

**THE FACTORS INFLUENCING INDIGENOUS POULTRY
PRODUCTION IN KATHIANI DISTRICT, MACHAKOS COUNTY,
KENYA**

**BY
NDUTHU PETRONILLA WANJUGU**

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DECLARATION

This research project report is my original work and has not been presented for award of degree in any other University

Nduthu Petronilla Wanjugu

Signature

DATE

Reg.No L50/69190/2011

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

Dr. Moses Otieno (PhD)

DATE.....

Signature

University of Nairobi

DEDICATION

This work is dedicated to my beloved husband Samwel Mwanzia and my lovely son Ken Kilungu Mwanzia, my parents Veronicah Wambui Nduthu and Joseph Nduthu Mathai, brothers and sisters for their patience and encouragement.

Thanks for your prayers and endurance, may God reward you abundantly.

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May God bless you all.

LIST OF ABBREVIATIONS/ACRONYMS

ASAL	-	Arid and Semi Arid Lands
CBS	-	Central Bureau of Standards
CTA	-	The Technical Centre for Agriculture
ERS	-	Economic Recovery Strategy
FAO	-	Food and Agricultural organization
FP	-	Farm poultry
GOK	-	Government of Kenya
GDP	-	Gross Domestic Product
HMPL	-	High to Medium Potential land
ICRAF	-	International Centre for Research in AgroForesrty
IFAD	-	International Fund for Agriculture Development
ITK	-	Indigenous Technical Knowledge
KARI	-	Kenya Agricultural Research Institute
KEFRI	-	Kenya Forestry research Institute
LIFDCs	-	Low-Income Food-Deficit Countries
MOA	-	Ministry of Agriculture
MOFA	-	Ministry Of Foreign Affairs
MOLD	-	Ministry Of Livestock Development
MOSNP	-	Ministry of State and National Planning
MOA&RD	-	Ministry of Agriculture and Rural Development
NALEP	-	National Agriculture and livestock Extension Program
NEMA	-	National Environment Management Authority
NEPAD	-	New Partnership for African Development
NCD	-	New Castle Disease
NGO	-	Non Governmental Organization
PPM	-	Poultry production manual
PSPK	-	Partnership for Safe Poultry in Kenya
SIDA	-	Swedish International Development Agencies

SPSS	-	Statistical package for social scientists
SRA	-	Strategy for Revitalizing Agriculture
TLU	-	Tropical livestock unit
TOF	-	The Organic farmer
UNEP	-	United Nation Environmental Program

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ABSTRACT

Although the livestock sector is the main source of livelihood and especially in the arid and semi arid districts (ASALs) and employ about 50 percent of the labour force, exploitation of the livestock subsector has been faced with many challenges and constraints. These include socio economic factors, technological factors, low productivity, policy and legal frameworks, erratic and unpredictable weather, prevalence of trans-boundary animal and zoonotic diseases and pests, inadequate capacity for service delivery, weak delivery of extension services, and demographic factors among others. The purpose of this study was to determine the factors influencing indigenous poultry production in Kathiani District. The study then would give recommendations to the relevant authorities and the indigenous poultry keepers to address those factors aimed at increasing indigenous poultry production in the District and subsequently improving the standard of living of the community through poverty reduction. The research was conducted by collecting primary and secondary data. Primary data was collected from small scale indigenous poultry farmers in the district with the help of divisional livestock officers working in the target area and who were involved in livestock extension and are conversant with the area. Pre testing of the questionnaire was done in one of the locations not sampled in the district before actual administering in the field. The data was then collected using personal interview. A semi structured questionnaire was used to collect the data during the interview. The sampling procedure was multi stage sampling method. The analysis was mainly descriptive in form of frequencies and percentages. The major analysis method was Logistic regression using SPSS. From the study, technological factors , demographic factors as well as social economic factors influenced indigenous poultry production in Kathiani district albeit differently. Trainings on indigenous poultry management practices, disease management (NCD and diarrhea control) and cock management significantly influenced indigenous poultry production in the district. The recommendation of the study was that government policies should be changed to allow for more employment of more staff to ensure that more livestock farmers are trained as 41% had not been trained. Policy makers should formulate policies aimed at addressing the livestock breeding and livestock diseases control to cushion the farmers from expensive private practitioners as majority, 77% of the respondents said that they do not consult the veterinarian because they are expensive.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Livestock plays a significant role in achieving food security in the developing countries. At the moment livestock keeping is receiving greater attention primarily due to expected rapid increase in the consumption of livestock products worldwide, indigenous poultry included (Delgado, 1998)

Nearly all rural and peri-urban families in the developing world keep household poultry. In Africa, village poultry contributes over 70 percent of poultry products and 20 percent of animal protein intake, Kitalyi (1998). In East Africa over 80 percent of human population live in rural areas and over 75 percent of these households keep indigenous chickens and Kenya is not exception to this situation, Kitalyi (1998).

According to Ndegwa et al(2000), indigenous poultry are among the local assets of the poor people living in the rural areas and who make up between 65- 80 percent of the total population in the sub- Saharan Africa.

In Kenya, up to 10 percent of the gross domestic product (GDP) and 30 percent of the farm gate value of agricultural commodities originate from livestock sub-sector. The sector is the main source of livelihood and especially in the arid and semi arid districts (ASALs) and employ about 50 percent of the labour force. About 80 percent of Kenyas' land area is ASAL where livestock production is best suited so livestock remains one of the subsectors with the highest potential of contributing to poverty alleviation in both rural and urban poor GOK (2009).

It is estimated that out of 32 million total poultry population in Kenya, 26 million are indigenous poultry. This is a huge number comprising over 80 per cent of the total poultry population in the country. Geoffrey (2011). This shows that indigenous poultry remain a priority enterprise to most household in the country. The poultry sector is important to

Kenya's agriculture sector, with 76 percent of all Kenyan rural households engaged in some kind of poultry rearing. Despite strong opportunities for growth, the sector is susceptible to constraints such as a weak feed industry, lack of market access, and a high prevalence of poultry diseases. PSPK (2010)

Intensification of indigenous chicken production requires large amounts of inputs, thus making many farmers to shy away from adopting management interventions package. However, efficient use of management interventions with limited wastage of resources would lead to higher productivity of indigenous chickens. KARI (2006) also reported that indigenous chickens were profitable if managed well and common diseases are controlled to improve survival rate of chicks by at least 30 percent while improved feeding, housing and disease control increases survival rate by up to 80 percent.

According to GOK (2009) exploitation of the livestock subsector has been faced with many challenges and constraints. These include socio economic factors, technological factors, low productivity, policy and legal frameworks, erratic and unpredictable weather, prevalence of trans-boundary animal and zoonotic diseases and pests, inadequate capacity for service delivery, weak delivery of extension services, and demographic factors among others.

Although Kenyan rangelands are best suited for extensive livestock production, recent trends in land subdivision coupled with increasing human population and influx of farming communities from neighbouring areas have made this production system untenable. This has led to increased land degradation and food insecurity. Indigenous chicken is an appropriate livestock for the rangelands when viewed in terms of its scavenging for most of its nutritional requirements and being hardy, well adapted to the rangeland conditions and surviving with minimal inputs and still producing according to Ndegwa et al (1996).

Traditionally, poultry plays an important role in Kenya. The chickens have been and are still a major source of protein in the form of eggs and meat, hence improving the nutrition of the rural people and providing cash money to the families. PPM(1989)

To address the problem of indigenous poultry production in the district, the government and various stakeholders have been addressing the problem over the years with limited success. The ministry of livestock development has been doing capacity building in collaboration with other stakeholders like Bidii in the area of poultry development with an aim of addressing the problem of indigenous poultry production in the district (MOLD 2009). The Ministry in collaboration with the Ministry of agriculture has also been doing capacity building on poultry development through various extension programmes for example National Agriculture and Livestock Programme (NALEP) MOA and SIDA (2005).

1.2 Statement of the problem

The market for the indigenous poultry continues to rise due to health related feeding preferences which seem to favour consumption of white meats. The demand for indigenous poultry in urban centers like Nairobi has continued to rise. According to Mailu et al(2008) from a study done of 68 farmers conducted in Kathiani, Machakos, Kibwezi, Nzau and Mwala District revealed that 70 percent of all indigenous poultry sales were conducted at the farm gate while only 19 percent of the sales were at the local market. The results suggests that while farmers complain of poor farm gate prices for indigenous chicken offered by middlemen, low volumes are an important drawback to market participation.

In an effort to improve poultry production the government and other stakeholders have invested in efforts to train the farmers to improve poultry management and hence increase poultry production in their farms. In spite of this trainings, the production of indigenous poultry still remains a low priority activity for the farmers. In its annual report the ministry of livestock development indicates that effort and desire by the government and stakeholders has barely been realized (MOLD, 2009).

This study aims to determine the factors that influence indigenous poultry production in Kathiani district.

1.4 Objectives of the study

To determine the factors influencing indigenous poultry production in Kathiani District.

1.4.1 Specific objectives

1. To establish how social economic factors influence indigenous poultry production in Kathiani District.
2. To establish how demographic factors influencing indigenous poultry production in Kathiani District.
3. To establish how technological factors influence indigenous poultry production in Kathiani district

1.5 Research questions

1. To what extent do socio-economic factors influence indigenous poultry production in Kathiani district?
2. To what extent are demographic factors influencing indigenous poultry production in Kathiani district?
3. To what extent do technological factors influence indigenous poultry production in Kathiani district?

1.6 Justification of the study

The study was to determine the factors influencing indigenous poultry production in Kathiani district and give recommendations. Implementation of the recommendations will enhance increase in indigenous poultry production which will lead to reduction of poverty through job creation consequently leading to improved living standard of the people of Kathiani district. The study was also to add more knowledge in livestock productivity.

1.7 Significance of the study

The study recommendation was to assist in addressing the factors influencing indigenous poultry production in Kathiani district as well as serving as body of knowledge since a copy of the report will be availed to the relevant ministry, Kathiani District and stakeholders for implementation aimed at helping livestock farmers improve on indigenous poultry production and fight poverty among them.

1.8 The scope

The study was done in Kathiani district. The subject of study was small scale poultry farmers in Kathiani District. Their main economic activity is in agriculture and livestock production. The small scale farmers depend on their farms as source of income.

1.9 Assumptions of the study

The study was based on the following assumptions;

1. The information provided by the farmers was accurate and reliable.
2. The study would not raise false expectations from the farmers.
3. The respondents would answer the questions themselves.

1.10 Limitations of the study

1. The small scale farmers might be unwilling to provide the correct, accurate and reliable information
2. The financial resources will not be adequate to collect the data from the entire population.
3. Inadequate time to collect as much data as possible.

1.11 Delimitations of the study

1. Data will be collected within one of the two divisions each of which has limited variation in indigenous poultry keeping practices and homogenous climatic condition.
2. More than one method of data collection will be used [Triangulation]
3. A representative sample sampling methods will be statistically selected from the population using different methods.

1.12 Defination of significant terms

Age structure –distribution of family members according to age.

Concentrates - this are feeds are made industrially like chick mash. Growers mash etc

Gender – are socially and culturally constructed differences between men and women.

Hay box brooder – this is a technology that is used to brood the day hold chicks after they are separated from the mother hen

Indigenous local poultry- this are chicken that are reared, breed locally and do not have high management.

Land - land that can be used to raise animals, crops, fodder and pastures.

Poverty - is a state of not being able to earn a dollar per day.

Scavenging - is where the indigenous birds look for feed themselves.

Sex - is biological difference between male and females.

Small scale farmers - farmers keeping between 1 and 20 indigenous local poultry.

Synchronized breeding - is identifying all the hens that are broody and then give them eggs to sit on the same day so that they hatch the same day.

