

**FACTORS INFLUENCING ESTABLISHMENT OF INDIGENOUS CHICKEN
VALUE CHAIN IN HAMISI CONSTITUENCY, VIHIGA COUNTY, KENYA**

BY

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

2014

DECLARATION

This project report is my original work and has not been presented for an award of a degree, diploma or certificate in a university.

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DEDICATION

To my mother Phanice Mbono Sungu for her continued support, in memory of my father John Leah Sungu who was my great teacher and grandmother Iren Khavula Jisuvei who was my mentor and advisor, and to God for being the source of my strength.

ACKNOWLEDGEMENT

I highly acknowledge the professional guidance and support I received from my supervisor; Prof. Christopher Mwangi Gakuu (PhD). His tireless effort and insistence on quality which saw me through my research work. This has taught me that with determination, passion, and above all God's guidance and strength all things are possible. I give many thanks to the lecturers who dedicated their time to give us the needed knowledge during the entire period. I am indebted to the University of Nairobi for giving me the chance and opportunity to further my studies.

I am indebted to my brother Kenneth Khavwanditsa, sisters Ann Mudeitsi, Doris Khavula, Patricia Kabole and Getrude Khamonya for their encouragement and support.

I give all the Glory to my heavenly Father God for good health, all the nice people I interacted with, and all His abundant provisions without which I could not have accomplished a thing.

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ABBREVIATIONS AND ACRONYMS

| | |
|-------------|-------------------------------------|
| ADB | Agricultural Development Bank |
| AI | Avian Influenza |
| CF | Chicken Farmer |
| CFG | Chicken Farmer's Group |
| DLP | Director Livestock Production |
| IC | Indigenous Chicken |
| ICVC | Indigenous Chicken Value Chain |
| KIT | Royal Tropical Institute |
| KNBS | Kenya National Bureau of Statistics |
| KPHC | Kenya Population and Housing Census |
| NCD | New Castle Disease |
| NGO | Non-Governmental Organization |
| VC | Value Chain |

ABSTRACT

The value chain approach embraces the full range of activities which are required to bring a product or service from conception, through the intermediary phases of production, delivery to final consumers, and final disposal after use. Traditionally extension agents have concentrated their efforts on technology transfer that targeted production aspects of a poultry and ignored other factors of the value chain. Most farmers specialize in production and may be excluded from decision making about issues that affect them outside their farms. There exists a knowledge gap of what potential there is for income generation and employment creation in the indigenous chicken value chain. Despite their hard work farmers continue to have low incomes resulting into low living standards. There are several factors that influence the Indigenous Chicken Value Chain. This study aimed to explore how factors of credit, disease control, extension services and market infrastructure influences the establishment of the indigenous chicken value chain in Hamisi Constituency, Vihiga County. The study employed a descriptive survey research design. The target population consisted of 302 farmers who were members of 23 chicken farmers' groups, 13 Agrovets attendants, 15 Indigenous Chicken Traders and one agricultural extension officer assigned to the study area. A random sample of 169 farmers was drawn from the 302 farmers using simple random sampling, with the guide of research randomizer generator. All the Agrovets attendants, extension service provider and IC traders were included in the study, as their number was small to sample. The reliability coefficient for the farmers' instrument obtained was 0.811(see appendix I). This was considered adequate for the study. Data was analyzed using frequencies, means, median, mode, variance and correlations. Results from the study indicated that control of NCD had significant influence ($r=0.588$) on the establishment of the indigenous chicken value chain in Hamisi Constituency. The correlation between the establishment of ICVC and Extension services was of $r=0.33$, Market access at $r=0.117$ and that with Credit access was low at $r=0.016$. Market facilities for slaughter, cold storage and dedicated sell outlets for birds were completely lacking in all the major market centers in the study area. Local authorities in consultation with relevant technical departments should invest in market infrastructure that will enhance sales of chicken and other chicken products. Extension Officers should be increased from the current 1 to at least 7 in order to adequately meet the demand of the services. They should embrace the value chain approach and provide information on credit. Credit providers should educate the masses on accessibility and types of credit they offer, being clear on terms and conditions so as to eliminate the negative perception on loans. The thermal stable NCD vaccine should be made available in rural areas where electricity is not available. Local leaders should educate and encourage farmers to commercialize indigenous chicken production as a means of poverty reduction.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Animal production in general and chicken production in particular plays an important socio-economic role in developing countries (Alders, 2004). Nearly all rural and peri-urban families in developing countries keep a small flock of free range chicken (Branckaert and Gueye 1999). Poultry are widely acknowledged as the livestock of the poor, and poultry production is part of most smallholder farming systems. Approximately 80% of the chicken populations in Africa are reared in free scavenging systems (Gueye, 1998).

According to KPHC (2009), out of the 31,827,529 chickens kept in Kenya, local chicken accounted for 81% (25,756,487) while the remaining 19% (6,071,042) were exotic chicken. Indigenous chicken production is an integral part of the farming systems in Western part of Kenya and represents almost the total poultry flock in the region. In 2009, Vihiga County had a population of 214,578 chickens out of which indigenous chicken accounted for 92.8% (199,210) while 7.2% (15,368) were exotic chicken. This trend was reflected in Hamisi Constituency where out of 130,642 chickens kept, indigenous chicken accounted for 93.2% (121,759) while the remaining 6.8% (8,883) were exotic chicken (KNBS, 2010). These birds are raised mostly under the scavenging free-range system with minimal resource inputs. The productivity of these chickens is very low. According to Okitoi (1997) the average annual egg production ranges from 36 to 97 eggs per hen, with a very small egg size of about 46g compared to a potential of 140 eggs per annum with an egg size of 60g.

The indigenous chicken production has the potential of contributing to the family income considering the existing popularity, suitability to the local conditions, low cost of investment needed, quick returns on investment and their potential for growth in

business. This kind of poultry is suitable where land is a limiting factor. Indigenous chicken are kept for various reasons, including cultural ceremonies which vary from one culture to another. Almost every household keeps some indigenous chicken (Director Livestock Production, 2008). In Kenya, there is an increasing demand for white meat in urban areas, this demand is not in tandem with the supply from the rural areas where most of the indigenous chicken are reared (Director Livestock Production, 2008). The growing domestic demand, which results from increased urbanization, higher income due to economic growth, and rising population, offers significant incentive for increased market oriented livestock production.

Consumption is shifting from basic food stuffs to fruits, vegetables and white meats especially in urban areas (Tropical Royal Institute KIT, Faida MaLi and International Institute of Rural Reconstruction, 2006). In Africa the food value chains are rapidly changing. The high requirements in terms of investments, technology and business skills suggest that small and remote farmers will be excluded from such markets. This poses a new challenge as well as a new opportunity for Kenyan indigenous poultry keepers. The question is how they can upgrade their products and activities so that they can meet this demand.

Wachira (2003) has reported that the productivity of indigenous chicken can be greatly increased. Poultry diseases, notably Newcastle Disease (NCD), are a major cause of high chicken mortality. NCD can only be controlled through vaccination, where the vaccine is handled through cold chain and this is a challenge in the rural areas where cold storage is mostly not available. The vaccine's affordability and administration also limits its usage among small scale poultry farmers. Credit services access also influences the extent to which one engages in the poultry business. Collateral requirements may lock out potential farmers especially women who most likely lack tangible assets. Because of the high poverty levels among the small scale farmers, credit may be used to offset other needs such as school fees for their children. Proper market infrastructure is very vital for any business to excel. This includes transportation, processing facilities, packaging and selling outlets. Availability of markets encourages the farmer to produce for the market

and not just market what they produce. Again, some customers may need parts of the chicken as opposed to the whole chicken.

Most technologies developed for improvement of poultry often are geared towards large commercial exotic flocks (broilers and layers). The value chain approach has been used mainly in crop based enterprises and not in livestock production systems. Value chain is the full range of activities which are required to bring a product or service from conception, through the intermediary phases of production, delivery to final consumers and final disposal after use (Kaplinsky, 2000). Poultry value chain is the processes through which birds and other inputs pass during the production processes, including information on the place each occurs and on the people involved. Understanding the poultry value chain is a starting point for understanding how small-scale poultry development can contribute to household income and well-being. A lot of efforts have been made by various agents like the Ministry of Livestock Development and NGO's to promote indigenous chicken production through provision of information and skill development. Despite all these efforts, the levels of commercialization of the project are still very low. Analysis of the indigenous chicken value chain in Hamisi will identify obstacles that hinder its establishment and will offer possible solutions to mitigate the constraints.

1.2 Statement of the Problem

Most farmers in Hamisi Constituency do have small land holding size. This limits farmers not to produce surplus crop for sale and generating income after satisfying the subsistence requirement. To solve this problem other alternative agricultural production system is livestock production system, and among this indigenous chicken production can be one. Often farmers are not attracted by new technology even when it appears to be better than their current practices owing to market limitation (Diao and Hazell, 2004, as cited in Aklilu, 2007). Despite the fact that poultry products play an important direct or indirect role in the livelihood of greater portion of the Kenyan people, its marketing and market chain, disease control and credit access aspects have not yet been studied in different parts of the country, especially in the study area of Hamisi Constituency. Thus,

this study investigates indigenous chicken value chain in this region and this will help to narrow the information gap on this area of interest.

Indigenous chicken farming is an integral part of farming activities in Hamisi Constituency. Despite efforts made by the Ministry of Livestock Development and NGO's to promote indigenous chicken production through provision of information on production, commercialization, organization and linkage development, the productivity of the project is still very low with an annual average egg production ranging from 36 to 97 eggs per hen, with a very small egg size of about 46g compared to a potential of 140 eggs per annum with an egg size of 60g (Okitoi, 1997). There is poor disease control, vaccinations against poultry diseases is low as cyclic chicken deaths are experienced every year. Information on potential for income and employment generation from chicken farming generally lacks.

Though indigenous poultry meat and eggs are relatively more expensive than those from exotic poultry, they are preferred by most consumers. Despite this popularity of the indigenous chicken, farm incomes remain minimal and so low living standards of the people. Production of this chicken can greatly be enhanced to positively impact household's incomes and food security thus aiding to improve the living standards of the small-scale farmers in Hamisi Constituency.

1.3 Purpose of the Study

This study aimed to investigate the influence of factors of credit access, disease control, market infrastructure and extension services on the establishment of indigenous chicken value chain in Hamisi Constituency.

1.4 Objectives of the Study

1. To determine how access to credit influences the establishment of indigenous chicken value chain in Hamisi Constituency
2. To establish the extent to which control of chicken diseases influences the establishment of indigenous chicken value chain in Hamisi Constituency
3. To determine ways in which market infrastructure influences establishment of indigenous chicken value chain in Hamisi Constituency
4. To investigate how agricultural extension services influences establishment of indigenous chicken value chain in Hamisi Constituency

1.5 Research Questions

1. How does access to credit influence the establishment of indigenous chicken value chain?
2. To what extent does control of chicken diseases influence the establishment of indigenous chicken value chain?
3. In what ways does the market infrastructure influence the establishment of indigenous chicken value chain?
4. What is the role of agricultural extension services on the establishment of indigenous chicken value chain?

1.6 Significance of the Study

Considering the existing popularity, suitability to the local breeding conditions, the low costs of investments required and the quick returns, indigenous chicken sector has the potential of contributing positively to the family income and hence improved well-being. Understanding the chicken value chain is the starting point for understanding how small-scale chicken establishment can contribute to the household income and well-being. The information will help farmers, traders and others who need this information for different purposes. Farmers will benefit from a fully established indigenous chicken value chain as they will be able to produce and sell chicken in an environment they are well knowledgeable in. Farmers will earn a living from chicken sale, and be self-employed, hence improved living standards. Chicken traders and transporters will operate more efficiently and improve their functions. Service providers will benefit by offering services like chicken slaughter facilities. The quality and range of chicken products will increase

through value chain addition. Employment opportunities will emerge when the value chain is fully established. The local county government of Vihiga and NGO's will use the information for investment opportunities.

1.7 Delimitation of the Study

This study involved indigenous chicken farmers from Hamisi Constituency sampled from four out of the seven County wards, namely; Banja, Shamakhokho, Gisambai and Shiru, local chicken traders, agricultural extension officer and Agrovet attendants. The farmers were the major study group, while the Agrovet attendants, extension officers and chicken traders' data corroborated data from the farmers to avoid bias from one end of the indigenous chicken value chain. This study restricted itself to the selected four factors that influence the indigenous chicken value chain in Hamisi Constituency. These factors were the access to credit; availability, affordability and administration of vaccine against Chicken diseases like Newcastle as was the major cause of chicken mortality; market infrastructure; and the role played by agricultural extension services on the ICVC.

1.8 Limitations of the study

The study faced a challenge of time as it had to be conducted within the academic calendar. This challenge was overcome by personal discipline and hard work of the researcher. In light of the hard economic times, another challenge was that of funds that were utilized during the process of conducting the research. This was overcome by having a budget in order to control excessive expenditure. Most of the farmers since they operate on small-scale, did not keep records. Hence the study depended on their word of mouth. Observation and physical counting of chickens was employed to overcome the limitation; and language barrier was another challenge as most farmers could not read and write in English, hence guided questionnaires were used.

1.9 Assumption of the Study

The study assumed that the respondents involved gave honest responses and that the chicken farmers are a homogenous group, hence similar characteristics.

1.10 Definitions of Significant Terms

Agrovet: These are outlets of veterinary goods and services. They stock inputs like vaccines, animal feeds and drugs. They may provide services like animal treatment. The operator of an Agrovet is a professional animal practitioner.

Commercialization: This is rearing indigenous chicken for purposes of generating income through sale of chicken meat, breeding stock and eggs.

Chicken Farmer: This is an individual who rears indigenous chicken either on large scale for sale or small scale for family consumption or both.

Chicken Farmers' Group (CFG): Indigenous chicken farmers who have come together for purposes of rearing and selling local chicken as a group. Members demand for extension services which they require such as training workshops, tours and market information. Jointly the members can bulk their birds and eggs for sell and also acquire inputs like vaccines.

Development: A change with a specific direction. The indigenous chicken production is changing over time from subsistence to commercial.

Establishment: The condition or fact of being established, an arranged order or system

Free range system: this is where chicken are left to scavenge for feed on their own. The birds are left to roam in the homestead and beyond, looking for feeds. They feed on kitchen waste/leftovers insects, grass and any other edible matter they come across. Feed supplements are rare. Basic housing is provided for, especially a night shelter. Predation on the young birds is very common.

Indigenous chicken: these are also known as backyard chicken, local chicken or scavenging chicken. In this study, any flock of chicken that is not classified as a conventional exotic commercial chicken breed will qualify to be indigenous.

Newcastle Disease: Poultry disease that is highly infectious. Symptoms are respiratory and nervous signs, gasping and coughing, drooping wings, dragging legs, twisting of the head and neck, circling, depression, complete paralysis, partial or complete cessation of

egg production, egg is rough-shelled, thin-shelled and contains watery albumen. Greenish watery diarrhea, swelling of the tissues around the eyes and in the neck. The mortality rate is high; sometimes the whole flock is lost.

Market Outlet: This refers to a dedicated area at shopping center where indigenous chicken and its products are sold. The products include eggs, meat, skins, bones and feathers.

Vaccine administration: Vaccine like for NCD is packaged in vials of hundreds of doses. The vaccine is reconstituted by diluting with distilled water. The procedure is simple enough to be done by a lay person but many farmers shy away. The farmers who cannot access a technician fail to vaccinate their chicken leading to chicken deaths.

Value Chain: This is a complex system of stakeholders and processes. The indigenous chicken value chain consists of specific inputs, breeding, production, collection and processing, transportation and trading, and consumption. In chicken, the value chain starts from what happens to the egg up to when the chicken is on the plate for consumption. The people involved in various activities such as producers, service providers, traders and consumers are the chain actors.

1.11 Organization of the Study

The activities of the study were organized systematically to ensure that the first step provides logical foundation and support to the proceeding ones. The study is arranged in five chapters which are; chapter one which has background that introduces the problem under study, the problem statement which identified the gap that the study was filling, objectives, research questions, significance of the study, delimitations and limitations of the study, basic assumptions of the study and the definitions of significant terms used in the study were then explained. In chapter two a wide range of literature was reviewed so as to ensure proper understanding of the problem and determination of the gaps to be filled by the current study. Theories that guide the study and the conceptual framework were also discussed here. The third chapter proceeded with the research design, target population, sample and sampling procedures, data collection and analysis methods, the operationalization of variables and ethical considerations used in the study were

highlighted. In chapter four, the results of the study were presented, analyzed and discussed as per the research objectives. Finally in chapter five, summary of findings, discussions, conclusions and recommendations for further action and contributions to the body of knowledge were highlighted and suggestions for further research listed.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, some of the literature done on the study topic will be looked at. The section analyses literature on general poultry production, indigenous chicken production, characteristics of the indigenous chicken value chain such as credit access, disease control, marketing and skills development. The chapter concludes by describing the theoretical and conceptual frameworks that guide the study.

