THE ROLE OF CO-OPERATIVE ON FARMERS’ ADOPTION OF POULTRY FARMING INNOVATIONS IN KWALE, KENYA: AN APPLICATION OF ROGER’S DIFFUSION OF INNOVATION

BY

JOHNSON KITHENDU

UNITED STATES INTERATIONAL UNIVERSITY - AFRICA

SUMMER 2017
THE ROLE OF CO-OPERATIVE ON FARMERS’ ADOPTION OF POULTRY FARMING INNOVATIONS IN KWALE, KENYA: AN APPLICATION OF ROGER’S DIFFUSION OF INNOVATION

BY

JOHNSON KITHENDU

A Project Report Submitted to the Chandaria School of Business in Partial Fulfillment of the Requirement for the Degree of Global Executive of Masters in Business Administration (GeMBA)

UNITED STATES INTERNATIONAL UNIVERSITY - AFRICA

SUMMER 2017
STUDENT DECLARATION

I, the undersigned, declare this my original work and has not been submitted to any other college, institution or university other than the United States International University of Africa in Nairobi for academic credit.

Signed: ___________________________  Date: ___________________________

Johnson Kithendu  (ID No:652065)

This project report has been presented for examination with my approval as the appointed supervisor.

Signed: ___________________________  Date: ___________________________

Dr. Peter Kiriri

Signed: ___________________________  Date: ___________________________

Dean, Chandaria School of Business
The main objective of this study was to investigate the role of co-operative on farmers’ adoption of poultry farming innovations in Kwale, Kenya using Roger’s diffusion of innovation model. The specific objectives were as follows: To establish how cooperatives influence the farmers’ adoption of poultry farming innovations, to establish how the economic factors influence the farmers’ adoption of poultry farming innovations, to examine how the social factors influence the farmers’ adoption of poultry farming innovations and to identify how the political factors influence the farmers’ adoption of poultry farming innovations.

The research design used was descriptive in nature. The target population in this study was 3,200 indigenous poultry farmers and the sample was 346 farmers who were randomly sampled. The data collection technique that was employed for the research included the use of a survey method in the form of questionnaires and focussed group interviews. A few questionnaires were administered to five respondents with the aim of achieving objectivity and clarity of the questionnaires. Descriptive analysis such as frequency distribution was used to measure the respondents’ demographic information and the means measured the weights of the independent variables (such as cooperative, economic, social and political factors). Inferential statistics was used on the relationship between the dependent (such as adoption of Poultry farming innovation) and the independent variables (such as cooperative, economic, social and political factors).

The findings revealed that co-operatives are able to engage members in different ways to explore and design improved methods of poultry farming. Cooperative societies provide the inputs, expertise, and services needed for poultry production and the markets for the produce. On the social factors, the findings established that low education levels also limit the farmers’ capacity to access and use existing information and knowledge about agriculture. Social networks encourage the development of innovation and creative ideas for new products. On the economic factors, the findings revealed that a good income is a source of diffusion and adoption of new innovation. The lack of sufficient income is a limiting factor among poultry farmers to adopt new innovation. The farmers also lacked adequate capital for expansion and adoption of new farming techniques. On the political factors, the findings revealed that the government policies made it difficult to compete
with foreign eggs and chickens. High taxes make it difficult for conducting poultry business.

The study concludes that co-operatives are able to engage members in different ways to explore and design improved methods of poultry farming. Low education levels can limit the farmers’ capacity to access and use existing information and knowledge about agriculture. A good income is a source of diffusion and adoption of new innovation. Government policies make it difficult to compete with foreigners hence hindering innovation in poultry farming.

The study recommends that cooperative societies should contribute significantly to poultry farming development while building social capital. Poultry farmers should have the knowledge and technology to adopt new poultry farming practices. There should be a good income as a source of diffusion and adoption of new innovation. Sustainable income is an attractive proposition for formal financial institutions. The government needs to build institutional capacity to provide a functioning enabling environment for poultry farming innovation.
ACKNOWLEDGEMENT

This project has come a long way towards its completion. There are numbers of people that I would be thankful to. First, the vote of thanks praises the Almighty God for the good health and positive spirit towards the accomplishment of my project. Without the help of the Almighty God the project wouldn’t have been completed. Second, I acknowledge different writers for providing insight into the research topic, without you I wouldn’t have gained much knowledge in doing the research. Also, I acknowledge Dr. Peter Kiriri for imparting research knowledge on me, I think you are God sent, you have also been very patient with me as I struggled to understand the course and knowledge gained gives me an edge in project writing. May God Bless you all who have contributed in one way or another in making this project become a reality.
DEDICATION

This project is dedicated to my loving wife, Grace Kithendu and children who have been patient, supportive and caring throughout my studies.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>STUDENT DECLARATION</td>
<td>ii</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>iii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>v</td>
</tr>
<tr>
<td>DEDICATION</td>
<td>vi</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>ix</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>x</td>
</tr>
</tbody>
</table>

## CHAPTER ONE ................................................................. 1

1.0 INTRODUCTION.............................................................. 1

1.1 Background of the Study .................................................. 1
1.2 Statement of the Problem .................................................. 5
1.3 General Objective ................................................................ 6
1.4 Specific Objectives ................................................................ 6
1.5 Justification of the Study .................................................. 7
1.6 Scope of the Study ................................................................ 8
1.7 Definition of Terms ........................................................... 8
1.8 Chapter Summary .................................................................... 9

## CHAPTER TWO ................................................................. 10

2.0 LITERATURE REVIEW ............................................................ 10

2.1 Introduction ........................................................................ 10
2.2 Co-operative Influence on Farmer’s Adoption of Innovation ............ 10
2.3 Influence of Social Factors on Farmer’s Adoption of Innovation ......... 15
2.4 Influence of Economic Factors on Farmer’s Adoption of Innovation ....... 22
2.5 Influence of Political Factors on Farmer’s Adoption of Innovation ....... 27
2.6 Chapter Summary .................................................................... 32

## CHAPTER THREE ................................................................. 33

3.0 RESEARCH METHODOLOGY ...................................................... 33

3.1 Introduction ........................................................................ 33
3.3 Population and Sampling Design ............................................. 34
3.4 Data Collection Method ..................................................................................35
3.5 Research Procedures ......................................................................................36
3.6 Data Analysis ..................................................................................................36
3.7 Chapter Summary ...........................................................................................37

CHAPTER FOUR ..........................................................................................................38
4.0 RESULTS AND FINDINGS ..................................................................................38
4.1 Introduction .......................................................................................................38
4.2 General Information .........................................................................................38
4.3 Co-operative Influence on Farmer’s Adoption of Innovation .......................44
4.4 Influence of Social Factors on Farmer’s Adoption of Innovation ................46
4.5 Influence of Economic Factors on Farmer’s Adoption of Innovation ..........48
4.6 Influence of Political Factors on Farmer’s Adoption of Innovation ............50
4.7 Chapter Summary ...........................................................................................52

CHAPTER FIVE .............................................................................................................53
5.0 DISCUSSION, CONCLUSION AND RECOMMENDATIONS .........................53
5.1 Introduction .......................................................................................................53
5.2 Summary ..........................................................................................................53
5.3 Discussion .........................................................................................................55
5.4 Conclusion ........................................................................................................63
5.5 Recommendations ............................................................................................65

REFERENCES .............................................................................................................67

APPENDICES ..............................................................................................................71
APPENDIX A: INTRODUCTORY LETTER ...............................................................71
APPENDIX B: QUESTIONNAIRE ..............................................................................72
APPENDIX C: INTERVIEW QUESTIONS .................................................................77
LIST OF TABLES

Table 3.1: Sample Size Distribution ................................................................. 35
Table 4.1: Response Rate .................................................................................. 38
Table 4.2: Co-operative Influence on Farmer’s Adoption of Innovation ............ 45
Table 4.3: Correlation between Innovation and Cooperatives ......................... 46
Table 4.4: Influence of Social Factors on Farmer’s Adoption of Innovation ........ 47
Table 4.5: Correlation between Innovation and Social Factors ......................... 48
Table 4.6: Influence of Economic Factors on Farmer’s Adoption of Innovation .... 49
Table 4.7: Correlation between Innovation and Economic Factors .................... 50
Table 4.8: Influence of Political Factors on Farmer’s Adoption of Innovation ....... 51
Table 4.9: Correlation between Innovation and Political Factors ....................... 52
LIST OF FIGURES

Figure 4.1: Gender of Participants ................................................................................. 39
Figure 4.2: Respondent’s Age ....................................................................................... 39
Figure 4.3: Respondent Level of Education .................................................................... 40
Figure 4.4: Participant Main Source of Income ............................................................... 41
Figure 4.5: Participant Marital Status ............................................................................. 41
Figure 4.6: Duration in Poultry Business in Years ............................................................ 42
Figure 4.7: Land Owned in Acres .................................................................................. 42
Figure 4.8: Market Segment for Poultry Products ........................................................... 43
Figure 4.9: Availability of Children ................................................................................ 44
CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

Innovation and adoption of technological inventions is inevitable among poultry farmers. Inventions and innovations, for many centuries, have been the focus of a few people in the areas of science and technology to improve and enhance the livelihood of people all over the world (Daberkow and McBride, 2013). Many inventors have faced tremendous challenges in convincing people of the advantages of adopting and using their inventions (Adeogun, Olawoye and Akinbile, 2010). Unfortunately, many people believed that these inventions are against religious, cultural or traditional practices. On the other hand, other people who have accepted these inventions and innovations have applied them in their real life situations and as a result spread to other nations who have benefited from innovations (Bryman and Cramer, 2009).