1.13 Organisation of the study

This section shows the organisation of the study from chapter one to chapter five. Chapter one gives an overview of the background information on the indigenous poultry production, statement of the problem and also identifies the gap that the study is going to address. It also contains the general objectives, specific objectives, research questions, limitations, delimitation, significance of the study and the scope of the study. Chapter two highlights all the literature review cited about the independent variables and the dependent variables of the study. Chapter three gives the overview of the methodology that was used that is it gives the research method to be used, sampling method, data collection and data analysis. Chapter four gives the findings from the study that was conducted while as chapter five gives the summary of the findings, conclusion and the recommendation. It also has the attachment which includes the references, transmittal letter and questionnaire used to collect the data.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section reviews the related literature to form the basis for the study. The study starts by looking at the demographic factors, specifically population growth, gender and age structure in relation to economic activities in the farming community. The literature also reviews the technological factors such as feeds and feeding, breeds and breeding, diseases and parasites control, housing among others in relation to indigenous poultry production.

The review goes deeper to look at the socio economic factors such as poverty, family income, land size and land tenure in relation to indigenous poultry production. Literature on government policies related to the sector is also reviewed. The literature reviews the status of indigenous poultry production globally, in Kenya and finally in Kathiani district. The review intends to determine the factors influencing indigenous poultry production in the said district.

2.2 Demographic factors

In this section the researcher is going to look at the gender, age structure, population and how they affect indigenous poultry production. Gender issues come in when the indigenous poultry farmers are looking at the control, access, benefits and decision making. In most cases this affects the production of the indigenous poultry. The age structure is also important when it comes to the labour required during the management of the local poultry.

2.2.1 Gender and indigenous poultry production

According to MOA&RD (2002) the term “gender” refers to the socially and culturally constructed differences between men and women, as distinct from “sex” which refers to their biological differences. In all societies, men and women play different roles, have different needs, and face different constraints.

The 2030 vision for gender is equity in power and resources between sexes. Specific strategies are aimed at increasing the participation of women in all economic, social and political decision making processes GOK (2007).

Agriculture is the mainstay of Kenyan economy and women provide about three quarters of labour on small holdings. In the face of male migration to urban areas in search of other job opportunities off the farm, women stay behind with their children to manage family land and in the process become the *defacto* household heads which is defined within the context of decision making. Although surveys by central bureau of statistics reveal that men continue to head the majority of rural households, female headed households form about 30% of the headship nationally, and the percentage is much higher in some districts MOFA (Netherlands Embassy, Kenya). This shows why most women are left to take care of the indigenous poultry.

Women are almost wholly responsible for productive work, are substantially involved in productive and community work but have little control over the household and community resources. The disparity between the access and control, by men and women, of resources frustrates individuals slows down development. Both men and women have access to most resources and have rights but these rights are determined by men. On the other hand, women have little control over sale of this indigenous poultry especially where the flocks get over 10. They also have little access over the benefits. Men control the sale and purchase of land MOA & RD (2002). GOK (2007) agrees that glaring gender gaps exist in access and control of resources. Though women constitute slightly over half of Kenyas' population, women continue to have less access to social services and productive resources than men.

Women are also left out during important training on important technologies of indigenous poultry rearing and management which they are expected to implement. Men attend those trainings but leave the implementation bit to women who are not trained on the same. This has far much effect on productivity MOA&RD (2002).

Womens' labour force has not been adequately captured in the estimation of the countrys' national accounts. On average male participation rate in the modern sector have remained higher than for females and the gap has not changed over the years GOK (2007).

Womens' unrecognized role and the undervaluing of womens' work contributions to society the world over have diminished their collective identity and self esteem. This situation not only precludes women from access to, control over and benefit from productive resources as if they do not exist, it also precludes women meaningful engagement in poverty eradication programs Wanyeki (2003). This could affect the morale of women in the production of the indigenous poultry especially taking that this is a women enterprise.

Despite all the regional differences in indigenous poultry production, one observation seems to remain the same, whether talking of smallholder households in Africa, Asia or Latin America namely that the day to day management of poultry is undertaken by women, often with assistance from their children. Whereas men may assist in the construction of housing (night shelters for the indigenous poultry) and in some localities in bringing indigenous poultry and eggs to the market, women and children are, as a general rule, the ones who feed and water the indigenous poultry, clean the housing and apply treatments. Mathias,(2006).

Sivard (1985) argues that women are poor because increasingly they are left with children support. The growing number of women headed households is a characteristic common to most countries today but the trend has been intensified in rural regions by the out migration of men to urban centres and other countries in search of paid work. Left behind with the burden of providing for the families are women who are severely handicapped not only by lack of resources but also by laws and social institutions which give them no independent status. They have no right to lease, buy, or sell the small piece of land which they cultivate for the familys' food. Without property rights, they are also often deprived of access to credit to buy farm implements.

The argument is supported in GOK (2008) in that only percent of Kenyan women own title deeds thereby minimizing their opportunities to access credit. By this they cannot be able to buy materials for indigenous poultry production like good breeds, drugs when the indigenous poultry gets sick and even buy construction material for the indigenous poultry.

2.2.2 Population growth

Each year, the number of people increase but the amount of natural resources with which to sustain this population, to improve the quality of lives and to eliminate poverty remains finite, increasing the challenges of sustainable development. At the beginning of the 20th century, the total population of Africa was about 118 million, accounting for 7.4 percent of the global population. From 1980-2000, it grew from 469 million to 798 million, representing 13 percent of the world population (<http://www.eoearth.org/eoe/contribute>)

Kenya population has grown from 10.9 million in 1969 to 28.7 in 1999. Most of the people live in high and medium potential areas. Population density in the high and medium potential areas is high. Population increase over the years has exerted considerable pressure on land and related natural resources. The consequences include decline in agricultural land over the years due to human settlement on those prime lands thereby resulting in less land on which to raise feeds for the animals (NEMA, 2004).

The high population growth leads to people migrating from the rural areas to the urban centres in search of jobs leaving the very old and young people to look after the animals. This has more negative effects on indigenous poultry production especially where people are keeping a big number which is labour intensive MOLD (2006).

According to GOK and IFAD (2005) high population density leads to intensified cultivation leading to land degradation, lower agricultural productivity and thus greater levels of poverty and increased livelihood security risk.

2.2.3 Age structure

Age structure refers to the distribution of population according to age. The structure of a population affects a nation's key social economic issues. The age structure can be used to help predict potential economic issues for example the rapid growth of young adult population can be used to predict availability of labour in an area.

Indigenous poultry production is not labour intensive. Most of the labour is supplied by young people/ women and it is therefore important to study the population age structure of an area in order to establish labour availability or non-availability of the same.

2.3 Socio-economic factors

In this area of the socio- economic the researcher will look at the land tenure/use, poverty, family income and will find what different researcher are saying on how they influence indigenous poultry production. This indigenous poultry needs a space for scavenging hence a reason why the farmer needs land. About land ownership, its crucial since one can construct permanent structures, but if one does not have ownership one will be unwilling to keep many indigenous poultry. Poverty is also an issue because one cannot be able to keep many indigenous poultry because management will not be practiced as required.

2.3.1 Land Tenure

Land is a critical resource for the socio-economic and political developments spelt out in Kenya Vision 2030. Respect for property rights to land, whether owned by communities, individuals or companies, is an important driver of rapid economic transformation GOK (2007).

According to Ogolla et al (1996) land tenure provides the legal and normative framework within which all agricultural as well as other economics activities are conducted. Tenure insecurity, whether customary or statutory tenure regimes, undermine the effectiveness of these activities. When tenure rights are certain, they provide incentives to use land in a sustainable manner or invest in resource conservation whether for individual or group of individuals.

Lack of security of land tenure has often resulted in low utilization of agricultural land. In particular, the process of land adjudication, the settlement of land disputes, and repossessing of irregularly acquired land are slow MOSNP& VISION 2030(2008).

According to Muya (1997) Insecurity of land tenure is one of the biggest constraints to land development and that greatest progress has been made where farmers have title deed to their land and boundary dispute no longer arise.

Land tenure in Kenya influences the choice of farming system. Each type of the farming system affects land use, conservation and management in different ways. Studies to assess the impact of land tenure on land use and management of environmental resources; finding was that tenure regimes influence land use Odhiambo (2002). Where farmers have no title deeds to their farms, they fear to invest in capital intensive infrastructures like poultry units MOLD (2005).

2.3.2.Land Use

Mwangore (2002) states that in Kenya, land means different things to different people and groups of people; to farmers and pastoralists is a source and key element of living while to the elite land is a marketable commodity and access to profits. This leads unavoidably into competition between different interests in and attitude towards land.

Of the total land size (576,000km²), about 16 percent (9.4 million ha) is of high to medium potential (HMPL) and the remaining 83 percent (48 million ha) are arid and semi arid. Of the 9.4 million ha HMPL, 2.8 million ha is crop land and 2.5 million ha is for grazing (mostly indigenous poultry),2.0 million ha is forest, 1.1 million ha national parks and reserves and 0.5 million ha for urban and infrastructure GOK(2004)

Due to population increase (2.9 percent per year), the pressure on the limited available agricultural land has increased substantially over the past 20 – 30 years leading to unsustainable use of the land resources and to degradation. The increased pressure on

resources (land, water, forage) in ASALs has led to degradation of this fragile ecosystem as shown in loss of forage and water. UNEP, IISD (2006).

Due to shrinking land parcels and a high population growth rate the possibilities for increasing livestock products lie mainly in the intensive livestock production systems. There is need therefore to focus on production of eggs and meat from intensive poultry production. The chicken has a high feed conversion efficiency as compared to large animals such as cattle (2kg of feed to 1kg of meat as compared to cattle 7kg of feed to 1kg of meat.) poultry production manual MOLD (1989)

2.3.3 Poverty

Poverty is usually measured by pricing the basic necessities of life, drawing a poverty line in terms of this price and defining as poor those whose income fall below that figure Huralambo (1980).

Poverty reduction has been a major challenge since independence in Kenya. The number of people living below the poverty line according to NEMA (2004) has increased from 42 percent in 1994 to 52 percent in 1997 and to 57 percent by 2003. Poverty denies peasant farmers access to credit and the resources necessary to undertake livestock production. A large number of Kathiani population is still unable to meet their basic needs given their levels of income CBS (2003a). CBS (1998/1999) in its integrated labour force survey argues that the spatial distribution of poverty shows that the rural areas of the district are far worse compared to the urban areas with corresponding poverty ratios of 70 percent and 39 percent.

2.3.4 Family income.

Livestock production is a labour intensive activity and most people fear the amount of labour involved. For one to get good income from poultry you need to be committed when it comes to brooding and taking care of them because of predators also because of diseases/ parasites. The income of a family therefore has an impact on whether one ventures into the activity or not with those with high income opting to purchase indigenous poultry rather than keeping them for fear of the tedious work involved MOLD (2002)

Despite efforts to develop intensive poultry production, family poultry (FP) is still very important in Low-Income Food-Deficit Countries (LIFDCs). In LIFDCs, the keeping of poultry by local communities has been practiced for many generations. FP is an appropriate system for supplying the fast-growing human population with high-quality protein. It can also provide additional income to the generally resource-poor small farmers, especially women. Although requiring low levels of inputs, FP contributes significantly to food security, poverty alleviation and ecologically sound management of natural resources. FP is also a source of employment for underprivileged groups and less-favored areas in LIFDCs. Developing schemes that aim to promote and improve the FP sub-sector in a way that is sustainable must not underestimate the roles and contributions of women. However, getting new information to the front line of production requires more gender-disaggregated data. This paper stresses the need to design, implement, monitor and evaluate FP development programs by taking into account socio-cultural, especially gender, issues. E.F. Gueye (2003)

The Ethiopian chickens' population accounts for about 60 percent of the total chicken population of East Africa (Mekonnen *et al.*, 1991). The contribution of these indigenous poultrys to household food security and income source is highly significant (Halima, 2007). It is widely accepted that village chickens are important in breaking the vicious cycle of poverty, malnutrition and disease (Roberts and Gunaratne, 1992). This is true in northern Ethiopia particularly in Tigray, Amhara and northern Oromia Regional States which collectively own about 43 percent of the total national poultry population. The average number of chickens per household (flock size) is estimated at 7.2 and 4.4 in Tigray and Amhara Regional State respectively, the values of which are above that of the national average of 4.1. Annual poultry meat and egg consumption per household is estimated to be 2.19 and 1.72 kg respectively in the Tigray Regional State as compared to the national average of 0.12 and 0, 14 kg respectively. Similarly annual live indigenous poultry and egg sale per household is estimated at 6 chicken and 100 eggs respectively in the Tigray Regional State. At a current market price these figures tend to indicate annual income of Birr 322 from household poultry, indicating that village poultry in extremely poor areas of these parts of the country play important economic, nutritional and socio-cultural roles in the livelihoods of the rural households. Rural

poultry is also the only capital that households have left when declining into poverty because of various reasons such as drought (Aklilu, 2007).