2.2 General Poultry production

Poultry consumption in the world is projected to grow by 2.5% per annum by the year 2030 with other meats growing at 1.7% or less. In developing countries poultry production is projected to grow at 3.4% per annum by the year 2030 (FAO, 2007). In developed countries poultry production is industrialized where commercial laying hens can produce as many as 325 eggs annually and broilers which can reach 2.5 kg in 42 days. In Kenya the exotic commercial layers produce on average 240 eggs annually and broilers attain 1.5 kg at 42 days (DLP, 2008).

2.3 Indigenous Chicken Production

In many developing countries around the world, small scale poultry production systems have developed as a source of livelihood support for the rural poor. In the recent years there has been growing recognition among the development community of the role of small scale commercial poultry production in accelerating the pace of poverty reduction and reaching out to the poorest of the poor. There is also growing evidence to demonstrate the role of small scale poultry in enhancing the food and nutrition security of the poorest households and in the promotion of gender equality (FAO, 2007). Indigenous breeds make up 63% of the world's poultry population. In Europe 52% of the poultry is indigenous, while in Africa indigenous poultry account for 80% (Gueye, 1998).

In a large number of low income countries, local chicken production is the largest system of poultry production and a critical source of income and nutrition for the poor households. Even in countries with a relatively large modern industrial poultry production sector like India, free ranging chicken running around in the backyards of rural households are a common sight especially in areas with high incidences of poverty and account for a very large proportion of the national poultry population. Ahuja and Sen, (2007) provide some figures on the approximate proportion of total poultry population made up by birds kept under small-scale farming production systems in selected African countries, these are presented in Table 2.1.

Table 2.1: Percentage of National Poultry Flocks Accounted by Local Chicken

| Country | % of Local Chicken to National Poultry Population |
|--------------------------|--|
| Cameroon | 70 |
| Central African Republic | 80 |
| Cote d'Ivoire | 73 |
| Ethiopia | 99 |
| Gambia | 90 |
| Kenya | 81* |
| Malawi | 90 |
| Mali | 90 |
| Nigeria | 93 |
| Senegal | 70 |
| Sudan | 75 |
| Tanzania | 70 |
| Togo | 70 |
| Uganda | 80 |

Source: Ahuja, and Sen, (2007) *note the figures for Kenya are adjusted to the KPHC, 2009 report.

From the table, it can be noted that in Ethiopia almost all the chicken (99%) are local birds, while for the other countries local chicken account for 70% and above of the total chicken population.

The poultry sub-sector is an important component of the Kenyan livestock production system yet there is insignificant support at national level as compared to dairy and beef sub-sectors. Indigenous chicken accounted for 81% (25,756,487) of the chicken population (KPHC, 2009). Western Province had 16% (4,144,351) of the national indigenous chicken population. Most rural households sell local chicken to satisfy basic needs. Local chicken production trends in western province are shown in Table 2.2

Table 2.2: Local Chicken production trends in Western Province

| YEAR | LOCAL CHICKEN POPULATION |
|------|--------------------------|
| 2005 | 2,667,819 |
| 2006 | 2,517,622 |
| 2007 | 2,644,148 |
| 2008 | 2,214,305 |
| 2009 | 4,144,351 |

Source: Provincial Director of Livestock Production annual reports 2005-2009.

2.4 Poultry Value Chain

According to Kaplinsky (2000) value chain is “the full range of activities which are required to bring a product from conception, through the intermediary phases of production, delivery to final consumers and final disposal after use”. Poultry value chains describe the processes through which birds and other inputs pass during the production process, including information on the place each process occurs and on the people involved. The value chain (VC) is made up of functions, operations, service providers, framework conditions and attitudes. Understanding this chain and the value of poultry to the owners and traders is vital in understanding how small-scale chicken establishment can contribute to household well-being. Chicken VC is shown in Figure 1.

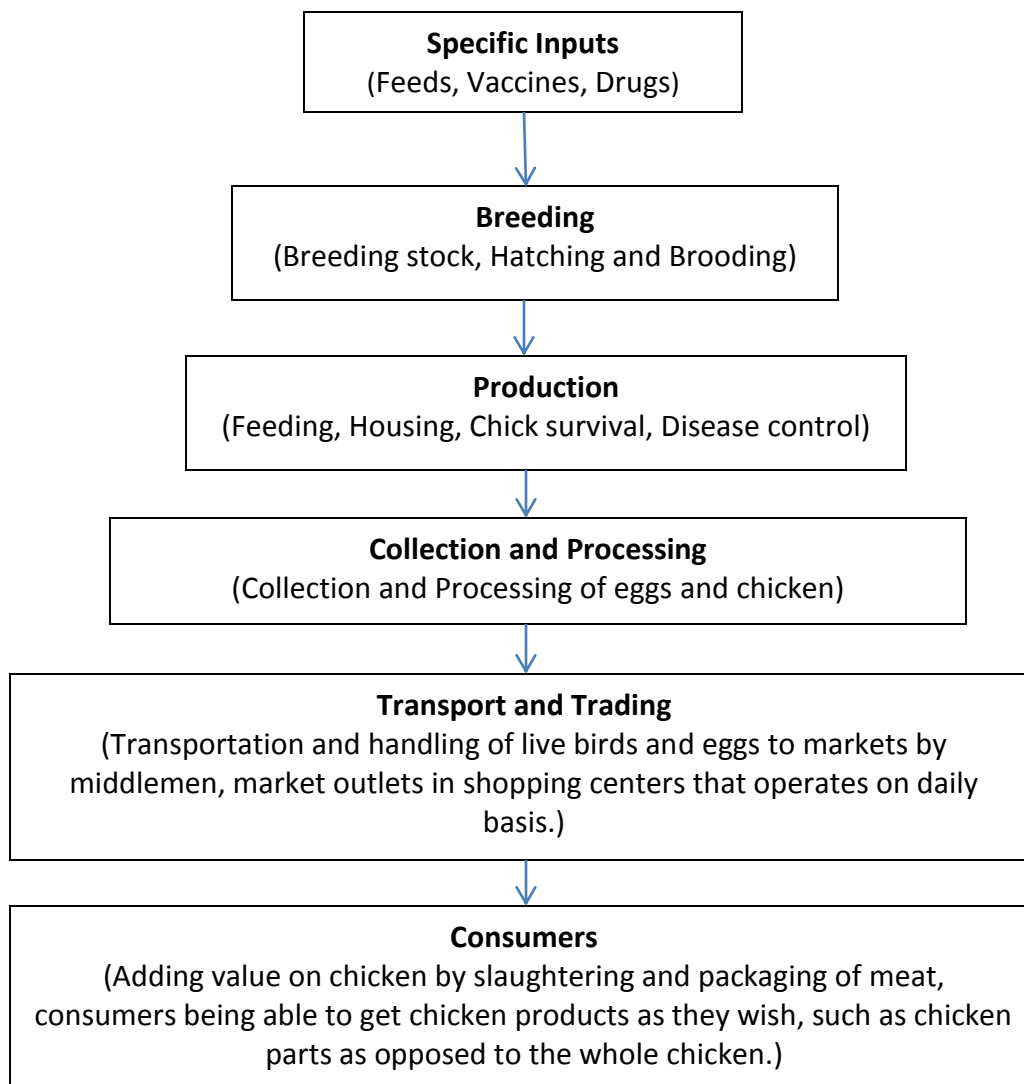


Figure 1: The Chicken Value Chain.

2.4.1 Components of the Value Chain

As seen in Figure 1 above, the components of Specific Inputs include Feeds, Vaccines, and Drugs. Those for Breeding include Breeding stock, Hatching and Brooding. The components of Production include Feeding, Housing, Chick survival and Disease control. Those of Collection and Processing include Collection and processing of eggs and chicken while the components of Transportation and Trading include transportation and handling of live birds and eggs to markets by middlemen, market outlets in shopping centers that operate on daily basis. Lastly, components for Consumption are adding value

on poultry through slaughtering and packaging of meat (Mathuva, 2005), Consumers being able to find poultry products as they wish such as chicken parts as opposed to the whole chicken.

2.4.2 Actors in the Indigenous Chicken Value Chain

Actors are those people involved in the processing, producing, trading or consuming the indigenous chicken. They include direct actors like producers, traders, consumers and indirect who provide financial or non-financial support services such as credit agencies, business service providers and researchers. Each actor plays a specific role at different points of the VC (KIT, et al 2006). Households produce birds and eggs, they exchange breeding stock with neighbors or buy from traders, markets and hatchery. Eggs are sold to primary egg collectors, neighbors and local market to local consumers. Secondary traders transport eggs from rural areas to urban markets where they sell to urban consumers through supermarkets, shops and restaurants. Live birds are given as gifts to family, friends, sold to primary collector or directly to local market. Secondary traders transport live birds to urban wholesale markets. Tertiary traders buy birds from the wholesale market to shops, supermarkets and restaurants. The chain ends with the urban consumers.

2.5 Factors influencing the Establishment of Indigenous Chicken Value Chain

There are many factors that influence the Indigenous Chicken value chain. However this study restricts itself to the selected four factors. These factors are the access to credit; availability, affordability and administration of vaccine against Chicken diseases like NCD as is the major cause of chicken mortality; market infrastructure; and role of agricultural extension services. The factors are discussed in detail in the following subsections.

2.5.1 Access to Credit services and its influence on chicken value chain.

Agriculture the world over continues to contribute to economies in various ways. In developing economies, for instance, it is the livelihood of the very many that live in the rural areas. Nowadays much of the world's agriculture is struggling and starved of the much needed investment (UN, 2006). Heads of state and governments meeting at the 2005 world summit at the United Nations stated that they recognize the need for access to

financial services, in particular for the poor, including through microfinance and microcredit (UN, 2005). This reflects what must be and increasingly is a concern of development and poverty eradication policy at national and local levels. Agriculture is typically a capital-intensive industry with investments in farmland, building, machinery, equipment, and breeding livestock dominating the asset structure of most types of farms (Barry, P. J., and Robison, L. J. 2001). However many of these investments have been identified to depend on success to appropriate financial services of which the provision of, and access to credit is prominent (IADB, 2001)

Agricultural credit plays a very important role in the development of the agricultural sector. It can meet a range of needs and can be critical to the success of agriculture. In fact, circumstantial evidence shows that where agriculture has grown more rapidly, institutional credit has expanded more rapidly (Hazell, P.B.R., 2010). Credit does not only serve as a valuable source of liquidity in responding to risk, but also readily available credit has facilitated many of the significant, long-term challenges in the farm sector increasing commercialization, larger farm sizes, fewer farms, greater capital intensity, adoption of new technology, stronger market coordination and others (Barry, P. J. 1995)

The need for credit can, therefore, not be overemphasized. In Ghana, this need gave rise to the establishment of the Agricultural Development Bank (ADB Act 286) in 1965 to promote the development and modernization of agriculture and allied industries, one of which is the poultry industry under the livestock subsector. The ADB is currently the largest provider of credit to farmers in Ghana. It, however, allows for a balance in the distribution of its loanable fund between the agricultural sector and the rest of the economy.

The constraints that the farm sector faces in accessing financial services can be classified as internal and external factors (FASDEP I 2002). The internal factors are lack of collateral due to poor quality of farm assets, poor financial management, risky nature of farm production and inability to prepare viable project proposals. The external factors are high interest rates; high cost of service delivery to the sector and perception of financial services providers about farming as being high risk. And even where banks advance loans

to the farm sector, the preference is for funding less risky and shorter duration processing activities and trade, cold storage facilities, and large-scale milling and plywood manufacture, rather than for primary production like poultry and fishing.

This study explores the influence of credit on the indigenous chicken value chain in Hamisi Constituency, where indigenous chicken are fed on food wastes/leftovers from the kitchen and left to scavenge. Chicks are once in a while fed on commercial feeds. Housing for poultry is not a common practice. For the farmer to shift from subsistence indigenous poultry rearing to commercial, they would have to increase flock size and intensify management (Kaunda, and Kityali, 2000). There is high potential in commercializing local chicken rearing if improvements are made on housing, feeding, disease control and breeding. Capital is required to implement these improvements. Credit facilities that provide affordable loans would be a financial source of capital for establishment of indigenous chicken production.

2.5.2 Control of Chicken diseases and its influence on the chicken value chain.

Poultry are kept as a source of animal protein throughout the world. Moreover, poultry are able to adapt to most geographical areas and conditions, they are not expensive to buy, they have rapid generation time and a high rate of productivity, and they do not require large areas of land. Poultry production systems differ, ranging from rural farming to highly industrialized and vertically integrated systems. Backyard poultry production is distributed in most rural and peri-urban areas of the world, and is mainly based on the rearing of domestic or indigenous poultry, both terrestrial and aquatic. Intensive poultry production is most common in developed countries, but in the last few decades, many developing countries have also adopted this system in order to meet the increasing demand for animal proteins. In recent times, the risk of transmission of certain trans-boundary poultry diseases to previously unaffected areas has increased as a result of globalization and the possible persistence and spread of disease agents through domestic and wild reservoirs. The widespread distribution of Newcastle disease and the epidemics of avian influenza (AI) that have occurred over the last years provide examples of the negative impact of such diseases on the poultry producing sector and on society as a whole (FAO, 2006). Different strategies can be implemented to effectively prevent and

control the spread of animal diseases at international, national and farm levels and poultry disease control plans often include the use of vaccination. Vaccines are, in fact, an important component of poultry disease prevention and control worldwide. Their use in poultry production is traditionally aimed at avoiding or minimizing the emergence of clinical disease at farm level and thus increasing production. Vaccines and vaccination programmes vary widely, depending on several local factors like the type of production, level of biosecurity, local pattern of disease, status of maternal immunity, vaccines available, costs and potential losses. Although poultry vaccination is generally managed by the poultry industry, it has only rarely been applied in the framework of a disease eradication programme at national or regional level to control a few major poultry diseases like AI and NCD (Alexander D.J., 2003).

In addition to NCD and AI, there exist other poultry diseases that affect indigenous chicken such as coccidiosis, Fowl pox and Fowl Typhoid. This study considered mainly Newcastle as it causes the highest mortality in poultry in the study area. This is a very highly infectious disease whose symptoms are respiratory and nervous signs: gasping and coughing, drooping wings, dragging legs, twisting of the head and neck, circling, depression, complete paralysis. Partial or complete cessation of egg production, egg is rough-shelled, thin-shelled and contains watery albumen, greenish watery diarrhea and swelling of tissue around the eyes and the neck. The mortality rate is very high sometimes the whole flock is lost. Newcastle disease is only controlled through vaccination. The vaccine is kept under a cold chain and is reconstituted before it is administered (Odwas, Wesonga, and Okitoi, 2006).

2.5.3 Market Infrastructure and its influence on the chicken value chain

Market infrastructure can be divided into market and marketing, marketing channels, marketing chain and marketing actors. The following sub-sections explore them.

2.5.3.1 Market and Marketing

Market can be defined as an area in which one or more sellers of given products/services and their close substitutes exchange with and compete for the patronage of a group of buyers. Originally, the term market stood for the place where buyers and sellers are gathered to exchange their goods, such as village square. A market is a point, or a place

or sphere within which price making force operates and in which exchanges of title tend to be accompanied by the actual movement of the goods affected (Backman and Davidson, 1962). The concept of exchange and relationships lead to the concept of market. It is the set of the actual and potential buyers of a product (Kotler and Armstrong, 2003). Conceptually, a market can be visualized as a process in which ownership of goods is transferred from sellers to buyers who may be final consumers or intermediaries.

2.5.3.2 Marketing channel

A marketing channel is a business structure of interdependent organizations that reach from the point of production or origin to the consumer with the purpose of moving products to their final consumption or destination (Kotler et al., 2003). This channel may be short or long depending on kind and quality of the product marketed, available marketing services, and prevailing social and physical environment (Islam et al., 2001).

2.5.3.3 Marketing chain

Market chain is the term used to describe the various links that connect all the actors and transactions involved in the movement of agricultural goods from the producer to the consumer (CIAT, 2004). A marketing chain is used to describe the numerous links that connect all actors and transactions involved in the movement of agricultural products from farmer to consumer (Lunndy et al., 2004). Functions conducted in a marketing chain have three things in common; they use up scarce resources, they can be performed better through specialization, and they can be shifted among channel members (FAO, 2005).

2.5.3.4 Marketing Actors

Marketing actors include; Producer: It is the first link in the poultry market chain, the producer harvests the products and supplies to the second agent. From the moment he/she decides what to produce, how much to produce and when to produce and sale. Consumer: It is the last link in the poultry market chain, the participants and their respective functions often overlap. The most widespread combinations are the following: Traders-whole sellers that collect the commodity and supply it to retailers, whole sellers-retailers (whole sellers that also sell directly to consumers) and whole sellers-exporters. Rural assembler: sometimes also known as transporter or trader, he/she is the first link between producer and other middlemen. Whole seller: He concentrates the various, intermediate

sized loads and puts the product into large, uniform units. These activities all contribute to price formation. Retailers: Middlemen that include super market another large-scale retailer who divides large shipments of produce and sell it to consumers in small units. The basic function they provide is bulk breaking.

