking small pieces of paper marked Yes and No folded and placed in a box. The papers were homogenously mixed, folded well and each member allowed to pick a piece from the box only once. Members who picked papers marked Yes were marked for the data collection. Choosing a sample by chance minimizes biasness by giving all individuals a chance to be chosen (Moor, 2000). The selected members were invited for data collection. Table 1 shows the propotionate distribution of sampled respondents from the groups.

Table 1. Distribution of Sampled Respondents

Division	Name of CIG	Total Members	No. Respondents (sampled)
Kadibo	Geneva	20	7
	SCIPA	20	7
	Oguta Comm. Dev.	18	6
	Kathing W/G	16	5
	Kamora W/G	18	6
	Orogno	20	7
	Kowiyo	15	4
	Kanyiuloka	20	7
	Alendu Oasis	18	6
	Kinda kakoth	16	5
	Kidilwanda	20	7
	Jiw pachi	20	7
	Nyamware	13	4
	Sub-total	**234**	**78**
Winam	Kondele	29	10
	Brave destiny	20	7
	Koyango zion	20	7
	Kiboko lake side	24	8
	Second eye vision	26	9
	Kajulu W/G	29	10
	Mamboleo poultry	18	6
	Sub-total	**166**	**57**
	Total	**400**	**135**

3.6. Instrumentaton

A questionnaire comprising of six open-ended and four closed-ended questions reflecting the objectives of the study was used to collect data from the sampled respondents. The instrument was suitable since most of the members of the groups were literate and the information required could be easily described in writing. According to Fraenkel & Wallen, (2000) questionnaires are used to collect views,

opinions and perceptions and are ideal for survey research because are economical, efficient and more applicable for large samples. Secondary data was accessed from journals, annual publications, library research and literature from both published and unpublished sources. The questionnaire was divided into six (A-F) sections based on the objectives.

Section A, elicited information on CIG membership (before and as a member). Some information generated included, Name of CIG, age, gender and level of education & reasons for keeping indigenous chicken. Section B, gave information on the various indigenous chicken management practices by the CIG members. In each practice three to four unrelated choices were offered to the members to choose one. The information included indigenous chicken housing, supplementary feeding vaccination, and artificial brooding. Section C elicited information on quantity of products and by-product (manure) from indigenous chicken produced within a year. The products were the number of indigenous chicken chicks, growers, hens, cocks and eggs. The by-product was the average kilograms of indigenous chicken manure collected in a year. The products were measured in numbers while the by-product was measured in kilograms per year.

Section D gave information on the volume of chicks, growers, hens, cocks and manure either sold or consumed within a year. Section E gave information on the average prices of products and by-product received from their sales by the CIG members. The sales were measured in Kenya shillings and covered the money generated from chicks, growers, hens, cocks, eggs and manure. Section F provided information on costs of inputs for indigenous chicken enterprise. Costs of purchased supplementary feeds, veterinary services, hired labour, marketing, indigenous chicken housing, poultry equipment and breeding stocks were gathered. This information was used to calculate profit margins got from indigenous chicken enterprise.

3.6.1 Validity

The questionnaire was tested in order to check its content, construct and face validity. Agricultural extension staff from the department of Agricultural Education and

Extension Egerton University, supervisors and peers were consulted and assisted in reviewing the instrument. Their comments were used to improve the instrument. The guidelines for review was focused on the representativeness of the items to the objectives and the variables coverage. The focus was also on the ability of the items based on the flow to elicit the intended data from respondents.

3.6.2 Reliability

Reliability is the level of internal consistency over time (William, 2006). To assess reliability and ensure consistency of the developed instruments, a guideline by Kathuri and Pals (1993) was used to decide on the number of farmers. The study used 35 respondents for the test (26% of the sample size). The test was done in South West Ward, Kisumu West sub- county. The area was chosen due to similar characteristics to the study location and is 25 Km away from study area. The pretesting area had the same farming systems and was covered by NALEP during the same period. The distant was appropriate to avoid contamination of the respondents in the study area. The testing of the instrument was to assess its appropriateness and to aid in its further refining. The data was later subjected to a reliability test using Cronbach's reliability coefficient method to measure internal consistency of data. Reliability co-efficient of 0.801 was obtained hence the tool was accepted.

According to Trochin, (2006) reliability threshold of $alpha \leq 0.70$ is accepted for social studies. If reliability co-efficient could have been less than 0.70, revision of the instrument could have been done accordingly. However adjustments were made to improve on the construction, language, flow and numbering of the instrument. Mugenda & Mugenda, 1999 recommends Cronbach's Alpha Coefficient because it reduces time to compute reliability coefficient compared to other methods.

3.7 Data Collection

The key ethical consideration of the study was the privacy and confidentiality upheld by the researcher to ensure that information given by the respondent was not used against him/her. The Researcher with the assistance of Egerton University Graduate School sought authority from the National Commission for Science, Technology and

Innovation (NACOSTI) to collect data before administering the questionnaire. The researcher had a meeting with the livestock extension staff who aanged fo a meeting with the officials of the selected CIGs. Respondents were informed in advance and CIG officials made them aware of the study exercise. Before administering the questionnaire the researcher explained to the respondents the purpose of the research.

3.8 Data Analysis

After data collection, it was cleaned and entered into computer. Cleaned data was subjected to both descriptive and inferential statistics using SPSS computer package software. Descriptive statistics included frequencies, percentages and means. Chi-square (McNemars) test and paired t- test were used for hypotheses testing. The McNemar test is used whenever the same individuals are measured (or surveyed) twice, matched on same variable. It measures the significant difference between the two outcomes (Rohlf & Sokal, 1995). The Null hypothesis was tested at $p \leq 0.05$ *alpha* level of significance set *a priori*.

Management practices used Mcnemars test because vaiables were count data fom paired nominal data. This is a statistical test used on paired nominal data. It is used to assess the significance on the difference between two correlated proportions. Scale vaiable data were tested using paired t-test for statistical significance (Table 2).

Table 2. Data Analysis Summary

Hypothesis	Independent Variables	Dependent Variables	Statistical Procedures
$H0_1$. Common Interest Group membership has no statistically significant association with indigenous chicken enterprise management practices in Kisumu East sub-county.	**CIG membership** • Before membership • As a member	**Management Practices** • Source of breeding cocks • Indigenous chicken housing • Practicing vaccination • Purchased supplementary feeds • Practiced Artificial brooding Purchased equipment	Frequency, Percentages and Chi-square test (McNemars)
$H0_2$. Common Interest Group membership has no statistically significant association with quantity of products and by-product produced from indigenous chicken enterprise. in Kisumu East sub-county	**CIG membership** • Before membership • As a member	**Product and by-products** • Annual average chicks raised • Annual average growers raised • Annual average hens kept • Annual average cocks kept • Annual average eggs produced Annual average kilos of manure produced	Means and paired t-test
Ho3: Common Interest Group membership has no statistically significant effect on income from indigenous chicken enterpris by smallholder farmers in Kisumu East sub-county	**CIG membership** • Before membership • As a member	**Income from IC** • Annual average profit (Ksh.)	Means and paired t-test

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

The chapter is organized to present the results based on sub-sections detailing description of the study subjects, indigenous chicken management practices, products and by-product and income from the enterprise. The findings are presented in table forms and a bar graph.

4.2 Profile of Respondents

The variables under this included gender, level of education, age and main reasons for keeping indigenous chicken before and as CIG member. These factors were important for the study as ealier research works show that they positively influence indigenous chicken management practices by farmers (Lionberger & Gwin, 1982; Hawkins & Van den Ban, 1992). The findings are shown in Table 3 and figure 3 respectively

Table 3. Description of Respondents by Personal Characteristics (n=135)

Personal characteristics	Categories	Frequency	Percentage
Age in years			
	20-40	42	31.2
	41-60	73	54.2
	>61	20	14.4
	Total	135	100
Gender			
	Female	88	65.7
	Male	47	34.3
	Total	135	100
Level of Education			
	No formal Education	9	6.7
	Primary	47	34.8
	Secondary	63	46.6
	Tertiary	16	11.9
	Total	135	100

4.2.1 Age of Respondents

The mean age was 46.68 years, the youngest being 20 years and the oldest 73 years. The mean age of 46.68 years may imply that IC rearing would be an enterprise of choice since these are farmers in their productive age category. Young farmers below thirty years of age were (31%), a situation that could be attributed to rural urban migration of the youth in search of white collar jobs in major uban centres. Age is known to affect farm level decisions and group participation. Age also influences decisions that underlie indigenous chicken production technology, the capacity to join CIG and roles played by the farmer in CIG activities (Taiy, 2007).