2.4 Technological factors

The technological factors here include feeds/feeding, breeds/breeding, diseases /parasites, housing and trainings. These factors are very important in indigenous poultry production because if the farmers ignore them the production will always be low. All the factors have to be considered equally but not disregard others.

2.4.1 Feeds

According to a recent World Bank study, farmers in Africa are likely to move slowly towards livestock. Managing livestock in Africa is likely to be more profitable than growing crops under future climatic conditions CTA (2008).

One of the major challenges facing livestock production in the country ASALs is the availability of adequate, good quality feeds all year round MOLD (2007).

Indigenous poultry need feeds that give the necessary elements for body functions, including growth, and egg and meat production. This is a requirement that the free-range production system does not meet adequately. To attain a balanced diet, it is recommended that in addition to scavenging, a farmer should include protein supplements from one of the recommended cheap but quality sources. KARI (2006)

The size and productivity of the village flock ultimately depend on the human population and its household waste and crop residues, and on the availability of other scavengable feed resources. There is a clear relationship between egg production and nutrient intake. This is demonstrated in Bangladesh, where fewer eggs are laid in the rainy season from August to September, but when snails are available in January and February, production increases (Horst, 1989). A list of feed resources available to smallholders was compiled from surveys undertaken in Nigeria (Sonaiya, 1995). These feedstuffs were mostly by-products of home food processing and agro-industries, and were similar to those found in other tropical countries. The Scavengable Feed Resources Base (SFRB) include household cooking waste,

cereal and cereal by-products, roots and tubers; oilseeds, trees, shrubs (including *Leucaena*, *Calliandra* and *Sasbenia*) and fruits, animal proteins, aquatic plants (*Lemna*, *Azolla* and *Ipomoea aquatica*) and commercially prepared feed.

Supplementation during the dry season is good because Kathiani District can be very dry especially during the period of August to October. This affects the production of the indigenous poultry because most farmers rear them in free range system MOLD (2006)

According to KARI (2006) the indigenous indigenous poultry should be supplemented with food that has energy, proteins and vitamins. They continue to say that those feeds should be locally found like blood from slaughter houses , white ants for proteins. For people living around the lake they can use Omena. This area being a dry region most farmers plant sorghum and this together with maize they use it to supplement the energy source of food.

2.4.2 Breeds

In Kenya Animal breeding is one of the key intervention areas for increased livestock productivity. Currently, livestock productivity is negatively affected by poor genetic make up of livestock being kept by the livestock producers. This has resulted in animals with slow growth rates, low mature sizes, low fertility and low production. The average indigenous poultry yield is estimated at 1- 1.5kgs. To increase the overall productivity, this parameter needs to be improved through breeding using superior genetics GOK (2009)

Conservation of local breeds possessing genetic variations specific to the particular environment is essential for sustainable development. Although they exist as numerically small populations, local breeds are not only highly adapted to the natural environment, but are also an integral part of the lifestyle of the rural people. People, livestock and environment form a delicately balanced but sustainable ecosystem, and thus the potential impact of any intervention to improve production in the traditional system should be predetermined. The situation is less sensitive in peri-urban, industrial and small-scale intensive poultry production, in which rapid improvements can be achieved through well-designed development programmes. The intensive poultry production sector, however, is generally much smaller than the family poultry sector in virtually all developing countries.FAO (1989)

According to KARI (2003) Opportunities identified are; crossbreeding with appropriate exotic breeds and selected indigenous chicken breeds and rotational use of different cocks in a village cockerel exchange programme.

Currently, most of the breeding stock is being supplied by farmers. In the past, the government supplemented this effort in the National Poultry Development Project. NPDP (1985) through selected farmers who did breeding and then sold to farmers' good breed cocks. However this never continued after the project came to end. This was done by selected farmers rearing cocks which would be exchanged with the farmers cock by the project leading to improved breeding and better indigenous poultry breed. This is constrained by weak enforcement of regulation. Consequently, this has resulted in indiscriminate cross-breeding leading to inbreeding and poor breeding records which have impeded the development of quality poultry stock.

KARI Naivasha also is a source of indigenous poultry. They supply any indigenous poultry of any age depending on the requirement but the challenge is the distance. Most farmers will want a starting stalk of ≤ 5 indigenous poultrys hence they do not find it economical to go to Naivasha for indigenous poultrys. KARI (2006)

According to the Machakos annual livestock production report MOLD (2006) showed that farmers could get better production through use of a technology called Hay Box brooder where chicks are removed from the hen immediately after hatching resulting to the hen starting to lay within a short time like 2- 3 weeks. This method leads to high production of indigenous poultry. The report goes on to say even if the above method is better the farmers are still leaving the hen with the chicks for as many as 4- 5 months.

Increased production can be achieved through synchronizing indigenous poultry so that they brood the eggs at the same time leading to so many chicks hatched at the same time then put in a brooder for rearing together KARI(2006). Though there are so many ways of improving breeding of indigenous poultry most farmers seems not to take them up and this could be due to inadequate technical knowledge MOLD (2009)

2.4.3 Diseases and parasites

The direct effect of indigenous poultry diseases on productivity are significant and include reduced feed intake, increased deaths, decreased rates of reproduction and weight gain among others. Parasites, both internal and external also affect indigenous poultry productivity in the similar manner. Kelly et al (1994)

Indigenous poultry are important in supporting the livelihoods of poor farmers, consumers, traders and labourers throughout the developing world. The greatest impact of livestock in sustainable development designed to help the poor is enhancement of livestock production systems. Animal diseases are crucial constraints in this: the animals of poor people are particularly vulnerable to disease because of the expense, absence or unsuitability of animal health and production inputs (<http://www.fao>).

The department of veterinary services has placed great attention to animal disease control in order to protect Kenya animal resource base. The focus has been in the control and eradication of animal diseases of major economic and public health importance in order to promote sustainable livestock farming and to facilitate trade in animals and animal products. The major diseases include Newcastle Disease, Fowl pox, Fowl Typhoid. The provision of veterinary services has been constrained by inadequacy of operational funds, shortage of transport and veterinary inputs, poor infrastructure and shortage of personnel all over the country (<http://www.livestock.go.ke>). Viral diseases like Newcastle Disease are some of the most important infectious diseases affecting poultry and causing large number of deaths. They are characterised by not being able to be treated, but most can be prevented with vaccines. Kelly *et al.*, (1994)

Poultry health is also affected by nutritional and environmental factors, such as insufficient feed or feed deficiencies. A high mortality rate among chicks during the first days or weeks after hatching may be caused by insufficient feed and water. A high mortality in adult indigenous poultrys may be due to nutritional problems, such as salt deficiency. Sonaiya (1995)

Energy and protein deficiencies and imbalances can arise when the feed contains insufficient quantities of these nutrients, resulting in poor growth in young stock and a drop in egg production and egg weight in laying hens. Mineral and vitamin deficiencies may result in poor growth, low production or death. Vitamin D deficiency causes rickets (bone deformities) in young chicks and, if combined with a calcium deficiency, in chickens of all ages. A lack of manganese results in deformities of the feet of older chickens. Sonaiya (1995)

MOLD (2006) in its Veterinary Services annual report reports that the major challenges facing indigenous poultry production in Kathiani district include among others poultry diseases and parasites, poor breeds resulting from poor breeding, inadequate quality feeds and inadequate extension services.

2.4.4 Poultry housing

Most farmers keeping indigenous poultry have no houses for them or are poorly built.

The reasons for not having poultry house by the farmers who never had poultry houses were mainly due to presence of small flock size/household, lack of construction materials and lack of knowledge and awareness on the importance of housing chickens. Kugonza et al (2008). The basic requirements for poultry housing are adequate space, good ventilation, good lighting and protection (from weather and predators).

Farmers reported theft as one of the major constraints that faces indigenous chicken production. This led to loss of mature indigenous poultry at the selling stage and eggs due to improper farm structures. This reduced chicken numbers and hence profitability of indigenous chicken in both Namasagali and Kamuli Town Council. It is apparent that building of proper structures for the indigenous indigenous poultrys would help to reduce theft in the study area. Kugonza et al (2008).

All the indigenous chicken farmers reported that predation was the other economically important constraint in indigenous chicken production system in the study area. Indigenous chicken farmer said they scared wild indigenous poultrys and animals away from their flocks by making noise and said they were not aware of other methods such as providing a fenced run and the fold and ark systems to protect their flocks from predators. These results agree with Halima (2007) who reported that predation was one of the major constraints in indigenous

chicken production in North-West Ethiopia. Similar results were reported by Bell and Abdou (1995).

The challenge of predators dictates that construction of ‘predator proof’ chicken houses could help to reduce losses, especially during the night. Chicks also needed to stay in protected areas for the first 4–5 weeks of life in order to avoid predators and accidents. Protection of young chicks, especially from wild indigenous poultry was found critical, as this is the time when they are most vulnerable to predators. Halima (2007)

2.4.5 Training and Extension

Extension services are an important prerequisite for promoting technology uptake and eventual utilization by end-users for increased productivity. Over the years, low funding and low staffing levels have hampered the production and dissemination of information on livestock production and disease management technologies to livestock farmers, resulting in poor performance of the livestock sub sector generally. Provision of public education in animal health for improved livestock productivity and to safeguard human health is important. Currently, the Ministry of Livestock Development has only 20 percent of its extension staff requirements, a situation that is likely to deteriorate in the next one to two years due to natural attrition and staff retirement. The recommended staffing ratios are one livestock extension officer to 500 farmers in high potential areas and 1:150 farmers in low potential areas to improve service delivery. GOK (2009).

To promote livestock productivity and particularly indigenous poultry production among the farming community in Kathiani district, extension agents use various methods depending on target group, time of the year and objectives. In addition to individual approach where farmers are trained individually, group approach where farmers are trained in a group and mass media as proposed by Muya (1997), demonstrations and field days are also used MOLD (2009).

The approach to extension changed from supply driven approach to demand driven approach in the year 2001 where farmers are expected to identify their problem(s) and then look for an extension agent to provide the technical knowhow. The farmers are also mobilized by the

extension agent to form groups where they are trained when they demand for service. The service is provided free (MOA and SIDA, 2005).

2.5 Government policies and indigenous poultry production.

Policies and legislation are necessary to engineer change, address challenges and create an enabling environment for investment, growth and development. Inappropriate policies may also hinder growth. The last livestock policy was enacted in 1980. Since then a lot of changes have taken place in Kenya and in the world. In Kenya, major changes include liberalization and commercialization strategies, ERS, SRA, and Vision 2030 GOK (2009).

In Kenya, land related challenges include access to land, sub-division into uneconomical sizes, poor practices resulting into land degradation, wildlife- human conflicts as well water conflicts and lack of feeds, especially during the dry seasons. The issues have constrained the development of sustainable indigenous poultry industry in the country (Republic of Kenya, 2007).

According to MOA (1995), although livestock contribute 42 percent of agricultural GDP, it gets limited attention from policy makers and research and as a result, much of the information on which planning for and debate on the sector is old and estimated. The document goes on to state that in the livestock industry many disease management issues are being handled through the privatization of veterinary services. The same document points out that the performance of these systems needs to be monitored and government still may have a role in those regions where private cattle owners may under-invest, particularly in tick control. The document finally points out that demand for animal products is set to increase drastically but investment in providing for that demand is discouraged by lack of information and lack of clear conducive government policy.