Meat and eggs from indigenous chicken are highly priced compared to the exotic ones. They are regarded as more tasty and safe since they are produced naturally without food additives like the growth hormones (FAO, 2007). Most of the consumers of chicken and chicken products are located in urban areas, hence need to transport the indigenous chicken produced in the rural areas to urban centers. Good roads in rural areas leading to urban areas and markets need to be in place with appropriate facilities in the urban centers for sale of the chicken. The facilities include slaughter areas, cold storage, processing and packaging and dedicated selling outlets (Mathuva, 2005). Farmers also need training to be business minded to produce for the market as opposed to just marketing what they produce.

2.5.4 Agricultural extension services and its influence on the chicken value chain

According to Farooq et al (2000), accessibility to extension service significantly improves free range indigenous poultry production systems. Inability to access extension services can be an indication of unfavorable government policies. Indigenous Chicken enterprise is common among rural households as it is better adapted to production circumstances of scavenging systems characterized by continuous exposure to disease incidence, inadequate quantity and quality of feeds, poor housing and health care (Gueye, 1998). To increase productivity, extension agents from the public and private domains have continually disseminated management intervention packages to small holders to mitigate these constraints. However farmers choose which interventions to adopt and hardly realize the benefits of the whole intervention package. The intervention package designed to improve productivity of indigenous chicken includes housing, feeding, disease control, breeding and brooding (Njue, Kasitii, and Gacheru, 2006).

2.6 Theoretical Framework

This study is guided by systems theory, market infrastructure models and supply chain theories which are discussed in the following sub-sections.

2.6.1 Systems Theory

Borrowing from system theory (first proposed by biologist Ludwig von Bertalanffy in 1928) it is possible to illustrate the link between establishment of indigenous chicken value chain and the variables of production of the indigenous chicken and how they blend in. A system can be said to consist of four things. The first is objects – the parts, elements, or variables within the system. These may be physical or abstract or both, depending on the nature of the system. Second, a system consists of attributes – the qualities or properties of the system and its objects. Third, a system has internal relationships among its objects. Fourth, systems exist in an environment. A system, then, is a set of things that affect one another within an environment and form a larger pattern that is different from any of the parts. The fundamental systems-interactive paradigm of organizational analysis features the continual stages of input, throughput (processing), and output, which demonstrate the concept of openness/closedness. A closed system does not interact with its environment. It does not take in information and therefore is likely to atrophy, that is to vanish. An open system receives information, which it uses to interact dynamically with its environment. Openness increases its likelihood to survive and prosper. Several system characteristics are: wholeness and interdependence (the whole is more than the sum of all parts), correlations, perceiving causes, chain of influence, hierarchy, suprasystems and subsystems, self-regulation and control, goal-oriented, interchange with the environment, inputs/outputs, the need for balance/homeostasis, change and adaptability (morphogenesis) and equifinality: there are various ways to achieve goals. Different types of networks are: line, commune, hierarchy and dictator networks. Communication in this perspective can be seen as an integrated process – not as an isolated event. Based on this, ICVC is seen as comprising of various variables that inter-relate to achieve the goal of establishment of the value chain.

2.6.2 Market Infrastructure Models

Market infrastructure is one of the independent variables being investigated here to have influence on the dependent variable of establishment of ICVC. The following are models related to how market infrastructure influence the ICVC.

Ajala and Adesehinwa (2007) noted a change in theoretical and applied models used in market analysis. These models included: Structure, conduct and performance (SCP), Commodity approach and Transaction Cost Economics (TCE). They attributed the wide array of models to inadequacy of any single model to study markets in the developing countries. Therefore they recommended a blend of the models for complementary purposes and depending on the nature of the problem under study.

Seanicaa et al. (2006) showed that there has been an evolution in the theory of marketing efficiency, which has led to emergence of at least two hypotheses. These two hypotheses include the “structure performance hypothesis” (SPH) and “efficient structure hypothesis” (ESH). The SPH proposes that markets with high concentration have a poor performance. On the other hand, the ESH proposes that performance is related to the market shares, which raises the profits. Examples of studies that confirmed the SPH are Bett et al. (2012) and Olufemi (2010), while those that confirmed the ESH included Emam (2011) and Dastagiri et al. (2013).

The elements of Market Structure include: the barriers to entry and exit and marketing channels; Conduct include: pricing strategies and promotion strategies; and Performance include: marketing costs, marketing margins and profits (Greer, 1992). These elements of the markets were assumed to have a sequential relationship (Ferguson and Ferguson, 1994). On the other hand, the socioeconomic characteristics of the traders were conceptualized to have an effect on the marketing efficiency (Dastagiri et al., 2013).

2.6.3 Supply chain theories

2.6.3.1 Functionalist, Interpretive and Emancipatory Sociological Paradigms

Paradigm refers to the worldview underlying the theories of a scientific discipline. As mentioned by Jackson (2003) there are four paradigms prevalent in social theory today-functionalism, interpretive, emancipatory and postmodern. The functionalist paradigm seeks to ensure well-functioning of the system by using scientific methods. The interpretive paradigm focuses on subjectivity and the meanings and purposes that people bring to their activities. It seeks to make a shared meaning among key stakeholders. The emancipatory paradigm seeks to emancipate oppressed individuals and groups in

organizations and society. The postmodern paradigm opposes the rationality of the other mentioned paradigms. It encourages variety and diversity to raise conflicts and emphasizes having fun. Using a variety of paradigms will result in a more holistic view than using just one paradigm.

2.7 Conceptual Framework

In this survey, the dependent variable is the establishment of indigenous chicken value chain. The independent variables considered here are access to credit, disease control, market infrastructure and agricultural extension services. The moderating variables are farmer's personal characteristics such as level of education, experience in indigenous chicken production, exposure and farm location in relation to accessing services and the markets. Intervening variables are the age, marital status and the gender of the farmers. The indicators of establishment of indigenous chicken value chain include household incomes from chicken and egg sale, the number of indigenous chicken reared, chicken mortality, intensified production, grading of eggs and meat and number of birds sold. The local poultry CFGs are the vehicles for commercialization of indigenous chicken and subsequently develop the value chain. Figure 2 shows the conceptual framework for the selected factors of access to credit, disease control, market infrastructure and agricultural extension services and their indicators with the moderating and intervening variables and how they influence the establishment of ICVC.

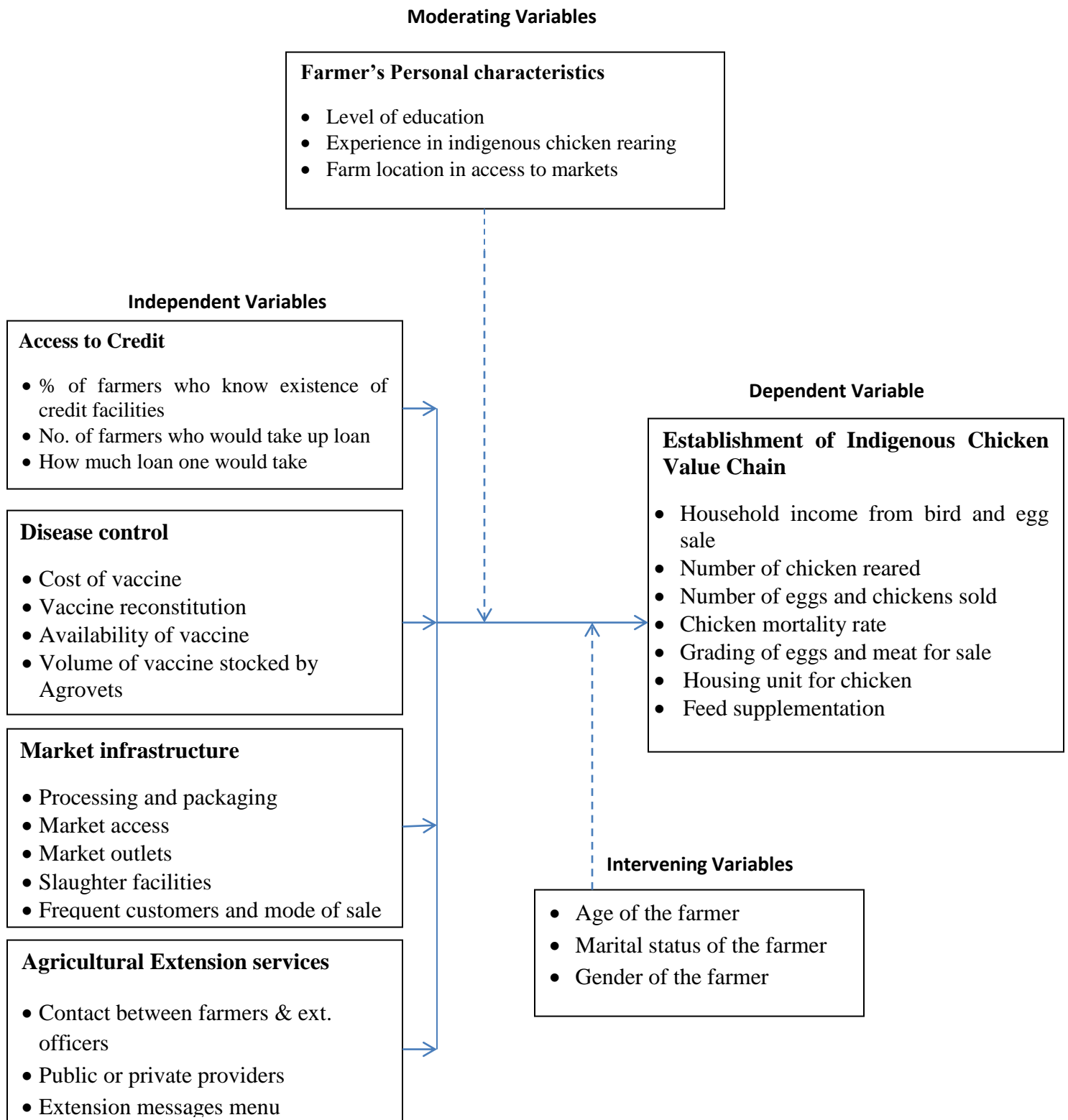


Figure 2: Conceptual framework

2.8 Knowledge Gap

Research effort to increase chicken production and productivity has been underway in many countries. A review of past research works indicates that the research largely concentrated on the biological aspects of poultry production such as supplementary feeding and breeding (Alemu and Tadele, 1997). Increased production, however, needs to be accompanied by efficient marketing systems, reduction of the high disease prevalence and the analysis of the limited credit services. There are a number of fundamental constraints that underlie the poor chicken production. These include traditional technologies, limited supply of inputs (feed, breed, stock, water) poor or non-existent of extension service, high diseases prevalence, poor marketing infrastructure, lack of marketing support service, lack of market information and limited credit services (Berhanu et al., 2007). Thus, this study attempts to address this knowledge gap.

2.9 Summary of Chapter Two

This section details literature on the establishment of indigenous chicken production. The section has analyzed literature on general poultry production, indigenous chicken production, characteristics of the indigenous chicken value chain such as access to credit, disease control, marketing and role of extension services. The chapter concludes by describing the theoretical and conceptual frameworks that guide the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research procedure and technique employed by the study. This include research design, target population, sample and sampling procedure, research instruments, data collection procedures, validity, reliability and methods of data analysis.

3.2 Research design

This is an ex-post-facto descriptive survey. This is a type of research used to obtain data that can help determine specific characteristics of a group. A descriptive survey involves asking questions (often in the form of a questionnaire) to a large group of individuals either by mail, by telephone or in person. This was done using guided structured and semi-structured questionnaires to collect data from indigenous chicken farmers, chicken traders, Agrovets attendants and the agricultural extension officer to avoid biases opinions from one side of the value chain. The design provides self-reported facts about respondents, their inner feelings, attitudes, opinions and habits (Kombo & Tromp, 2006). Descriptive design was chosen because it is usually the best method for collecting information that will demonstrate relationships and describe the world as it exists and can answer questions such as “what is” or “what was.” The study aimed to gain insight into the people’s attitudes and behaviors concerning the ICVC.

3.3 Target population

The target population comprised of 302 farmers from 23 local CFGs in the selected four wards of Shamakhokho, Banja, Gisambai and Shiru. The average membership per CFG was 13 farmers. The rationale for choosing farmers from CFGs was that they had been exposed to farming as a business and therefore it was envisaged that they had commercialized their indigenous chicken enterprises. The families were selected by simple random sampling technique, with the guide of research randomizer generator that

generated the specific families out of the 302. There were thirteen Agrovets which provided farm inputs and other services in the selected county wards and fifteen indigenous chicken traders who operated on daily basis between the markets and received supplies mainly from middlemen. These traders rotate in these markets as market days are different for each market center. There was 1 agricultural extension officer assigned to the study area by the Ministry of Agriculture. The Table 3.1 shows the periodic markets and market days in the selected study area.

Table 3.1: Periodic Markets and market days

| Days | Specific Days | All days of the week |
|-------------|----------------------|-----------------------------|
| Tuesday | Cheptulu | None |
| Wednesday | Serem | |
| Friday | Cheptulu, Hamisi | |
| Saturday | Serem | |
| Sunday | Banja | |

3.4 Sample size and sampling procedure

The study used sampling frame to determine the size of the sample to include in the study and the procedure of arriving at the sample.

3.4.1 Sample size

The study used a sample size of 198 which comprised of 169 IC farmers, 15 IC traders, 13 Agrovets attendants and 1 Agricultural extension officer

Table 3.2: Sample size by category

| Category | Total Number | Sample | Percentage |
|---------------------|---------------------|---------------|-------------------|
| Agrovets attendants | 13 | 13 | 100% |
| Farmers in CFGs | 302 | 169 | 55.96% |
| Chicken Traders | 15 | 15 | 100% |
| Agri. Ext Officer | 1 | 1 | 100% |
| Totals | 331 | 198 | 59.8% |

3.4.2 Sampling procedure

The sample size of 169 farmers was derived from the table for determining sample size for research activities Robert and Morgan (1970) (see appendix E). For Agrovets attendants, traders and the extension officer, all units were used as they were few.

In order to get a representative sample from a population, Kathuri and Pals (1993) recommend that when a survey targets a major sub-group, at least 100 cases should be investigated. The sampling design that was used is a survey design. This comprised of three stages. First, a purposive random sampling was used to select Hamisi Constituency from among IC producing areas in Kenya. Secondly, purposeful sampling was used to select four regions (wards) from other ward areas in Hamisi Constituency. Thirdly, 169 farmers were randomly selected from the 302 farmers in the 23 CFGs in the study area using the Research Randomizer generator. (Appendix F). The selected wards were Gisambai, Shamakhokho, Banja and Shiru from where all chicken traders were used in the study. The traders were selected based on their availability during market days. Data was collected using a guided structured and semi-structured questionnaire, since the literacy levels of the targeted population was low hence could not comprehend English well. Again this was guided because some of the targeted individuals were busy working on their firms or businesses, hence there was no need of setting aside specific time for the questionnaire answering, but this was done while the individual respondent continued with their daily businesses, hence no rushing to answer in order to resume working.

Since the number of Agrovets attendants, chicken traders and extension officers was small in the area, all in each category was used. 13 Agrovets attendants, 15 traders and 1 extension officer were included. Most of the traders were not stationed in one market center, as they rotate as per the market days for each market center.

3.5 Data Collection instrument

Four sets of questionnaires were used to collect data from the four different categories that included farmers from the CFGs who kept the indigenous chicken, Indigenous chicken traders, Agrovets attendants and an extension officer. Data from the traders, Agrovets attendants and the extension officer was to corroborate data from the farmers to avoid bias from any one chain actor.

The questionnaire for indigenous chicken farmers was divided into six sections. The first section was to collect data on the respondent's background while the second section was to collect data on the indigenous chicken project. The third section was designed to collect data on vaccination against diseases and the availability, cost and reconstitution of vaccines like the NCD vaccine. Section four was on access to credit for indigenous chicken projects, that constituted the availability of loans to invest in the indigenous chicken projects and the fifth one was the market infrastructure that covered access of markets. Section six was on extension services. This was to seek data on the extension services provider, frequency of contact, the menu of extension messages given, and other sources of information on indigenous chicken value chain. The instrument had a total of twenty two closed-ended and six open-ended questions, totaling to twenty eight questions. (Appendix A). The questionnaire for indigenous chicken traders was used to corroborate data from farmers. The instrument had one section with five closed-ended and four open-ended questions, totaling to nine questions. Data required was on the volumes of sales of chicken and eggs, the type of market facilities available, sources of stock and market information. (Appendix B). The questionnaire for Agroveter attendants had one section with two closed-ended questions and six open-ended questions, totaling to eight questions. The data from this instrument covered the availability and cost of vaccines, especially the NCD vaccine, the quantities sold and other services offered to indigenous chicken farmers. (Appendix C). The questionnaire for Extension staff was to seek the perception of Extension officers regarding the use of NCD and other diseases vaccine by farmers using two closed-ended items. The officer was asked to rate the level of establishment of the ICVC on a four-point likert scale. The scale was; well developed (1) moderately developed (2), not developed (3) and don't know (4). Their opinion on what they would consider a well-developed ICVC was sought. The instrument consisted of four closed ended items and two open ended items. (Appendix D)

3.5.1 Validity of Research Instrument

According to Kathuri and Pals (1993) validity refers to the appropriateness of the measure for specific inferences that result from the scores generated by the measure. To test for validity of instruments, the instruments were presented to the supervisor for guidance. The advice, suggestions and recommendations were incorporated in the final

document of the research instruments. This further improved the content and face validity of the instruments.