4.2.2 Gender of the Respondents

Female gender were 65.2%, while the male were 34.3%. The result is an indication that indigenous chicken membership is mostly female and that indigenous chicken farming is still predominantly a female occupation. Women are however more involved in indigenous chicken groups than the men. Culturally, women prefer indigenous chicken production to other enterprises that might require more resources. This seemed to indicate that most of the farm activities dealing with IC rearing were handled by women and agrees with the findings of Kingori et al. (2010). In their study, Kingori et al. (2010) found that IC rearing is highly associated with women and the youth as it was viewed as a venture for the poor. The results also agrees with Aklilu, (2007) that more women than men participate in the production of indigenous chicken in Ethiopia.

4.2.3 Level of Education

The level of education of CIG members was operationalized as the highest level of education attained. These levels of were: no formal education, primary, secondary and tertiary levels. The result shows that the level of education of poultry farmers was fairly high (93.3%) in the study area while 6.7% had no formal education . Modern poultry rearing requires people who understand and can apply technical information in the production and management of poultry farming. Level of education of CIG members is important in sourcing for technologies and other activities which collectively contribute towards their empowerment. With high education level, farmers' intellectual capacity is expected to be high. This should enhance application

of proper IC rearing practices hence improving the products and the household income derived from IC. Similar findings were reported by Mafimisebi et al. *(*2006) among livestock farmers in South-western Nigeria. Gitter et al. (2012) reported a positive relationship between schooling and group membership. Balakrishman, (2002) in his studies also found that there is a causal relationship between level of education and personal empowerment to increase agricultural production.

4.2.4 Main reason for Keeping Indigenous Chicken

Respondents were asked to indicate their main reason for keeping indigenous chicken before and as members of indigenous chicken group. Figure 2 indicates that 72.6% of membes kept indigenous chicken mainly for subsistence before joining group. As indigenous chicken group members 83.7% kept indigenous chicken for commercial and 20% still kept indigenous chicken for subsistence. Percentage of farmers who kept indigenous poultry for social identity before joining CIG was 7.4% while 12.6% after joining indigenous chicken groups. The number of farmers who kept indigenous chicken for commercial purpose after being members of ICCIGs may be as a result of NALEP training influence to move fom subsistence farming to commercial. According to Thompson, (2012) the Livestock development policy emphasizes on the commercialisation of cattle, poultry and pigs, as well as goats in order to create employment and attain food security in the rural areas. The Figure 3. illustates main reason for keeping indigenous chicken.

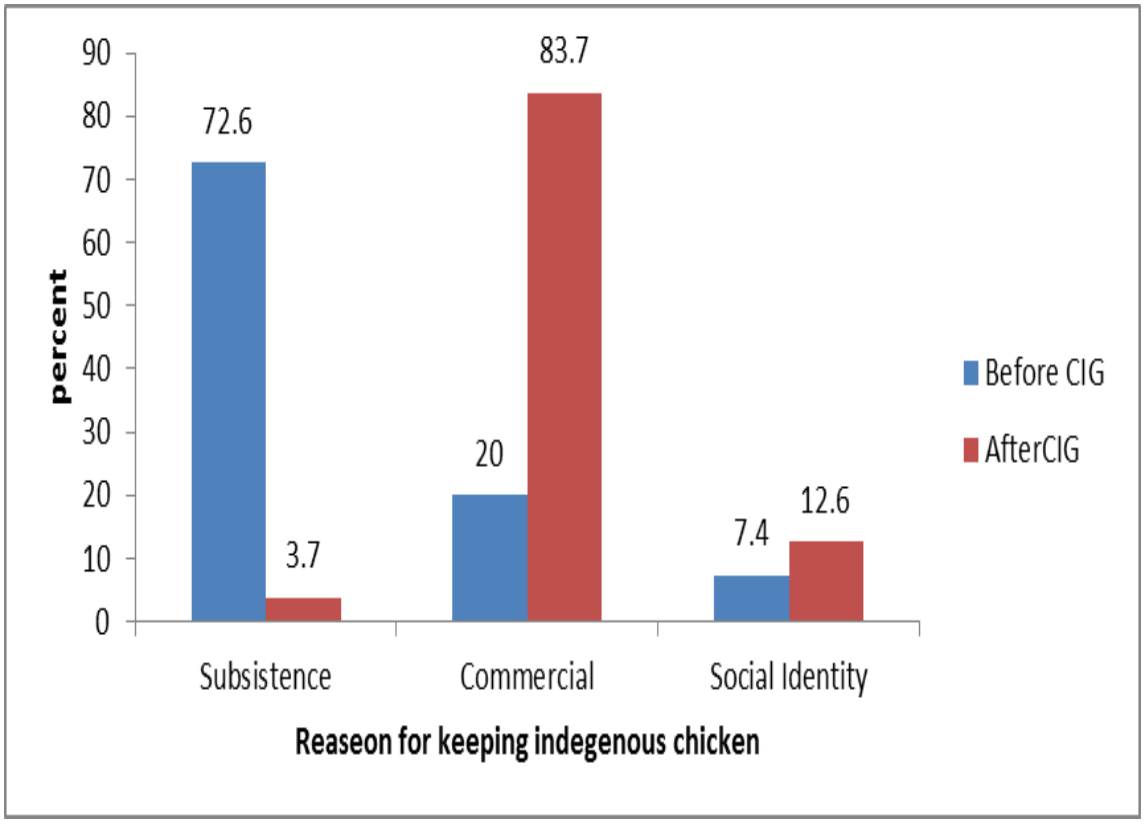


Figure 3. Main Reason for Keeping Indigenous Chicken (n=135)

4.3: Influence of CIG Membership on Indigenous Chicken Management Practices

Management practices investigated were; source of breeding cocks, indigenous chicken housing, vaccination, purchase of supplementary feeds and practice of artificial brooding. Understanding indigenous chicken management practices was to determine the CIGs membership adoption on the technologies communicated during trainings. Each management practice was measured differently: source of breeding cocks (Own hatched and reared indigenous cocks , purchased indigenous cocks, own reared exotic breed cocks and purchased exotic breed cocks). Type of indigenous chicken housing: (no housing , house without a run and house with a run). Vaccination: (not practiced, occassinally practiced and regularly practiced). Supplementay feeding: (not practiced, occassionally practiced and regularly practiced). Artificial brooding of birds (not practiced, occasionally practiced and regularly practiced), while for poultry equipment (yes for farmer who had purchased and No for farmers who had not purchased). The results are tabulated in Table 4. Indigenous Chicken Management Practices.

Table 4. Description of Management Practices by CIG members (n =135)

		Before joining CIG	After joining CIG
Management Practices	Measurement	%	%
Source of breeding cocks	Own hatched and reared indigenous cocks	80.7	5.9
	Purchased indigenous cocks	18.5	44.4
	Own reared exotic cocks	0.7	21.5
	Purchased exotic cocks	0	28.1
Housing for IC	No housing	82.2	7.4
	Housing without a run	16.3	47.4
	Housing with a run	1.5	45.2
Vaccination of IC	Not practiced	73.3	1.5
	Occasionally practiced	25.9	41.5
	Regularly practiced	0.7	21.5
Supplementary feeding	Not practiced	77.0	1.5
	Occasionally practiced	23.0	54.8
	Regularly practiced	0	43.0
Practice of artificial brooding	Not practiced	95.6	34.8
	Occasionally practiced	3.7	37.8
	Regularly practiced	0.7	27.4
Chicken equipment	Yes	13.3	85.1
	No	86.9	14.2

4.3.1 Source of Breeding Cocks

The study found that 80.7% of the respondents out of 135 sampled used own hatched and reared cocks before joining CIG for breeding, while as CIG member

5.9% used own hatched and reared indigenous cocks for breeding. 18.5% respondents purchased indigenous cocks for breeding before joining CIG while as CIG member 44.4% purchased indigenous cocks for breeding. Before joining CIG, one farmer 0.7% reported rearing an exotic cock while 21.5% reared exotic cocks after joining CIG for breeeding. Good indigenous chicken breeding practices are important to maintain and increase good quality poultry flock. Correct selection of cocks and hens is essential to maintain good stock. The results of the study indicates that after joining the ICCIGs, members were trained on proper selection for breeding with more emphasis on the introduction of cocks from outside the farm to reduce inbreeding for improved productivity. The findings agrees with (KARI, 2006) that farmers need to change their breeding cocks after two years to avoid inbreeding and improve on quality chicks.