2.6 Drought

An indigenous chicken is locally adapted to free range scavenging. This is mainly due to the poor management accorded to them. However they are able to scavenge and harvest enough nutrients for growth, production and reproduction. Though their yield potential is relatively low, indigenous chicken contribute significantly to the national egg, meat production and to the welfare of the smallholder family. (poultry production manual- 1989)

Drought as an intervening variable has an influence on numbers of indigenous poultry produced in that it affects feeds availability which in turn results in reduced production thereby influencing numbers of indigenous poultry produced. This is because most of the farmers keeps indigenous poultrys in free range which means they fed for themselves. Drought also affects water availability to the animals. Drought at the same time triggers incidences of build- up of parasites Hall (1980) which has direct influence on quantity of indigenous poultry produced by the affected indigenous poultry.

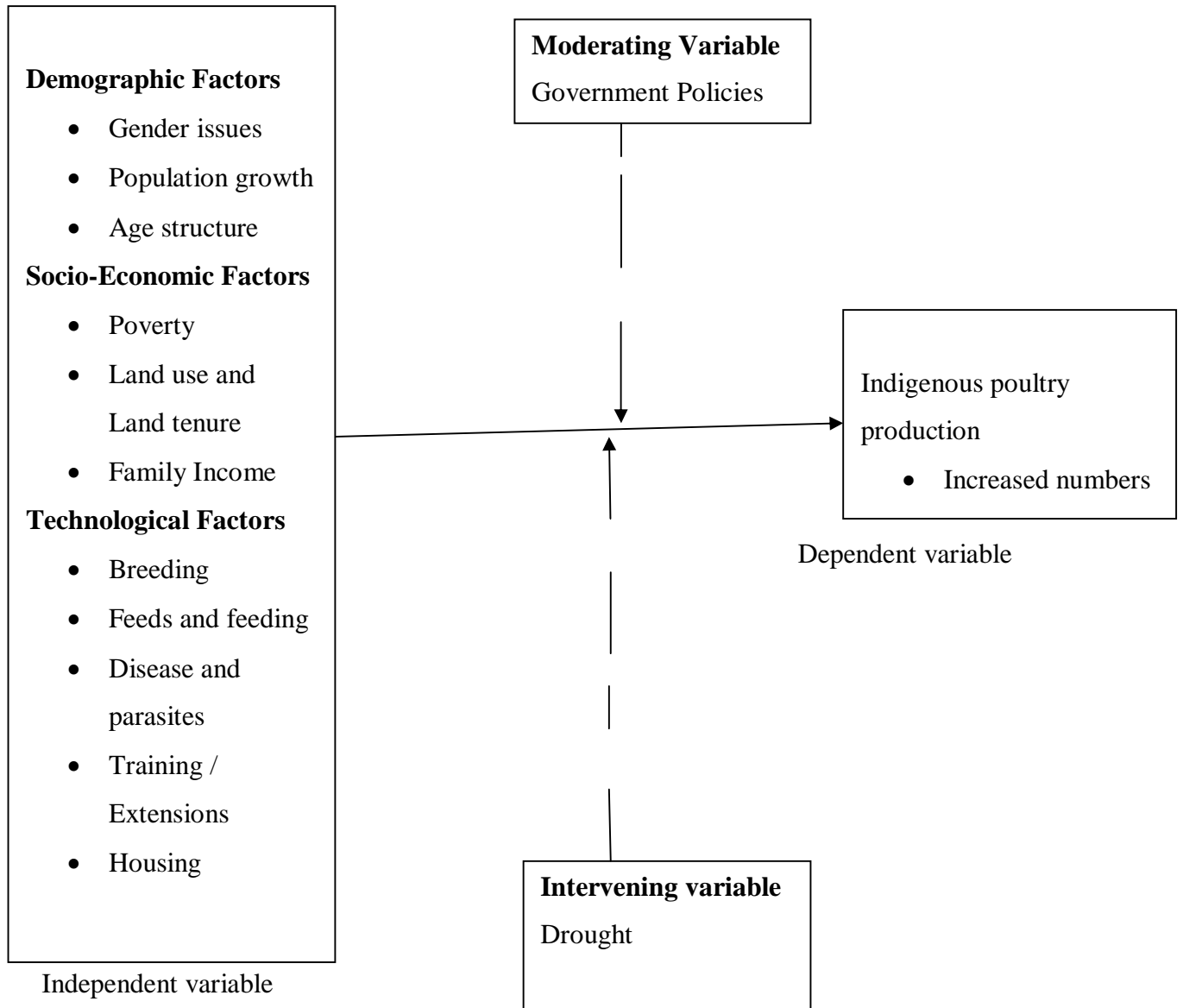


Figure 2.1 Conceptual frame work

2.7 Interrelationship between variables

Socio-economic factors, demographic factors and technological factors have direct influence on the numbers of indigenous local poultry production in Kathiani district.

Poverty denies peasant farmers access to credit and the resources necessary to undertake livestock production activities which are capital intensive in terms of infrastructure development such as poultry housing units and purchase of good poultry breeds thereby influencing directly indigenous local poultry production. Land use and land tenure on the other hand determines the extent to which agricultural activities are undertaken; insecurity of land tenure is one of the biggest constraints to land utilization. The main source of family income is very important in relation to indigenous poultry production.

Gender issues, population growth and age structure have direct influence on milk production; the disparity between the access and control, by men and women, of resources frustrates individuals slows down development. Only 3% of Kenyan women own title deeds thereby minimizing their opportunities to access credit GOK (2008) with which they can use to rear indigenous local poultry. High population growth leads to people migrating from the rural areas to the urban centres in search of jobs leaving the very old and young people to look after the livestock. This has more negative effects on indigenous local poultry. Indigenous local poultry production is labour intensive especially with construction of poultry house units and most of this labour is supplied by young people and it is therefore important to study the population structure of an area in order to establish labour availability or non-availability of the same.

Indigenous local poultry breeding is one of the key intervention areas for increased livestock productivity which is negatively affected by poor genetic makeup which has resulted in chicken with slow growth rates, low mature sizes, low fertility and low production. To increase overall productivity, improvement through breeding using superior genetics is a must. Diseases and parasites on the other hand influence indigenous poultry productivity through reduced feed intake, increased deaths, decreased rates of reproduction, weight gain and low production numbers. Extension services are an important prerequisite for promoting

technology uptake and eventual utilization by end-users for increased productivity and therefore have a direct influence on the number of indigenous local poultry produced.

Drought as an intervening variable has an indirect influence on number of indigenous local poultry produced in that it affects feeds growth and availability which in turn results in reduced feeds for scavenge which has a direct influence on numbers of indigenous local poultry produced. Drought also triggers incidences of some diseases and build-up of parasites Hall (1980) which has direct influence on number of indigenous local poultry.

Government policies and legislation are necessary to engineer change, address challenges and create an enabling environment for investment, growth and development and therefore a moderating variable which cannot be ignored in the analysis of factors influencing milk production in any given geographical area.

2.8 Summary of literature review

Indigenous poultry production faces many challenges in the district. This can be addressed through a combination of several factors; socio-economics, Demographic, and technological factors among others. The government and other stakeholders recognize the importance of indigenous poultry in the district and have been supporting small scale farmers mainly good poultry husbandry in capacity building on good management. MOLD (2006).

Indigenous poultry production in the district has been a challenge over the years despite government and stakeholders' efforts to capacity build the small scale farmers on indigenous poultry husbandry. There is therefore need to determine the factors that influence indigenous poultry production in the district. Once the factors are determined, the study will give recommendations to key players in the industry to address them.

Currently, the Ministry of Livestock Development has only 20 percent of its extension staff requirements, a situation that is likely to deteriorate in the next one to two years due to natural attrition and staff retirement. The recommended staffing ratios are one livestock extension officer to 500 farmers in high potential areas and 1:150 farmers in low potential areas to improve service delivery. GOK (2009).

CHAPTER THREE

METHODOLOGY

3.1 Introduction

In this section research methodology to be employed is explained and how the data will be collected, analyzed and presented. The study will utilize both descriptive and inferential analysis. Under descriptive analysis percentages, tables and frequency distribution will be used while under inferential analysis, logistic regression analysis will be used to determine the relationship between dependent and independent variables.

3.2 Research design

The study used a descriptive research design. This is a rigid design that makes adequate provision for protection against bias and maximizes reliability (Kothari, 2008). This design helped to collect complete and accurate data to help determine how the conceptualized factors have influenced indigenous poultry production in Kathiani.

3.3 Target population

The target population of the study was 20,000 small scale livestock farmers in Kathiani District. The subject participants are individual small scale indigenous poultry farmers who are household head in one of the divisions which is Kathiani. These are small scale farmers who derive their livelihood from farming. They have a land size of 4-5 acres and below.

3.4 Sampling design

Feurstein (1986) define sampling as the use of definite and defined procedure(s) in the selection of a total population for the purpose of obtaining from it descriptions, estimates and analysis of certain characteristics of the whole.

In this study, multi stage sampling design was employed to generate the required sample. Multi stage sampling design is used when it is not possible to obtain a sampling frame because the population is either very large or scattered over a large geographical area.

Kathiani district has 2 divisions, Kathiani and Ithaeni respectively. Due to the expansiveness of the district, it was not possible to cover the two divisions and therefore one division which is Kathiani was randomly selected using simple random sampling. Both divisions have 4 locations each with indigenous poultry farmers well distributed in all the locations. One location which is Kathiani location was then selected using simple random sampling. The area was then divided into blocks following the existing sub locations boundaries and the data collected in the Kathiani sub-location Ngoleni village.

Singleton (1993) argues that while a sample size of 2000-3000 is considered the extreme upper limit, extreme lower limit is generally 30 cases for statistical analysis but continues to add that most social researchers would recommend a sample size of a 100. The area has one community with similar livestock keeping practices and in the same geographical locality. The study population is therefore considered homogeneous.

Due to the time and resources limitation (Mutai 2000) and going by Singleton (1993) a sample size of 100 would be considered adequate since the study population is considered to be homogeneous.

3.5 Research instrument

The study used both open and closed ended structured questionnaires to collect the data. The questionnaire was in two sets that is the household questionnaire set one and the extension officers questionnaire set two. The household head questionnaire was administered face to face by the livestock extension officers in that study area to the respondent while the extension officer questionnaire was self administered.

3.6 Reliability of the research instrument

To ensure reliability of the instrument the researcher used livestock extension officers working in that region both from the NGO and ministry of livestock. The knowledge that this livestock personnel have in livestock increased the reliability. These personnel collecting the data were

well facilitated and motivated financially so that they could not become demoralized. The study was done using 130 questioner as recommended by most of the researcher and not the lower limit of a sample of 30 as recommended by singleton (1993).

3.7 Validity of the research instrument

To ensure that the instrument content was appropriate to the purpose of the study, the content was very comprehensive so that all the factors mentioned in the study that is the independent and the dependent variable are measured. The instrument questions representing the content to be measured was articulated well in the research instrument. To ensure the appropriateness, meaningfulness and usefulness of the data the instrument had to be pretested in another division which is not part of the study area where 3 respondents were asked to provide the data. The personnel who were to administer the instrument were taken first through the instrument to ensure that there was no bias.

3.8 Data collection.

The research was conducted by collecting primary and secondary data. Primary data was collected with the help of divisional livestock officers and staff from the NGOs working in the target area and who are involved in livestock extension. Pre testing of the questionnaire was done in the other division before actual administering in the field. The data was collected using personal interview. A semi structured questionnaire was used to collect the data during the interview.

The questionnaires were in two sets. One set of 100 was administered to household heads which was to capture data to help in finding out the factors that influence indigenous poultry production in the area. Socio-economic status of the sampled households will also be captured using this set of questionnaire.

The second set of 10 questionnaire was self administered on livestock extension officers working in the target area to get information on their perception on factors influencing

indigenous poultry production in the district. This information was used to validate the data collected using questionnaires from the small scale livestock farmers in the target area.

3.9 Data analysis

The data was collected using questionnaires with both closed and open ended questions. Ordinal, nominal and interval scales were used in data measuring to make coding and categorizing easier after the data collection. Descriptive statistics in the form of tables, frequencies and percentages was used to establish the general characteristics of the study sample. The Logistic regression was then used to determine the relationship between dependent and independent variables and their significance using multivariate analysis. SPSS software package was used in data analysis.