The Diffusion of Innovations (DOI) approach, was developed and updated by Rogers (2003), for the purpose of helping Extension Agents (EA) in their duties, especially in convincing farmers with the new techniques and practices and allowing them to adopt them. The DOI is considered the most accepted approach, which answer the questions on how the new techniques will be explained, anticipated and judged. This was widely known and gave the definition of the diffusion process (Assefa, 2015). Based on this definition, diffusion is defined as the process, in which new techniques are transferred to people through certain channels in a specific time among community people (Rogers, 2003). This include all the main factors including time, social factors as well as the innovation itself, which affect the speed and rate of adoption based on the cost, clearance of its objectives, adaptability, acceptability, relevance and the farming methods used (Bryman and Cramer, 2009). Hence, the current study aims to examine Roger’s diffusion of innovation by specifically looking at the role of co-operatives, social, economic and political factors on the adoption of poultry farming innovations in Kwale County.

The problems faced by farmers when applying new techniques of farming and improve their productivity of poultry farming can range from the lack of poultry feeds, low amount of rain, a lack of training to apply techniques of poultry production can also be considered as a major problem. There is also the high cost of applying the farming
Arnold and Lori (1989) also justifies that farmers are sometimes poor because they have not been able to innovate agricultural technologies fast enough to keep pace with change in the new knowledge of agricultural development. The farmers should be adequately informed in this connection and trained in new innovation and be provided with the modern equipments and tools to enhance adoption and as a result, increase production and productivity (Patterson, Mugera and Burton, 2015). According to Adams (1982), adoption of new technologies was found to be dependent on the interaction of a number of factors. The organized delivery of inputs and outputs, provision of technical advices, stable price and credit for participating farmers are all important determinants of poultry farmers’ adoption of innovation.

Poultry farmers rear various poultry breeds both as supplemental food sources and for income generation. Farmers sell directly to consumers or to poultry traders who sell to consumers on the open market. In the commercial component, entrepreneurs invest in poultry production, which is mainly based on exotic chicken breeds as a business venture (Kwesisi, Oloko and Ommeh, 2015). Products include eggs, live birds, and dressed chicken. The market consists of the traditional open markets, small retail shops, and big supermarkets. Commercial production is supported by veterinary service providers, producers of poultry feeds, transporters, and other support service providers (Odoemenem and Obinne, 2010).

In the poultry industry, there have been some production-level innovations. For instance, through technological hardware innovations are the advances in machinery and industrial plants for making products. In the classical concept of innovation, these are the expected and obvious innovations (Novkovic, 2008). For example, Asare Farms in Ghana are experimenting with the use of Moringa additives in poultry feed to reduce mortality. Improved feed used quality protein maize variety from the Crops Research Institute, which has been widely extended to farmers. The Moringa additive is touted as having several health benefits, and Asare Farms Company used it on its 20,000-bird farm. Darko Farms Company controlled Gumboro disease on its farms using a concoction prepared from the bark of mango trees mixed with prekese, a tropical fruit. There were also innovations in farm management in how flocks were housed.
Process innovations also signify the extent to which technology users have mastered the technological hardware. The processing component of the value chain shows a variety of entrepreneur developed product innovations (Reij and Waters-Bayer, 2011). There were processed local foods such as cassava flour, maize flour, meat products with local spices, soybean, Moringa-based health products, protein-enriched poultry feed, and herbal products for the Gum-boro poultry disease, among others. The variety of product innovations in the three commodity subsectors illustrates the diversity of opportunities for product innovation among poultry farmers (Marenya and Barrett, 2007).

There are also marketing innovations. Several companies have innovated their marketing strategies through radio and television advertisements, which also expanded in recent years; participation in trade fairs and exhibitions locally and abroad; and durable and attractive packaging and labeling. Some packaging techniques were innovated to suit particular markets (Manrique, Marcén, Maza and Olaizola, 2012). Besides marketing, there are also organizational innovations where cooperative societies and livestock related ministries fight against poultry diseases (Kolade and Harpham, 2014). There can also be another form of innovation through finance where expenditure are incurred in developing a new food product, adapting a particular machine to perform a specific task, or improving a given process in the enterprise used resources meant for the general operations of the enterprise (Kolade and Harpham, 2014). As a reaction, businesses make sure that the money is plowed back in the poultry business operations.

In terms of innovation, Kenya still lags behind other countries in the poultry sector. The Unites States is the largest producer of poultry meat with 18.2 million metric tons. Brazil overtook China as the world’s second largest poultry producer with 12.9 million metric tons. This was followed by the European Union with 11.2 million metric tons, China produced 12.3 million metric tons, India produced 4.2 million metric tons, Russia produced 3.7 million metric tons, Mexico produced 3.3 million metric tons, Argentina produced 2 million metric tons, Turkey produced 1.9 million metric tons, Thailand produced 1.8 million metric tons and Indonesia 1.6 million metric tons (CCAgr, 2017). In Africa, South Africa was the highest producer of poultry meat at 0.56 million metric tons. The other African countries that lead in poultry production were Algeria, Egypt, Morocco and Nigeria with very little statistical information on the industry from other African countries, with few exceptions. Poultry production systems in the Middle East and some
African countries are quite diverse, ranging from rural very small-scale, extensive poultry production to highly intensive caged systems. Recently there has been a general trend towards more vertical integration and the establishment of large scale production multinationals companies (CC Agr, 2017).

In Kenya, the diffusion of innovation among poultry farmers is not well managed and sustainable to reach the critical mass of farmers. The poultry production in Kenya is dualistic in nature; the commercial hybrid and indigenous poultry production systems. The commercial poultry production system comprises 23.8 percent (approximately 5,082,700 birds) of the total poultry population. The system, which is further divided into layer and broiler subsystems, relies heavily on the imported exotic parent and grandparent stock and is exclusively market oriented. In Kenya, the indigenous poultry production system is the leading poultry production system. It is largely concentrated in rural areas and comprises 75 percent (approximately 22,114,300 birds) of rural households. Approximately 71 percent of eggs and poultry meat in Kenya are derived from indigenous poultry (Kwesisi, Oloko and Ommeh, 2015). The indigenous poultry system is characterized by free-range system in which the birds scavenge around the homestead and in the process intermingle with wild bird species (Royer, 2014). Indigenous poultry sector plays an important role in Kenya’s food security and economic development of the country; thus the significance of smallholder farmers’ adoption of innovations to enhance productivity especially in Kwale County.

Kwale County is a county in the former Coast Province of Kenya. Its capital is Kwale, although Ukunda is the largest town. The county has a population of 649,931. Kwale is mainly an inland county, but it has coastline south of Mombasa. Diani Beach is part of the Msambweni division. Shimba Hills National Reserve and Mwaluganjie elephant sanctuary are other attractions in the county. The county has four constituencies: Msambweni Constituency, Matuga Constituency, Kinango Constituency and LungaLunga Constituency. The study area is a semi-arid area where crop farming is unsustainable due to unreliable and insufficient rainfall leading to recurrent crop failure. Therefore chicken provide an alternative land use option since they are more resilient to climate variability.

In Kwale County, there are many factors affecting the poultry production in these countries such as: disease, housing and feeding. One of the constraints for increasing
poultry production is poor health with Newcastle disease killing up to 80% of household poultry. Another important disease, especially for small scale intensive broiler flocks, is Gumboroor Infectious Bursal Disease (IBD). This can kill up to half the chickens in a susceptible flock. Another constraint to increasing poultry production in rural areas are losses due to predators and insufficient feeding (Reij, 2015). A large proportion of village poultry are lost due to nocturnal predators. In some cases, simple night shelters are constructed from locally available materials where little attention is given to the possibility of providing overnight shelter to family poultry due to the high cost of local building materials. Feeding is another issue where poultry survive by scavenging and with no feed supplements provided (Valentinov, 2014). However, sometimes, household waste is fed to the birds and under other circumstances the diet is supplemented with limiting poultry production and increasing mortality which creates a need to pursue the study.

1.2 Statement of the Problem
There is consensus among poultry farming experts that one of the principal barriers to promote growth in the industry is the lack of innovation and adoption knowledge that can improve the performance of the sector. There have been a number of studies that have been conducted in the sector. For instance, Njenga (2015) carried out a study on the productivity and social-cultural aspects of local poultry farmer in Nyeri. The findings indicated that the farmers experienced shortage of funds, incurred high input cost and lacked the assistance from veterinary officers on how they can boost their production. The current study aims to establish whether the same is evident in Kwale County.

Elsewhere, Munyaka (2010) conducted a study among small poultry farmers in Karuri, Kenya who were 154 in small scale poultry farming enterprises. The findings showed that marketing was ranked as one of the challenges facing farmers in the area. The major factor affecting marketing was the low buying prices being offered by traders in the local markets. The innovations identified for growth were crossbreeding with exotic breeds and upgrading the local chickens by using selected indigenous types. In this case, the current study also aims to evaluate and modify the innovative solution provided by determining its applicability for improving poultry production also in Kwale County.
Mwobobia, Amwata and Kanui (2016) also conducted a study by comparing production characteristics of poultry farmers in Katulani District in Kitui County. The finding established that diseases were the major cause of chicken deaths and discourages farmers from keeping large flocks for fear of losing them during disease incidences. Also, the unavailability of chicken rearing technologies prevented farmers from overcoming traditional chicken farming behaviours thereby unable to increase income and reduce poverty. Unavailability of superior chicken breeds was also reported. The study indicated that innovation on the chicken breeds was important in boosting chicken production and improved egg yield. From various studies it is evident that there is little research done on effect of the smallholder producer co-operatives on farmers’ adoption of innovation. In this regard, this study focuses on the role of co-operative, besides other socio-economic factors, in influencing the rural smallholder farmers’ adoption of poultry production innovations in Kwale County.