4.3.2 Indigenous Chicken Housing

Proportion of farmers who did not have a house to rear poultry were 82.2%, before joining and 7.4% after joining CIG. Out of the 135 respondents, 16.3% had indigenous chicken house without a run before joining CIG while 47.4% had chicken house with a run after being members of CIG. Only 1.5% of the respondents had constructed poultry houses with a run before joining CIG while as members 45.2% had indigenous chicken housing with a run. Protective housing should be used in free-range poultry farming system to protect chicks from predators and bad weather. The results revealed that membership had the advantage of capacity building on the importance of constructing an indigenous chicken house. The specifications of indigenous chicken house are distinct for their comfort and control of pests and diseases. The inclusion of a run helps in proper placement of feeders and waterers outside the house and it allows confined movements of the chicken which minimizes the contact with predators, therefore easien the management practices. Indigenous chicken should be housed separately from human. The findings supports the study by Ochieng et al. (2011) that the key determinants of indigenous chicken productivity included adoption of management intervention and group membership.

4.3.3 Indigenous Chicken Vaccination

The majority of the respondents, 73.3% did not practice vaccination of indigenous chicken before joining IC CIG, while 41.5% respondents occasionally vaccinated their birds after joining the group. Before Joining CIG, 0.7 (1)% of the respondents regularly vaccinated their chicken while 21.5% of the respondents regularly vaccinated their chicken after joining CIG. The results of the study shows that membership to indigenous chicken CIG have the inclination towards vaccination. The advavantages of vaccinating indigenous birds includes; boosting the birds immune body system, reduction of disease incidence and improvement of the quality and quantity of products and by- poduct. This study found that being a member of indigenous chicken facilitates the practice to indigenous chicken vaccination. The study fndings concurs with Kingori et al. (2010) that most farmers do not practice regular indigenous chicken vaccination even after being capacity built.

4.3.4 Supplementary Feeding

Majority of farmers (77%) did not practice supplementary feeding before joining CIGs while after joining ICCIG, 54.8% and 43.0% occasionaly and regularly practiced supplementary feeding respectively. The focused and hands on type of trainings passed to group members facitates the impotance of purchased supplementation to indigenous chicken feeding. Some of the advantages of supplementary feeding include; minimal diseases occurrence because it limits the range of scavenging, it boosts the indigenous chicken growth rates and improves quality and quantity of products and by- product. Joining ICCIG gives the members the advantage of tailor made topics which include supplementary feeding. The results reveal that members of indigenous chicken are trained on the necessity of supplementation in feeding of indigenous chicken. These findings agrees with Pousgas, Boly, Linberg & Ogle, (2007) that farmers generally adopt indigenous chicken feed supplementation as it can lead to better performance of the birds.

4.3.5 Practice Artificial Brooding

Farmers were required to indicate whether before or as members of CIGs they practiced artificial brooding. 95.6% respondents indicated that they did not practice artificial brooding before joining indigenous chicken CIGs while 34.8% partially

practiced artificial brooding after joining CIG. Artificial Brooding involves the chicks and removal of chicks from their parental hens at hatching and kept in the brooder for a period. Atificial brooding revolves around cost effective management of chicks and marketing strategy. It increases the number of indigenous chicken products in a year from the laying hens. The results agrees with Gueye, 2009) that when farmers practice artificial brooding of indigenous chicks they inceases their products. This percentage improvement may be associated with trainings and demonstrations given to members of common interest groups.

4.3.6 Purchase of Poultry Equipment

Members were asked whether they purchased various poultry equipment for use in their farms. The two options were Yes and No. Before joining CIGs 86.9% of the respondents indicated that they did not purchased any poultry equipment while after joining CIGs, 85.1% of the respondents purchased indigenous chicken equipment. Poultry equipment are necessary for th development and protection of birds. They minimizes feed and water wastages and thus facititates the growth rate of the birds. Other studies KARI, 2006 also supported the impotance of good poultry equipment. The results may be attributed to trainings farmers get while in groups.

4.4 Description of quantity of Products and by- product .

The mean chicks raised by respondents before joining CIGs were 8.7 (Std.dev.5.1) chicks in a year while after joining CIG the mean was 24.6 (Std,dev. 16.9) chicks giving a mean difference of 15.9 chicks. Mean growers kept by the respondents in a year before joining CIG was 5.6 while after joining CIG the mean number of growers kept was 21.9 giving a mean difference of 16.4 growers. Respondents indicated a mean of 2.2 (Std. dev.1.9) hens kept before joining CIG while as members the mean was of 4.1 (Std.dev.4.1) indicating 1.9 mean difference. The mean number of cocks kept before joining CIG was indicated as 1.04 while as CIG members the mean was 1.6 this gave a mean difference of 0.6. Indigenous chicken by- product (manure) collected gave a mean difference of 1.2 from before and as members of CIG as indicated in Table 5. Dscription of indigenous chicken products.

Table 5. Description of Indigenous Chicken Products by CIG members

Products and by-product	Unit	Before joning CIG		As CIG member	
		Mean	Std. dev	Mean	Std. dev
Chicks raised	Number.	8.7	5.1	24.6	16.9
Growers raised	Number.	6.0	4.2	22.0	11.4
Hens kept	Number.	2.12	1.9	4.1	3.7
Cocks kept	Number.	1.0	0.6	1.6	0.7
Laying cycles	Number.	2.6	0.6	3.6	0.7
Eggs laid per cycle	Number	12.4	2.7	15.4	2.5
Manure collected	Kgs.	0.7	1.6	2.5	2.7

The results in Table 5. indicated a geneal mean increament in the products by membership. The improvement may be as a result of focused training to members by extension workers. The trainings give emphasis on proper selection of breeding cocks, good indigenous chicken housing, regular vaccination of birds and provision of supplementary feeds. The compounding effects of the above four management practices is a pointer to inceased products and by- product. The study was in agreement with Njue et al. (2006) that it is necessary to equip farmers with knowledge and skills for improved indigenous chicken products. These results also agree with Manrid, et al. (2012) that farmers who are in groups benefit more than those who are not in groups and so improve on production.

4.4.1 Consumed Products and by- Product

In the study consumed products were the indigenous chicken either eaten at home or given away to other people as gifts. Consumed by-product (chicken manure) in the study was the quantity in kilograms of by-product from indigenous chicken used by the farmers in their farms or given away to other farmers freely. Before CIG membership the respondents consumed mean of 1.5 (Std.dev. 1.1) growers in a year while as member of CIGs they consumed 3.9 (Std.dev. 2.2) growers in a year giving a mean difference of 2.4 growers. The mean number of eggs consumed before membership was 3.1 while as CIG member the mean number consumed was 7.9 in a

year giving a mean difference of 4.84 eggs as in Table 6. Trainings on management pactices may be a contributing factor in membership consumed products.

Table 6. Description of Consumed indigenous chicken products and by- product (n=135).

Products and by-product	Unit	Before Joining CIG		As members of CIG	
		Mean	Std. Dev	Mean	Std. Dev
Growers consumed	No.	1.5	1.0	3.9	2.2
Hens consumed	No.	0.72	0.8	0.9	1.2
Cocks consumed	No.	0.5	0.6	0.7	1.0
Eggs consumed	No.	3.1	6.3	7.9	11.6
Manure consumed	Kg.	0.4	0.8	1.4	1.7

The mean difference in consumed products may be as a result of adopting indigenous chicken management practices (breeding, housing, supplementay feeding, vaccination and artificial brooding) by the members which may also result into improved products of indigenous chicken. Good housing, supplementary feeding and disease control are core indigenous chicken husbandry practices to improved production. Membership trainings, information sharing and networking may have been the cause of the results. Ochieng et al. (2013) in his work on Management practices and challenges in smallholder indigenous chicken production in Western Kenya found that adoption of IC management practices resulted to higher indigenous chicken products and by- product.