Operationalization Table 3.1

Objective /research question	Type of variable	Indicator	Measure	Level of scale	Analysis
(1).To determine the extent to which demographic factors influence indigenous poultry production in Kathiani district.	Independent variables (a). Gender (b) Age	Sex	Male/female	Nominal	Qualitative
		Years	Number of years	Ordinal/interval	Qualitative
	Dependent variable Number of indigenous poultry produced	Numbers of indigenous poultry	% increment	Ratio	Mixed mode
(2).To analyse the extent to which socio-economic factors influence indigenous poultry production in Kathiani district	Independent variables (a) poverty level	Housing	Types of houses	Nominal	Qualitative
	(b) land use and tenure	land size/ ownership	Acreage	Nominal/interval	Qualitative
	(c) family Income	Income	Income per month	Nominal/ interval	Qualitative
	Dependent variable Number of indigenous poultry produced	Number of indigenous poultry	% of increment	Ratio	Mixed mode
(3) To determine the extent to which technological factors influence indigenous poultry production in Kathiani District	Independent variables (a) Breeds and breeding (b) Feeds and feeding (c) Housing (d)Veterinary services (e) Trainings /Extension services	Cock management	How often they change cock and sources of cocks	Nominal	Qualitative
		Types of feeds	% of farmers giving supplementation feeds	Nominal and ratio	Mixed mode
		Presence of poultry houses	% of farmers with poultry houses	Nominal and ratio	Mixed mode
		Incidences of diseases	% of farmers seeking vet services	Nominal and ratio	Mixed mode
		Presence/absence of extension agents	% of farmers seeking extension services	Nominal and ratio	Mixed mode
	Dependent variable Quantity of indigenous poultry produced	Number of indigenous poultry	% increment	Ratio	Mixed mode

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, AND INTERPRETATION

4.1 Introduction

This chapter deals with data analysis, presentation and interpretation of findings. It provides the overall findings based on primary and secondary data which was collected from the field using both closed and open ended questionnaires. The data analysis was mainly descriptive using percentages, tables and frequency distribution and logistic regression analysis to determine the relationship between independent and dependent variables.

4.2 Data Analysis

A total of 100 questionnaires were administered but 98 were returned with 1 questionnaire having only section A filled and 1 was not returned. Therefore 98 respondents were interviewed. Semi structured questionnaires were used in the interview. Nine questionnaires were purposefully administered to all livestock extension workers working with the ministry of livestock development who filled and returned them. The findings in the questionnaires were analyzed descriptively using percentages and frequencies followed by interpretation. Logistic regression was then used to determine the relationship between dependent and independent variables.

4.2.1 Descriptive Analysis

It involved presenting the general characteristics of the respondents which included the gender, age and education levels of the households head among other independent variables.

4.2.1.1 Demographic factors that influence indigenous poultry production in Kathiani district

This section involved presenting the findings of the demographic factors likely to influence indigenous poultry production in Kathiani district in percentages and frequencies inform of tables followed by interpretations.

4.2.1.2.1 Gender

The study sought to establish the gender distribution, household head distribution and who determines the use of family labour of the farmers interviewed.

Table 4.1 gender distribution of farmers interviewed

Gender	Frequency	Percentage
Male	22	23%
Female	76	77%
Total	98	100

This table 4.1 shows that majority, 77% of females were interviewed as compared to males at 23%.

Table 4.2 Household head distribution interviewed

Household heads	Frequency	Percentage
Yes	52	53%
No	46	47%
Total	98	100

These table 4.2 shows that majority, 53% of the household head interviewed were household heads and 47% were not. Though only , 23% of the men were interviewed as shown in table 4.1, it showed that the members interviewed that were household heads were 53%. This is because most of those women were household heads either because they are widowed, single or separated.

Table 4.3 Distribution of household decision maker on use of family labour

Response	Frequency	Percentage
Male	49	50%
Female	43	44%
Both	6	6%
Total	98	100

The information in Table 4.3 shows that majority, 50% of males make decision, 44% of the females make decision and only 6% of the households decisions are made by both gender.

4.2.1.2.2 age structure

The study sought to establish the age bracket of the farmers interviewed and their family members.

Table 4.4 Age category of the household heads

Household heads' age	Frequency	Percentage
Less than 45 years	70	71%
Above 45 years	28	29%
Total	98	100

Table 4.4 shows that household heads within the category of above 45 years was lower, 29% than those below 45 years at 71%. This showed that there were more household heads below 45 years engaged in indigenous poultry keeping. Age, according to the study, is likely to influence the indigenous poultry production because of low income and labour intensiveness of some activities like house construction which requires younger people to look for construction materials.

4.2.1.2.3 Household heads' education level

The study sought to establish the household heads highest level of education.

Table 4.5 Household heads level of education

Household head highest level of education	Frequency	Percentage
At least primary	41	42%
Secondary and above	57	58%
Total	98	100

The analysis from Table 4.5 shows that 58 % of the household heads had attained secondary education and above while 42% of the household heads' highest level of education was primary level. This means most of household heads had post primary education hence a high level of literacy. The high literacy level implied the likelihood for households to positively take up the poultry good management practices.

4.2.1.3 Social Economic factors that influences indigenous poultry production in Kathiani district

This section involved presenting the findings of the social economic factors likely to influence indigenous poultry production in Kathiani district in percentages and frequencies inform of tables followed by interpretations.

4.2.1.3.1 Households average monthly income

The study sought to establish the average monthly income level of the household heads.

Table 4.6 Average monthly households' income

Households average monthly income(Kshs)	Frequency	Percentage	Average income(ksh)
Below 5000	75	76%	5700
5001-10,000	17	17%	
above 10,000	6	7%	
Total	98	100	

Majority of the households' monthly income was below Ksh 5,000 constituting 76% while only 17 % earned more than Ksh 5,000 and only 7% earned more than ksh10,000. This implied that most of the households had low level of income to meet basic needs and invest in intensive indigenous poultry activities such as construction of poultry house, purchase of good indigenous poultry breeds and even do good disease/ parasites control. The average monthly income was ksh 5700.

Table 4.7 composition of household members by age

Age composition (years)	Frequency	Percentage
<18	243	68%
18-30	89	25%
31-40	10	3%
41-50	10	3%
>50	2	1%
Total	354	100

Table 4.7 shows that majority, 68% of the household members are at age of less than 18 years, 25% are at the ages of between 18- 30 years, 3% were between 31-40years, 3% were between 41-50 years and 1% were of age of above 50 years. The study shows that the family members had people who would provide labour either in management or construction of poultry houses.

4.2.1.3.2 Household housing

The study sought to establish the type of house occupied by the house hold members.

Table 4.8 Type of house occupied by house hold members

House type	Frequency	Percentage
Permanent	10	10%
Semi-permanent	70	71%
Mud-walled	18	19%
Total	98	100

Table 4.8 shows that majority of the respondents, 71% owned semi- permanent houses, 19% of the respondent had mud- walled houses and 10%, have permanent houses. This was due to low level of incomes of majority of the households. However, this could be as a result of the fact that sand is abundant in the area and farmers bake their own bricks for construction of semi permanent houses. Termites are also a menace and trees are scarce warranting the use of bricks.

4.2.1.3.3 Households farm size

The data sought to establish the households' head farm size

Table 4.9 Households farm size

Households farm size	Frequency	Percentage	Average farm size
Below 1 acre	28	29%	1.9 acres
1 to less than 2 acres	38	39%	
2 to less than 3 acres	19	19%	
3 to less than 4 acres	9	9%	
4 to less than 5 acres	2	2%	
Above 5 acres	2	2%	
Total	98	100	

Table 4.9 shows majority of the households, 87 %, had a land size of less than 3 acres while only 13% had more than 3 acres. The average farm size was 1.9 acres. This implied high land pressure in an effort to derive their livelihood from the small land size given the climatic condition of the area which is semi arid. The study shows that land size had an influence on indigenous local poultry production in the study area both because of the scavenging area and also in construction of good poultry house.

4.2.1.3.4 Land tenure

The data sought to establish the households land tenure.

Table 4.10 Households land tenure

Response	Frequency	Percentage
Own	27	28%
Leased	6	6%
Family land	63	64%
Communal land	2	2%
Total	98	100

Table 4.10 shows that the land ownership was mainly family owned constituting 64%. Land tenure insecurity was cited in the study as a factor that is likely to influence indigenous poultry production from the fact that farmers are likely to shy off from investing heavily in a farm that they are not sure of what can happen to it in future especially when it comes to constructing a poultry house.

Table 4.11 household number of indigenous poultry in the homestead

Response	Frequency	Percentage
1-5	37	38%
> 6	61	62%
Total	98	100

Table 4.11 showed that majority of the household, 62% had more than 6 indigenous poultry while as only 38% had between 1-5 indigenous poultry. This showed that the household interviewed showed that only two farmers had more than 30 indigenous birds meaning production is low.

4.2.1.3.5 Sources of Farm Labour

The study sought to establish households' main sources of farm labour.

Table 4.12 Households' main source of farm labour

Response	Frequency	Percentage
Family	80	82%
Hired	18	18%
Both	0	0%
Total	98	100

Table 4.12 shows that majority, constituting 82% were depending on family labour. 18% were depending on hired labour. This shows that indigenous poultry production is not that labour intensive hence the higher percentage in family labour as compared to the hired labour.

4.2.1.3.6 Sources of capital used on Farm

The study sought to establish the households' main sources of capital used in farm.

Table 4.13 Main source of capital used on the farm

Response	Frequency	Percentage
Own	92	94%
Borrowed	6	6%
Total	98	100

Table 4.13 shows that the main source of capital, constituting 94%, used in the farm is from the household heads themselves while only 6% of the same is borrowed. This was expected from the study given the income levels of most households which could not be enough to allow them to borrow finances.

4.2.1.3.7 Ownership of indigenous local poultry in the household

The study sought to establish who owns indigenous local poultry in the household.

Table 4.14 Ownership of indigenous local poultry in the household

Response	Frequency	Percentage
Man	32	33%
Wife	56	57%
Both	10	10%
Total	98	100

Table 4.14 shows that indigenous local poultry are mainly owned by the wife at 57% and the man at 33%. While as 10% said that the indigenous local poultry is owned by both women and men. This shows that the responsibility of taking care of the indigenous local poultry is likely to be done by the wife or women.

4.2.1.3.8 Responsibility of who takes care of indigenous local poultry

The study sought to establish who takes care of indigenous local poultry among the household members.

Table 4.15 Response on who takes care of indigenous local poultry

Response	Frequency	Percentage
Man	13	13%
Wife	66	67%
Children	5	5%
Any	14	15%
Total	98	100

Table 4.15 shows that taking care of indigenous local poultry mainly is the responsibility of women constituting 67% while only 13% is taken by men. This shows that women are heavily burdened and this is likely to influence indigenous local poultry production in the study area.

4.2.1.3.9 Determiner of the slaughter and sale of the indigenous local poultry in the household

The data sought to establish who determines slaughter and sale of the indigenous local poultry among the household heads.

Table 4.16 Determiners of slaughter and sale of the indigenous local poultry in the household

Response	Frequency	Percentage
Man	25	26%
Wife	59	60%
Both	14	14%
Total	98	100

Table 4.16 shows that women are the main determiners of slaughter and sale of the indigenous local poultry comprising 60% as compared to men determiners who constitute only 26%. This

shows that women, who owns more indigenous local poultry, 57%, compared to men 33% according to Table 4.14 also takes the main burden of taking care of indigenous local poultry where 67% of them were responsible for taking care compared to men 13% going by the findings in Table 4.15. This is likely to influence the indigenous local poultry production in the area of study where the sweat of one's labour is rewarded.

4.2.1.4 Technological factors influencing indigenous local poultry production in Kathiani district, Kenya.

This section involved presenting the findings of the technological factors likely to influence indigenous local poultry production in Kathiani district in percentages and frequencies in form of tables followed by interpretations.