During the field survey, the following among others were put in place to ensure validity.

- i) Checking one informant's descriptions of something against another informant's description of the same thing.
- ii) Learning to understand and, where appropriate, speak the vocabulary of the group being studied.
- iii) Writing down the questions asked (in addition to the answers received). This helped to make sense at a later date out of the answers recorded earlier, and this helped reduce distortions owing to selective forgetting.
- iv) Recording personal thoughts while conducting observations and interviews. Responses that seemed unusual or incorrect were noted and checked later against other remarks or observations.
- v) Documenting the sources of remarks whenever possible and appropriate. This helped make sense out of comments that otherwise seemed misplaced

3.5.2 Reliability of Research Instruments

Reliability is the measure of the degree to which research instrument yields consistent results after repeated trials (Mugenda & Mugenda, 1999). The questionnaires were pre-tested with 31 farmers from the neighboring Sabatia Constituency, in the same Vihiga County. The internal consistency technique was employed to determine the reliability of the instruments. Internal consistency reliability is the extent to which items in a single test are consistent among themselves and the test as a whole (Gay, Mills & Airasian, 2006). The reliability of the questionnaires was tested using Cronbach's Alpha Coefficient. Mugenda, and Mugenda, (1999) recommend a threshold level of 0.70 for an acceptable reliability Coefficient. The Alpha obtained was 0.811(Appendix I)

3.6 Data collection procedures

The proposal was presented before the University of Nairobi examination panel for defense. Upon approval of the proposal, the researcher obtained a letter of introduction from the University of Nairobi and a research permit from the National Commission for

Science, Technology and Innovation as pre-requisite for data collection. Once all permissions were granted, the researcher visited the study area to make appointments with assistant chiefs and the Agricultural extension officer. The respondents were visited on the agreed dates and the research instruments administered to them.

3.7 Data analysis techniques

Data analysis is the process of systematically arranging field findings for presentation. The questionnaires were perused to ensure that they were filled correctly. The data received were coded and clustered for subsequent statistical analysis. Data was then analyzed using descriptive statistics such as frequencies and percentage counts and presented in tabular forms. Statistical Package for Social Sciences (SPSS) was used in analyzing quantitative data. Responses from open-ended questions were described and given variable values. The sample population was described by giving the demographic and socioeconomic characteristics. Frequency distributions were determined for background data on age, sex, marital status, level of education and household heads. Means, percentages and correlations were calculated for the various indicators.

To achieve objective (i) the responses to knowledge of existence of credit facilities by listing them, whether collateral was required or not were analyzed for frequency distribution table. The need for a loan and how much one would take if available to invest in local chicken was also analyzed as proportions of respondents who would take a loan, how much and those who would not take any. For objective (ii) responses on availability, cost, reconstitution, and use of NCD vaccine were analyzed and frequency distribution tables determined. Data from Agrovets on whether they reconstituted the vaccine was analyzed and included in the report. To achieve objective (iii) data on market accessibility for eggs and chicken, whom they sold to, and mode of sell by the farmers was analyzed for frequency distribution table to determine whether farmers faced any difficulty disposing their eggs and birds. The outcome was then corroborated with data from the traders. Objective (iv) was achieved by analysis of data from farmers concerning contact with Extension staff whether private or public, frequency of the contact, and the type of information that was provided about the indigenous poultry value chain.

3.8 Ethical considerations

Information obtained from other sources or from authors to support the relevance of this study was acknowledged in the form of references. Adequate and clear explanation on the purpose of the study to each respondent was provided. The study also sought the respondent's permission to participate in the study while assuring them that their participation was voluntary. All the participants were assured of total confidentiality and that the information they provided would be used for research purposes only. The study endeavored in maximizing good outcomes for science, humanity, and the individual research participants and minimized and avoided unnecessary risk, harm, or wrong to anyone involved. Respondents were treated with respect and courtesy, including those who were not autonomous like small children and people who had mental retardation or senility.

3.9 Operationalization of variables

| Objective | Variables | Indicators | Scale | Method of Data collection | Analysis |
|---|---------------------------------|--|---------|---------------------------|---|
| 1. To determine how access to credit influences the establishment of indigenous chicken value chain in Hamisi Constituency | Establishment of ICVC | i) Household income from bird and egg sale | Ratio | Questionnaires | Means Mode Percentages Frequencies Correlations |
| | | ii) Number of chicken reared | Ratio | | |
| iii) Number of eggs and chickens sold by farmers | Ratio | | | | |
| iv) Chicken mortality rate | Ratio | | | | |
| v) Grading of eggs and meat | Nominal | | | | |
| vi) Housing unit and feed supplementation | Nominal | | | | |
| 2. To establish the extent to which control of chicken diseases influences the establishment of indigenous chicken value chain in Hamisi Constituency | Disease control | i) Number of farmers who know existence of credit facilities | Ratio | | |
| | | ii) No. of farmers who would take up loan | Ratio | | |
| | | iii) How much loan one would take | Ratio | | |
| | | iv) Collateral required or not | Nominal | | |
| 3. To determine ways in which market infrastructure influences establishment of indigenous chicken value chain in Hamisi Constituency | Access to Market infrastructure | i) Cost of vaccine (High or low) | Ordinal | | |
| | | ii) Quantities/doses of vaccines sold | Ratio | | |
| | | iii) Vaccine reconstitution | Nominal | | |
| | | iv) Availability of vaccine | Ordinal | | |
| | | v) Volume of vaccine stocked by Agrovets | Ratio | | |
| 4. To investigate how agricultural extension services influences establishment of indigenous chicken value chain in Hamisi Constituency | Extension services | i) Processing and packaging and farmers | Nominal | | |
| | | ii) Market access for both traders and farmers | Ordinal | | |
| | | iii) Market outlets and availability of store for live chicken | Nominal | | |
| | | iv) Slaughter facilities and cold storage | Nominal | | |
| | | v) Frequent customers and mode of sale | Nominal | | |
| 4. To investigate how agricultural extension services influences establishment of indigenous chicken value chain in Hamisi Constituency | Extension services | i) Contact between farmers & ext. staff | Ordinal | | |
| | | ii) Public or private providers | Nominal | | |
| | | iii) Extension messages menu | Nominal | | |
| | | iv) Vaccine access & administration | Ordinal | | |

CHAPTER FOUR

DATA ANALYSIS, PRESENTATIONS, INTERPRETATIONS AND DISCUSSIONS

4.1 Introduction

This section is a presentation of analyzed data from the field, explanations and discussions according to the research objectives. The analysis is presented by a presentation of the demographic and socio-economic characteristics of the sample surveyed. Thereafter the analysis and discussion is based on the themes of the study namely whether access to credit, control of Newcastle disease (NCD), marketing and market infrastructure, and Extension services have influence on the establishment of indigenous chicken project value chain in Hamisi Constituency.

4.2 Questionnaire return rate

The study sent out 169 questionnaires to farmers out of which 160 were duly filled and returned. Additionally the study sent out questionnaires to 15 chicken traders, 13 Agroveter attendants and 1 extension officer, all of which were duly filled and returned. Table 4.1 gives the response rate.

Table 4.1 Questionnaire Response rate

| Response Rate | Frequency | Percentage |
|----------------------|------------------|-------------------|
| Returned | 189 | 95.46 |
| Not returned | 9 | 4.54 |
| Total | 198 | 100.00 |

The table shows a total of 189(95.46%) responded to the questionnaires while 9(4.54%) did not respond. According to Mugenda and Mugenda (1999), a response rate of 50% is

adequate for analysis and reporting; a response rate of 60% is good and that of 70% and above is very good. Thus, the return rate of this survey was relatively higher and was therefore deemed acceptable for the study. The relatively high questionnaire return rate was attributed to the fact that most of the questionnaires were guided as most respondents could not fill by themselves either due to illiteracy levels or being occupied. This also allowed personal interaction and giving ample time to the respondents to attend to the questionnaires first hand. The use of interview guide generated by the research randomizer (Appendix F) also came in handy as the study used it as a checklist. The 9 questionnaires not returned were those that respondents suggested to fill and submit at a later time, but defaulted.

4.3 Demographic Characteristics of farmers respondents

The study looked at the farmer respondent’s characteristics of age group, gender, marital status, household head and education level to assess whether they had influence on the establishment of ICVC. These were discussed in the subsequent sections.

4.3.1 Distribution of farmers by gender and household head

The farmer’s gender and household head was determined by the questionnaire analysis. Finding about farmer’s gender and household head was important to assess if one’s gender determines who is the head of family, which in turn determines who makes the decisions on chicken rearing and who stays on the farm more to take care of the chicken. Table 4.2 explains the distribution of respondents by gender, while Table 4.3 shows household head.

Table 4.2: Distribution of farmers by Gender

| Gender | Frequency | Percentage |
|---------------|------------------|-------------------|
| Female | 74 | 46.25 |
| Male | 86 | 53.75 |
| Total | 160 | 100.00 |

Out of the 160 farmer respondents, 74(46.25%) were female while 86(53.75%) were male. It can be concluded that men were more involved with the chicken farming activities than women.

Table 4.3: Distribution of farmers by Household head

| Household Head | Frequency | Percentage |
|-----------------------|------------------|-------------------|
| Yes | 112 | 70.00 |
| No | 48 | 30.00 |
| Total | 160 | 100.00 |

Out of the 160 farmers, 112(70%) were heads of the family, while 48(30%) were not. This shows that men are mostly the head of families in this study area, as men were the majority of the respondents. They make the decisions related to the chicken farming.

4.3.2 Distribution of farmers by Age

The study sought to establish the distribution of farmers by Age. The study was interested in ascertaining whether age had influence on the establishment of ICVC. In view of this, respondents were asked to state their age bracket. The results were as reflected in Table 4.4.

Table 4.4: Distribution of farmers by Age

| Age (Years) | Frequency | Percentage |
|--------------------|------------------|-------------------|
| 20 and below | 3 | 1.9 |
| 21 to 30 | 16 | 10.0 |
| 31 to 40 | 48 | 30.0 |
| 41 to 50 | 42 | 26.3 |
| 51 and above | 51 | 31.9 |
| Total | 160 | 100.00 |

All the 160 respondents heeded to the quest for age, out of which the majority, 31.9% were above 50 years followed by the age between of 31 to 40 years at 30%. This trend indicates that it is the older people who mostly engage in rearing indigenous chicken.

4.3.3 Distribution of farmers by marital status

Marital status of the farmers was sought, as it was important for the study to determine if there was any relationship between the marital status of the farmer and the extent to which the ICVC is established. The majority of farmers were married at 70.6%, followed widowed/widowers at a substantial 18.8%. This shows that married people are more engaged in chicken farming. Table 4.5 shows the distribution.

Table 4.5: Distribution of farmers by marital status

| Marital status | Frequency | Percentage |
|-----------------------|------------------|-------------------|
| Married | 113 | 70.6 |
| Widowed/Widower | 30 | 18.8 |
| Separated | 7 | 4.4 |
| Single Parent | 6 | 3.8 |
| Single-Never married | 4 | 2.5 |
| Total | 160 | 100.0 |

4.3.4 Distribution of farmers by level of education

The farmers were asked their highest education level attained. This was important as the level of education determines if information sharing can be done with ease. Table 4.6 shows the results.

Table 4.6: Distribution of farmers by the highest education level

| Highest education level | Frequency | Percentage |
|--------------------------------|------------------|-------------------|
| Did not attend | 13 | 8.1 |
| Primary | 68 | 42.5 |
| Secondary | 54 | 33.8 |
| Tertiary/ College | 25 | 15.6 |
| Total | 160 | 100.0 |

From the study, the majority (91.9%) had attained at least primary school education. Imparting knowledge and skills on indigenous chicken production to such a population can be done with a high level of success.

4.4 Social-economic characteristics of respondents

Number of indigenous chicken kept at the time of survey had a mean of 23.26 birds per household with a standard deviation of 10.492. This flock size compares well with the study carried out by Tobias et al (2011) where the mean was 23.9 birds per household. In this study flock sizes ranged from 10 to 59 birds per household. This range was higher than that reported in a study in South Nyanza (Kenya) in an extensive management system (Olwande et al, 2010), where the flock size ranged from 15 to 19. This could be explained by fluctuation in chicken population due to seasons and time and also the fact that some farmers were practicing semi-confined and confined systems of production which always have a high carrying capacity than extensive system. Family food was cited as the main purpose of keeping local chicken by 52.5% of the respondents while those who kept mainly for income were 45.6% and as a hobby were 1.9%. Kaunda and Katalyi, (2000) in a study in Nyando District (Kenya) documented the purpose for keeping indigenous chicken for income as 39.4% and for food as 36.2%. The percentages differ with this study maybe because farmers in Nyando were much informed of possibilities of generating income from IC as compared to the farmers in Hamisi. Annual income from eggs ranged from 2000 to 32500 Kenya shillings with a mean of Kshs.7558.31 while income from chicken ranged between 13000 and 58000 Kenya shillings, with a mean of Kshs.19540.63. Total annual income from both chicken and eggs was between 15000 and kshs.87000 with a mean of kshs.27098.94. Table 4.7 gives the details on annual income from eggs and chicken.

Table 4.7: Statistics on Income from Eggs and Indigenous Chicken in Hamisi Constituency

| INCOME | WARD | MEAN | STD.DEV |
|----------------------------|----------------------------|-----------------|------------------|
| Income from Eggs (Kshs) | Gisambai | 8916.41 | 5267.439 |
| | Shamakhokho | 7463.02 | 4900.028 |
| | Banja | 6598.14 | 2591.873 |
| | Shiru | 7341.71 | 2838.691 |
| Income from Chicken (Kshs) | Gisambai | 23094.87 | 13706.394 |
| | Shamakhokho | 19343.02 | 9398.598 |
| | Banja | 17666.28 | 5183.177 |
| | Shiru | 18125.71 | 5854.528 |
| Total Income (Kshs) | Gisambai | 32011.28 | 18674.958 |
| | Shamakhokho | 26806.05 | 13608.846 |
| | Banja | 24264.42 | 7295.361 |
| | Shiru | 25467.43 | 8285.262 |
| Total Income (Kshs) | Hamisi Constituency | 27098.94 | 13027.262 |

An annual income from chicken of Ksh.19540.63 at the price of Ksh.600 per bird, translates to 32.6 birds sold per household per year. This figure greatly contrasts that of 10.6 birds sold per household per year in a study by Kaunda et al (2000) in Nyando District, though the average flock sizes were comparable (23.9 birds for Nyando case and 23.26 for Hamisi).

4.5 Access to Credit and its influence on Establishment of ICVC

The first objective was to determine if access to credit influences establishment of the indigenous chicken value chain in Hamisi Constituency. The respondents were asked to list the available credit facilities in the study area. This was to ascertain whether they were aware of the existence of the facilities in their area. They were to state whether

collateral was required or not, and how much credit they would take to expand their indigenous chicken project. Responses are in the following subsections.

4.5.1 Availability of credit facilities

Three types of credit facilities were mentioned as available in the study area (Table 4.8)

Table 4.8: Credit Facilities in Hamisi as Listed by the Farmers

| Type of facility | Collateral required | frequency | percentage |
|-------------------------|----------------------------|------------------|-------------------|
| BANKS: KCB & EQUITY | Yes | 35 | 21.9 |
| SACCOS | Yes | 19 | 11.9 |
| Others | Yes | 20 | 12.5 |
| Don't know | - | 86 | 53.8 |

The farmers who mentioned that they know credit facilities that are available for loan were 46.2% while those who did not know were majority at 53.8%. Those who mentioned banks were 21.9%, SACCOS were 11.9% while those who mentioned other facilities like women groups were 12.5%. This is an alarming statistic that indicates that most farmers have no information of where they can get credit services. Most farmers who mentioned a credit facility reported that collateral was required by the different facilities. It was apparent that a knowledge gap existed about the availability and conditions of lending.

4.5.2 Willingness to take up loans

Farmers were asked how much loan they would take to expand their IC rearing projects, and the results were as shown in Table 4.9

Table 4.9: Amount of Credit that would be taken by Farmers

| Amount of credit (Kshs) | Frequency | Percentage | Mean Income | Std. Deviation |
|--------------------------------|------------------|-------------------|--------------------|-----------------------|
| None | 27 | 16.9 | 24720.00 | 9639.456 |
| 10,000-50,000 | 88 | 55.0 | 26324.89 | 12545.889 |
| 50,001-100,000 | 40 | 25.0 | 30950.00 | 15937.747 |
| 100,001 and above | 5 | 3.1 | 22760.00 | 4325.275 |
| Grand Mean | | | 27098.94 | 13027.262 |

Farmers who would take a loan ranging between ksh10, 000 and ksh50, 000 were 55%. This illustrates the low cost investment in the indigenous chicken enterprise. Ndegwa et al, (2000) affirms that though credit was insignificant for local poultry production farmers needed credit to settle an array of needs including school fees, funerals, housing and food. The respondents who would invest more than kshs.100000 were 3.1%. It was rather puzzling that such a small proportion of the respondents would invest in the indigenous chicken project despite its popularity and availability of market.