4.5 Influence of Membership on Income from Indigenous Chicken Enterprise.

To determine annual income from CIG members, the following sales of products and by-product were considered: income from sale of growers, hens, cocks, eggs, and manure. The profit margin was calculated by getting the difference in sales and variable costs.

4.5.1 Profit Margin from indigenous chicken

The profit margin from indigenous chicken enterprise (before & as members of CIG) was measured and calculated from the difference between sales of indigenous chicken products and by product and the costs incurred in purchasing farm inputs as shown in Table 7.

Table 7. Description of Indigenous Chicken Sales and Expenditures

Products & by-product	**Unit**	**Sales before joining CIG**		**Sales after joining CIG**	
		Mean	Std. dev	Mean	Std. dev
Chicks	Ksh.	0	-0	145.5	892.2
Growers	Ksh.	485.3	1071.1	6687.6	3389.4
Hens	Ksh.	109.3	193.54	685.4	639.1
Cocks	Ksh.	170.1	286.41	256.5	346.6
Eggs	Ksh.	38.9	61.23	145.6	186.1
Manure	Ksh.	0	0	1.2	11.1
Total		**803.75**	**632.7**	**6,120.87**	**920.7**
Expenses/costs		**cost before joining CIG**		**cost after joining CIG**	
		Mean	Std. dev	Mean	Std. dev
Feeds purchased	Ksh.	100.2	167.3	2217.8	2264.1
	Ksh.		80.4		385.8
Veterinary services		73.1		502.85	
Poultry labour	Ksh.	9.78	46.1	139.6	249.6
Marketing	Ksh.	3.85	12.7	52.81	67.1
Purchase of stock	Ksh.	313.11	352.8	667.76	628.9
Total inputs	Ksh.	507.41	459.4	3398.53	2468.4
Total sales-costs		**196.3**		**2,722.3**	

Mean veterinary cost before membership was ksh.73.12(Std.dev.80.4) while as members the mean veterinary cost was Ksh. 502.85(Std.dev.385.8) giving a mean difference of Ksh. 429.73. The mean sales of products from indigenous chicken was

Ksh. 803.75 (Std. dev. 632.6). before joining CIG while mean sales from products as membes was Ksh 6120.87 (Std.dev. 920.6). This gave a mean difference of Ksh. 5,317.12.

The use of agricultural inputs is important if productivity is to be enhanced. Farmer groups are known to be avenues that facilitate and link farmers to new technologies and production practice (Adong, Mwaura, & Okoboi, 2012). The compounding effects of the adoption of management practices is a pointer to inceased products and by- product. Due to increased indigenous chicken products, sales and consumption also improved. The results portrays improved profit margin by the membership. The results observed in this study agrees with those reported in other developing countries in Africa and Asia (Dana et al., 2010), the readily available markets and ever increasing demand for Indigenous chicken products especially live chicken and eggs may explain why members improved in their incomes. This mean difference in income by common interest group members may have been influenced by access to extension services and sharing of production ideas among members. These results agree with the main aim of initiating Common Interest Group approach by Ministry of Agriculture which stated that the approach will help enhance farmer's collective capacities to improve their economic and social status by increased productivity. It aslo concurs with the findings by Joash, (2010) that being in common interest groups can contribute more than 100% increase in productivity.

4.6 Hypotheses Testing

Based on the objectives of the study, the formulated hypotheses were tested in order to establish any significant difference. The first hypothesis was tested using McNemars test while the last two hypotheses were tested using simple paired t- test to test significance of influence of Common Interest Group membership on productivity of smallholder indigenous chicken enterprise at 0.05 level. McNemar test is used whenever the same individuals are measured (or surveyed) twice, matched on some variable. The test was used to assess the association of management practices and indigenous chicken memmbeship. In the study same individual member gave information before and as member of indigenous chicken CIG. Simple paired t-test

was used to compare the means from the two related samples before and after membership. The following hypothesis were tested.

4.6.1 Ho_1 Common Interest Group membership has no statistically significant influence on indigenous chicken management practices by smallholder farmers in Kisumu East sub-county.

To test the hypotheses Chi- square test (McNemars test) was used to test association of Management practices and membership. McNemars formula $X^2 = (c-b)^2/c+b$ was the guide. C and b were the values before and as members of the CIG. The df=1 at 0.05 level of significance. Table 8. provides a summary of the findings.

Table 8. Chi-square (McNemars) test on Management Practices (n=135), df=1, 0.05 level of significance.

Management practices	Description of poduction	Before joining CIG	After joining CIG	**McNemars Test**
Source of breeding cocks	Own hatched and reared indigenous cocks	80.7	5.9	<0.0001
	Purchased indigenous cocks	18.5	44.4	0.0241
	Own reared exotic cocks	0.7	21.5	<0.0001
	Purchased exotic cocks	0	28.1	NA
Housing for indigenous chicken	No housing	82.2	7.4	<0.0001
	Housing without a run	16.3	47.4	0.0100
	Housing with a run	1.5	45.2	<0.0001
Vaccination of indigenous chicken	Not practiced	73.3	1.5	0.0254
	Occasionally practiced	25.9	41.5	0.1303
	Regularly practiced	0.7	21.5	<0.0001
Practiced supplementary feeding	Not practiced	77.0	1.5	0.0138
	Occasionally practiced	23.0	54.8	0.0028
	Regularly practiced	0	43.0	NA
Practice of artificial brooding	Not practiced	95.6	34.8	<0.0001
	Occasionally practiced	3.7	37.8	0.1265
	Regularly practiced	0.7	27.4	<0.0001
Purchase of indigenous chicken equipment	Yes	13.3	85.1	<0.0001
	No	86.9	14.2	

The management practices under consideration were; Source of breeding Cocks, Housing for indigenous chicken, Vaccination of indigenous chicken, practiced supplementary feeding, practice of artificial brooding, and purchase of indigenous chicken equipment. The results indicated statistical significance in most practices. The P values on management practices were <0.0001. Therefore H_o was rejected and H_1 accepted that there is association of indigenous chicken management practices and CIG membership.

4.7.2 Ho_2. Common Interest Group membership has no statistically significant influence on products and by-product from indigenous chicken by smallholder farmers in Kisumu East sub-county.

To test the hypothesis, Simple paired t- test was used. The products and by- product tested were the number of indigenous chicks, growers, hens, cocks eggs and kilograms of manure raised, kept and produced from indigenous chicken respectively. Table 9. Summarises the results on Paired t-test.

Table 9. Paired t-test on Influence of Indigenous Chicken Products and by-product.

Products and by- product	Before Joining CIG	After Joining CIG	Mean difference	Paired t-test (p-value)
Chicks raised	8.7	24.6	15.9	<0.001
Growers raised	6.0	22.0	16.0	<0.001
Hens kept	2.2	4.1	1.9	<0.001
Cocks kept	1.0	1.6	0.6	<0.001
Egg aying cycles	2.6	3.6	1.1	<0.001
Eggs laid per cycle	12.4	15.4	3	<0.001
Manure collected	0.7	2.5	1.8	<0.001

The mean differences of the indigenous chicken products and by- product were subjected to simple paired t- test. The results are displayed on Table 8. There was statistically significance difference on influence of CIG membership on the volume of indigenous chicken products and by- product. T-test conducted revealed statistical significance in all the products P<0.001. The null hypothesis was rejected, and

hypothesis accepted that there is significant influence of CIG membership on quantity of indigenous chicken products and by- product.

4.7.3 Ho_3. Common Interest Group membership has no statistically significant influence on income from indigenous chicken by smallholder farmers in Kisumu East sub-county.