4.2.1.4.1 Main types of feeds used on the farm

Table 4.17: Determiners of households who use concentrates

Response	Frequency	Percentage
Yes	21	22%
No	77	78%

Table 4.17 shows that only 22% uses concentrates while as 78% do not use concentrates. This showed that only a small percentage uses concentrates. This could be true because most of this indigenous poultry are scavengers.

4.2.1.4.2 The data sought to establish the main types of feeds used on the farms

Table 4.18 main types of feeds used on the farms

Response	Frequency	Percentages
Chick mash	18	86%
Growers mash	2	10%
Layers mash	1	4%
Broiler starter	0	0%
Broiler finisher	0	0%
Total	21	100

Table 4.18 shows that the main type of feeds used in the farms in the study area was chick mash comprising 86% while as only 10% feeds growers mash and only 4% fed their indigenous poultry with layers mash. From the study, this is likely to influence indigenous local poultry production as chick mash ensures that the chicks grows fast if supplementation is done

4.2.1.4.3 Main rearing system practiced by farmers in Kathiani district

The data sought to establish the main rearing systems practiced by indigenous poultry farmers in the study area.

Table 4.19 Main rearing systems practiced by indigenous poultry farmers

Response	Frequency	Percentages
Free range	64	65%
Semi confined	30	31%
Fully confined	4	4%
Total	98	100

Table 4.19 shows that only 65% of the respondents reared their birds on free range, 31% reared their birds on semi confined method and 4% of the respondent had fully confined their birds. This is likely to influence indigenous local poultry production in the study area as most of the chicks are predated on when they are young. This explains the result of table 4.17 as to why most indigenous poultry farmers do not use concentrates. It is because most of this indigenous poultry are reared on free range.

4.2.1.4.4 Feeds and feeding

The data sought to establish whether indigenous poultry farmers in the study area grew poultry feed and if so, what type.

Table 4.20 To determine the Feeds type that the respondents used

Response	Frequency	Percentages
Concentrates	3	3%
Home made	48	49%
Home left over's	45	46%
Others (scavenging)	2	2%
Total	98	100

Table 4.20 shows that most of households, 49% used homemade feeds, 46%, uses by products from muthokoi or 'nthenga' the other. This supplementation is usually done during the dry period as the Kathiani region is a semi- arid.

4.2.1.4.5 Households trained on indigenous local poultry

The data sought to establish the households trained on indigenous local poultry those who have been practicing what they learned, the challenges they have been facing while practicing, those who have not been trained and whether they have been interested in the training or not and if interested whether they knew where to get assistance.

Table 4.21 Households trained on indigenous local poultry

Response	Frequency	Percentage
Yes	58	59%
No	40	41%
Total	98	100

Table 4.21 shows that majority of the respondents, 59%, had received training on indigenous local poultry as opposed to only 41% who had not received the same. According to this study, this is likely to influence indigenous local poultry production in the area as majority of the

indigenous poultry farmers will practice good indigenous poultry husbandry due to the knowledge acquired.

Table 4.22 Households practicing what they learnt after being trained on indigenous local poultry

Response	Frequency	Percentage
Yes	58	100
No	0	0
Total	58	100

Table 4.22 shows that all those who received training on indigenous local poultry husbandry practiced what they learnt, a good indication that if more are trained, they are likely to do the same thereby influencing indigenous local poultry production in the area positively.

Table 4.23 Households' major challenges in implementing indigenous local poultry practices

Response	Frequency	Percentage
Capital	20	20%
Disease	51	52%
Predators	24	24%
Others	3	4%
Total	98	100

Table 4.23 shows that majority, 52%, of households practicing indigenous local poultry Practices cited disease as the major challenge towards implementing what they learnt 24% cited predation as a major constraint, 20% cited capital as a major constraint. This shows that disease could be the one affecting the production taking that it has a higher percentage than the other two.

Table 4.24 Households not trained on indigenous local poultry production and their response on interest

Response	Frequency	Percentage
Yes (interested)	32	80%
No (not interested)	8	20%
Total	40	100

Table 4.24 shows that majority of the households not trained on indigenous local poultry practices expressed interest to be trained while only 20% did not have the interest to be trained on indigenous poultry good management practices possibly due to loss of hope after most animals died due the disease.

Table 4.25 Households interested in indigenous local poultry trainings and know/ don't know where to get assistance.

Response	Frequency	Percentages
Yes (know where)	24	41%
No (don't know where)	34	59%
Total	58	100

Table 4.25 shows that majority of the households, 59%, interested in indigenous poultry good management training actually don't know where to get assistance while only 41% knew where to get assistance. This was expected from the study given that the staff position at the grass root is very low. The government policy has changed to demand driven that is you go for them when one has an interest.

4.2.1.4.6 chicken feed concentrates use

The data sought to establish whether indigenous poultry farmers use chicken concentrates

Table 4.26 Response of household that use chicken feed concentrates

Response	Frequency	Percentage
Yes	21	22%
No	77	78%
Total	98	100

Table 4.26 shows that majority of the households, 78%, do not use poultry feed and only 22% use the concentrate. This goes together with table 4.19 showing that most farmers keep their indigenous poultry on free range hence seeing no need of feeding them with poultry feeds concentrates.

4.2.1.4.7 Type of poultry feeds concentrates used

The data sought to establish the type of concentrates used and if so the category of indigenous poultry they feed the concentrates to.

Table 4.27 Households using concentrates

Response	Frequency	Percentage
Chick mash	19	90% %
Growers mash	1	5%
Layers mash	1	5%
Total		100

Table 4.27 shows that majority of the households, 90%, used chick mash while as 5% used growers mash and 5% used layers mash all. This was expected from the study given that high cost of concentrates, the low level of training and the average monthly income of the respondents which stood at 76% of those getting below 5000/= as shown in table 4.6.

Table 4.28 Category of indigenous poultry fed on concentrates

Response	Frequency	Percentage
Chicks	19	90%

Growers	1	5%
Big birds	1	5%
All	0	0%
Total	21	100

Table 4.28 shows that only 90% of the respondents gave concentrate to chicks while only 5% gave their growers and 5% gave their birds layers mash. The results showed that there was a farmer who was keeping both indigenous and exotic birds.

4.2.1.4.8 Availability of poultry feeds

This data sought to establish the availability of the poultry feeds.

Table 4.29 Availability of poultry feeds

Response	Frequency	Percentage
Yes (available)	35	36%
No (not available)	53	64%
Total	98	100

Table 4.29 shows that majority of the households, 64%, said the poultry feeds were not easily available as opposed to 36% who claim the poultry feeds were available. This agrees with the findings in Table 4.28 which shows that the majority of the households do not use poultry feeds. This could be caused by issue of the poultry feeds availability.

Breeds and breeding

4.2.1.4.9 household knowledge on cock management

Table 4.30 household knowledge on cock management

Response	Frequency	Percentages
Buy	16	16%
From own birds	26	27%
Exchange with neighbors'	52	53%
All	4	4%

Total	98	100
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Table 4.30 showed that most of the indigenous poultry farmers, 53% knew about cock management as they would exchange their cocks with the neighbours after sometime, 16% were getting their cocks from outside meaning they understood about breeding, 27% got their cocks from their own flock meaning they did not have good knowledge on breeding management and 4% used all the above to get a cock for breeding meaning they did not have knowledge on inbreeding.

4.2.1.4.10 Households' knowledge on inbreeding in indigenous poultry

The sought to establish whether the indigenous poultry farmers knew about cock management. As continued use of the same cock could bring about inbreeding which affect production and the vigour of the chicks leading to high mortality rate.

Table 4.31 Households' knowledge on inbreeding in indigenous poultry

Response	Frequency	Percentage
Yes	56	57%
No	42	43%
Total	98	100

Table 4.31 shows that majority of the household indigenous poultry farmers, 57% had knowledge on inbreeding as compared to 43% who had no knowledge. This agrees with table 4.30 where by 69% of the indigenous poultry farmers will change their cock by either buying or exchanging with their neighbors.

Table 4.32 Household who knew the effect of inbreeding

Response	Frequency	Percentages
Yes	24	43%
No	32	57%
Total	56	100

Table 4.32 shows that majority of the households, 57%, do not know the effect of inbreeding 43% said they knew the effect of inbreeding. This was expected from the study given that 41% had not been trained in indigenous poultry management as seen in table 4.21.

Table 4.33 Household who had heard about hay box brooder

Response	Frequency	Percentage
Yes	30	31%
No	68	69%
Total	98	100

Table 4.33 showed that majority, 69% of the indigenous poultry farmers did not know about hay box brooder while as only 31% knew about the technology. This table agrees with table 4.21 on only 41% had received training and also why the production is low as seen in table 4.11

Table 4.34 household who had heard about synchronized brooding

Response	Frequency	Percentage
Yes	23	24%
No	75	76%
Total	98	100

Table 4.34 shows that a majority, 76% of the indigenous poultry farmers interviewed did not have any knowledge on synchronized brooding while only 24% had the knowledge. This also explains why numbers are low as shown in table 4.11. This also agrees with the study in table 4.21 that only 41% have received indigenous poultry training.

4.2.1.4.11 Indigenous poultry diseases management in Kathiani District

The data sought to establish the households' response to indigenous poultry diseases management once their animals fell sick, the availability or non-availability of qualified

veterinary officers and the major challenges the households faced in accessing qualified veterinarians.

Table 4.35 Households' indigenous poultry diseases management

Response	Frequency	Percentages
Treat animals myself	20	21%
Consult a Veterinarian	7	7%
Use ITK	57	58%
Consult a fellow farmer	14	14%
Total	98	100

Table 4.35 shows that majority of the households, 58%, used indigenous technical knowledge in case their animals fell sick with only 21% of the households seeking attention elsewhere including treating the animals themselves, 14%, consulted fellow farmers and only 7% consulted a the veterinarian. This information shows that the indigenous poultry farmers do not take the treatment of their chicken serious. The reason why most of them went for indigenous technical knowledge. This agrees with the study in table 4.23 where most, 52% households interviewed said that the disease was a challenge.

Table 4.36 Availability/Non- availability of veterinarians

Response	Frequency	Percentages
Yes (easily available)	2	29%
No (not easily available)	5	71%
Total	7	100

Table 4.36 shows that majority, 71%, of the same households who used qualified veterinarian had problems in accessing the officer(s) while 29%, of the households who consulted qualified veterinarians had no problem accessing the personnel. This was expected from the study given the low coverage of qualified veterinary officers at the grass root level. This

shows the reason why the indigenous poultry farmers are using other ways to treat their chicken as shown in table 4.35.

Table 4.37 Hindrance to using qualified veterinarians among households

Response	Frequency	Percentage
Not available	15	16%
Expensive	70	77%
Other reasons (non reliable)	6	7%
Total	91	100

Table 4.37 shows that majority, 77%, of those households which do not use the services of a qualified veterinarian cited cost as a major reason while 16% cited non- availability of the officers as a reason for their not using the services of qualified veterinarians in managing indigenous poultry diseases and only 7% said that they do not use them because they were non reliable..

4.2.1.4.12 indigenous poultry disease control and frequency of control.

The data sought to establish whether households controlled New Castle Disease, diarrhoea, parasites and the frequency of control.

Table 4.38 New Castle Disease (NCD) control methods

Response	Frequency	Percentages
Vaccinate	21	22%
ITK	62	63%
None	15	15%
Total	98	100

Table 4.38 shows that the majority of indigenous poultry farmers uses ITK (indigenous technical knowledge) to control NCD, 22% vaccinate against NCD while as 15% do not do any of the above. This explains see disease as the biggest challenge they face in indigenous

poultry production among other things as shown in table 4.23. This was in agreement with table 4.21 where only 41% of the those indigenous poultry farmers having not been trained.

Table 4.39 Frequency of NCD control among the households

Response	Frequency	Percentages
Yearly	4	19%
Every six months	6	29%
Anytime	11	52%
Total	21	100

Table 4.39 shows that majority of the households, 52%, vaccinate their indigenous poultry anytime, 29% does it every six months while as 19% vaccinate their indigenous poultry yearly. This study shows that this could be happening because of inadequate knowledge they have about vaccination of indigenous poultry against NCD.