1.3 General Objective
The general objective of this study was to investigate the role of co-operative on farmers’ adoption of poultry farming innovations in Kwale, Kenya using Roger’s diffusion of innovation model.

1.4 Specific Objectives
The specific objectives were as follows:
1.4.1 To establish how cooperatives influence the farmers’ adoption of poultry farming innovations.
1.4.2 To establish how the economic factors influence the farmers’ adoption of poultry farming innovations.
1.4.3 To examine how the social factors influence the farmers’ adoption of poultry farming innovations.
1.4.4 To identify how the political factors influence the farmers’ adoption of poultry farming innovations.
1.5 Justification of the Study
The benefits that accrue from this study are numerous and can affect the following:

1.5.1 Poultry Farmers
The study can benefit poultry farmers in understanding the relationship between the enterprise growth on one hand and training, finance, entrepreneurial culture, economic factors and market on the other hand in the missing middle would contribute to a better understanding of the barriers to sound growth of poultry enterprises. The results of this study highlighted the strategies that can be used by poultry enterprises to overcome training, financial, entrepreneurial cultural and market access which hinder successful growth of the poultry enterprises. Current and potential poultry farmers would gain from the study by getting an insight of the complexes of the business, identifying the growth gaps and looking for the strategies to address them. Knowing their weaknesses would help them address and well diagnose.

1.5.2 Government
The government can find the results useful for economic planners who may require knowledge and adaptive strategies of successful poultry enterprises which can be used to identify needs for training, financing, entrepreneurial culture and market necessary for growth of poultry enterprises. This would help in crafting economic policies and strategies aimed at fighting poverty and unemployment through development of entrepreneurship especially through the ministry of finance, economic development and Youth Development.

1.5.3 Financial Institutions
This study can help financial institutions interested in targeting poultry farmers’ men, women and youth and their enterprises particularly microfinance institution (MFIs). They would be interested in gaining new knowledge of how to integrate all the necessary parameters required for sustained growth of poultry farming enterprises rather than taking that provision of credit alone would guarantee success. Many could have been wondering why poultry farming fail to grow even after provision of credit.
1.5.4 Researchers and Academicians
This study can act a source of reference and information to other researchers, practitioners, consultants and business students who might use the study to borrow ideas on innovation in poultry farming enterprises would find it very useful as a source of knowledge and a base for further research.

1.6 Scope of the Study
The study was limited to poultry farmers in Kyalele, Katwala and Kanduti locations of Kwale East and Kwale Rural Sub-Counties in Kwale County; where the indigenous poultry farmers have established ‘Nguku’ (Poultry) Producers and Marketing Cooperative Society. The target population in this study was 3,200 indigenous poultry farmers. The survey was conducted for a period of three weeks beginning 27th March 2017 to mid June 2017. Due to the language barrier, it was difficult to carry out data from the respondents. This challenge was overcome by having a language translator.

1.7 Definition of Terms
1.7.1 Adoption
Adoption refers to the acceptance and continued used of a product, idea or service in this case of poultry farming (Baraghani, 2007).

1.7.2 Innovation
Innovation is “an idea, practice, or project that is perceived as new by an individual or other unit of adoption” (Rogers, 2003, p. 12). Further, Cardoso de Sousa, (2012) argues that innovation involves changing processes or creating more effective processes or ideas. Innovation may be adopted or rejected. Adoption is a decision of “full use of an innovation as the best course of action available” and rejection is a decision “not to adopt an innovation” (Rogers, 2003, p. 177).

1.7.3 Poultry
The term poultry applies to a wide variety of bird species like chicken (domestic fowl), duck, turkey, geese, pigeon, guinea fowl, pheasants, quail and other game birds. In other words, poultry is very often used as synonymous to chicken as they are more commonly found in our country and are of great importance for meat and egg. Chicken, and up to
certain extent, ducks are kept for commercial production of both eggs and meat. Turkey, guinea fowl, geese and others are maintained for meat (Biggs and Matsaert, 2014).

1.8 Chapter Summary
Chapter one presents the background of poultry industry across the world, regionally and nationally in relation to Rogers’ diffusion and innovation approach with respect to Kwale County. The chapter also describes the statement of the problem in the context of Kwale County and outlines the specific objectives of this research, the significance of the study, importance and the scope of the study as well as the working definitions of specific terms used in the project.

The chapter two provides the literature review based on the following specific objectives to establish how cooperatives influence the farmers’ adoption of poultry farming innovations, to establish how the economic factors influence the farmers’ adoption of poultry farming innovations, to examine how the social factors influence the farmers’ adoption of poultry farming innovations and to identify how the political factors influence the farmers’ adoption of poultry farming innovations.

The chapter three highlights the research methodology and procedures the researcher adopted in conducting the study in order to answer the specific objectives raised in the first chapter. Chapter four presents the results and findings while the last chapter, Chapter five, provides a discussion, conclusion and recommendations on the findings of the study.
CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This purpose of this chapter is to examine literature by other academicians on Roger’s diffusion of innovation and the factors that influence the farmers’ adoption of poultry farming innovations. This chapter is structured according to the specific: To establish how cooperatives influence the farmers’ adoption of poultry farming innovations, to establish how the economic factors influence the farmers’ adoption of poultry farming innovations, to examine how the social factors influence the farmers’ adoption of poultry farming innovations and to identify how the political factors influence the farmers’ adoption of poultry farming innovations. The chapter ends with a summary.

2.2 Co-operative Influence on Farmer’s Adoption of Innovation

2.2.1 Awareness

The co-operatives are able to engage different ways for the diffusion of innovations. These include: technical and commercial information provided by means of periodic fliers and posters and messaging distributed among members; talks, meetings, field demonstrations, and educational courses are also arranged for members to learn new production techniques, and co-operatives often appoint some members in their ranks to specialist teams whose responsibility is to explore and design improved methods and subsequently provide feedback and relevant advice for members (Manrique, et al. 2002). The type of technologies for indigenous poultry farmers include, improved breeds, vaccinations and poultry housing. These agricultural innovations are well applicable in their design and applications to groups of farmers than individual households, and this is where the role of co-operatives is even more significant. For they can contribute significantly to agricultural development (Royer, 2014) whilst building social capital (Richards and Reed, 2015).

Farmers get most of their information through mass media (radio, television, newspaper and magazine) and group contact known as farmer’s cooperatives. It is showed that most of the innovations were more to the farmers associated than those who are not members (Poole and Donovan, 2014). Cooperatives incorporates major agents such as universities,
firms, and other organizations that can tap into the growing stock of global knowledge, assimilate and adapt knowledge to local needs, and create new technology and products. Cooperatives borrow valuable ideas from new organizations and partnerships, processes, products, and marketing in different places to boost productivity of its members (Langyintuo and Mungoma, 2008). The role of cooperative societies is significant in promoting innovations in agriculture that also requires coordinated support to agricultural research, extension, and education, while fostering innovation partnerships and links along and beyond agricultural value chains, and enabling agricultural development (Bello, 2010). This fosters a strong link for an active innovative system.

### 2.2.2 Extension Services

Many cooperative have adopted new ways of doing business in response to existing market opportunities and threats to the operating environment of agribusiness firms. For instance, the Kenya Seed Company has clustered farmers in seed production to overcome the problem of land subdivision and reduce the isolation between fields. Also, many cooperatives have established extensive distribution networks through working closely with poultry farmers (Feleke and Zegeye, 2016). More effective networking has improved the education, business knowledge, and skills of small scale poultry farmers. Networking has also improved the professional and marketing edge of poultry farmers and customers are assured of a good quality product and timely service. Some cooperative also assist farmers through the use of ICT to market their poultry products efficiently online (Royer, 2014). ICT is an important component for poultry farming. Farmers can use computers and the internet to facilitate internal communication and e-commerce. For instance, some poultry companies have set up the Enterprise Resource Planning software system to enhance connectivity to their outlets. For instance, one milling company uses ICT in the formulation of food or feed rations and quality control (Mwobobia, Amwata1 and Kanui, 2016).

Developing and implementing strategic plans that focus on business growth: Many poultry enterprises have adopted new ways of doing business that reorganize market function. Previously, the poultry enterprises used to wait for customers but now package their products and look for customers. They also provide handling and storage services for third parties to use available storage facilities as a way of expanding their markets through innovation (Larsen, Kim and Theus, 2009). Farmer cooperatives have also
developed support service systems particularly in veterinary services and increased production of feed concentrates to ensure smallholder participation in formal poultry markets. Kenyan and Rwandan farmer cooperatives have provided financial services through savings and credit cooperatives (SACCOs). One cooperative has set up a revolving credit program among the firm, feed manufacturers, and farmers, so that farmers receive feed on credit and pay the feed supplier upon receipt of sales. Another cooperative in Tanzania is expanding its own fleet of vehicles to ensure effective distribution of poultry products to various markets (Portsmouth, 2013)

2.2.3 Finance

For poultry business, limited access to finance is the most common barriers to innovation. Innovative financial services provision in poultry farming lags behind innovation in other service areas; there are high risks, the uncertainty of collateral, and high transaction costs for smallholder farmers or community-based processors have limited the extension of financial services into rural areas (Patterson, Mugera and Burton, 2015). The country studies provide some examples of innovative financial instruments that overcome those challenges, such as the expansion of micro-credit banks and savings and credit cooperatives (SACCOs) into rural areas, as well as warehouse receipt systems and credit schemes offered by agribusiness organizations. Effective training programs for bank personnel to evaluate the risk and creditworthiness of clients must accompany innovative loan and credit schemes (Farrel and Stapleton, 2010).