To test the hypotheses Simple paired t- test was used to test significance on mean income from indigenous chicken kept by CIG members. Summary of the results are in Table 10. Profit margin analysis subjected to simple paired t-test showed significance. There was statitally significance on profit margin from indigenous chicken enterprise ($p<0.001$), thus the null hypothesis was rejected and the hypothesis accepts that indigenous chicken CIG membership has influence on income from indigenous chicken enterprise.

Table 10. Paired t-test on Income from Indigenous Chicken.

Indigenous chicken income	**Mean profit margin before joining CIG (ksh)**	**Mean profit margin as CIG member (ksh)**	**Mean difference (Ksh)**	**P-value**
Profit margin	196.3	2,722.3	2526	P<0.001

CHAPTER FIVE

SUMMARY, CONCLUSSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of the key findings, draws conclusions and makes recommendations. The study investigated the influence of Common Interest Group membership on productivity of smallholder indigenous chicken enterprise in Kisumu East sub-county, Kisumu County.

5.2 Summary

Common Interest Group extension approach reinforces intervensions in extension delivery. It is relevant in adoption of indigenous chicken management practices, product and by-product development and income generation. Indigenous chicken CIGs were formed in Kisumu East sub-county to facilitate and empower the members to improve on indigenous chicken productivity. Indigenous chicken is an important food security product in Kisumu County. It is mostly kept for subsistence and forms an integral component of the diet of majority of smallholder farmers in Kisumu East sub-county. Despite the support by extension progamme, the influence of group membership on productivity of indigenous chicken remained unclear.

The study adopted a cross-sectional survey design. A closed and open–ended questionnaire was used to collect data . Simple random sampling was used to sample 135 farmers from 20 active indigenous chicken CIGs. McNemars test of proportions was perfomed on the influence of indigenous chicken membeship on management practices. The key management practices studied were source of breeding cocks, housing of chicken, practicing vaccination, supplementary feeding, artificial brooding and purchased poultry equipment. The test revealed significance in most practices where $P = <0.001$ at 0.05 level of significance. Simple paired t- test was done on influence of CIG membership on indigenous chicken products and by- product. The test revealed significance $P<0.001$. Paired t- test was also done on the influence of CIG membership on income from indigenous chicken enterprise. The test revealed significance $P<0.001$.

5.3 Conclusions

The following conclusions can be made based on the study:

i. Indigenous chicken Common Interest Group membership was associated with changes on management practices on the enterprise.
ii. Common Interest Group membership was associated with changes on the quantity of products and by-product from indigenous chicken.
iii. Common Interest Group membership was associated with changes in pofit magin from indigenous chicken.

5.4 Recommendations

The study recommends the following based on the observed changes:

i. To improve on indigenous chicken management practices farmers to join and use common interest groups as avenues to incease indigenous chicken productivity.
ii. CIG membership and skills to be strengthened and geared towards improving quantity of products that supports it's commercialization along the value chain.
iii. Other development organizations that intends to reduce smallscale farmers poverty may use the approach to improve household income..

5.5 Suggestions for Further Study

i. Factors affecting indigenous chicken Common Interest Group membership sustainability. These factors were not studied in this study but could have influence on the productivity.

REFERENCES

Adong, A., Mwaura, F., & Okoboi, G. (2012). *What factors affect membership to farmer groups in Uganda*? Retrieved at http://ageconsearch.umn.edu/ bitstream /126774/2/ AdongWCover.pdf on 23/3/2015

Agarwal, B. (2003). 'Gender and Land Rights Revisited: Exploring New Prospects via the State, Family and Market', Journal of Agrarian Change, 3 (1&2), 184–224.

Agrawal, A. & Goyal,S. (2010). Group size and collective action: Third-party monitoring in common-pool resources. Comparative Political Studies 34(1):63–93

Agriculture and Rural Development (ARD) (2012). Implementing Agriculture for Agriculture: Toward 2030/2050. Rome: Food and Agriculture Organization of the United Nations. Retrieved at (http://www.fao.org/es/ESD/AT2050 web.pdf) on 24thJanuary 2016.

Aklilu, H.A., Almekinders, C.J.M., Udo, H.M.J., & Vander Zijpp, A.J. (2007).*Village Poultry Consumption and Marketing in Relation to Gender, Religious festivals and Market access*. Tropical Animal Health and Production 39 (3): 165-177

Asante, B. O., Sefa, V. A., & Sarpong, D. B. (2011). Determinants of small scale farmers' decision to join farmer based organizations in Ghana. *Africa Journal of Agricultural Research, 6*(10), 2273-2279.

Assefa, T. (2007).*Poultry Management Practices and on Farm Performance. Evaluation of Rhode Island Red, Fayomy and Local Chicken in Umbulo Wachu Water Shade in Sidama Zone.* MSc. Thesis. Hawassa University. Hawassa, Ethiopia. 126pp

Balakrishnan, R. (2002) Barriers to Harness ICTs for the Advancement of Rural Women. Accessed at http://www.fao.org/sd/2003/PE12033aon.htm. On 23/11/2015

Bett, H.K. Peters,K.J.Kahi, A.K, Lagat, J.k,& Bokenlmann, W. (2009a).*An Economic Analysis of the Market Channels and Factors Influencing Indigenous Chicken Marketing in Kenya.* Tropentag 2009, October6-8 Hamburg, Germany.

Casley J. D and Kumar K. (1988): *The collection, Analysis and Use of Monitoring and Evaluation Data*. A World Bank Publication. Washington D.C. USA.

Danida (2004).Farmer Empowerment-Experiences, lessons learned and ways forward. Presentation at Neuchatel Initiative Annual Meeting on case examples from Africa and Asia.

Development Network of Indigenous Voluntary Associations (DENIVA) (2005b). *Effectiveness of farmer groups as viable institutions for farmer empowerment and poverty reduction in the implementation of the plan for the modernization of Agriculture (PMA)*. Retrieved on 25thFebruary 2013 at http://www.deniva. or.ug/files/programmeagriculturetrade_research_farmergroups.pdf

DFID. (2012). Report No.7946 27/02/2001.Relationship between Changes in Agricultural Dynamics and the Contribution of Chicken to Household in a Smallholder Farming Dynamics in village poultry systems, Agricultural Systems., 88:255-269.Education Book Service, Kenya.

Ellis, F. (1988). *Peasant Economics;* Farm Households and Agrarian Development. Cambridge University Press, Cambridge.

FAC, (2009).Challenges and Opportunities for strengthening farmers organizations in Africa: Lessons from Ethiopia, Kenya and Malawi. Retrieved from www.future-agricultures.org

Food and Agriculture Organization (FAO). (2010). *Producer Organizations: Reducing opportunities for Development*. Policy brief

Food and Agriculture Organization of the United Nations (FAO). 2006. World Agriculture: Toward 2030/2050. Rome: Food and Agriculture Organization of the United Nations. Retrieved at (http://www.fao.org/es/ESD/AT2050 web.pdf) on 2/5/2014

Food and Agriculture Organization of the United Nations. (2002). *Egg Marketing*. A guide for the Production and Sale of eggs. FAO, Rome, Italy

Fraenkel,, J.R & Wallen.N.E. (2000). *How to design and evaluate Research in Education*. New York, NY: McGraw Hill Publishing Co.

Gichohi, C. M & Maina, J.G. (1992). Poultry Production and Marketing, Ministry of Livestock Production .Paper presented in Nairobi- Kenya, Nov., 23-27.

Gitter, S., Weber, J., Barham, B., Callenes, M. & J. L. Valentine. (2012). Fair Trade-Organic Coffee Cooperatives, Migration, and Secondary Schooling in Southern Mexico. Journal of Development Studies 48, 445-463.

GoK (Government of Kenya). 2010. Agricultural Sector Development Strategy, 2010-2020.

GoK, (2002). NALEP final reports by Mid-term Review Mission, October/November 2002. Government printers, Nairobi: Kenya.

GoK, (2009): *National Agricultural Sector Extension Policy*. Ministry of Agriculture; Nairobi, Kenya.

GoK, (2011) Ministry of Agriculture, District Agriculture Annual Report, Kisumu East District.