Table 4.40 Knowledge of how they control diarrhoea.

Response	Frequency	Percentage
ITK	57	58%
Buy antibiotics	24	25%
Call a qualified vet	7	7%
None	10	10%
Total	98	100

Table 4.40 shows that a majority, 58% of the indigenous farmers uses ITK to control diarrhoea, 25% buys antibiotics, 7% of those farmers calls a qualified veterinarian and 10% do not use any of the above method. This agrees with table 4.23 where farmers cited disease as the major challenge.

4.2.1.4.13 Internal and external parasites.

The study sought to establish whether households controlled internal and external parasites in their indigenous poultry as this could also affect indigenous poultry production.

Table 4.41 External parasites control methods

Response	Frequency	Percentages
Dusting	85	87%
Dipping	6	6%
Others	7	7%
Total	97	100

Table 4.41 showed that majority, 87% of the indigenous poultry farmers had knowledge on external parasites control and used dusting to get rid of poultry flea, ticks, and mites. 6% used dipping and 7% never used any method to control external parasites.

Table 4.42 response of household that dewormed their birds

Response	Frequency	Percentage
Yes (dewormed)	47	48%
No (did not deworm)	51	52%
Total	98	100

Table 4.42 shows that 47% of the households interviewed controlled internal parasites in their indigenous poultry, with majority, 52%, not deworming their indigenous poultry.

4.2.1.4.14 Indigenous poultry housing

The study sought to establish whether this indigenous poultry farmers had poultry houses as this is important when it comes to control of predators and external parasites.

Table 4.43 Households with poultry houses

Response	Frequency	Percentage
Yes (have)	30	31%

No (do not)	68	69%
Total	98	100

Table 4.43 showed that a majority, 69% of the indigenous poultry farmers interviewed did not have poultry houses and only 31% had poultry houses. This showed why the number of the indigenous poultry kept is small. This agrees with table 4.10 which shows that only 28% owns the land. This shows that so long as they do not own land they shy away from constructing poultry house

Table 4.44 when the households interviewed enclosed their chicken in the poultry houses.

Response	Frequency	Percentage
Day	1	3%
Night	29	97%
Total	30	100

Table 4.44 showed that the majority, 97% puts their indigenous poultry in the houses at night where as only 3% enclosed their chicken during the day. This agrees with table 4.19 which showed that 65% of the household interviewed left their chicken on free range system of rearing. A big number said that they enclosed them because of safety from thieves or predators.

Table 4.45 where household without houses enclosed their chicken

Response	Frequency	Percentage
Kitchen	51	75%
Granary	10	15%
Main house	7	10%
Total	68	100

Table 4.45 showed that the majority, 75% of the household kept their indigenous poultry in the kitchen, 15% kept them in the granary and 10% kept them in the main house. Due to the place why they were kept it showed that this chicken had to be let out during the day either to feed or allow for space for those households to work in the kitchen, main house or the granary.

4.2.1.5 Extension Workers Questionnaire Analysis

This section seeks to know the views of the extension officers and it is from this views that the study will be able to help validate the response household.

4.2.1.5.1 Poultry farmers facing challenges in indigenous poultry production.

The data sought to establish from the extension workers whether poultry farmers in their area of work faced challenges in indigenous poultry productivity in order to validate farmers' data.

Table 4.46 Extension workers view on whether farmers faced challenges in productivity.

Response	Frequency	Percentages
Yes	9	100%
No	0	0
Total	9	100

Table 4.46 on extension workers views on whether indigenous poultry in their area of work faced challenges in productivity shows that all, 100%, recorded that the farmers faced challenges in productivity. This was in agreement with the farmers' response.

4.2.1.5.2 Indigenous poultry gender limitations in Kathiani district

The data sought to establish from the extension workers point of view whether indigenous poultry farmers in their area of work experienced indigenous poultry gender issues so as to validate the households' data.

Table 4.47 Extension workers view on whether indigenous poultry farmers experienced gender limitation

Response	Frequency	Percentages
Yes	8	89%
No	1	11%
Total	9	100

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Table 4.47 shows that majority, 89%, of the extension workers recorded that indigenous poultry farmers in their area of work experienced indigenous poultry gender limitations which corresponded with what majority of the farmers recorded. 67% women took care, 56% women owned the poultry, 92% said they used own finances since they could not borrow due lack of collateral and 50% male controlled the labour yet the women played a big role in the indigenous poultry. Gender limitation included access, control of resources, ownership of land and management. This was recorded in the household interviews.

4.2.1.5.3 Indigenous poultry farmers extension service demand in Kathiani district

The data sought to establish from the extension workers point of view whether indigenous poultry farmers in their area demanded extension services. If yes, how the farmers addressed the problem of training in order to validate the households' data.

Table 4.48 Extension workers response on whether indigenous poultry farmers demand extension services

Response	Frequency	Percentages
Yes	9	100
No	0	0
Total	9	100

Table 4.48 shows that all extension workers said that indigenous poultry farmers in their area of operation demanded them. This agrees with table 4.20 % showing that 41% has not been trained this could be because they cannot demand for extension services.

Table 4.49 Extension workers response on government policies discouraging extension services

Response	Frequency	Percentages
Yes	0	0
No	9	100%
Total	8	100

Table 4.49 shows that majority of the extension workers, 100%, recorded that there were no government policies that discouraged extension services. This agrees with table 4.23 where the indigenous poultry farmers did not cite the government policies as a challenge in implementing practices.

4.2.1.5.4 Indigenous poultry management in Kathiani district

The data here sought to establish from the extension workers whether there were farmers keeping indigenous poultry. Whether these farmers experienced feed shortage and how they dealt with the shortage. It also sought to know if the extension workers visited the farmers and how often, and whether the indigenous poultry farmers experienced disease and parasite problems.

Table 4.50 Extension workers response on whether farmers keep indigenous poultry.

Response	Frequency	Percentage
Yes	9	100%
No	0	0%
Total	9	100

Table 4.50 showed that all the extension workers said that there were keeping poultry in the working area. This shows that the enterprise is a priority to the rural urban farmer. This agrees with table 4.11 where all farmers interviewed were keeping the indigenous poultry even if they were in small numbers.

Table 4.51 Extension workers response on indigenous poultry feed shortage

Response	Frequency	Percentage
Yes (feed shortage)	9	100%
No (no feed shortage)	0	0%
Total	9	100

Table 4.51 shows that the all, 100% of the extension workers said the farmers experience shortage. They said that the indigenous poultry farmers cope with the problem of feed

shortage by reducing the number of chicken, substituting with grains and others buy by products from posho mills. This is in agreement with household response in table 4.20 which showed that 49% uses homemade feeds while as 46% uses home left over's. This mostly will happen in September and October when there is nothing to scavenge on.

Table 4.52 Response on how often they visit the livestock farmers

Response	Frequency	Percentage
Weekly	0	0
Monthly	0	0
When demanded	9	100%
Never	0	0
Total	9	100

Table 4.52 shows that all, 100% visit the farmers when demanded. This agrees with table 4.48 where extension officers said that the farmers demanded them. This can be validated by household response in table 4.20 which shows that 41% have not received training. This could be because they do not demand.

Table 4.53 Response on when the extension workers were last trained

Response	Frequency	Percentage
1 year	4	44%
2 years	1	12%
3 years	0	0%
Over 3 years	4	44%
None	0	0%
Total	9	100

Table 4.53 shows that 44% of the extension workers have been trained within 1 year, 12% within 2 years and 44% were trained over 3 years ago. This shows that this extension worker have the new technologies that have to do with indigenous poultry production. The only problem being that they can only visit the farmers when demanded. This can be validated by household response in table 4.33 that shows that 69% have not been trained on hay box brooder and table 4.34 that shows that 76% have not been trained on synchronized breeding.

Table 4.54 response on whether indigenous poultry farmers encounter poultry diseases and parasites

Response	Frequency	Percentage
Yes	9	100%
No	0	0
Total	9	100

Table 4.54 shows that all the extension workers said the indigenous poultry farmers encounter poultry diseases and parasites. This can be validated by household response in table 4.23 which that 52% of the indigenous poultry farmers faced the challenge of the disease and table 4.41 which showed that 87% of the farmers control the external parasites with dusting.

Table 4.55 Response on how indigenous poultry farmers address the problem of disease

Response	Frequency	Percentage
Treat them	3	33%
Seek veterinarian assistance	1	11%
ITK	5	56%
Total	9	100

Table 4.55 shows that majority, 56% used Indigenous Technical Knowledge (ITK) , 33% said they treat the chicken themselves while as 11% seek veterinarian assistance. This can be validated by household response in table 4.35 that shows 58% use ITK, 25% buy antibiotics hence treat the chicken themselves while as 7% seek veterinarian assistance.

Table 4.56 Extension workers response on where indigenous poultry farmers get cock for breeding

Response	Frequency	Percentage
Buy	2	22%
From own poultry	4	44%
Exchange with neighbor	3	34%
Total	9	100

Table 4.56 on extension workers' views on indigenous poultry breeding system used in Kathiani District shows that majority, 44% of the indigenous poultry farmers get the breeding cock from their own poultry, 34% exchange with their neighbors and 22% said that the farmers buys the cock. This corresponded with the households' response in table 4.30 which indicated that 53% exchange cock with neighbors, 27% use cocks from own poultry and 16% buy the cocks.

4.2.2 Multivariate Analysis

This section presents multivariate analysis of data in order to determine independent variables that were significant or not significant and which influenced or did not influence indigenous local poultry production in Kathiani district using Wald test through logic regression analysis.

Table 4.57 Results of Multivariate Analysis

Variables	Std error	Wald	Significant	Significant
Gender Male Female	0.719	0.898	0.343	*
Age less than 45 years Above 45 years	1.222	0.617	0.432	*
Education level At least primary Secondary and above	0.543	0.490	0.484	*
Source of family labour Own Hired Both	0.561	0.05	0.945	*
Income Ksh 0-5000 Ksh 5001-10000 Ksh above 10000	1.443	0.013	0.910	*
Source of capital Own Borrowed Both	1.848	0.565	0.452	*
Farm size below 1 acre 1-below 2 acres 2- below 3 acres 3 –below 4 acres 4- below 5 acres 5 acres and above	1.753	37.017	0.000	**
Land tenure Own Family	1.610	0.032	3.322	*
Training on indigenous poultry Trained Not trained	0.779	2.316	0.128	**

NCD	ITK				
	Vaccinate	1.322	2.396	0.377	**
	None				
Poultry house	Yes	1.440	0.435	0.509	*
	No				
Diarrhoea	ITK				**
	Call vet	1.484	2.756	0.377	
	Buy antibiotics				
Cock management					
	Buy				**
	From own poultry	1.116	1.238	0.287	
	Exchange with neighbor				
	All				

* Variable not significantly influencing indigenous local poultry production at 95% confidence level.

** Variable significantly influencing indigenous local poultry production at 95% confidence level.

An independent variable with a level of Wald of 2 and above was significant and hence influenced indigenous local poultry production in Kathiani district. An independent variable with a Wald level of between one and two were not significant but were likely to influence indigenous local poultry production in the district while an independent variable with a Wald level of less than one was not significant and not likely to influence indigenous local poultry production in the district.

Thus trainings, poultry diseases (NCD, diarrhoea) and cock management were found to be significant and therefore influenced indigenous local poultry production in the said district.

Although income was not found not to be significant from the analysis, farmers with higher monthly income were more likely to invest in capital intensive activities like the construction of poultry units and purchase of good poultry breeds / buying concentrates. At the same time,

although education levels was found not to be significant from the analysis, farmers trained on indigenous poultry practices were more likely to carry out good indigenous poultry management practices more professionally than those farmers who were not educated hence influencing indigenous local poultry production in the said district.