4.6 Control of Newcastle Disease and its influence on establishment of ICVC

The second objective was to determine how control of NCD influences the establishment of the indigenous chicken value chain in Hamisi Constituency. The least average income was for those farmers who reported that the cost of vaccine was out of reach, never vaccinated and did not reconstitute the vaccines themselves. Details are in the sub-sections.

4.6.1 Availability of Newcastle Vaccine

Availability of the Newcastle and other disease vaccine was reported as regular by 11.9% of farmers, irregular 12.5%, never 33.8% and don't know 41.9%. From this statistics, it was seen that most farmers did not vaccinate their chickens against diseases as required. Farmers who vaccinated their flock regularly had a higher income as compared to those who never or did not know.

Table 4.10: Responses on availability of NCD Vaccine

| Availability of vaccine | Frequency | Percentage | Mean income | Std. deviation |
|--------------------------------|------------------|-------------------|--------------------|-----------------------|
| Regular | 19 | 11.9 | 50056.84 | 23682.352 |
| Irregular | 20 | 12.5 | 30259.50 | 12798.362 |
| Never | 54 | 33.8 | 22646.85 | 3516.968 |
| Don't know | 67 | 41.9 | 23233.28 | 3557.246 |

4.6.2 Reconstitution of Newcastle Vaccine

Majority of the farmers, 59.4% did not reconstitute vaccine by themselves, only 40.6% could. The average incomes were higher for those who could reconstitute than that of the group that did not reconstitute. Reconstitution of NCD vaccine in the Agrovets was the norm but this leaves the begging question on the efficacy of the vaccine. Reconstituted vaccine must be used within two hours after reconstitution. This statistic affirms the response of the Agricultural Extension Officer who when asked if the farmers could reconstitute the vaccines, disagreed.

Table 4.11: Reconstitution of Vaccine

| I reconstitute vaccine | Frequency | Percentage | Mean income | Std. deviation |
|-------------------------------|------------------|-------------------|--------------------|-----------------------|
| Yes | 65 | 40.6 | 33484.92 | 18187.212 |
| No | 95 | 59.4 | 22729.58 | 3789.211 |

4.6.3 Cost of Newcastle Vaccine

The cost of vaccine was scored as fair by 22.5%, high 46.9%, low 3.1% and out of reach by 27.5%. According to the Agrovet attendants, the cost of vaccine was between ten and twenty shillings per dose. The unvaccinated birds no matter how few could have the potential to spread NCD which is air borne and highly contagious. The challenge of the number of birds kept by individual households which was an average of 24 birds could limit the purchase of the NCD vaccine since it is packaged in doses of 100 and above.

Table 4.12 shows the responses, average income and the standard deviations.

Table 4.12: Cost of Newcastle Disease

| Cost of vaccine | Frequency | Percentage | Mean income | Std. deviation |
|-----------------|-----------|------------|-------------|----------------|
| Low | 5 | 3.1 | 54116.00 | 26414.282 |
| Fair | 36 | 22.5 | 36779.17 | 19834.315 |
| High | 75 | 46.9 | 23233.47 | 3472.419 |
| Out of reach | 44 | 27.5 | 22697.50 | 3529.278 |

Stockists of NCD vaccine in the study area were located only at major market centers. Farmers who purchased the reconstituted NCD vaccine had to walk long distances in the sun back home and sometimes had to wait for their birds to come home at night fall before they administered the vaccine. The farmers who reside far from the major market centers incur travel costs and time and this may be the reason they found the cost of vaccine to be high. Odwasy et al, 1999 observed that expenditure on disease control for local poultry in Kakamega was minimal. Farmers did not prioritize disease control and the cost of vaccine was low. The Agricultural Extension staff said that farmers were not able to administer the NCD vaccine to their birds. This implies that even those who said they could administer, could be poorly handling the vaccines.

4.7 Market Infrastructure and its influence on Establishment of ICVC

The third objective was to determine how market infrastructure influences the establishment of the indigenous chicken value chain in Hamisi Constituency. Farmers were asked about market accessibility, their frequent customers and their criteria of pricing their birds. Chicken traders were asked to state market facilities available to them to facilitate trade of birds and eggs.

4.7.1 Marketing

Market access was reported as very easy by 15% and fairly easy by 76.9% of the farmers. 8.1% reported that access to markets was difficult. No one reported market access to be very difficult. Farmers who sold their birds to neighbors were 26.3%, local market 60.0%, primary collector 13.1% and to hotels 0.6%. Since most sales were locally done,

there were minimal marketing costs. A similar observation was made by Emuruon et al, 2008 in a study on marketing of local chicken in Kampala. They observed that most of the local chicken farmers sold their birds in their local markets yet the consumers who could pay premium prices were in the urban areas. Responses of market access are shown in Table 4.13.

Table 4.13: Market access

| Market access | Frequency | Percentage | Average income (Kshs) | Std. deviation |
|--------------------------------|------------------|-------------------|------------------------------|-----------------------|
| Very accessible | 24 | 15.0 | 37560.83 | 21762.359 |
| Fairly accessible | 123 | 76.9 | 25849.02 | 10062.412 |
| Difficult | 13 | 8.1 | 19610.77 | 3982.425 |
| Very difficult | 0 | 0 | 0 | 0 |
| Frequent customers | | | | |
| Neighbors | 42 | 26.3 | 26923.57 | 12449.748 |
| Local Markets | 96 | 60.0 | 27462.50 | 13994.550 |
| Chicken Vendors | 21 | 13.1 | 26021.90 | 9901.850 |
| Hotels | 1 | 0.6 | 22180.00 | - |
| Mode of selling chicken | | | | |
| Weighing | 26 | 16.3 | 30580.38 | 20287.793 |
| Physical observation | 127 | 79.4 | 26353.07 | 11341.454 |
| Age | 7 | 4.4 | 27700.00 | 4050.514 |
| Grading of Eggs | | | | |
| Yes | 65 | 40.6 | 33386.92 | 18323.156 |
| No | 95 | 59.4 | 22796.63 | 3525.184 |

Information from the poultry traders in Hamisi indicated that consumers preferred the indigenous chicken to the exotic ones. When it came to selling chicken, physical

observation was used by 79.4% of farmers to determine the selling price of birds, 4.4% considered age, and 16.3% sold by weight. Lack of standardized buying and selling measures may be exploitative especially to the primary producer. CFGs are purported to be avenues for members to bulk their produce and look for favorable markets. No farmer reported selling birds to or through the CFG. Excess eggs were sold and the rest preserved for brooding. The eggs were graded by 40.6% of farmers while majority at 59.4% did not.

4.7.2 Market Infrastructure

The traders sold on average 67 birds and 50 eggs per week. They all operated from makeshift shades at the market places and had to hire rooms to keep the left over birds at night or carry them home. The traders sold only live birds due to lack of slaughter and other facilities at the market centers. The marketing of live birds promotes the spread of NCD (Mckenzei, 1985). Lack of market infrastructure hinders the development of the local poultry chain (Emuruon, et al, 2008). Chicken traders in the markets in the study area reported lack of facilities; they operated from under tree shades and temporary structures. The details are in Table 4.14

Table 4.14: Market infrastructure

| Name of market | Market facilities available | | | | |
|----------------|-----------------------------|------------|--------------|----------------------|------------------------|
| | Slaughter | Processing | Cold storage | Store for live birds | Dedicated sell outlets |
| Serem | No | No | No | No | No |
| Banja | No | No | No | No | No |
| Hamisi | No | No | No | No | No |
| Cheptulu | No | No | No | No | No |

4.8 Contribution of Extension Services to the Establishment of ICVC

The fourth objective was to determine the contribution of extension services to the establishment of the indigenous chicken value chain in Hamisi Constituency. Extension service officers are the main change agents concerning Agriculture. The farmers expect to get information from them to be able to make informed decisions on indigenous

chicken production and the ICVC as a whole. Farmers indicated whether they were in contact with extension service providers stating whether they were from public or private. They gave the frequency of contact and the type of information provided.

4.8.1 Contact with Extension Services

Farmers who had contact with Extension services were 46.3%, of which public Extension served 7.5%, private 38.8%. They had higher mean income of Kshs.33381.08 as compared to Kshs.21693.37 of farmers who reported not to seek extension services who were majority at 53.8%. The high number of farmers who did not access extension service can be explained by the fact that the whole of Hamisi Constituency had only one extension staff. Table 4.15 shows the responses for extension services contact and provider.

Table 4.15: Extension service contact and provider

| Do you contact Ext service provider | Frequency | Percentage | Mean Income |
|--|------------------|-------------------|--------------------|
| Yes | 74 | 46.3 | 33381.08 |
| No | 86 | 53.8 | 21693.37 |
| Service provider | | | |
| Private | 62 | 38.8 | 31450.97 |
| Public | 12 | 7.5 | 43095.00 |
| No contact | 86 | 53.8 | 21729.42 |

4.8.2 Frequency of Contact with Extension Providers

Most of the farmers were not consistent (42.5%). This is a reflection of the Government policy on demand driven Extension where the Extension officer does not follow a pre-determined routine. The Extension officer visits when the farmer has made a request to be visited. Monthly visits were 33.1%. Weekly visits were 4.4%, fortnightly were 1.3% while those who never had contact were 18.8%. Table 4.16 shows the frequency of contact between farmers and Extension service providers.

Table 4.16: Contact between farmers and Extension Service providers

| Contact | Frequency | Percentage | Mean Income (Kshs) | Std. Deviation |
|----------------|-----------|------------|--------------------|----------------|
| Weekly | 7 | 4.4 | 30157.14 | 18617.452 |
| Fortnightly | 2 | 1.3 | 23600.00 | 5232.590 |
| Monthly | 53 | 33.1 | 26956.98 | 10123.051 |
| Not consistent | 68 | 42.5 | 25057.79 | 7180.598 |
| Never | 30 | 18.8 | 25086.00 | 10007.252 |

4.8.3 Extension Messages Menu

The Extension messages menu comprised of (1) housing, (2) feeding, (3) credit, (4) disease control, (5) marketing, and (6) breeding. Respondents were given an opportunity to add any topic related to the subject that had not been listed, but none was added. The most frequently discussed topic was disease control (52.5%) while the least was credit (0.6%). Feeding had a frequency of 15.6%, housing 6.3%, breeding 1.9%, and marketing 4.4%. Those who reported that they did not know were at a significant 18.8%. Disease control, feeding and housing took center-stage in the interaction between the farmers and the extension officers. Credit (0.6%), breeding (1.9%) and marketing (4.4%) were lowest. This could be due to the attitude that indigenous chicken is for subsistence production and the change agents take it as business as usual. Emphasis on basic production components take precedence over other components which end up at the periphery and can easily be forgotten. Notably, farmers who sought marketing messages had a high average income than the rest at Kshs.31422.86. Table 4.17 gives the results of the extension messages menu.

Table 4.17: Results of the extension messages menu

| Messages | Frequency | Percentage | Average income (Kshs) | Std. deviation |
|-----------------|------------------|-------------------|------------------------------|-----------------------|
| Housing | 10 | 6.3 | 29434.00 | 16092.238 |
| Feeding | 25 | 15.6 | 28064.00 | 1028.776 |
| Credit | 1 | 0.6 | 16000.00 | - |
| Disease control | 84 | 52.5 | 24869.64 | 5971.673 |
| Marketing | 7 | 4.4 | 31422.86 | 20549.201 |
| Breeding | 3 | 1.9 | 23333.33 | 4387.862 |
| Not applicable | 30 | 18.8 | 25086.00 | 10007.252 |

4.9 Statistical Analysis

The study aimed to determine how credit access, control of NCD, market access and infrastructure and extension services influences the establishment of the indigenous chicken value chain. Data on independent variables were organized and presented in tables as means, median, mode, standard deviations, skewness and variations. The study employed parametric statistical tests hence indices were developed to bench mark threshold values to determine the extent of the establishment of the ICVC. The indices were for income, birds population, mortality rate, grading of eggs and meat, Intensive production system and birds sold.

An annual income of Kshs.60000 was the breakeven point where a farmer would be said to have commercialized in indigenous chicken project. The number of birds one would have to sell at Kshs.600 per piece to earn Ksh60000 was 100. The minimum flock size was 50 birds and mortality rate of 20%. Scores were assigned to each of the independent variables which included credit access, control of NCD, market access and extension services. The details of the scores are in Table 4.18

Table 4.18: Scores for independent variables

| Variable | Score range | Criteria |
|------------------------|--------------------|--|
| Credit access | 1-2 | Access=2; no access=1 |
| Control of NCD | 3-6 | Vaccine available; yes = 2, no = 1 Vaccine affordable; yes = 2, no = 1 Can reconstitute vaccine; yes = 2, no = 1 |
| Market access | 1-2 | Access=2; no access=1 |
| Extension services | 1-2 | Contact=2; no contact=1 |
| Aggregate score | 6-12 | |

The minimum aggregate score for the independent variables was 6 and the maximum was 12, the maximum implied that credit was accessible, the NCD vaccine was available, was affordable, the farmer could reconstitute, markets were accessible and they had contact with extension services. Means, median, mode, standard deviation, skewness and variance were determined.

Table 4.19: Means, Median, Mode, Standard Deviations, Skewness, and Variation of Independent Variables

n=160

| Independent variable | Score | Mean | Median | Mode | Std. Deviation | Skewness | Variance |
|-----------------------------|--------------|-------------|---------------|-------------|-----------------------|-----------------|-----------------|
| Credit access | 1-2 | 1.46 | 1.00 | 1 | 0.500 | 0.152 | 0.250 |
| Control of NCD | 3-6 | 3.91 | 4.00 | 3 | 1.109 | 0.944 | 1.230 |
| Market access | 1-2 | 1.92 | 2.00 | 2 | 0.274 | -3.094 | 0.075 |
| Extension services | 1-2 | 1.46 | 1.00 | 1 | 0.500 | 0.152 | 0.250 |
| Aggregate score | 6-12 | 8.75 | 9.00 | 8 | 1.598 | 0.351 | 2.553 |

Credit access and Extension services had similar mean of 1.46, a mode and median of 1, standard deviation of 0.5, skewness of 0.152 and a variance of 0.25. Respondents who had access to credit and extension services were 46.3%. Control of NCD had a mean score of 3.91, a mode of 4, median of 3, a skewness of 0.944 and a variation of 1.230. For control of NCD, 16.9% of farmers scored the maximum (6). For market access, 91.9% had access. Market access had a mean of 1.92, median and mode of 2 and a variation was 0.075. The aggregate score for independent variables ranged from 6 to 12. Respondents who scored above the mean were about 50.6%. 5.6% of respondents scored the maximum (12). This scenario suggests that about a half of the respondents were above the mean and the value chain was about 50% established.

The dependent variable domains which included annual income from chicken and eggs, population of birds, mortality, grading of birds and eggs, intensive production system and birds sold were given scores. Annual income had a critical point measure of Ksh.60000 and mortality critical point measure of 20%. The number of birds sold per year had a critical point measure of 100, and a minimum flock size of 50 birds. The details are shown in Table 4.20.

Table 4.20: Scores for Dependent Variable

| Dependent variable | Scores | Criteria | |
|----------------------------|---------------|-----------------------|-----------------|
| Annual Income (Kshs) | 1-2 | Income = or > 60,000 | yes = 2, no = 1 |
| No. of birds kept | 1-2 | Flock size = or > 50 | yes = 2, no = 1 |
| Annual Mortality (%) | 1-2 | Mortality = or < 20 | yes = 2, no = 1 |
| Grading eggs and meat | 2-4 | Grade eggs | yes = 2, no = 1 |
| | | Grade meat | yes = 2, no = 1 |
| Intensive production | 2-4 | Housing unit | yes = 2, no = 1 |
| | | Supplementation | yes = 2, no = 1 |
| No. of birds sold annually | 1-2 | Birds sold = or > 100 | yes = 2, no = 1 |
| Aggregate score | 8-16 | | |

The range of the aggregated score for the dependent variables was 8 to 16. At the lower end of score were those whose annual income was below Ksh60000, their flock size was less than 50 birds, mortality rate was more than 20%, eggs and meat were not graded, birds were not housed and not supplemented and number of birds which were sold annually was below 100. The maximum score of 16 implied that the annual income was equal or higher than Ksh60000, flock size was 50 or higher, mortality rate was 20% or lower, eggs and meat were graded, birds were housed and supplemented, and 100 or more birds were sold annually.