This implies that access to credit may not have a direct impact on productivity. But it could have a positive and significant indirect impact through positive influence on agricultural technologies adoption, increase capital for investment, hire labour and improve household welfare through improved health care and better nutrition. Feder et al. (1990) posit that credit allows farmers to satisfy the cash needs induced by the production cycle which characterize agriculture in which very little cash revenue is earned, while expenditure on materials, purchased inputs and consumption need to be made in cash (Langyintuo and Mungoma, 2008). Thus access to credit may affect farm productivity and innovation capability because farmers facing binding capital constraints would tend to use lower level of inputs in their production activities compared to those not constrained (Petrick, 2004).
2.2.4 Access to Information Sharing

Lack of sufficient market information poses a great challenge to the innovation of small poultry farmers (Orodho, 2015). Despite the vast amount of trade related information available and the possibility of accessing national and international database, many poultry farmers continue to rely on private or even physical contacts for market related information. This is due to inability to interpret the statistical data (Muteti, 2005) and poor connectivity especially in rural areas. Since there is vast amount of information and only lack of statistical knowledge to interpret and internet connectivity, poultry farmers’ need to be supported by cooperative societies (Greiner, Patterson and Miller, 2009).

In reference to the economies of scale, farmer groups, rather than individual farmers, benefit optimally from adoption of innovation, are better positioned to share and mitigate innovation risks, and can deal more effectively with limits arising from the amount of innovation procurement, application, and maintenance costs (Kolade and Harpham, 2014). It is argued that information about, access to, and benefits from agricultural innovations are more easily available in co-operatives. Furthermore, because of high ratio of farmers to extension officer, extension officers are able to work more effectively and efficiently with farmer groups, rather than individual holders (Patterson, Mugera and Burton, 2015). Co-operatives may be able to contribute funds for purchase of equipment and seeds for group demonstrations and use (Adeogun, Olawoye, and Akinbile 2010). Thus, co-operatives are social structures that can promote adoption of agricultural innovations among farmer-members.

2.2.5 Access Inputs

Cooperative societies provide the inputs, expertise, and services needed for poultry production and the markets for the produce. It also provides employment and entrepreneurial opportunities for poultry farmers in rural and urban areas though the establishment of market links (Enweze, 2015). As the key interface between markets and rural households, cooperative societies are the key actors involved in linking agriculture to industry (OECD, 2007). Moreover, in many developing countries, cooperative societies often fills the vacuum caused by the retreat of inefficient state-supported operations in delivering essential input and marketing services. Cooperative societies also respond to opportunities growing out of the liberalization of economies and globalization of trade.
Although the growth and development of poultry business depend largely on private sector initiatives, public policies are essential in creating and facilitating an enabling environment (Kolade and Harpham, 2014).

The price of poultry inputs are a major expense for small scale farmers. Yet, access and appropriate use of improved inputs will significantly increase farmers’ poultry yields. Improving input supply is more than introducing new feeds and shelter for poultry; it includes innovative ways to incorporate input supply into the value chain and make the chain itself more competitive (Cardoso de Sousa, 2012). For instance, a value chain approach to improving input access could identify input suppliers with access to small-scale farmers and create a certification system that turns an input supply source into an agricultural information hub (Assefa, 2015).

Linking small farmers to input suppliers is mutually beneficial because the small-scale producer gains access to improved inputs and the input supplier enjoys greater business through a new role (Nwakwo, Peters and Bolkemann, 2009). For example, input suppliers could further increase sales by storing and packaging their products well to last for long. Buyers can also actively facilitate the availability of desirable inputs. In many cases, intermediaries in the value chain, such as processors or wholesale brokers, provide inputs on credit, with repayment due upon sale of the poultry products (Reijand and Waters-Bayer, 2011). Value chain performance will seriously deteriorate if farmers produce spoil or diseases. Thus a full set of inputs with the associated services are necessary to ensure optimal results (Daberkow and McBride, 2013).

2.2.6 Business Associates and Farmer Organization

Farmers’ associations ensure effective business practices for farmers. Cooperative societies unite with other cooperatives in pursuit of shared business interests which leads to a strong lobbying capacity. Some cooperative have criticized the government for not doing enough to encourage the growth of small scale poultry farmer (Sidibe, 2015). Agribusinesses in Kenya have also lobbied for selective protectionist policies to shield the private sector from unfair foreign competition, but lobbying efforts for protectionist policies have not been successful, because the international trade regime which has to be adhered to when targeting export markets does not favor protectionism (Patterson, Mugera and Burton, 2015).
Cooperative societies also engaged in in-house R & D in collaboration with other research institution. For example, Marinoff Cooperative collaborates with the Animal Science Department of the Kwame Nkrumah University of Science and Technology (KNUST). As Marinoff Farm seeks to develop improved feed for poultry, it engages the department to test new feed it formulates with soybean, fish, and other proteins. Also, Afariwa cooperative society now collaborates with the Animal Research Institute for the production of breeding stocks for the poultry industry (Tanui, Feng, Li, Wang and Kipsat, 2014).

This exemplifies the process of acquiring knowledge by interacting with companies abroad and serving as market representative for farmers. For instance, Darko Farms Co. obtains its breeding stocks from a foreign company based in Zimbabwe. The Ghana country study also found links with outside knowledge centers, such as the collaboration between Asare Farms and the University of Florida on quality issues in poultry feeds. Locally the interaction and links come out of proximity, convenience, and shared interest (Biggs and Matsaert, 2014). The international links come about through business dealings and personal contacts.

2.3 Influence of Social Factors on Farmer’s Adoption of Innovation

2.3.1 Age

Age is sometimes found to be an important characteristic in the adoption of innovations, with younger people generally being more likely to adopt (Rogers). Jatto (2012) study on economics and social characteristics of registered poultry egg producers in Ilorin in Kwara State showed that younger farmers are likely to adopt new innovation faster than the older ones. The finding is in agreement with Sani et al., (2007) that majority of farmer within the age range of 41 to 50 years are still in there active age and more receptive to innovation.

On the other hand, it has also been established that farmers with more experience would be more efficient, have better knowledge of climatic conditions and market situation and are thus, expected to run a more efficient and profitable enterprise (Jatto, 2012). Onyebinama (2004), also support the finding of that previous experience in farm business management enable farmers to set realistic time and cost targets, allocate, combine and
utilize resources efficiently and identify production innovation that can avert risks in the poultry industry. However, in this case, it aims to determine whether the age of poultry farmers will influence the adoption of innovative poultry farming.

2.3.2 Level of Education

Poultry farmers may have entrepreneurial skills but without knowledge and technology, they may resort to traditional way of poultry farming which is costly. Also with lack of information and knowledge, farmers may not know the innovative way for caring for the poultry, medications to administer should there be an outbreak of diseases and even how feed is to be rationed for the birds (Doss and Morris, 2011). Adequate knowledge and information is needed to innovatively raise healthy birds in order to make profit since no buyer will purchase sick and unhealthy poultry. With an appropriately developed innovative plan, poultry farmers will be informed more on how to feed, vaccinate, house, clean and sanitize both the flocks and the farm as a whole (Patterson, Mugera and Burton, 2015). Effective and efficient modern and innovative farm practice need to be carefully followed which results in raising healthy birds, thereby minimizing or preventing the degree of exposure of both birds and meat to contaminations or diseases and increasing the sales of healthy birds thereby increasing farmers’ revenue at the long run (Reij, 2015).

The absence of entrepreneurial skills and management will make it difficult for poultry farmers to create wealth using innovation (Orodho, 2015). Lack of management, entrepreneurship and a good decision making skills limits the ability of farmers to increase their capacity and their profits (Bryman and Cramer, 2009). Reason being that, funds that come in either as profits and investments may not be managed well and may be allocated to areas where they are mostly not needed. Also, small scale farmers with the aim of practicing subsistent farming may not deem it important to increase their farm capacity (Adeogun, Olawoye and Akinbile, 2010).

To increase their wealth and a means of increasing their standard of living in the long run education and skills are needed to run micro and small poultry business innovatively. Research shows that majority of the lot carrying small scale poultry in Kenya are not quite well equipped in terms of education and skills towards their poultry farms (Wanjohi
and Mugure, 2008). A greater demand for skilled and educated poultry farmers may reduce poverty as a consequence. The level of education for most poultry farmers is postsecondary education in Ghana and Kenya. But agribusinesses prefer hiring polytechnic graduates over university graduates for the practical technical work in their firms, despite the fact that university graduates seemed better suited for managerial functions and could be sources of innovation in administration. On the whole, however, agribusiness is rather dissatisfied with the quality of graduates from tertiary educational institutions (Poole and Donovan, 2014).

Low education levels also limit the farmers’ capacity to access and use existing information and knowledge about agriculture. Use of information and communication technology (ICT) is severely curtailed by low levels of education. Furthermore, the low level of education also inhibits compliance with the Global Gap requirements for export products, including requirements to keep records of farm management practices and due diligence (Tanui, Feng, Li, Wang and Kipsat, 2014). As a consequence, small poultry farmers from Ghana, Uganda and Kenya cannot compete with other countries in exporting products that would otherwise contribute to poverty reduction and economic growth for the country and its farmers. Education is also the key to conscious observance of health and hygiene practices, which are a strict requirement in food handling (Royer, 2014).

2.3.3 Entrepreneurial and Managerial Skills
In the light of these opportunities, most small-scale poultry farmers lack entrepreneurial and managerial skills that will help them to innovatively and effectively run their farms (Sidibe, 2015). In order to help small scale poultry farmers be innovative, there is need for training both on the job and through seminars by using a model farm to test its activities before the selected farmers will be taught the modern practices of poultry farming and management for them to be accountable (Orodho, 2015). Training enables the farmers to make managerial decisions regarding their operations for them to understand the importance of management on the farm.