4.2.3 Summary of chapter

The analysis from the study shows that indigenous local poultry production in Kathiani district was being influenced by demographic factors, social economic factors and technological factors albeit differently. Thus trainings, poultry diseases (NCD, diarrhoea) and cock management significantly influenced indigenous local poultry production in the said district. Source of capital, gender, land tenure, education level, poultry housing, source of labour on the farm and average monthly income of the house hold head were not significantly influencing indigenous local poultry production in Kathiani district.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary, conclusion and recommendations of the study findings. It summarizes the results which were obtained from the analysis of the questionnaires. The aim of the study was to analyze the factors influencing indigenous poultry production in Kathiani district.

5.2 Summary of Findings

Table 5.1 below presents the findings of the study based on the specific objectives of the study and type of analysis.

Table 5.1 Summary of findings

Objective	Type of analysis	Main findings
To establish demographic factors influencing indigenous poultry production in Kathiani district	Descriptive Logistic regression	Gender, age and educational level of the household head did not significantly influenced indigenous poultry production in the district.
To establish the extent to which social economic factors influenced indigenous poultry production in the district	Descriptive Logistic regression	Land tenure ,farm size and average monthly income of the house hold head, source of capital and source of farm labour had no significant influence on indigenous poultry production in the district.

To establish the extent to which technological factors influenced indigenous poultry production in the district.	Descriptive Logistic regression	Trainings on indigenous poultry management practices, disease management (NCD and diarrhea control) and cock management significantly influenced indigenous poultry production in the district. The findings showed that 41% had not been trained on indigenous local poultry management, 52% cited diseases as the major challenge while as 31% did not know anything about cock management.
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5.3 Discussions of Findings

From the study, technological factors , demographic factors as well as social economic factors influenced indigenous poultry production in Kathiani district albeit differently.

Trainings on indigenous poultry management practices, disease management (NCD and diarrhea control) significantly influenced indigenous poultry production in the district. This was proved true in the study where a 52% of the household respondents said that diseases was a challenge in indigenous local poultry production. This was also proved true from the literature review where the direct effect of indigenous poultry diseases on productivity are significant and include reduced feed intake, increased deaths, decreased rates of reproduction and weight gain among others. Parasites, both internal and external also affect indigenous poultry productivity in the similar manner according to Kelly et al (1994)

Average households land size was 1.9, which from the study is enough for farming and doing indigenous poultry production. This however significantly influenced indigenous poultry production positively according to the study.

Breeding of poultry kept and cock management affect indigenous poultry production to a great extent. This proved true from the study where cock management and training significantly influenced indigenous poultry production positively. It was also proved in the literature review where increased production can be achieved through synchronizing indigenous poultry so that they brood the eggs at the same time leading to so many chicks hatched at the same time then put in a brooder for rearing together KARI(2006). Though there are so many ways of improving breeding of indigenous poultry most farmers seems not to take them up and this could be due to inadequate technical knowledge MOLD (2009)

Source of capital, source of labour on the farm and average monthly income of the house hold head were not significantly influencing indigenous poultry production in Kathiani district.

Although a percentage of farmers,41 %, were not trained on indigenous poultry husbandry practices, 100% of those trained practiced what they learnt, an indication that if more are trained, they could also follow the trend and contribute to increased indigenous poultry production.

5.4 Conclusions

Indigenous poultry production in Kathiani district was being influenced though differently by technological factors, social economic factors and demographic factors.

According to the Wald test gender, age and educational level of the household head did not significantly influence indigenous poultry production in the district though it did to a small extent. Farm size significantly influenced indigenous poultry production in the district since the indigenous poultry are scavengers while average monthly income of the house hold head, source of capital and source of farm labour had no influence on indigenous poultry production in the district.

Government policies and drought did not influence indigenous poultry production at all. However, cock management which plays a big part in breeds and breeding in the household, diseases (NCD and diarrhea control) significantly influenced indigenous poultry production in the district.

5.5 Recommendations

This section is going to give recommendations to policy makers, private practitioners and to projects / programmes on steps to take to deal with those challenges that are affecting the indigenous poultry production.

5.5.1 Recommendations to policy makers

Policy makers should formulate a livestock policy especially one aimed at addressing livestock breeding and livestock diseases control to cushion livestock farmer from expensive private practitioners who exploit farmers. The policy makers should also address the issue of staff shortage through employment of more livestock extension workers as the study shows that majority of the households, 59%, do not know where to get assistance in case of a problem with their animals which can be attributed to staff shortage .

5.5.2 Recommendations to private practitioners

1. The private veterinarian should be more aggressive and charge realistic fee for the service to attract more farmers. This recommendation was because majority, 77% of the respondents said that they do not seek the help of the veterinarian because they are expensive.
2. More players in the field of feeds, drugs and concentrates should be encouraged to invest in the sector to make these commodities easily available to the livestock farmers.

5.5.3 Recommendations to projects / programmes

1. The programmes /projects should target more women who, from the study, carry out most of the livestock based practices and majority, 57% of them own indigenous poultry compared to men.
2. The programmes / projects should explore possibilities of training the farmers on breeding, diseases (NCD and diarrhea) to help improve the coverage area of the service. This is because the findings from the study showed that 43% do not know about breeding, 52%

cited disease as the major challenge and 41% of the respondents had not been trained on indigenous poultry management.

5.5.4 Recommendation for further research

1. Further research to establish relationship between average monthly income of households and type of housing should be conducted. The findings showed that majority, 76% of the respondents earned below ksh 5,000
2. Further research to establish the reasons why more females owned indigenous poultry than males as found out from the study should be conducted.

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APPENDICES

APPENDIX 1: TRANSMITTAL LETTER

**Nduthu Petronilla Wanjugu
P.O. BOX 2623-90100
MACHAKOS
12TH April 2013**

To

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

RE: Letter of Transmittal of data collection

I wish to inform you that I am undertaking research for my Masters of Art degree in Project Planning and Management of the University Of Nairobi.

The study deals with factors influencing indigenous poultry production in Kathiani district.

Your assistance on data collection will be appreciated as the study will assist beneficiaries. Attached please find questionnaires that requires you to provide information by answering the questions.

Please fill questionnaire urgently once you receive it.

Thank you and God bless you.

**Nduthu Petronilla Wanjugu
Contact 0721252423/0733816757**

APPENDIX 2: QUESTIONNAIRE FOR HOUSEHOLDS HEADS

Introduction

My name is Nduthu Petronilla Wanjugu, a student at the University of Nairobi. I am requesting for your assistance by providing the information required for my research work. The information you give will be handled in confidence, and will be used for the purpose of this research only. Please provide the information.

God bless you.

Section A: General information

The household Head

1) Gender of the respondent ? Female []

 Male []

2) Are you the household head?

 Yes []

 No []

3) If not, what is your relationship with the household head?

.....

4) What is your highest level of education?

 Primary school and below []

 Secondary school and above []

5) What is your age bracket?

 Below 45 years []

 Above 45 years []

6) Average monthly income

 Below kshs5000 []

kshs 5001- kshs10000 []
kshs 10001 and above []

7) Composition of household members by age, indicate how many in each category.

18 years and below..... []
19 -30 years []
31 – 40 years []
41 -50 years []
51 years and above..... []

8) Housing ; Type of house used by the household members

Permanent []
Semi- permanent.... []
Mud walled.... []
Others []

9) Land size and tenure

Land farm size

Below 1 acre []
1- 2acres []
2- 3 acres []
4 acres []
Below 5 acres []
Above 5 acres []

10) Ownership status of the land

Own []
Leased []
Family land []
Communal []
Others [] specify.....

11) Number of indigenous poultry in the homestead

One to five []

Six and above []

Section B: Social Economic issues

12) What is the main source of labour required on the farm?

Family []

Hired []

Others (Specify).....

13) Is the capital used on the farm

Own? []

Borrowed? []

14) Who determines use of family labour?

Man []

Wife []

Both []

15) Who owns the indigenous poultry in the farm?

Man []

Wife []

Both []

16) Who takes care of the indigenous poultry?

Man []

Wife []

Children []

Any []

17) Who determines the slaughter of indigenous poultry and selling of the indigenous poultry?

Man []

Wife []

Both []

Section C: Technological factors

Feeds and feeding

18) What are the main types of feeds used on the farm?

Concentrates []

Home made ration []

Home left overs []

Others [] specify.....

19) What type of system do you rear your poultry?

Free range []

Semi- Confined []

Fully confined []

20) Have you received any training on poultry production?

Yes []

No []

21) If yes to (20) above, have you been practicing what you learned?

Yes []

No. []

22) What have been your challenges?
.....

23) If no (20) have you been interested?

Yes []

No []

24) If yes (23) above (interested) do you know where to get assistance?

Yes []

No []

Chicken feed (Concentrates)

25) Do you use concentrates?

Yes []

No []

26) If yes what type?

27) What type of animal do you feed concentrates?

Big indigenous poultry []

Growers []

Chicks []

All []

28) Are they easily available?

Yes []

No []

Breeds and breeding

30) If Where do you get the cock used for breeding?

Buy []

From your indigenous poultry []

Exchange with neighbour []

All []

31) Have you heard of inbreeding in poultry?

Yes []

No []

32) If yes do you know its effect to production?

Yes []

No []

33) Have you heard of a hay box brooder?

Yes []

No []

34) have you heard of synchronized brooding of hens?

Yes []

No []

Diseases and parasites

35) What do you do when your indigenous poultry get sick?

Treat the animal myself []

Consult a trained animal health personnel []

Use indigenous technical knowledge (ITK)

Consult a fellow farmer

36) If you use a trained vet officer, is she/he available?

Yes []

No []

37) If you do not use a trained vet officer, why?

Not available []

Expensive []

Other reasons.....

38) How do you control Newcastle Disease in your farm?

Vaccinate []

Use indigenous technical knowledge (ITK) []

None []

39) If you control Newcastle Disease, how often?

Yearly []

Every six Months []

Any time []

40) How do you control diarrhoea in your indigenous poultry?

Use indigenous technical knowledge (ITK) []

Buy antibiotics []

Call a qualified animal health personnel []

None []

41) How do you control external parasites?

Dusting

Dipping

Others

Specify

42) Do you deworm your indigenous poultry?

Yes []

No []

Housing

43) Do you have a poultry house

Yes []

No []

44) If yes(43) above which time of the day do you use it

Day

Night

Specify why

45) If no where do you house them?

Specify

We have now come to the end of our interview. I take this opportunity to thank you very much for your cooperation.

Nduthu Petronilla Wanjugu

APPENDIX 3: QUESTIONNAIRE FOR EXTENSION WORKERS

Introduction

This study seeks to analyze the factors influencing indigenous poultry production in Kathiani district and being in this field for some time and being conversant with the area, your answers will assist very much in the analysis of the information related to the research. The information you give will be handled in confidence, and will be used for the purpose of this research only.

Please answer the following.

- 1) How long have you been in extension services in this area?

- 2) What is your field of specialization?

- 3) Do livestock farmers in your area face challenges in productivity?
Yes []
No []

- 4) If yes, list 3 most critical challenges
.....
.....
.....

- 5) Are there gender limitations by the farmers in livestock production?
Yes []
No []

- 6) If yes what are the limitations for
Female.....
Male

- 7) The government policy nowadays on extension is demand driven as opposed to supply driven; do farmers demand for livestock production services?

Yes []

No []

If no, give the 2 main reasons.

.....

.....

8) Are there government policies that may be discouraging farmers from being actively involved in indigenous poultry production in your area?

Yes []

No []

9) Are there farmers keeping indigenous poultry in your area?

Yes []

No []

10). Do farmers in your area experience poultry feed shortage?

Yes []

No []

11). How often do you visit your livestock farmers?

Weekly []

Monthly []

When demanded []

Never []

12). When were you last trained on livestock husbandry issues?

1 year [] 2 years [] 3 years [] over 3 years [] None []

13) Do farmers in your area encounter indigenous poultry diseases and parasites problems?

Yes []

No []

14) If yes, how do they address the problem of disease?

Treat []

Seek veterinarian assistance []

ITK []

15) Where do indigenous poultry farmers get cock in poultry breeding?

Buy []

From own poultry []

Exchange with neighbour []

We have now come to the end of our interview. I take this opportunity to thank you very much for your cooperation.

Nduthu Petronilla Wanjugu