Data on the dependent variable domains was also organized and the means, median, mode, standard deviations, skewness and variations determined (Table 4.21)

Table 4.21: Means, Median, Mode, Standard Deviations and Variations of domains of Dependent Variable

n=160.

| Dependent variable | Scale | Mean | Median | Mode | Std. deviation | Skewness | Variance |
|---------------------------|--------------|-------------|---------------|-------------|-----------------------|-----------------|-----------------|
| Income (Kshs) | 1-2 | 1.07 | 1 | 1 | 0.254 | 3.441 | 0.064 |
| No. of birds kept (pop) | 1-2 | 1.03 | 1 | 1 | 0.175 | 5.439 | 0.030 |
| Mortality (%) | 1-2 | 1.16 | 1 | 1 | 0.364 | 1.911 | 0.133 |
| Grading | 2-4 | 2.57 | 2 | 2 | 0.749 | 0.898 | 0.561 |
| No. of birds sold | 1-2 | 1.07 | 1 | 1 | 0.254 | 3.441 | 0.064 |
| Intensive production | 2-4 | 2.55 | 2 | 2 | 0.716 | 0.914 | 0.513 |
| Aggregate score | 8-16 | 9.44 | 9 | 8 | 1.722 | 1.331 | 2.965 |

The aggregate score of the dependent variable domains ranged between 8 and 16 with a mean of 9.44. The variation was 2.965. Income, birds' population, mortality and birds sold had similar median and mode of 1, while grading and intensive production had a similar median and mode of 2. Income and number of birds sold had all similar scores mean (1.07), standard deviation (0.254), skewness (3.441) and variance (0.064). Respondents who scored above the mean were 41.9% and 0.6% scored the maximum. Respondents who scored above the midpoint (12) of the dependent variable were 10%. Such a scenario implies that majority of the farmers are not half way to achieving the indicators of an established ICVC.

4.9.1 The Relationship between Access to Credit and the Establishment of the ICVC

The first research question was how credit access influences the establishment of the indigenous chicken value chain in Hamisi. The six domains which constituted the dependent variable were Total Income from Indigenous Chicken (TIIC), Bird Population (BP), Mortality Rate (MR), Grading of eggs and meat (GD), Intensive Production System (IPS) and Birds Sold (BS). The means of the six domains of establishment of the indigenous chicken value chain were computed and correlated with the mean responses of access to credit. Table 4.22 indicates the Pearson Product-moment correlation results between access to credit and establishment of the indigenous chicken value chain.

Table 4.22: The Pearson Product Moment Correlation between Access to Credit and Establishment of the ICVC

n=160

| Establishment of ICVC | | | | | | |
|-----------------------|--------|--------|--------|-------|-------|--------|
| | TIIC | BP | MR | GD | IPS | BS |
| Credit Access | -0.103 | -0.167 | -0.123 | 0.116 | 0.093 | -0.103 |
| | 0.016 | | | | | |

This indicates there was a very low positive correlation ($r = 0.016$) between access to credit and the establishment of the indigenous chicken value chain. The correlation

between access to credit and grading of eggs and meat was higher ($r=0.116$) followed by that of Intensive Production System (IPS) at $r= 0.093$. Correlations of Total Income from Indigenous Chicken (TIIC), Bird Population (BP), Mortality Rate (MR) and Birds Sold (BS) with the credit access were all negative.

4.9.2 The Relationship between Control of NCD and Establishment of the ICVC

The second research question was to what extent does control of NCD influences the establishment of the ICVC in Hamisi Constituency. The means of the six domains of establishment of the indigenous chicken value chain were computed and correlated with the mean responses of disease control. Table 4.23 indicates the Pearson Product- moment correlation results between disease control and establishment of the indigenous chicken value chain.

Table 4.23: The Pearson Product-Moment Correlation between Control of NCD and Establishment of the ICVC

n=160

| Establishment of ICVC | | | | | | |
|-----------------------|-------|-------|-------|-------|-------|-------|
| | TIIC | BP | MR | GD | IPS | BS |
| Control of NCD | 0.515 | 0.340 | 0.815 | 0.382 | 0.152 | 0.515 |
| | 0.588 | | | | | |

Table 4.23 indicates that there was a high positive correlation ($r =0.588$) between disease control and establishment of the indigenous chicken value chain. However there was a strong positive correlation between control of NCD and Mortality Rate (MR) at $r=0.815$. The correlation between control of NCD and Intensive Production System (IPS) was low and positive at $r=0.152$, while the correlation between Control of NCD and Total Income from IC (TIIC) and Birds Sold (BS) was similar and positive at $r=0.515$.

4.9.3 The Relationship between Market Access and the Establishment of the ICVC

The third research question was in what ways does market access influences the establishment of the indigenous chicken value chain in Hamisi Constituency. The means

of the six domains of the establishment of the indigenous chicken value chain were computed and correlated with the mean responses to market access. Table 4.24 indicates the Pearson Product- moment correlation results between market access and establishment of the indigenous chicken value chain.

Table 4.24: The Pearson Product Moment Correlation between Market Access and Establishment of the ICVC

n=160

| Establishment of ICVC | | | | | | |
|-----------------------|-------|-------|-------|-------|-------|-------|
| | TIIC | BP | MR | GD | IPS | BS |
| Market Access | 0.081 | 0.053 | 0.128 | 0.135 | 0.005 | 0.081 |
| | 0.117 | | | | | |

Table 4.24 shows market access had low positive correlation with the establishment of the indigenous chicken value chain at $r=0.117$. Furthermore Bird Population (BP), Mortality Rate (MR), Grading of eggs and meat (GD) and Intensive Production System (IPS) had low positive correlations with Market Access at $r=0.053$, $r=0.128$, $r=0.135$ and $r=0.005$ respectively. Total Income from IC (TIIC) and Birds Sold (BS) had a similar low positive correlation of $r=0.081$ with Market Access.

4.9.4 The Relationship between Extension Services and the Establishment of the ICVC

The fourth research question was the role of Extension Services in the establishment of the indigenous chicken value chain in Hamisi. The means of the six domains of establishment of the indigenous chicken value chain were computed and correlated with the mean responses of the role of Extension Services. Table 4.25 indicates the Pearson Product- moment correlation results between the role of Extension Services and establishment of the indigenous chicken value chain.

Table 4.25: The Pearson Product Moment Correlation between Extension Services and Establishment of the ICVC

n=160

| Establishment of ICVC | | | | | | |
|-----------------------|-------|-------|-------|-------|-------|-------|
| | TIIC | BP | MR | GD | IPS | BS |
| Extension Services | 0.293 | 0.194 | 0.429 | 0.217 | 0.093 | 0.293 |
| | 0.330 | | | | | |

Extension services had a moderate positive correlation with establishment of the indigenous chicken value chain at $r = 0.33$. In addition Total Income from Indigenous Chicken (TIIC) and Birds Sold were correlated with Extension services with a similar low positive correlation of $r=0.293$. Bird Population (BP), Mortality Rate (MR), Grading (GD) and Intensive Production System (IPS) had a low positive correlation with Extension Services at $r=0.194$, $r=0.429$, $r=0.217$ and $r=0.093$ respectively.

4.9.5 Summary of Relationship between the Dependent and Independent variables

The summary of the relationship between the Establishment of Indigenous Chicken Value Chain and the Independent Variables are as given in Table 4.26.

Table 4.26: Correlations between the Establishment of Indigenous Chicken Value Chain and the Independent Variables

| | Credit Access | Control of NCD | Market Access | Extension Services |
|------------------------------|---------------|----------------|---------------|--------------------|
| Establishment of ICVC | 0.016 | 0.588 | 0.117 | 0.330 |

Credit access had a very low positive correlation of $r = 0.016$ to the establishment of the indigenous chicken value chain. Disease control had above average correlation ($r = 0.588$), Market access had a low positive correlation of $r = 0.117$ while Extension services had a moderate positive correlation of $r = 0.33$ with the development of the indigenous poultry value chain.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the findings, discussions, conclusions and recommendations for policy considerations and for further research.

5.2 Summary of findings

The study objective was to interrogate the influence of access to credit, control of NCD, market infrastructure and extension services on the establishment of Indigenous chicken value chain in Hamisi Constituency. The findings are in the following subsections.

5.2.1 Access to credit

Three types of credit facilities that were available in the study area include banks (KCB and EQUITY), SACCOs and unregistered groups like local women/men groups. Banks were popular at 21.9% while majority of respondents (53.8%) were not aware of credit facilities available. Credit was accessible to 46.3% of the respondents. Collateral was required by all the credit facilities. Most of respondents (55%) were interested in small loans ranging from ksh10000 to ksh50000. Correlation between access to credit and establishment of ICVC was lowest at $r=0.016$.

5.2.2 Control of Newcastle Disease

Availability of the NCD vaccine was reported by respondents as regular by 11.9%, irregular by 12.5%, never vaccinated by 33.8% and 41.9% were unaware of vaccines for NCD. The cost of NCD vaccine was reported as affordable by 25.6% of respondents. 40.6% of respondents were able to reconstitute the vaccine. The Agrovets which stocked NCD vaccine except two reconstituted the vaccine before dispensing it to farmers. The respondents who got a full score for control of NCD were 16.9%. Correlation between control of NCD and establishment of ICVC was above average at a positive $r=0.588$.

5.2.3 Market access and market infrastructure

Market access was easy by majority of respondents (91.9%). All the respondents sold their indigenous poultry within their locality. Eggs from the indigenous poultry were mainly preserved for brooding, few were sold. Chicken traders reported that there were no chicken slaughter facilities, cold storage, store for live birds, dedicated outlets for chicken in all the markets. All the traders on market days operated from open spaces and temporary shelters. Correlation between market access and establishment of ICVC was found to be lowly positive at $r=0.117$.

5.2.4 Extension Services

Respondents who were in contact with extension service providers were 46.3%. Frequency of contact between farmers and extension service providers was not consistent (61.3%). Disease control for indigenous chicken was the most frequently discussed topic (52.5%), while the least discussed was credit (0.6%). Correlation between extension services and the establishment of ICVC was found to be moderately positive at $r=0.330$.

5.3 Discussions of the findings

Ndegwa et al, (2000) found that credit was insignificant for indigenous poultry production. This study found credit access to have the lowest correlation ($r=0.016$) with the establishment of the indigenous chicken value chain, yet credit access was at a significant 46.3% of respondents. This implies that credit access in itself is not helpful unless the individuals have the need and will to utilize this accessibility for development. Having many credit facilities in an area without educating the masses on the usefulness of the facilities is not helpful. For the enterprise to shift from subsistence to commercialization, in addition to availability of credit facilities, farmers need the knowledge and business mind of investment.

The findings of this study are similar to findings of McKenzie (1985) in New Zealand. He reported that control of Newcastle Disease was significant in the indigenous poultry value chain. The practice of reconstitution of NCD vaccine by input suppliers was also reported in that study. 40.6% of respondents reported to be able to reconstitute and administer the NCD vaccine to their poultry, and this corresponded to the high correlation between

control of NCD and the total income from poultry at a significant $r=0.515$. Failure to vaccinate or poor handling of the vaccine resulted in high Mortality rates of Chicken.

Lack of market infrastructure hinders the development of the local poultry chain (Emuruon, et al, 2008). Chicken traders on the markets reported lack of facilities as a major challenge. They operated from under tree shades and temporary structures. This study found that market access by the farmers to be below average correlated to establishment of the indigenous chicken value chain. Most respondents had access to markets at 91.9% yet its correlation with establishment of ICVC is low at $r=0.117$. Market access does not in itself influence the establishment of ICVC unless the people have a business mind and idea to take advantage of the access.

Skills development is a prerequisite for any venture. Branckaert et al 1999 advocates for a systematic process at both the farmer and extension levels that takes into account the objectives, results to be achieved and the activities. While it is to be appreciated that the farmers choose what to adopt, they should be given the full range of knowledge and skills to make informed decisions (Gueye, 2000). Hamisi Constituency has seven administrative wards hence having one public Agricultural Extension Officer to cover such a vast area is way below average. Each county ward needs to have its own staff for the establishment of ICVC to materialize.

5.4 Conclusions of the study

From the study findings we can conclude the following;

Despite the existence and availability of credit facilities in Hamisi Constituency, chicken farmers and traders had not utilized them to the maximum for the establishment of the indigenous chicken value chain. The influence of access to credit facilities to the establishment of ICVC in Hamisi Constituency is very insignificant due to lack of knowledge by the respondents on income generation possibilities and opportunities from indigenous chicken farming.

Control of NCD was not sufficiently done due to lack of knowledge and skills by the farmers to handle the vaccine, yet the study reports a high influence of the control to the establishment of ICVC. Accessing the vaccines was a major concern as the vaccines are

sold in major town centers. Lack of cold storage was attributed to low electrification of the area as the cold storage needs electricity.

Though market access was highly reported, its influence on establishment of ICVC was low as farmers did not utilize the accessibility to produce for the markets rather they sold just what they produced. This can be attributed to lack of knowledge of the viability and the potential the chicken project has as a business. Local chicken traders operated in difficult conditions and could not invest in value addition.

The opportunities in marketing of indigenous chicken were unexploited despite the popularity of indigenous chicken in and out of Hamisi. The Agricultural Extension services were generally lacking in this study area due to inadequate number of public staffing and the number of private practitioners does not meet the demand.

5.5 Recommendations of the Study

Based on these findings, the following recommendations were suggested:

Commercialization of indigenous chicken production should be encouraged by leaders and development agents as a means of poverty reduction. Credit providers should take time to educate the masses on the accessibility and types of credit they offer, being clear on terms and conditions. This will eliminate the negative perception on loans.

The farmers should be educated more by extension service providers on how to properly reconstitute the NCD and other chicken disease vaccines. The thermal stable NCD vaccine should be made available in the rural areas where electricity is not available. County Government should consider widening the scope of rural electrification to the very locals.

County Authorities should invest in market infrastructure that supports poultry sales. The facility should include an area for slaughter, processing, cold storage, stores for live birds and selling counters. County Government should consider increasing the number of Agricultural Extension service providers in Hamisi Constituency from the current one individual. The area is vast with seven county wards. Private investors should take this as an opportunity to invest in extension service provision.

5.5.1 Suggested areas for further research

There are other factors that influence the establishment of indigenous chicken value chain that need to be investigated. These are factors such as culture, housing and feeding. There is also need to find out why farmers and traders are not investing heavily to expand their indigenous chicken enterprise despite the easy access to market, credit availability and the popularity the indigenous chicken has over the exotic chickens.

5.6 Contribution to the body of knowledge

| No. | Objective | Contribution |
|-----|--|--|
| 1. | To determine how access to credit influences the establishment of ICVC in Hamisi Constituency | Credit access in itself is not helpful unless the individuals have the need and will to utilize the accessibility for development. Having many credit facilities in the vicinity without educating the masses on the usefulness of the facilities is not productive. For the enterprise to shift from subsistence to commercialization, in addition to availability of credit facilities, farmers need the knowledge and idea of investment. |
| 2. | To establish the extent to which control of chicken diseases influences the establishment of ICVC in Hamisi Constituency | Availability of vaccines to farmer is ineffective in controlling diseases unless the very farmer is knowledgeable on the proper mechanisms of administration of the vaccine. |
| 3. | To determine ways in which market infrastructure influences establishment of ICVC in Hamisi Constituency | Market access does not in itself influence the establishment of ICVC unless the people have a business mind and idea to take advantage of the access. |
| 4. | To investigate how agricultural extension services influences establishment of ICVC in Hamisi Constituency | Skills development is very critical for the success of any business endeavor. Extension services need to be devolved to the very targeted individual farmer in the rural areas for value chain to be established |

REFERENCES

- Ahuja, V. and Sen, A. (2007). Scope and space for small scale poultry production in developing countries. <http://www.vinodahuja.in2007-12-02Ahuja.pdf>. (Accessed 28/05/2014)
- Ajala MK, Adesehinwa AOK (2007). *Roles and efficiency of participants in Pig marketing in Northern part of Nigeria*. 8 (3) :(311-326).
- Aklilu Hailemicheal, (2007) *Village Poultry in Ethiopia; Socio-technical analysis and learning with Farmers*. PhD thesis, Wageningen University, the Netherlands.
- Alders R. 2004. *Poultry for profit and pleasure*. FAO Diversification Booklet 3. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Alemu Yami and Tadele Dessie, (1997). *The Status of Poultry Research and Development in Ethiopia, Research Bulletin No.4, Poultry Commodity Research Program Debre-Zeit Agricultural Research Center, Alemaya University of Agriculture, Ethiopia*. pp.62.
- Alexander D.J. (2003). – *Newcastle disease*. In *Diseases of poultry* (Y.M. Saif, ed.), 11th Ed. Iowa State University Press, Ames, 64-87.
- Backman, T. N. and W. R. Davidson, 1962. *Marketing Principle*. The Ronald Presses Co., New York. pp. 3-24.
- Barry, P. J., and Robison, L. J. 2001. *Agricultural Finance: Credit Constraints and Consequences, Credit Groups in Madagascar*, World Development 22.
- Barry, P. J. 1995. *The Effects of Credit Policies on U.S. Agriculture*. The AEI Press, Washington, DC
- Berhanu Gebremedhin, H. Dirk and Samson Jemaneh. 2007. *Heading towards commercialization? The case of live animal marketing in Ethiopia. Improving*

- Productivity and Market Success (IPMS) of Ethiopian Farmers Project*. Working paper 5. ILRI (International Livestock Research Institute), Nairobi, Kenya. 73pp
- Bett HK, Bett RC, Peters KJ, Kahi AK, Bokelmann W (2012). *Linking Utilisation and Conservation of Indigenous Chicken Genetic Resources to Value Chains*. J. Anim.Prod.Adv. 2(1):33-51.
- Branckaert RDS and Gueye. 1999. *FAO's Programme for support to family poultry production. In: Proceedings workshop on poultry as a tool in poverty eradication and promotion of gender equality*. Tune Landboskole, Denmark.
- CIAT (Centro International de Agricultural Tropical), 2004. *Increasing the Competitiveness of Market Chains for Smallholder Producers*. Manual 3: Territorial Approach to Rural Agro- enterprise Development Project.
- Dastagiri MB,Ramesh Chand, Immanuelraj TK, Hanumanthaiah CV ,Paramsivam P, Sidhu RS, Sudha M, Subhasis M, Basantha S, Khem C,Ganesh K(2013). *Indian Vegetable Production Trends, Marketing Efficiency and Export Competitiveness*. Am. J. Af. 1(1): 1-11.
- DLP (Director Livestock Production), (2008). *Livestock production annual report: Ministry of Livestock Development*.
- Emam AA (2011). *Evaluating marketing efficiency of tomato in Khartoum State, Sudan*. J. Agric. Soc. Sci., 1(7): 21–24
- Emuron, N., Magala, H., Kyazze, F.B. ,Kugonza, D.R. and Kyarisiima, C.C. (2008). *Factors Influencing the Trade of Local Chickens in Kampala City Markets* <http://www.Irrd.org.Irrd/22/4/emur22076.htm> (accessed 30/05/2014)
- FAO (Food and Agriculture Organisation), (2007). *Approaches to Linking Producers to Markets, Agricultural Management*. Marketing and Finance occasional paper no.13. Rome: FAO.
- Farooq, M., Shoukat, K., Asrar, M., Shah, M., Durrani, F.R., Asghar, A.,and Faisal, S.(2000). *Impact of Female Livestock Extension Workers on Rural Household*

Chicken Production. Livestock Research and Rural development (12) 4. Accessed on 30th May 2014, <http://www.Irrd.org/Irrd12/4/faro124.htm>

FASDEP I 2002. *Food and Agriculture Sector Development Policy*, Ministry of Food and Agriculture, Republic of Ghana.