Without proper entrepreneurial education and management skills, farmers may only learn the practical aspect of properly taking good care of the poultry at the detriment of being accountable of the finances of the farm (Poole and Donovan, 2014). Without proper
bookkeeping, activity log books, budget and cost management, farmers may have difficulty in assessing the performance and growth of their farms (Reij, 2015). Seminars and on-the-job training aim at identifying and developing both their managerial and entrepreneurial capabilities, which in turn will help sharpen their decision making skills concerning their operations and help them come out with innovative ways that will help them further expand their operations and positively affect their performance (Chand, 2013).

2.3.4 Willingness of Farmers to Adopt Innovation

Bdour (2014) and Rogers (2003) suggest that there are three broad categories of variables affecting the adoption and diffusion of agricultural innovations: personal characteristics of farmers, farm characteristics, and perceived characteristics of the innovation (Rogers, Stoneman, Sunding and Zilberman). Personal characteristics of farmers such as their age and education can influence adoption decisions in some cases (Rogers). Access to resources, which depends on wealth and personal social networks, is a personal characteristic influencing the adoption of innovations (Feder and Umali, Rogers, Sunding and Zilberman). Another personal characteristic is awareness of the innovation, which was the focus of many early adoption and diffusion studies using the epidemic model (Rogers, 2003). Finally, Rogers notes the importance of a person’s values and beliefs in the adoption decision.

The second group of characteristics includes those related to the poultry farming system. Farm size and location as well as land tenure have been found important to the adoption of poultry innovations (Rogers, 2003). Although Rogers discusses compatibility, in regard to an individual’s beliefs and values, Contant and Korsching as well as Stoneman note that compatibility among the innovation, previous investments, other inputs and the production system is important. Thus, indicating the importance of compatibility between the innovation and the overall farming system. The other category includes the perceived characteristics of the innovation. Rogers notes that perceptions are important because people make decisions based on their perceptions. One important perception for the adoption is that of relative advantage, which the additional benefit is from using the innovation (Rogers, 2003). Relative advantage could mean lower cost of production, increased efficiency or increased quality, all of which lead to increased profitability.
Several studies find that increased profitability is an incentive for adoption (Contant and Korshing, 2013; Fuglie and Kascak, 2014; Griliches, Sturm and Smith, 2015). Relative advantage can also take the form of incentive payments and subsidies, which encourage adoption of conservation agricultural practices (Cooper and Keim, 2015). However, profitability and payments ultimately contribute to utility. Other costs and benefits, such as the presence of externalities and the social costs and benefits associated with them, personal satisfaction, convenience, environmental quality and discomfort are other factors that affect a person’s utility and have been found to affect the adoption decision (Nowak and Rogers, 2012).

Although discomfort is mentioned in the theoretical adoption and diffusion literature (Rogers, 2003), there was little empirical work on this factor. Besides the perceived relative advantage of adopting an innovation, perceived complexity and uncertainty are other perceptions that impact adoption. Rogers (2003), as well as Contant and Korsching (2005), have found that adoption and diffusion occurs more readily and rapidly with innovations that are easily understood and used. The uncertainty associated with adopting an innovation is a barrier to adoption (Lindner, et al., Llewellyn, et al., Nowak, Pannell, Rogers, Sunding and Zilberman).

2.3.5 Cultural Belief
While most innovation research has focused on the innovativeness of the idea, there is an urgent need to consider consumers’ perceptions of the adoption (Kalliny and Hausman, 2007). Takada and Jain (1991) confirmed that diffusion of innovation is greater in high-context cultures. Further, the adoption of IT products is not fully understood; partially because of the lack of fit between technology and culture (Soh and Sia 2004). It is claimed that the value system of the individual is critical to innovation adoption (Daghfous, 1999). There is an urgent need to analyze the effect of cultural characteristics on the innovation diffusion process by looking at two main cultural dimensions of Hofstede measures: Individualism/Collectivism and Uncertainty Avoidance on innovation acceptance and diffusion.

Individualistic and Collectivism is the most critical factor that affects innovation adoption (Flight et al. 2011). An individualist society is characterized by reliance on personal beliefs in making decisions, and group norms are not strictly followed (Perez-Alvarez,
2009). On the other hand, group consensus is critical to decision making in collectivist societies (Wickliffe and Pysarchik 2001). In individualist societies, people tend to be involved in several “out-group” that affect their decisions in the long-term; while collectivist societies are linked to one “in-group” that affects their decisions in the short-term. Accordingly, it is argued that Innovation Acceptance at the early stage of the innovation is fostered in collectivist societies, where in-groups are influential. On the other hand, Innovation Diffusion is influenced by the various out-groups in individualist societies (Dwyer et al., 2005). Uncertainty Avoidance is also another critical cultural dimension that influences innovation adoption. It refers to the level of tolerance to risk (Hofstede 2001). A high Uncertainty Avoidance leads to a generation of rigid rules within the society, and is expected to slow the acceptance and diffusion of innovations (Kalliny and Hausman 2007; Perez-Alvarez, 2009).

2.3.6 Opinion Leaders

Opinion leaders are identified as having greater access to mass media as well as interpersonal networks in comparison with their followers. In addition, they are perceived as having higher socio-economic status and tendency to adopt new innovative ideas before their followers (Dearing, 2009). Their main characteristics are knowledge (Eastman, Eastman, Eastman, 2002; Rogers, 2003); social influence (Rogers, 2003); innovativeness (Lyons & Henderson, 2005; Rogers, 2003); and interpersonal factors (Rogers, 2003). It is empirically proved that opinion leaders influence the consumer decision-making process through spreading positive word of mouth. In addition, they act as a role model to be imitated (Dearing, 2009). This relationship was supported by the diffusion research, which highlight that opinion leaders influence the evaluation of new innovation and hence they affect the rate of diffusion (Rogers, 2003).

Based on the above model, companies could possibly classify consumers into either lead users or opinion leaders or normal consumers (followers). It is argued by Myers and Robertson (1972) that opinion leaders are not innovators, and there is a moderate relationship between opinion leadership and innovative behavior. However, Goldsmith and Witt (2005) proved a positive correlation between innovativeness and opinion leadership across several product categories. This is also supported by Rogers (1983) who proved that “opinion leaders are more innovative than their followers” (p.284). Also, Goldsmith and Witt (2005) identified opinion leadership as one of the dimensions of lead
users. In addition, a number of researchers mentioned that innovation is one of the main attributes of opinion leadership (Lyons and Henderson, 2005). Further, lead users could act as opinion leaders and hence spread positive word of mouth about the product, which will positively affect the rate of diffusion (Bilgram et al., 2008).

Inventors are lead users characterized by a high level of innovation and willingness to contribute ideas for new product development. Promoters are opinion leaders who like to try new innovations and are willing to spread word-of-mouth to convince other consumers to try them (Portsmouth, 2013). Followers are normal consumers who do not buy the products until other consumers try them. Finally, Champions are characterized by both lead users’ and opinion leaders’ characteristics. These are very important consumers to target as they both help in the design and modification processes to ensure innovation acceptance; and at the same time they are willing to spread positive word-of-mouth to help in innovation diffusion among followers (Patterson, Mugera and Burton, 2015). Identifying the above groups is critical to companies eager to introduce successful innovations on a regular basis. In this case, lead users could act as opinion leaders and hence spread positive word of mouth about the product, which will positively affect the rate of diffusion (Franke et al., 2006). This is possible if these lead users possess social influence capabilities. Marketers should utilize lead users and opinion leaders effectively in different cultures, depending on the urgency of the situation.

2.3.7 Virtual Community

Communicability is crucial to the innovation adoption process, as it incorporates the role of word-of-mouth through both lead users and opinion leaders, along with other interpersonal networks. Accordingly, it is recommended to identify the lead users at the early stages of the innovation development in order to optimize all innovation attributes (Orodho, 2015). One way to do so is to rely on online communities. They are defined as a community where people come together around a common goal and share common interest using internet channels like email, chat rooms or internet user group (Williams and Cothrel, 2000). Online communities’ participants exchange information, knowledge and reviews around service, product or a common interest.

Virtual communities create a new medium where like-minded strangers come together regardless of their physical location and not constrained by time. Through virtual
Online communities could be useful in two ways. First, companies are encouraged to develop an online community for Champions, aiming to attract customers that would act as both lead users and opinion leaders (Portsmouth, 2013). This way, they can post their recommended modifications online as well as creative ideas for new products. Second, companies need to form online communities for opinion leaders, whereby interested users are encouraged to chat around the product, provide recommendations and referrals, and invite potential followers. This could be an effective credible word-of-mouth tool to drive innovation diffusion (Orodho, 2015).

2.4 Influence of Economic Factors on Farmer’s Adoption of Innovation

2.4.1 Income

Other benefit that comes with the improved poultry sector is employment. Many people will be employed into the sector as farm and food inspectors, consultants, advisors, program extension officers, quality assurance officers, laboratory supervisors among others. If only good system is developed and investment (both capital input ad money) into the sector is huge since it is capital intensive (Patterson, Mugera and Burton, 2015). In effect, there will be a cut down in the rate of unemployment in the country since most people will be employed to undertake inspections, give advice, organize programmes and seminars for farmers o latest developments and changes in the industry (Reij, 2015).