GoK, (2012). Ministry of Livestock Development: District Livestock Production Annual Report Kisumu East District

Griliches, Zvi (1987), "Productivity: Measurement Problems", in J. Eatwell, M. Milgate and P. Newman (eds.), *The New Palgrave: A Dictionary of Economics*

Gueye, E.F. (2009). Women and Family Poultry Production in Africa. Development in Practice Journal 10:98-100

Hale. J. (2011). The 3 Basic Types of Descriptive Research Methods. Psych Central. Retrieved on 04/11/2014 from http://www.psychcentral.com/blog/archieves /2011/09/27/the 3-basic types-of-descriptive-research-methods/

Halima, H., 2007, 2005. Phenotypic and Genotypic characterization of indigenous chicken population in North West Ethiopia. PhD Thesis university of Free State Bloemfontein South Africa.

Hawkins, H.S., & Van den Ban, A.W. (1992): *Agricultural Extension*. New York USA: Longman Scientific and Technical Publishers.

Heft-Neal Kahrl, F. Otte, J. & Roland-Host, D. (2009). HPAI RISK Reduction and Smallholder Poultry Supply Chain-The case of Thailand. HPAI Research Brief No.14. Accessed on 24/6 2012 at http://www.fao.org/ag/againfo/progr ammes/en/pplpi/docarc/rep_0810.vum.implement

Ifft, J. Otte, J., Nguyen, D.T., Roland-Holst, D., & Zilberman, D. (2008). Implementation of a certified Smallholder Supply Chain and Test Marketing Traceable Free Range Chicken: 1. Methodology.

International Livestock Research Institute. (1995). *Livestock Policy Analysis*. ILRI Training Manual 2. ILRI.

Joan, J. C. (2009b).Population Sampling Techniques. Retrieved on 10/6/2013 from http://explorable.com/population-sampling.html.

Joash.O.O. (2010). Influence of Common Interest Group strategy on Implementation of Crop Production Technologies; Nyando District, Nyanza

KARI. (2006). *Indigenous Chicken Production Manual*. Kenya Agricultural Research Institute, Technical Notes Series KARI Technical Note No. 18, 2006. Accessed on 26th March 2014 from http/www.kari.org/publications /tech..note18...20060810/pdf.

Kathuri, N.J. & Pals, A.D. (1993). *Introduction to Educational Research* Njoro: Egerton Education Book Service, Kenya.

Kingori, A., Wachira, A. & Tuitoek, J. (2010). Indigenous Chicken Production in Kenya. *International Journal of Poultry Science 9* (4): 309-316, 2010.

Kombo, K. D. & Tromp, A. L. D. (2007).*Proposal and thesis writing: An Introduction.*(168 pp). Nairobi: Paulines publication Africa.

Kothari, C. R. (2007). *Research methodology methods and Techniques*. (pp. 1 - 56). New Delhi: New Age International (P).Ltd.

Lewis,W. A. (1984), *'Development Economics in the 1950s'*, in G. Meier and D. Seers (eds.).

Li, Xuiqi. (2008). *Study on Identification and Characterization of Promising Chinese Best Agricultural Extension Practices.* Consultancy Report: Rome: Food and Agriculture Organization of the United Nations.

Lionberger, H.F. and Gwin, P.H. (1982): *Communication Strategies*: A Guide For Agricultural Change Agents. New York, USA: Interstate Printers and Publishers

Madeley, J. (2002); *Food for all*: The need for new agriculture. New York, USA: SED Books Ltd.

Mafimisebi, T.E., Onyeka, U.P., Ayinde, I.A. and Ashaolu, O.F. 2006. Analysis of farmerspecific socio-economic determinants of adoption of modern livestock management technologies by farmers in Southwest Nigeria. Journal of Food, Agriculture and Environment, 4: 183-186.

Mallorie, E. (1996). Impact of IFAD supported agricultural projects. Retrieved at http://www.ifad.org/english/operation/pi/bgd/documents/impact.pdf on March 15 2014.

Manrid J.K., Peter. A.,and Wakhungu J.K., (2012). Libaisi CIGs Youth Groups' contribution to Food Security in Western Kenya. Ministry of Agriculture Success Stories, Western Kenya.

Martaamidjaja, A. S., & Rikhana, M. (1996).*Group based extension programme for natural resource conservation in Java.*SD Dimensions FAO. Retrieved at http://www.fao.org/sd/EXdirect/EXanOO12.htm on February 5th 2014.

Mbowa, S., Shinyekwaand, I., & Mayanja, M. (2012). *Dairy sector reform and transformation in Uganda since the 1990s*. EPRC Research Report No.4 Uganda.

McAish, C.V., Kristensen, A.R., (2004). Dynamics modelling of traditional African chicken production system. Tropical Animal Health and Production 36, 1-17

MOA & MOLD (2009): NALEP Evaluation and impact assessment report Kilimo House, Nairobi; Kenya.

MOA & MOLFD. (2006): *NALEP Operational procedures, 2004/2005* financial year Kilimo House, Nairobi: Kenya

MoARD, (2001): National Agriculture and Livestock Extension Programme Implementation Framework. MoARD, Nairobi, Kenya

MOLD, (2011).Ministry of Livestock Development: Proposal on Kenya National Poultry Improvement Programme (KNPIP) 2011 to 2015.

MOLFD, (2006). Animal Production Division, annual report. MOLD, Nairobi, Kenya

Moore, D.S. (2000). *The Basic Practice of Statistics (2nd Edition).* New York: W.H. Freeman and Company.

Muchadeyi, F.C., Sibanda, S.,Kusina, N.T., Kusina, J.F., &Makuzas, S.M. (2005). *Village Chicken Flock Dynamics and the Contribution of Chicken to Household Livelihood in a Smallholder Farming Area in Zimbabwe.* Tropical Animal Health and Production 37,333-344

Mugenda, O. M. & Mugenda, A. G. (1999).*Research Methods: Quantitative and Qualitative Approaches.* Acts Press, Nairobi, Kenya.

NALEP (2001). Implementation framework, MOARD**.** Nairobi.

Njue, S .W. Kasiiti, J.L., & Gacheru.S.G. (2006). Assessing the economic impact of commercial Poultry feed supplementation and vaccination against Newcastle disease in local chicken in Kenya. Proceeding of a final research coordination meeting organized by the joint FAO/IAEA held in Vietnam, 24-28 May 2004.

O'Connor,(2002*):Research Methods*. Available online at http://fuculty.ncwc. edu.tonaccor/308/ect07.retrieved on 25/12/2012

Ochieng, J., Owuor, G., Omedo, B. (2011): *Management Interventions and Indigenous chicken Productivity. The case of Smallholder Farmers in Western Kenya,* Lambert Academic Publishing.

Okitoi, L.O., Ondway, H.O., Obal, M.P., & Murekefu, F. (2007). Gender Issues in Poultry Production in Rural households of Western Kenya. Livestock Research for rural development. 19 (2)

Owuor, G., & Bebe, B. (2009). What influences price Efficiency in Indigenous chicken Market in Africa? Evidence from Smallholder Farmers in Kenya. European Association of Agricultural Economics 111thSeminar, June 26-27 2009, Cantechbury UK. Available at http://purl.umn.edu/53075.accessed on January 30 2014.

Peterson, R.A. (2000). *Constructing Effective Questionnaire*, Sage Publications

Picciotto, R., & Anderson, J.R. (1997). *Reconsidering agricultural extension*. Washington, DC: The World Bank.

Pousga,S., Boly,H., Lindberg,J.E. and Ogle,B., (2007). Effects of supplements based on fishmeal on cottonseed cake and management system on the pefomance and eeconomic efficiency of exotic hens in Burkina Faso. African Journal of Agicultural Research, 2:496-504.

Republic of Kenya (2005). *First Medium term plan (2008-2012), Kenya Vision 2030*.A globally Competitive and prosperous Kenya.

Republic of Kenya, (2006*). NALEP Phase II Project Document-January 2007-December 2011*. Ministry of Agriculture and Ministry of Livestock Development, Nairobi: Kenya.

Research into Use, (2010). Market Study for Formulating an Indigenous Chicken Sub-Sector Development Strategy, Dares salaam MUVEK Development Solutions.