Ferguson PR, Ferguson GJ (1994). "Industrial Economics: Issues and Perspective (2nd ed.)". London. The Macmillan Press Ltd, 38.

Food and Agriculture Organization (FAO) (2006). – Avian influenza disease emergency bulletin 41. FAO, Rome. Available at: http://www.fao.org/docs/eims/upload//211877/IDEnews_aug06_no41.pdf (accessed on 26/05/2014).

Food and Agriculture Organization/World Organisation for Animal Health (FAO/OIE) (2005). – *A global strategy for the progressive control of highly pathogenic avian influenza (HPAI)*. FAO, Rome and OIE, Paris. Available at: http://www.fao.org/ag/againfo/subjects/documents/ai/HPAI_GlobalStrategy31Oct05.pdf (accessed on 28/05/2014).

Gay, L.R., Mills, G.E. & Airasian, P. (2006). *Educational Research: Competences for Analysis and Application* (8th ed.). New York: Macmillan.

Greer DF (1992). *Industrial organisation and Public Policy*. Macmillan Publishing Company New York.

Gueye EF. 1998. *Village egg and fowl meat production in Africa*. World's Poultry Science Journal 54:73-86.

Gueye, E. F. (2000). *Information Dissemination for Family Poultry Research and Development* (Paper presented at the Family Poultry Pre-Congress, 17th Central American and the Caribbean Poultry Congress, 1-4 October 2002, La Havana, Cuba) <http://www.fao.org/sd/cddirect/cdrec0054.htm> (accessed 17/10/2011).

Hazell, P.B.R., 2010. Chapter 68: *An assessment of the impact of agricultural research in south Asia since the green revolution*. Handbook Agric. Econ., 4: 3469-3530

- IADB. 2001. *Rural Finance Strategy, Sustainable Development* Department Sector Strategy and Policy Papers Series, IADB, Washington, DC.
- Islam, M.S., T.H. Miah, and M.M. Haque, 2001. *Marketing system of marine fish in Bangladeshi*. Bangladeshi J. of Agric. Economics. 24(2): 127-142p.
- Jackson, M. C. (2003). *Systems thinking: creative holism for managers*. John Wiley and sons.
- Kaplinsky, R. (2000). *A handbook for Value Chain Research*. Institute for development studies University of Sussex.
- Kathuri, N. J. & Pals (1993). *Introduction to Educational Research*. Egerton Education book series, Egerton University
- Kaunda ,T. J. and Kitalyi, A.(2000) *Commercializing Rearing of Village Chicken in Kenya* <http://www.fao.org/ag/aginfo/themes/en/infdp/paper12.html> (accessed 29/05/2014)
- KIT, Faida MaLi, & IIRR, (2006). *CHAIN EMPOWERMENT supporting African farmers to develop markets*. Royal Tropical Institute, Amsterdam; Faida Market Link, Arusha; and International Institute of Rural Reconstruction, Nairobi.
- KNBS (Kenya National Bureau of Statistics), (2010). Kenya Population and Housing Census 2009 vol .IB and II. Nairobi: Government printers.
- Kombo, K. D. & Tromp, A.L.D. (2006). *Proposal and Thesis Writing, an Introduction*. Nairobi: Pauline's Publications.
- Kotler, P. and G. Armstrong, 2003. *Principle of Marketing*, 10th Edition. Hall of India Pvt.Ltd., New Delhi. pp 5-12.
- Lunndy, M., M.V. Gottret, W. Cifuentes, C. F. Ostertag, R. Best, D. Peters and S.Ferris, 2004. *Increasing the competitiveness of market chains for smallholder producers*. Manual 3: Territorial approach to rural agro-enterprise development. International Centre for Tropical Agriculture. Colombia.117p

- Mathuva, J. (2005). *Analysis of the Indigenous Poultry Value Chain in Kilifi and Kwale Districts*. Smallholder Project Coast province: unpublished.
- Mckenzi, J. S. (1985). *Factors influencing the control of Newcastle disease*. Proceedings of the 4th international symposium on veterinary epidemiology and economics 1985. <http://www.sciquest.org.nz> (accessed 30/05/2014).
- Mugenda, O. M. and Mugenda, A. G. (1999). *Research Methods Quantitative and Qualitative Approaches*. Nairobi: Acts Press
- Ndegwa, J. M., Norrish, P., Mead, R., Kimani, C. W. and Wachira, A. M. (2000). A Research Process and methodology focusing on indigenous Kenyan chickens. Proceedings of the International Network for Family poultry Development symposium during the XXI world's poultry congress, 20-24 August 2000, Montreal, Canada, pp312 <http://www.fao.org/ag/againfo/themes/en/infdp/paper7.html> (accessed 30/05/2014)
- Njue, S.W., Kasiiti, J.L., Gacheru, S.G.(2006). *Assessing the economic impact of commercial poultry feeds supplementation and vaccination against Newcastle disease in local chicken in Kenya*. IAEA-TECDOC-1489, 116-124 Viena www.pub.iaea.org/mtcd/publications/pdf/te-1489-web-pdf (accessed on 1st June 2014)
- Odwassy, H.O. , Nenkare, J. ,Logono, W. ,Nelima, K.(1999). *Improved Management Packages for Indigenous Poultry Farmers in Ileho Division, Kakamega District*. Unpublished manuscript in the Ministry of Livestock Development, Kenya
- Odwassy, H., Wesonga, H. and Okitoi, L.(2006). *Indigenous Chicken Technical Manual*, KARI Technical note no. 18, February 2006. Nairobi: Kenya
- Okitoi, L. O. (1997). *Productivity of Indigenous Chicken in Western Kenya*. KARI Nairobi: Kenya.
- Olufemi AY and Adeolu BA (2010). *Structure, Conduct and Performance of the Broiler processing enterprise in Southwestern Nigeria*. Learning Publics Journal of Agriculture and Environmental Studies 2(2):1-20.

- Olwande, P .O., Ogara, W. O., Okuthe, S. O., Okoth, E., Odindo, M. O, and Adhiambo, R. F.(2010). *Assessing the Productivity of Indigenous Chicken in an Extensive Management System in Southern Nyanza, Kenya*. *Tropical Animal Health and Production* 42, 283-288
- Seanicaa E, Albert JA, Saleem S (2006). *Market Conduct Performance(SCP) Hypothesis revisited using stochastic frontier Efficiency Analysis*. Selected Paper for presentation at the Agricultural Economics Association Annual meeting, Long Beach, California, July 23-26,2006.
- Tobias, O. O., Kahi, A. K., Kurt, J. Peters, (2011). *Characterization of Indigenous Chicken Production Systems in Kenya*. *Tropical Animal Health and Production*
- UN. 2006. *Transforming Microfinance Institutions-Providing Full Financial Services to the Poor*.
- UN. 2005. *Food Day Report, Rome, Italy*.
- Wachira, A. (2003). *Economic of Indigenous Chicken Rearing*. Nairobi: Kenya.

APPENDICES

APPENDIX A

QUESTIONNAIRE FOR INDIGENOUS CHICKEN FARMERS IN HAMISI CONSTITUENCY, KENYA.

The questions in this Questionnaire are for academic purposes only and all information given will be treated as confidential.

Section A: Respondent's Background Data

1. Particulars

Date:

Name: (Optional)

Gender:

2. County Ward area

Gisambai Banja Shamakhokho Shiru

3. Which category below includes your age? (Years)

20 or younger 20-30 31-40 41-50 50 or older

4. Which of the following best describes your current relationship status?

Married Widowed Divorced Separated Single parent Never married

5. What is the highest level of education you have completed?

Did not attend school Primary Secondary Tertiary Education Adult

6. Are you the head of family?

YES

NO

Section B: Local poultry enterprise

7. What is the main purpose of keeping indigenous chicken?

Hobby

Income

Family food

Other (please specify)

8. How many indigenous chicken do you have now?

9. Do you house your chicken?

Specific Chicken house

Shared house

Other (please specify)

10. Do you give feed supplements to your indigenous chicken?

Yes

No

11. How many birds do you sell per year?

100 or less

101-200

201-300

301-400

401 and above

None

12. Do you grade your eggs?

Yes

No

13. What is your annual income from sale of eggs and chicken?

Eggs Kshs..

Chicken Kshs..

Section C: Vaccination against New Castle and other Diseases

14. Availability of Newcastle and other diseases Vaccine?

Regular Irregular Never Do not know

15. Cost of New Castle and other Vaccine?

Low Fair High Out of reach

16. I reconstitute the vaccine on my own

Yes No

17. What is your bird mortality rate per year? Specify %

Section D: Credit for Local Chicken Enterprise

18. What credit facilities are available for rearing Indigenous Chicken? List

(i)

(ii)

(iii)

(iv)

19. For the Listed above, is collateral required?

| | Yes | No |
|-------|----------------------------------|-----------------------|
| (i) | <input checked="" type="radio"/> | <input type="radio"/> |
| (ii) | <input type="radio"/> | <input type="radio"/> |
| (iii) | <input checked="" type="radio"/> | <input type="radio"/> |
| (iv) | <input type="radio"/> | <input type="radio"/> |

20. How much credit would you take to expand your indigenous chicken rearing project? (Kshs)

- 10,000- 50,000 51,000- 100,000 Above 100,000 None

Section E: Market infrastructure

21. Is the market accessible?

- Very accessible Fairly accessible Difficult Very difficult

22. Who are your frequent customers you sell most of your birds to?

- Neighbors Local market Chicken collectors Hotel

Other (please specify)

23. I sell my birds by

- Weighing (Kgs) Physical observation Age

Other (please specify)

Section F: Extension Services

24. Do you have contact with extension services?

- 1. Yes []
- 2. No []

25. Is your Extension provider from?

- 1. Public []
- 2. private []

26. How often are you in contact with them?

- 1. Weekly []
- 2. Fortnightly []
- 3. Monthly []
- 4. Not consistent []
- 5. Never []

27. What information does extension staff provide about local poultry value chain?

- 1. Housing []
- 2. Feeding []
- 3. Credit []
- 4. Disease control []
- 5. Marketing []
- 6. Breeding []
- 7. Other specify

28. From what other sources do you get information about local poultry value chain?

(List them)

- (i).....
- (ii).....
- (iii).....
- (iv).....

-Thank you for your cooperation-

APPENDIX B

**QUESTIONNAIRE FOR INDIGENOUS CHICKEN TRADERS IN HAMISI
CONSTITUENCY, KENYA.**

The questions in this Questionnaire are for academic purposes only and information given will be treated with high level of confidentiality.

1. Particulars

Date:

Name (Optional)

2. County Ward Area of operation/work:

Gisambai Banja Shamakhokho Shiru

3. Which Indigenous chicken products do you trade in? Tick

Live chicken Dressed chicken Chicken cuts Eggs

4. How many chickens do you sell per week? Specify

5. How many eggs do you sell per week? Specify

6. Do you get adequate supplies of Chicken?

Always Often Never

7. What are your sources of market information? List

- (i)
- (ii)
- (iii)
- (iv)

8. What facilities are available at the market for chicken trade? Tick as appropriate

| | Yes | No |
|----------------------|--------------------------|--------------------------|
| Slaughter facilities | <input type="checkbox"/> | <input type="checkbox"/> |
| Processing | <input type="checkbox"/> | <input type="checkbox"/> |
| Cold storage | <input type="checkbox"/> | <input type="checkbox"/> |
| Store for live birds | <input type="checkbox"/> | <input type="checkbox"/> |

9. Selling is done from? Tick

- Open space Temporary shade Market outlet
- Other (please specify)

-Thank you for your cooperation-

APPENDIX C

**QUESTIONNAIRE FOR AGROVETS ON INDIGENOUS CHICKEN IN HAMISI
CONSTITUENCY, KENYA.**

The questions in this Questionnaire are for academic purposes only and information given will be treated with high level of confidentiality.

1. Particulars

Date:

Name (Optional)

Gender:

2. County Ward Area:

Gisambai Banja Shamakhokho Shiru

3. Do you stock any Chicken Vaccines?

Yes No

4. If Yes, which vaccines do you specifically stock and sell?

(i)

(ii)

(iii)

(iv)

5. What dose quantities do you stock? Specify

6. How many doses of the vaccines mentioned do you sell per month? Specify

7. What other inputs do you stock for Indigenous Chicken production? Specify

8. What other services do you offer to the Indigenous Chicken farmers? List

(i)

(ii)

(iii)

(iv)

(v)

-Thank you for your cooperation-

APPENDIX D

**QUESTIONNAIRE FOR EXTENSION STAFF ON INDIGENOUS CHICKEN IN HAMISI
CONSTITUENCY, KENYA.**

The questions in this Questionnaire are for academic purposes only and information given will be treated with high level of confidentiality.