2.4.2 Market Factors

The lack of sufficient market information poses a great challenge to small scale farmers. Despite the vast amount of trade related information available and the possibility of accessing national and international database, many small scale poultry farmers continue to rely heavily on private or even physical contacts for market related information (Reij, 2015). This is due to the inability to interpret the statistical data and poor connectivity especially in rural areas. Since there is vast amount of information and only lack of statistical knowledge to interpret and internet connectivity, small enterprises entrepreneurs need to be supported (Muteti, 2005).
The successful commercial exploitation of new domestic and regional market opportunities and food security strategies in the quest for higher income and profits, can increase production of better products through adaptive and innovative capacity of poultry farmers (Sidibe, 2015). Many new agricultural activities and products emerge when private farmer entrepreneurs respond to new market opportunities. Farmers and commercial producers may benefit especially if they can diversify their production into higher value-added products and if they can expand their adaptive capacity to exploit those new market opportunities in both staple food and high value commodity subsectors (Tanui, Feng, Li, Wang and Kipsat, 2014). The access to new markets is driving innovation. The spread of supermarkets beyond urban areas shortens distances for transporting perishable products, provides new outlets for products and triggers innovations in product development and innovation.

2.4.3 Profits

Most small scale poultry farmers, and particularly poor rural farmers, do not participate in the formal value chains. Rather, small scale poultry farmers tend to be limited to informal markets. Although innovations are already taking place in these informal markets, they rarely lead to significant improvements in profits and incomes (Valentinov, 2014). From a profitable point of view, the question is how to strengthen innovation processes in these value chains so that they present a real opportunity for the rural poor to escape poverty and regular cycles of food insecurity. The challenge is how to integrate small scale poultry farmers into formal markets (Sidibe, 2015). The government plays an important supporting role in making inputs affordable by lowering the transaction costs of market access and supporting producer organizations that will achieve economies of scale. In this case, sufficient profit margins are critical for the development of innovation. Failed initiatives among farmers are usually due to high innovation costs, insufficient infrastructure, long distances, and medium-term climate change effects which can be offset by future profits if the innovation is sustainable (Patterson, Mugera and Burton, 2015). Similarly, sufficient profit margins in export and regional markets are drivers for innovation by poultry farmers.

Export markets and regional markets with higher profit margins are sufficient drivers for the private sector, especially on the processing scale, to assume a major coordination role (Royer, 2014). For example, the recent success of the Ugandan fish industry demonstrates
that private sector and community-driven efforts can be effective if empowered and legalized by the state, as well as supported by international stakeholders. In this way new models emerge, especially given the limited capacity of the state to assume coordination, support, and implementation roles (Reij, 2015). Uganda also pioneered in contracting out agricultural advisory services, giving producer organizations a voice in awarding the contracts (World Bank 2007). The private sector is slowly expanding its role, but market access for smallholder farmers is still a considerable challenge. The same applies to poultry farmers in the country. Another example of cassava starch initiative in Ghana indicates the difficulty in redirecting a whole value chain and creating economies of scale without being attentive to the dynamics and specifics of a staple food subsector characterized by different markets (informal, formal), different products (cassava, gari) and fragmentation across the value chain.

2.4.5 Lack of favorable credit facilities and “no subsidy” policy for inputs

Lack of investment capital is a limiting factor among poultry farmers. Small scale poultry enterprise in rural areas in particular are not an attractive proposition for formal financial institutes because they cannot meet the minimum requirements and are perceived as high risk borrowers (Onumah, 2013). Adegbite (2009), citing Ezike (1984), Nweke and Onyia (2001) and Kodieche (2002), stated that financial lending Institutions in Nigeria often shy away from giving loans to farmers because of the high cost of administering such loans and the perceived high default rates among farmers. Ghosh et al. (2000) believe that it is largely because poorer farmers lack sufficient assets to put up as collateral, a usual prerequisite for borrowing from banks.

As a result, poultry businesses suffer from lack of access to credit at favorable terms or face the exploitation of commercial banks, which charge unrealistic interest rates for genuine business. For example, some poultry factories have either closed or are under receivership because of the failure to pay back loans obtained from commercial banks. Lack of credit facilities has discouraged innovation in the poultry industry (Poole and Donovan, 2014). This situation is complicated by structural adjustment policies that make inputs too expensive for resource-poor farmers. Microfinance institutions (MFIs) have proliferated to provide credit facilities to small and medium-size poultry enterprises, but their conditions, interest rates, and repayment schedules are not favorable to agricultural-
related businesses whose markets are not reliable (Reij and Waters-Bayer, 2011). There is need for a reliable source of favorable credit to agribusinesses to enable the flow of income in the value chain that extends to the producers who happen to be among the poorest workers in the population.

2.4.6 Record Keeping

Most poultry farmers today are more business oriented as compared to 20 years ago where farmers farm because it was something they liked to do. In present times, being a talented farmer is not enough to help grow one’s farm and increase profitability but also being a good financial manager helps to increase one’s success of operating a farm profitably (Portsmouth, 2013). In order to be a good financial manager, a farmer has to keep records of activities which are undertaken at the farm daily. This helps to track the growth of the farm through accessing and analyzing these activities, measuring their impact and concluding if some practices are good or not (Patterson, Mugera and Burton, 2015). Farmers with basic education are to easily understand the basics of bookkeeping since it is not difficult to record daily activities on the farm. Most people think it is appropriate to keep farm records or financial records of their farms in order to make it easy for tax payment and other legal related issues. In actual fact, a history of farm records helps farmers in making proper management decision of the farm, cutting cost, sticking to budgets which at the end helps to increase the profitability and growth of the farm (Hartsfield, 2012).

Records’ keeping also helps to record daily routines in rearing birds. When filing is done properly, changes in the health of flocks can be detected on time and proper medication can be administered to the flock as a result of the records kept on the health of the birds (Richards and Reed, 2015). For instance a farmer who takes records of farm activities is able to administer vaccination for the flocks if a similar or same disease affected the flocks previously as compared to a farmer who does not keep farm records. In a large farm with more than 50,000 birds, a farmer who keeps records of the process is able to know the number of birds that have been debeaked and he is also compelled to differentiate between debeaked birds and non-debeaked birds (Spielman, Ekboir, Davis and Ochieng, 2015). Rather than memorising farm activities in the head, a farmer who keeps a daily record of activities on the farm can also design a routine which can be used
to run the daily operations of the farm. This helps to design a system which helps to run
the farm and procedures that must be followed when precautions are to be taken when
handling delicate matters on the farm (Doss and Morris, 2011).

Aside managing the birds, record keeping helps farmers to draw budgets on feed
rationing, food supplement; vaccination, labour resources and future expansion of farm
can the estimated easily. Also workers data collected on farms can help in career
development (Assefa, 2015). As the farm expands, workers who want to develop their
career can be trained in specific fields of their choice so as to effectively manage the
farm. In addition, farm records present detailed information on the finances of the farm
for investors. Investors, before investing may want to know the financial position of the
farm and to know the growth rate of the farm before investing (Royer, 2014). Keeping a
farm record in times like this makes it to make easier for decisions to be made by both
farmers and investors and to an extent farmers may receive advices from experts due to
the records that have taken. As compared to farmers who do not take records of farm
activities, run a risk of incurring huge operating costs since there are no plans and budgets
that are followed in running farm operations. Information for investors is either limited or
unavailable making it difficult for farmers to receive investments for the growth of their
farms (Patterson, Mugera and Burton, 2015).

In this initiative, records keeping by farmers will be a priority since it will provide
more information about the performance and growth of the farm. Records keeping will
range from simple to complex system depending on the level of literacy of the farmers
(Reij, 2015). Those with no formal education will be taught how to record daily activities
where lessons will be adapted to the local setting of the farmer which will be made easier
to understand. Farmers in this category will receive lot of attention from both Bank X and
the education center since they do not have much idea on records keeping, planning,
budgeting and farm management. Both Bank X and the education center will design a
teaching programme for these farmers which will be made simple and easier for them to
understand the concept of recording keeping (Portsmouth, 2013). Farmers in this category
will be taught on recording of simple daily activities and as they understand the concept
simple accounting recordings will be included, ensuring that farmers will make informed
decision in managing the farm as a result of the knowledge acquired through the recording of activities and the financial statement of the farm (Biggs and Matsaert, 2014).

For farmers with formal education, a standard system for recording daily activities and finances will be designed since some accounting system may be difficult to understand. A simplified balance sheet will be designed for the farmers who will be taught on how to use it (Nwakwo, Peters and Bolkemann, 2009). Credit and debit entry on sales and expenses, profit and loss account for recording profits and loss will be simplified for farmers to use in recording the financial transactions of the farm (Patterson, Mugera and Burton, 2015). With farmers who are farming on a large scale with professional qualifications in managing farms, their farm recording systems and financial recording will be overviewed and any difficulties that these farmers have in understanding these complex systems will be explained to them or better still design a system that is not too complex and easy to understand for them to use (Poole and Donovan, 2014).

2.5 Influence of Political Factors on Farmer’s Adoption of Innovation

2.5.1 Government Policies
Innovations can arise at any point of the value chain as the result of mediated or coordinated interactions among different actors. Thus, the appearance of innovation does not necessarily depend on any specific government role or action (Sidibe, 2015). Nevertheless, because public policies directly influence the national competitiveness of firms and the health of value chains, the innovation system requires a comprehensive and complex set of pro-innovation agriculture, trade, science and technology, finance, and education policies. Well-crafted and coordinated public policies may facilitate, steer, and reinforce innovation by providing incentives (Richards and Reed, 2015; Patterson, Mugera and Burton, 2015).