Robbins, S.P. (1997). *Essentials of organizational behaviour*. Upper Saddle River, NJ; Prentice Hall In

Rogers, E.M. (1983): *Diffusion of innovations*. New York, USA: The Free Press

Rohlf, F. J & Sokal, R.R. (1995). *Biometry* 3rd ed. W.H. Freeman and Company, New York, NY.

Salifu, A., Francesconi, G. N., & Kolavalli, S. (2010). A Review of Collective Action in Rural Ghana. IFPRI Discussion Paper 0099

Swanson, B.E., Singh, K.M., & Reddy, M.N. (2008).*A decentralized, participatory, market-driven extension system*: The ATMA model in India. Paper presented at Advancing Agriculture in Developing Countries through Knowledge and Innovation, Addis Ababa, Ethiopia

Tadelle, D., Million, T., Alemu, Y., & Peters, K.J. (2003): *Village Chicken Production Systems in Ethiopia* .2. Use Patterns and Performance Valuation and *Chicken* Products and Socio-Economic Functions of chicken. Livestock Research for Rural Development 15 (1). Retrieved at http://www.Irrd. 0ra/Irrd15/1/tadeb151.htm.accessed on 24/4/2013.

Tadelle,d, Alemu, Y.,& Peters, K.J. (2000). Indigenous Chicken in Ethiopia; Genetic Potential and attempts at improvement. *World's Poultry Science Journal*., 56:45-54.

Taiy, R.J. (2009): *Characteristics of Common Interest Groups and Their Effectiveness in Empowering Smallholder Dairy Farmers in Uasin Gishu District, Kenya*. MSC Thesis presented at Egerton University in October, 2009.

Teketel, F. (1986).*Studies on the meat production potential of some local strains of chicken in Ethiopia*. Ph.D. Thesis, J, L Giessen University.

Thompson, C. F. (2012). Swaziland Business Year Book. Government of Swaziland. Mbabane. Swaziland. http//www.swazibusiness.com, accessed on 03/10/2015.

Torimiro, D.O., Lawal, B.O. and Agbelemoge, A. 2002. Comparative study of cooperative and no cooperativepoultry farmers in Ijebu Division of Ogun State, Nigeria. Nigerian Journal of Rural Sociology, 3: 33-42.

Trochim, W.M. (2006). *The Research Methods Knowledge Base, 2nd Edition*. www Page, at URL:<http://www.socialresearchmethods.net/kb/>accessed on 17/3/2013.

Tu Huang, (2006). *Farmer Interest Groups*: *Factors influencing their sustainability and involvement of extension agencies.* Available http://www.dieoff. com/cah.html>accessed on 25/5/2014.

Udo, H.M.J., Asgedom, A.H., & Viets, T.C. (2005*). Modelling the impact of interventions on the Dynamics in Village Poultry Systems, Agricultural Systems*. 88:255-269. 126 pp. University Press, Cambridge.

United Nations (UN). (2010). *Innovation for Sustainable Development: Local Case Studies from Africa*. Kenya: UN Nairobi.

Upton, M. (2000).The Livestock Revolution- Implication for Smallholder Agriculture. A case of milk and poultry production in Kenya. FAO, Livestock Policy Paper Discussion paper No. 1. URL :< http://www.socialresearchmethods.net/kb/> accessed last 5th January 2015.

Waithaka, M. M., Thornton, P.k., Hernerton, M., & Gonzalez-Estrada, E. (2005). Decision Support tool for Crop- Livestock systems. Application in Vihiga, Kenya.

Wiersma, W. (2000): *Research Methods In Education*: *An Introduction*. Needham Heights, M.A: Zone. MSC Thesis. Hawassa University, Hawassa Ethiopia126 pp.

William, M. K. (2006). Social research methods. Retrieved online on 14/12/13 from www.socialesearchmethods.net/kb/relable.php

World Bank (2008). Agriculture for Development. *World development report*. The World Bank, 1818H NW, Washington DC 20433, USA. Retrieved on 17/5/2014 from siteresource.worldbank.org/INTWDR2008/…WDR-oo-book.pdf

Yamane, T. (1967). *Statistics, an Introductory Analysis*, 2nd Ed., New York: Harper and Row

Yang, D. and Liu, Z. (2012). Does farmer economic organization and agricultural specialization improve rural income? Evidence from China. Economic Modelling 29, 990-99

APPENDICES

APPENDIX A: QUESTIONNAIRE FOR COMMON INTEREST GROUP MEMBERS.

Introduction

May I kindly request you to share with me your experience on indigenous chicken productivity by filling in the information below. This information required is for academic purposes. Your honest answers are very vital to the study. Your response will be treated with confidentiality and only used for the purpose of this study. Your consent to data gathering is thus essential.

Questionnaire Objective: To gather data from CIG participants on realised indigenous chicken productivity before joining CIG and as CIG member in Kisumu East sub-county Kenya.

SECTION A: General Members' Information

1. Fill in your details by indicating appropriate numbers in the table below (choose the numbers below for gender and Education Level respectively).

Respondent's details	**Name (optional)**	**Gender**	**Age (years)**	**Education level**

Gender: 1=male; 2= female

Education: 1= No formal education 2= Primary 3=Secondary 4= Tertiary
5 =others (specify)

2. Fill in the general information in the two tables below.

Location details	**Village**	**Sub location**	**Location**	**Division**	**Date administered (dd-mm-yyyy)**

CIG membership details	Name of CIG	Year joined CIG	Total CIG membership at start	Total CIG membership presently

3. What is the **most** important reason for keeping indigenous chicken? (Only one choice in each category)

Before joining CIG	As a CIG member

1= Subsistence; 2= Commercial; 3= Social Identity

4. What is your **most** important reason for joining indigenous chicken CIG? [ ]

(1) Social networks (2) Commercialize production (3) Domestic food supply

SECTION B: Management Practices

5. What management practices best reflects the situation on your flock enterprise at these times?

Management Practice	Measure	Before being a member of CIG	As a CIG member
Source of breeding cocks	**1**= Own hatched and reared indigenous cocks **2**=Purchased indigenous cocks **3**= Own reared exotic cocks **4**=Purchased exotic cocks	[ ]	[ ]
Housing for indigenous chicken	**1**= No. IC housing **2**= IC housing without a run **3**= IC housing with a run	[ ]	[ ]
Vaccination	**1**=Not practiced **2**=Occasionally practiced **3**= Regularly practiced	[ ]	[ ]
Purchase of supplementary feeds	**1**=Not practiced **2**=Occasionally purchased **3**= Regularly purchased feeds	[ ]	[ ]
Artificial brooding	**1**=Not practiced **2**=Occasionally practiced **3**= Regularly practicing brooding	[ ]	[ ]
Purchased Equipment for enterprise	**1: Yes** **2: No**	[ ]	**[ ]**

SECTION C: Volume (number & kilos) of Products and by-product produced per year

6. Indicate in numbers or kilograms as appropriate the annual average production of the following products and by-product from the flock of indigenous chicken enterprise at the two levels.

Products and by products	**Measure**	**Before being a member of CIG**	**As CIG member**
Chicks raised	Quarterly average number	[ ]	[ ]
Growers (Pullets and cockerels) raised	Quarterly average number	[ ]	[ ]
Hens kept	Quarterly average number	[ ]	[ ]
Cocks kept	Quarterly average number	[ ]	[ ]
No.of laying circles	Number circles per year	[ ]	[ ]
Eggs laid per circle	Average per circle	[ ]	[ ]
Manure	Quarterly average kilograms	[ ]	[ ]

SECTION D: Sales of Products and by-product

7. Indicate the average numbers / kilograms of the following products and by-product sold from your flock of indigenous chicken enterprise in a year.

Products and by-product	**Measure**	**Before CIG Membership**	**As CIG member**
Growers(Pullets and cockerels) sold	Average number/quarter	[ ]	[ ]
Hens sold	Average number/quarter	[ ]	[ ]
Cocks sold	Average number/quarter	[ ]	[ ]
Eggs sold	Average number/quarter	[ ]	[ ]
Eggs Hatched	Average number/ circle	[ ]	[ ]
Manure sold	Average kilograms per quarter	[ ]	[ ]

8: Indicate the average number of indigenous chicken products **consumed or given out as gifts** within a year of production

Products	**Measure**	**Before CIG membership**	**As a CIG member**
Chicks	Average number	[ ]	[ ]
Growers	Average number	[ ]	[ ]
Hens	Average number	[ ]	[ ]
Cocks	Average number	[ ]	[ ]
Eggs	Average number	[ ]	[ ]
Manure	Average kilograms	[ ]	[ ]

SECTION E: Average Income (Ksh.) from Products and by-product

9. Indicate the average income from the following products and by-product of your indigenous flock in the market outlets where your products were/ are traded within the year.