1. Particulars

Date:

Name (Optional)

2. County Ward Area of operation/work:

- Gisambai Banja Shamakhokho Shiru

3. Farmers readily access NCD and other diseases' vaccine

- 1) Agree 2) strongly agree 3) Disagree 4) Strongly disagree

4. Most farmers are able to administer NCD vaccine.

- 1) Agree 2) strongly agree 3) Disagree 4) Strongly disagree

5. Do you think the indigenous chicken value chain (ICVC) in your ward/division area is:

(Choose one)

- 1) Well developed 2) Moderately developed 3) Not developed
4) don't know

6. What would be considered a well-established ICVC?

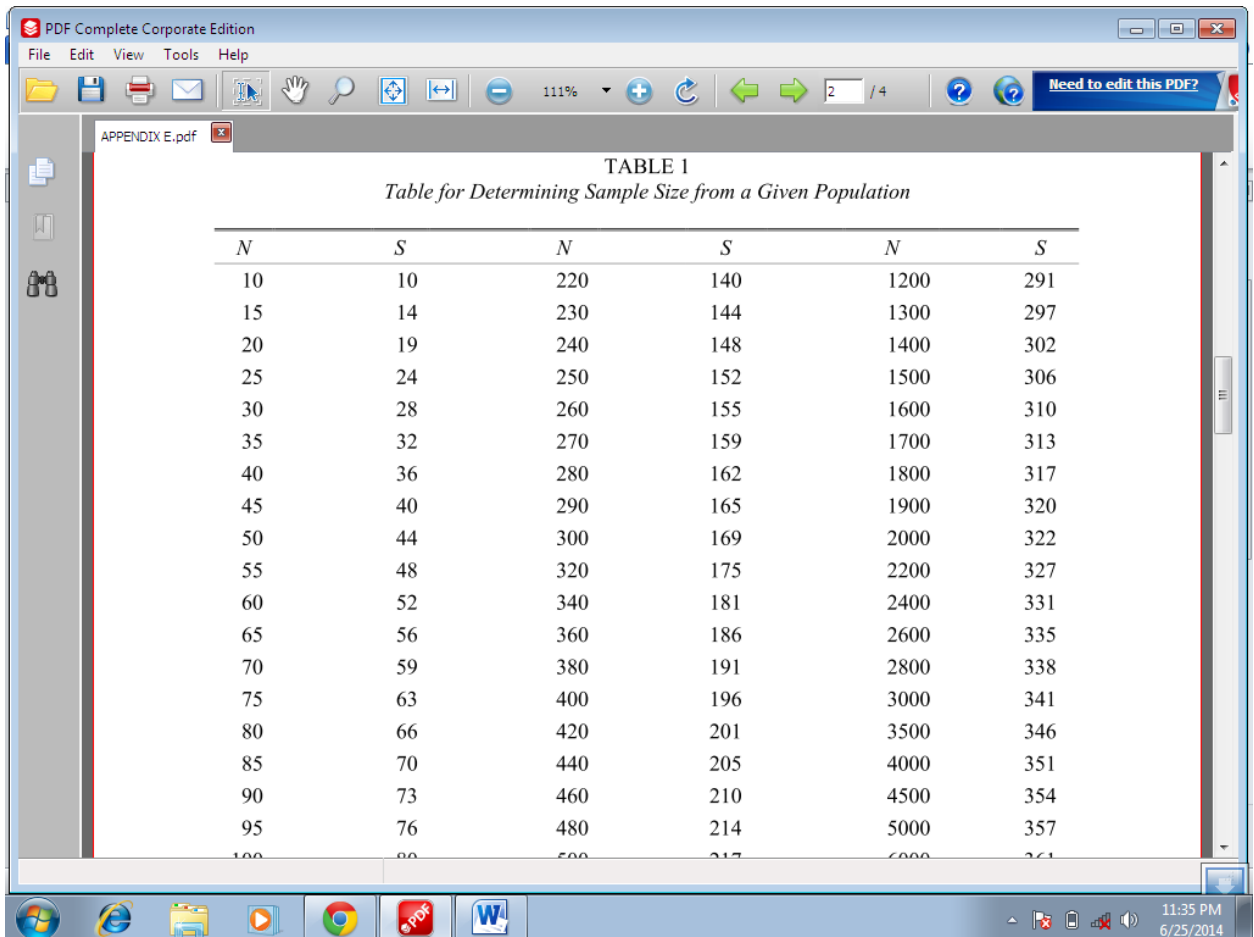
Specify:

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

-Thank you for your cooperation-

APPENDIX E

ROBERT AND MORGAN TABLE (1970)



The image shows a screenshot of a PDF viewer window titled "PDF Complete Corporate Edition". The window displays a document titled "APPENDIX E.pdf" containing a table. The table is titled "TABLE 1" and has the subtitle "Table for Determining Sample Size from a Given Population". The table consists of six columns, with the first two columns labeled 'N' and 'S', and the last two columns labeled 'N' and 'S'. The data is organized into three groups of three columns each. The first group has 'N' values from 10 to 95 in increments of 5, and 'S' values from 10 to 76 in increments of 4. The second group has 'N' values from 220 to 500 in increments of 20, and 'S' values from 140 to 214 in increments of 11. The third group has 'N' values from 1200 to 6000 in increments of 1000, and 'S' values from 291 to 361 in increments of 7. The PDF viewer interface includes a menu bar (File, Edit, View, Tools, Help), a toolbar with various navigation and editing tools, and a status bar at the bottom showing the system clock (11:35 PM, 6/25/2014) and taskbar icons for various applications.

| <i>N</i> | <i>S</i> | <i>N</i> | <i>S</i> | <i>N</i> | <i>S</i> |
|----------|----------|----------|----------|----------|----------|
| 10 | 10 | 220 | 140 | 1200 | 291 |
| 15 | 14 | 230 | 144 | 1300 | 297 |
| 20 | 19 | 240 | 148 | 1400 | 302 |
| 25 | 24 | 250 | 152 | 1500 | 306 |
| 30 | 28 | 260 | 155 | 1600 | 310 |
| 35 | 32 | 270 | 159 | 1700 | 313 |
| 40 | 36 | 280 | 162 | 1800 | 317 |
| 45 | 40 | 290 | 165 | 1900 | 320 |
| 50 | 44 | 300 | 169 | 2000 | 322 |
| 55 | 48 | 320 | 175 | 2200 | 327 |
| 60 | 52 | 340 | 181 | 2400 | 331 |
| 65 | 56 | 360 | 186 | 2600 | 335 |
| 70 | 59 | 380 | 191 | 2800 | 338 |
| 75 | 63 | 400 | 196 | 3000 | 341 |
| 80 | 66 | 420 | 201 | 3500 | 346 |
| 85 | 70 | 440 | 205 | 4000 | 351 |
| 90 | 73 | 460 | 210 | 4500 | 354 |
| 95 | 76 | 480 | 214 | 5000 | 357 |
| 100 | 80 | 500 | 217 | 6000 | 361 |

APPENDIX F

RESEARCH RANDOMIZER RESULTS



Print  Download in Excel  Close 

Research Randomizer Results

1 Set of 169 Unique Numbers Per Set

Range: From 1 to 302 -- Sorted from Least to Greatest

Job Status:

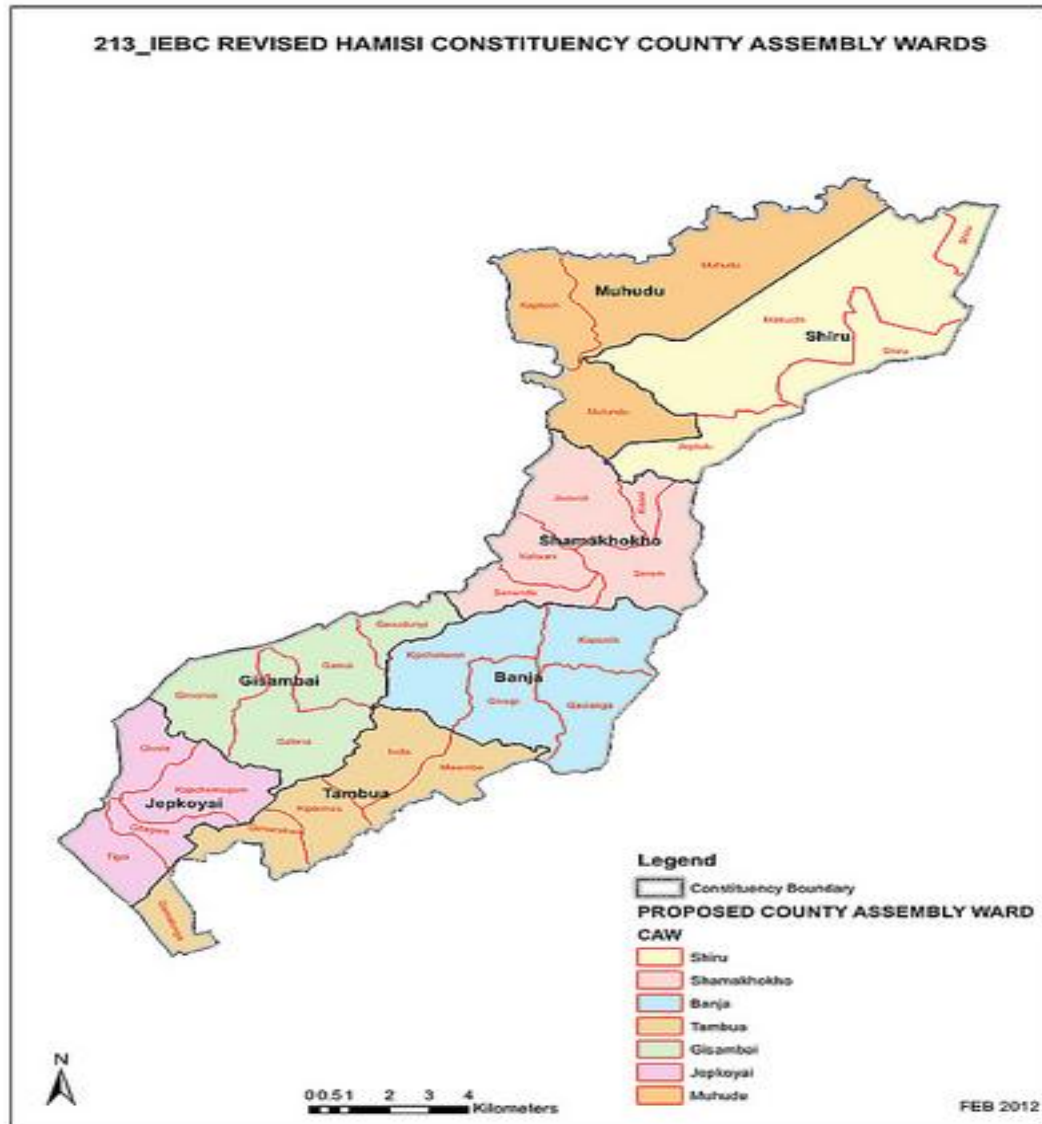
Set #1:

2, 7, 9, 10, 13, 14, 17, 18, 20, 21, 23, 26, 28, 31, 32, 36, 37, 40, 41, 42, 43, 44, 45, 46, 47, 48, 50, 51, 52, 54, 55, 58, 60, 62, 64, 65, 66, 67, 68, 69, 71, 75, 76, 77, 79, 81, 82, 88, 92, 93, 95, 96, 98, 99, 100, 103, 104, 105, 108, 110, 111, 114, 115, 117, 119, 120, 121, 123, 124, 125, 126, 128, 130, 131, 133, 134, 135, 136, 137, 139, 140, 141, 143, 146, 148, 150, 151, 154, 155, 157, 158, 160, 161, 162, 163, 165, 169, 173, 174, 175, 177, 179, 180, 181, 184, 186, 188, 190, 194, 195, 196, 198, 200, 203, 205, 208, 210, 213, 216, 218, 221, 222, 223, 225, 228, 229, 230, 232, 233, 234, 235, 238, 239, 240, 241, 242, 245, 248, 249, 251, 252, 253, 254, 255, 257, 259, 261, 263, 264, 265, 268, 269, 274, 277, 278, 279, 280, 282, 285, 286, 288, 289, 291, 292, 293, 295, 297, 300, 302

Source: <http://www.randomizer.org/form.htm>

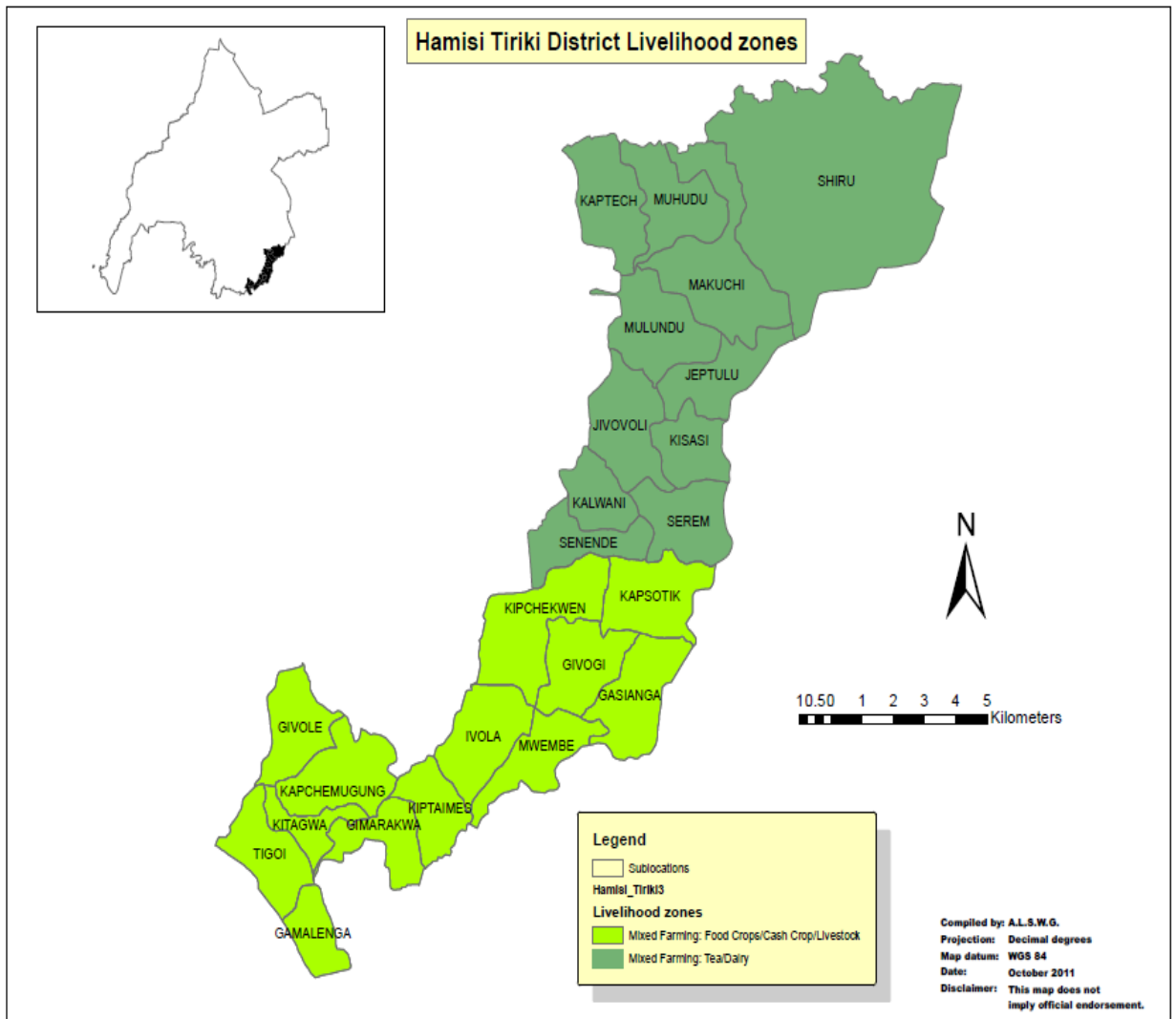
APPENDIX G

MAP OF HAMISI CONSTITUENCY SHOWING COUNTY WARDS



APPENDIX H

MAP OF HAMISI CONSTITUENCY SUB-LOCATIONS



Source: <https://www.flickr.com/photos/albertkenyaniinima/8244334577/in/photostream/>
accessed on 4th June 2014.

APPENDIX I:

RELIABILITY STATISTICS

| | | |
|------------------|---|------------|
| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
| .811 | .810 | 17 |

Item-Total Statistics

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| GENDER | 33.42 | 24.252 | .119 | . | .817 |
| AGE | 31.06 | 19.596 | .477 | . | .803 |
| HIGHEST EDUCATION LEVEL | 32.39 | 23.978 | .121 | . | .820 |
| HEAD OF FAMILY | 33.48 | 24.791 | .010 | . | .822 |
| NO. OF CHICKEN AT THE MOMENT | 32.74 | 21.265 | .782 | . | .781 |
| DO YOU HOUSE YOUR CHICKEN | 33.68 | 23.759 | .251 | . | .810 |
| DO YOU GIVE FEED SUPPLEMENTS TO YOUR CHICKEN | 33.19 | 23.695 | .296 | . | .808 |
| HOW MANY BIRDS DO YOU SELL ANNUALLY | 33.55 | 20.323 | .785 | . | .775 |
| ANNUAL INCOME FROM EGGS | 33.26 | 16.998 | .820 | . | .762 |
| ANNUAL INCOME FROM CHICKEN | 32.61 | 18.778 | .730 | . | .773 |
| AVAILABILITY OF NCD AND OTHER DISEASE VACCINE | 33.10 | 23.957 | .308 | . | .808 |
| COST OF VACCINE | 33.35 | 24.103 | .154 | . | .815 |
| CREDIT ONE WOULD TAKE TO EXPAND IC PROJECT | 33.71 | 23.346 | .362 | . | .805 |
| WHO ARE YOUR FREQUENT CUSTOMERS | 32.84 | 23.406 | .478 | . | .801 |
| MODE OF SALE- SALE BY EXTENSION PROVIDER FROM | 32.84 | 23.406 | .478 | . | .801 |
| HOW OFTEN DO YOU CONTACT EXT SERVICES | 33.13 | 23.383 | .436 | . | .802 |
| | 31.13 | 23.383 | .436 | . | .802 |



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SCHOOL OF CONTINUING AND DISTANCE EDUCATION
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Our Ref:

Telephone: 318262 Ext. 120

1st July, 2014

REF: UON/CEES/NEMC/18/338


TO WHOM IT MAY CONCERN

RE: LINCOLN JISUVEI SUNGU - REG NO L50/61386/2013

This is to confirm that the above named is a student at the University of Nairobi College of Education and External Studies, School of Continuing and Distance Education, Department of Extra- Mural Studies pursuing Master of Arts in Project Planning and Management.

He is proceeding for research entitled "factors influencing the establishment of indigenous chicken project value chain in Hamisi constituency, Vihiga County, Kenya.

Any assistance given to him will be appreciated.


CAREN AWILLY
CENTRE ORGANIZER
NAIROBI EXTRA MURAL CENTRE