2.5.2 Enabling Environment
The public sector plays an important role in establishing an enabling environment. Endemic in virtually all countries in developing world is the limited access of producers and agribusinesses to credit and finance. The lack of access hampers vital factors of production, including inputs for farmers or technology for the processing industry (Biggs and Matsaert, 2014). The Kenyan financial sector is a notable exception, with significant
expansion in the number of SACCOs in the poultry industry and microfinance banks into rural areas. The warehouse receipt system is another form of credit and finance for staple food markets. With the rise of more efficient integrated supply chains (especially in horticulture and high-value products) and contract farming, financial intermediation through interlinked agents such as cooperatives is becoming more common. But in general, access to finance is a major impediment to innovation in farmers (Patterson, Mugera and Burton, 2015).

The government needs to build institutional capacity to provide a functioning enabling environment for poultry farming innovation. However, that the different actors in the innovation system rarely benefit (Royer, 2014). The lack of effective enforcement or implementation of standards and certification systems or other supportive governmental policies hinders poultry farming business efforts to compete in export markets with higher profit margins (Sidibe, 2015). In the absence of effective state implementation capacity, poultry business establishes its own enabling environment. The government should strive to close those gaps, and, in the event of scarce resources, legitimize and support private sector institutions for quality management and regulations enforcement (Orodho, 2015).

Another important aspect of the establishment of an enabling environment is that the private and public sectors need to provide more access to finance for poultry business, particularly in rural areas. For the poultry business, limited access to finance coupled with an insufficient transport infrastructure and education systems are the most common barriers to innovation (Royer, 2014). Innovative financial services provision in Kenya’s poultry industry lags behind innovation in other service areas. High risks, the uncertainty of collateral, and high transaction costs for small scale poultry farmers or community-based processors have limited the extension of financial services into rural areas (Biggs and Matsaert, 2014). There should also be effective training programs for bank personnel to evaluate the risk and creditworthiness of clients must accompany innovative loan and credit schemes (Poole and Donovan, 2014).

2.5.3 Public-Private Partnership
Supporting and strengthening public-private sector partnerships is essential for poultry industry innovation. There are success stories where synergies could be created by combining market-based and knowledge-based interactions and strong links within and
beyond the value chain point to an innovation strategy that has to be holistic in nature and focus, in particular, on strengthening the interactions between key public, private, and civil society actors (Nwakwo, Peters and Bolkemann, 2009). Both formal markets and infrastructure put a premium on organizational innovation for poultry business. On the processing and the production level, cooperatives and other organizations are pivotal for achieving critical mass, economies of scale, and credit scheme organization (Spielman, Ekboir, Davis and Ochieng, 2015).

Public-private partnerships (PPPs) must be strengthened and extended beyond the traditional field of research and development (R&D). The traditional view of public-private partnerships focusing mainly on R&D should be replaced by a broader notion of PPPs that extends to advisory, extension, and other support services (Nwakwo, Peters and Bolkemann, 2009). Partnerships are critical to ensure that agribusiness demands will be heard by the public sector, which often plays a supply function. In the absence of the public sector’s capacity to perform finance, extension, training, and regulations enforcement functions on its own, PPPs may provide a possible solution (Royer, 2014). Collaborative government and private sector programs should successfully be provided to farmers in the poultry business with the necessary training, demonstration sites, information, technical capacity, and inputs to increase their adaptive innovative capacity and raise the volume and quality of their agricultural products (Assefa, 2015).

Sponsorship of the various fairs and exhibitions could be significantly increased. Public institutions such as the extension departments of the relevant ministries and organizations also transmit knowledge. For example, poultry farmers commended the veterinary services department of the Ministry of Food and Agriculture (MOFA) for its frequent visits and relevant technical advice (Poole and Donovan, 2014). Farmers mentioned contacts with agricultural extension officers who advised them on agronomic practices and new inputs. The quality assurance institutions also encourage good links with enterprises especially in relation to products destined for supermarkets and export markets (Poole and Donovan, 2014). Environmental Protection Agency (EPA) also contributes to good production practices by inspecting production premises to ensure compliance with the company’s environmental action plan, which all companies are legally required to prepare and submit to the EPA.
2.5.4 Taxes

One element to innovation of poultry industry is the tax regime. Tax policies are not always aligned with broader growth strategies in the poultry industry and agricultural sector as a whole. Tax policies may be pivotal to the incubation phase of poultry businesses (Patterson, Mugera and Burton, 2015). Poultry companies face significant barriers to entry as they are taxed before production and receive fewer investment incentives, including tax holidays, foreign exchange retention, and access to utilities, than international companies (Essegbey, 2009). In some cases, small scale poultry farmers sell their products below market prices leading to lower profit margins which are a clear disincentive to poultry production. When devising tax increases, governments must consider the actual profits made by poultry companies and inflation, so that tax policies do not impede competitiveness and innovation as it is the case (Portsmouth, 2013).

Taxing the import of inputs, technology, and machinery can also act as a disincentive (Valentinov, 2014). Easy access to technology, inputs, and machinery is vital for a competitive industry, and high costs raise the bar for companies to become competitive. Import taxes on raw materials hurt the poultry industries. Liberalization policy is not sufficient to lower input prices for poultry farming (Royer, 2014). But there have been other success stories in other sectors that have showed beneficial government policies, especially through the horticulture sector in Kenya, cocoa in Ghana, and fish in Uganda are all examples of the successful interplay of industry-specific institutions and policy programs some supported by international public and private sector agents to create the conditions to compete in international markets (Sidibe, 2015).

2.5.5 Public Investment

Governments must focus on investment in infrastructure, with some investments sector specific and others geared toward the whole economy. Economists identify poor transport facilities as a particular problem, especially poor quality and low density road networks (Portsmouth, 2013). Investment in improved feeder roads is critical for improving farmers’ access to markets and reducing trader and farmer marketing costs, especially in landlocked countries such as Rwanda or Uganda. Access to power and water is also difficult, and public investment in utilities is not adequate (Spielman, Ekboir, Davis and Ochieng, 2015). A notable development in the ICT industry is the spread of cell phones following the liberalization of the telecommunications markets. Cell phones are vital to
communication and information gathering, thereby significantly improving coordination and reducing transaction costs. Government investments are also necessary in specific production and marketing infrastructure such as village, district, and urban markets; warehouses; and cooling facilities for the staple food and horticulture subsectors, especially in the earlier stages of development (Royer, 2014).

If the processing industry is critical to innovation, coordination, and value addition, public investment and support in nascent industries where the private sector has recently gotten involved should be a government priority. To jump-start a processing industry and make it competitive, some initial PPPs and public investments might be needed, for example as the development of the Ugandan fish industry and Kenyan horticulture subsectors (Royer, 2014). The poultry industry in Kenya could benefit from public sector support to acquire the necessary technology to realize profits (Poole and Donovan, 2014). Also, the public investments in R&D are also insufficient. Research and Development in the poultry business can help capture the economies of scale. The public education institutions and the private sector must coordinate in setting their agendas and curricula to better serve poultry business needs.

**2.5.6 Infrastructure and Support Structure**

Infrastructure and support structure which feed into poultry business performance are a main area the public sector has neglected, which has negatively affected the poultry industry (Patterson, Mugera and Burton, 2015). A typical example is transportation, which affects all components of the value chain. Poor transportation infrastructure and facilities are major constraints on the supply side of poultry outputs (Assefa, 2015). The poor road networks are often impassable during the rainy season, and transport vehicles are often not roadworthy. It is estimated that transportation accounts for about 70 percent of total marketing costs (Aryeeetey and Nyanteng 2006). The challenges relating to roads and transportation also extend to ports and harbors. Clearly infrastructure networks either facilitate or constrain the movement of outputs from poultry business production centers to local and foreign markets. Evidence suggests that the infrastructure for moving goods in and out of the country is improving. Handling services still need improvement to cut down on delays and congestion at the ports (Reij, 2015).
2.6 Chapter Summary
This chapter presented literature by other academicians on Roger’s diffusion of innovation and the factors that influence the farmers’ adoption of poultry farming innovations by specifically looking at how cooperatives influence the farmers’ adoption of poultry farming innovations, to establish how the economic factors influence the farmers’ adoption of poultry farming innovations, to examine how the social factors influence the farmers’ adoption of poultry farming innovations and to identify how the political factors influence the farmers’ adoption of poultry farming innovations. The next chapter is on the research methodology.
CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction
The study aimed to investigate the role of co-operative on farmers’ adoption of poultry farming innovations in Kwale, Kenya using Roger’s diffusion of innovation model. In this chapter, the key elements of research methodology are discussed starting with the research design, the population, the sampling technique, sample frame, sampling techniques, sampling size, data collection methods, research procedures, data analysis methods and the chapter ends with a summary of the research methodology.

3.2 Research Design
The research designed utilized in this study was descriptive in nature. The descriptive research design is defined as a method of conducting research through observation and description of the research elements without bias (Shutterworth, 2006). Also, the study aims to identify elements, by identifying and defining their problems through the collection of research data and analysis of the results to reveal what influences farmers to adopt innovation.

On the other hand, exploratory research is research conducted for a problem that has not been studied more clearly, establishes priorities, develops operational definitions and improve the final research design. Exploratory research helps determine the best research design, data-collection method and selection of subjects. Given its fundamental nature, exploratory research often concludes that a perceived problem does not actually exist.

The study adopted a quantitative and qualitative approach by specifically looking at how cooperatives influence the farmers’ adoption of poultry farming innovations, establish how the economic factors influence the farmers’ adoption of poultry farming innovations, examine how the social factors influence the farmers’ adoption of poultry farming innovations and identify how the political factors influence the farmers’ adoption of poultry farming innovations. Therefore, a descriptive method was used to measure the farmer’s adoption of Roger’s diffusion and innovation among poultry farmers in Kwale County.
3.3 Population and Sampling Design

3.3.1 Population
Population can be defined by Cooper and Schindler (2006) as everything that results from the combination of elements where meaning is inferred. The population under consideration is this study included 3,200 indigenous poultry farmers. The poultry farmers were members of a cooperative society, they were males and females from different economic backgrounds and they conducted innovation in poultry farming.