Product(s)	**units**	**Before CIG membership**	**As CIG member**
Chicks	Ksh each	[ ]	[ ]
Growers	Ksh each	[ ]	[ ]
Hens	Ksh each	[ ]	[ ]
Cocks	Ksh each	[ ]	[ ]
One Egg	Ksh each	[ ]	[ ]
Manure	Ksh/ kg	[ ]	[ ]

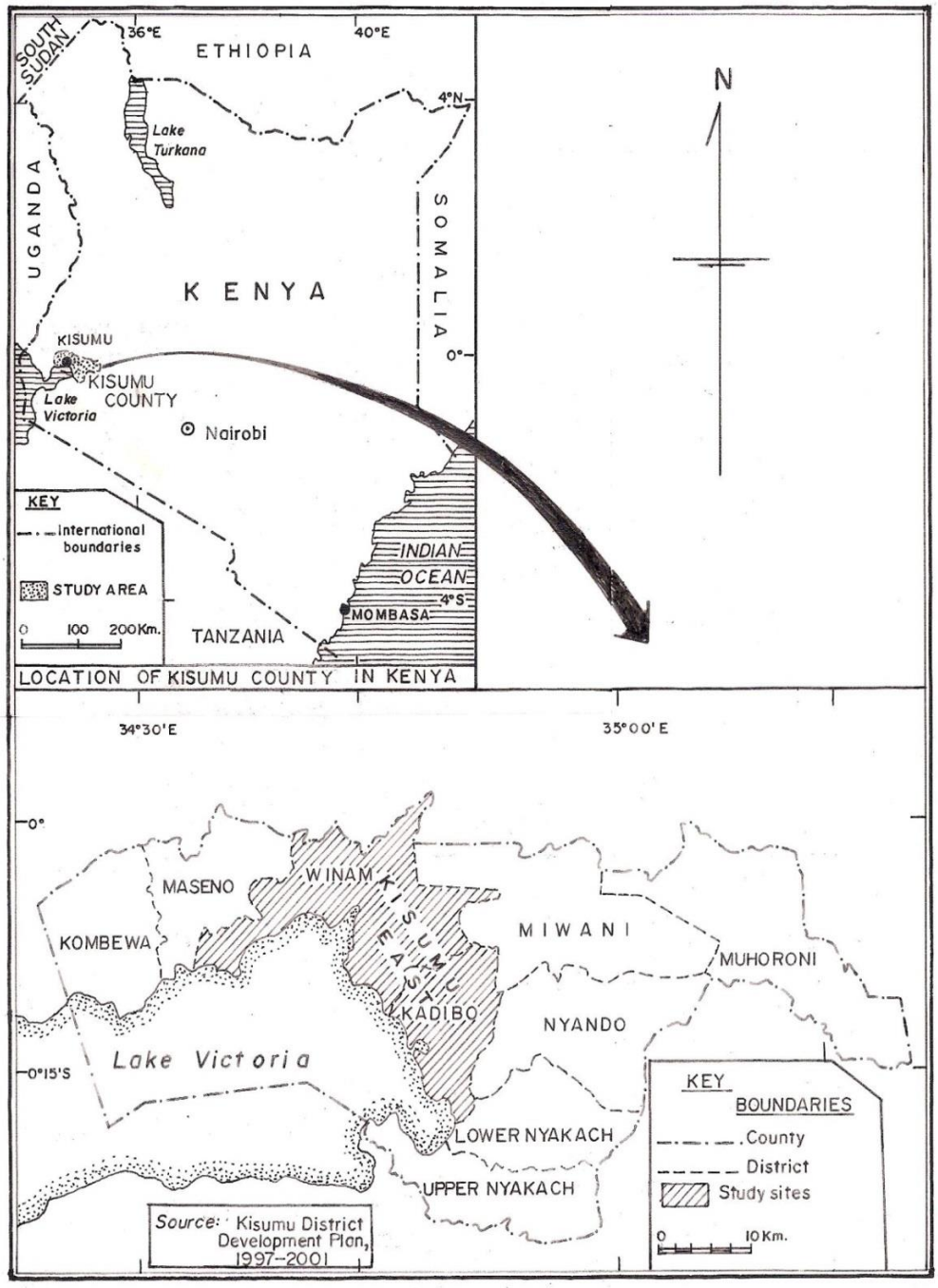
SECTION F: Cost of Inputs for Indigenous Chicken Enterprise

10. Indicate the average cost incurred on the following inputs of indigenous flock within the **first two years** as CIG member

Inputs	**units**	**Before CIG membership**	**As CIG member**
Purchased Feeds	Monthly average Ksh	[ ]	[ ]
Veterinary services	Monthly average Ksh	[ ]	[ ]
Hired labor for poultry	Monthly average Ksh	[ ]	[ ]
Marketing of poultry (market levies)	Monthly average Ksh	[ ]	[ ]
Purchased flock (chicks, growers, hens, cocks), & eggs	Total average value Ksh	[ ]	[ ]

Thank you for sparing your valuable time to fill in this questionnaire. A feedback of this research finding will be shared.

APPENDIX B: MAP SHOWING THE LOCATION OF KISUMU EAST SUB-COUNTY IN KENYA.



Map showing the location of Kisumu East Sub-County in Kisumu County Kenya

Source: Kisumu East District Development Plan, 2008-2012

APPENDIX C: COPY OF RESEARCH PERMIT

THIS IS TO CERTIFY THAT:
MS. ROSE AKINYI ONYANGO
of EGERTON UNIVERSITY, 1086-40100
Kisumu,has been permitted to conduct
research in *Kisumu County*
on the topic: *INFLUENCE OF COMMON INTEREST GROUP MEMBERSHIP ON PRODUCTIVITY FROM SMALL HOLDER INDIGENOUS CHICKEN ENTERPRISE IN KISUMU EAST- SUB COUNTY, KISUMU COUNTY*
for the period ending:
31st August,2015

.....
Applicant's Signature

Permit No : NACOSTI/P/14/2195/4214
Date Of Issue : 10th December,2014
Fee Recieved :Ksh 1,000

.....
Secretary
National Commission for Science, Technology & Innovation

APPENDIX D: RELIABILITY RESULTS

```
RELIABILITY
  /VARIABLES=GENDER EDUCATION WHYKEEPB WHYKEEPA REASONCIG SOURCEB SOURCEA HOU
SINGICB HOUSINGICA VACCINATIONB VACCINATIONA FEDSUPPLEM
   ENTARYB FEDSUPPLEMENTARYA ARTBRODB ARTBRODA EQUIPPURCHASEB EQUIPPURCHASEA
CHICKSRAISEDB CHICKSRAISEDA GROWERSRAISEDB
GROWERSRAISEDA HENSKEPTB HENSKEPTA COCKSKEPTB COCKSKEPTA EGGSLAYEDPERCYCLEB E
GGSLAYEDPERCYCLEA GROWERSSOLDB GROWERSSOLDA HENSSOLDB H
   ENSSOLDA COOKSSOLDB COOKSSOLDA EGGSSOLDPERCYCLEB EGGSSOLDPERCYCLEA INCOMEB
 INCOMEA
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=SCALE CORR.
```

Reliability

```
[DataSet1] C:\Users\GOGO\Documents\Q reliability test.sav
```

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	26	96.3
	Excluded[a]	1	3.7
	Total	27	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.801	.773	37

Inter-Item Correlation Matrix

	The Gender of the respondent	The level of education of the respondent	Why keep indeginous chicken before joining CIG	Why keep indeginous chicken after joining CIG
The Gender of the respondent	1.000	-.163	.305	.047
The level of education of the respondent	-.163	1.000	-.010	-.041

Page 1