3.3.2 Sampling Design

3.3.2.1 Sampling Frame
The sampling frame can be defined as the source of where the population elements are drawn to be studied (Cooper and Schindler, 2006). In this study, the sampling frame was drawn from the members of various poultry cooperative societies in Kwale County. This made an important assurance that the study was dealing with adequate data which were relevant to answer all the research objectives raised in the study.

3.3.2.2 Sampling Techniques
The study adopted random sampling technique. According to Fisher (2007), random sampling technique are suitable for large sample that can allow the researcher to determine what average is and what the variations around the average are, to a definable level of statistical confidence. The advantage of using simple random sampling was to overcome biasness by achieving fairness in selecting the subjects for the research.

3.3.2.3 Sampling Size
A sampling size can be defined as a partial element that represents the wider population that is being studied (Cooper and Schindler, 2006). Determining sample size is a very important issue for collecting an accurate result within a quantitative survey design. One of the real advantages of quantitative methods is their ability to use smaller groups of people to make inferences about larger groups that would be prohibitively expensive to study (Kotlik, and Higgins, 2001). According to Chava and Nachmias (1969), to obtain the result that is representing the whole population, sample size should be taken regarding in part on the size of the margin of error that researcher can accept. A total population of 3,200 indigenous farmers was factored in at a margin of error of 5%, the sample size that was identified was 346 respondents as shown in Table 3.1.
The sample size was established by using the following statistical formulae

\[ n = \frac{Z^2pqN}{e^2(N-1) + Z^2pq} \]

Where:

- \( N \): Size of the population (Indigenous Poultry Farmers)
- \( n \): Sample Size
- \( p \): Sample Proportion
- \( q \): 1 - p
- \( e \): acceptable error (e=0.05)
- \( Z \): value of the standard variant at a confidence level

\[ n = \frac{(1.96)^2 \times (0.95)^2 \times (1-0.95) \times (3,200)}{(0.05)^2 \times [(3,200-1)] + (1.96)^2 \times (0.95)^2 \times (1-0.95)} = 346 \]

<table>
<thead>
<tr>
<th>Population Category</th>
<th>Population Size</th>
<th>Sample Size</th>
<th>Percentage of Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indigenous Farmers</td>
<td>3,200</td>
<td>346</td>
<td>10.8</td>
</tr>
<tr>
<td>Total</td>
<td>3,200</td>
<td>346</td>
<td>10.8</td>
</tr>
</tbody>
</table>

3.4 Data Collection Method

Data collection method can be defined as a technique for gathering important information needed in order to achieve the research objectives. In data collection, there are two processes that are involved in the collection of data. They include primary and secondary data. Primary data refers to the obtaining of data by the use of questionnaires given to the indigenous farmers while secondary data can be obtained from book, journals, reports and thesis (Maholtra, 2007). However, for this study, the collection of data was done through the use of questionnaires and interview questions as a source of primary data collection. The questionnaire administered to collect data was subdivided into different segments. The first segmented collected data on the respondent’s demographic information, the second segmented collected data on the influence of cooperatives on the farmers’
adoption of poultry farming innovations, the third section analyzed how the economic factors influence the farmers’ adoption of poultry farming innovations, the fourth section examined how the social factors influence the farmers’ adoption of poultry farming innovations and the fifth section identified how the political factors influence the farmers’ adoption of poultry farming innovations. In addition, informal qualitative approaches through in-depth interviews and focus groups were conducted.

3.5 Research Procedures
Before the actual data collection, a pilot questionnaire was distributed to test the objectivity and authentic of the research variables meant to be answered in the study. After the experiment, the questionnaires were amended to fit the research objectives and the direction of the research. Then after, the questionnaires were administered to the poultry farmers. The questionnaires were personally administered by the researcher with the help of a research assistant. This method of administration was justified as the nature of the research required expert knowledge of innovative poultry techniques for the participants to be able to provide appropriate response as was expected from the research objectives. Follow up on the filling of the questionnaires ensured high response rate. Each questionnaire took approximately 8 minutes to fill.

3.6 Data Analysis
Data analysis can be defined as the interpretation of raw data collected from the field into relevant information (Maholtra, 2007). Before, the analysis of the data, editing of the same was done. The data was analyzed using qualitative and quantitative techniques. Qualitative techniques analyzed themes of respondents opinions collected through interviews. Quantitative data analysis on the other hand analyzed raw data collected by the use of questionnaires. The collected raw data was analyzed using Statistical package for Social Sciences (SPSS). The entered data was then analyzed using descriptive statistics specifically using percentages to analyze the demographic patterns of the respondents and means provided an interpretation of the research objectives (such as cooperative, economic, social and political factors). Inferential statistics was used on the relationship between the dependent (such as adoption of Poultry farming innovation) and the independent variables (such as cooperative, economic, social and political factors). The interpretation of the data was done within the framework of the research problem while the output of the data was presented in the form of tables and figures.
3.7 Chapter Summary

The research designed utilized in this study was descriptive in nature. The population under consideration is this study included 3,200 indigenous poultry farmers. The study adopted random sampling technique. A total population of 3,200 indigenous farmers was factored in at a margin of error of 5%, the sample size that was identified was 346 respondents. The collection of data was done through the use of questionnaires and interview questions as a source of primary data collection. Before the actual data collection, a pilot questionnaire was distributed to test the objectivity and authentic of the research variables meant to be answered in the study. The entered data was then analyzed using descriptive statistics specifically using percentages to analyze the demographic patterns of the respondents and means provided an interpretation of the research objectives (such as cooperative, economic, social and political factors). Inferential statistics was used on the relationship between the dependent (such as adoption of Poultry farming innovation) and the independent variables (such as cooperative, economic, social and political factors). The interpretation of the data was done within the framework of the research problem while the output of the data was presented in the form of tables and figures. The next chapter is on the results and findings of the study.
CHAPTER FOUR

4.0 RESULTS AND FINDINGS

4.1 Introduction

In this section, the collected data was analyzed, interpreted and the findings presented in this chapter. The findings were based on the role of co-operative on farmers’ adoption of poultry farming innovations in Kwale, Kenya using Roger’s diffusion of innovation model. The chapter was organized in a number of segments. The first segment looked at the demographic profile of the respondents, the section established how cooperatives influence the farmers’ adoption of poultry farming innovations, the third section examined how the economic factors influence the farmers’ adoption of poultry farming innovations, the fourth section identified how the social factors influence the farmers’ adoption of poultry farming innovations and the fifth section examined how the political factors influence the farmers’ adoption of poultry farming innovations. A total of 346 questionnaires were administered to the respondents but slightly more than half of the respondents replied back to the questionnaires 220 (64%). The response rate was shown in Table 4.1.

<table>
<thead>
<tr>
<th>Category</th>
<th>Target Respondents</th>
<th>Response</th>
<th>Response Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poultry farmers</td>
<td>346</td>
<td>222</td>
<td>64</td>
</tr>
<tr>
<td>Total</td>
<td>346</td>
<td>222</td>
<td>64</td>
</tr>
</tbody>
</table>

4.2 General Information

The respondent’s general information was presented as follows: it looked at the gender of the respondent, their age, how long they have lived in Kwale County, the highest level of schooling attained, main source of income, marital status, how long the farmers have been in poultry business, the monthly sales category, market segment of the poultry products and the type of poultry farming products sold.

4.2.1 Gender of Participants

The study determine the gender of the respondents who participated in the survey. From the survey, 64 percent of the respondents were male as compared to 36 percent female. The male constituted the biggest percentage of the respondents.
4.2.2 Respondent’s Age

The study investigated how old the respondents’ were. From the survey findings as shown in Figure 4.2 indicated that the majority of the respondents (23%) were aged between 46 to 52 years of age, 22% were above 53 years, 20% between 39 to 45 years, 17% between 32 to 38 years, 10% between 25 to 31 years and 7% were aged between 18 to 24 years. Majority of the respondents were above 46 years of age.
4.2.3 Respondent Level of Education
The study aimed to determine the respondent level of education. From the findings shown in Figure 4.3, most of the respondents had no education (47%), while 19% had attained primary education, 17% had other forms of education, 6% had completed primary school education and another 6% had completed secondary school education, 3% had university education and 2% had college education. The findings indicated that majority of pastoralist community had attained primary level of education.

![Figure 4.3: Respondent Level of Education](image)

4.2.4 Participant Main Source of Income
The study intended to establish the participant main source of income. The findings in Figure 4.4 established that their main source of income was poultry (39%). This was combined with pastoralism (35%), wages (11%), salary (9%), crop farming (5%) and business (1%) of the respondents.
4.2.5 Participant Marital Status

The study intended to establish the participant marital status. The findings in Figure 4.5 established that 78% of the respondents were married, 19% were single, 2% were divorced and 1% either widows or widower.

4.2.6 Duration in Poultry Business in Years

The study intended to determine the number of years the respondents worked as poultry farmers. The findings in Figure 4.6 established that 33% of the respondents had worked for over 20 years, 27% worked between 6 to 10 years; another 27% had worked for less than 5 years and 13% worked between 11 to 20 years. This indicates that the majority of the respondents had more than 20 years of experience in raising poultry.
4.2.7 Monthly Sales Category

The study intended to determine the monthly sales category of poultry products among the participants involved in the study. The findings in Figure 4.7 established that 44% of the respondents sold between Ksh. 20,001 to 50,000, 39% sold between Ksh. 50,001 to 100,000, 14% sold between Ksh. 10,001 to 20,000 and 3% sold between Ksh. 5,001 to Ksh. 10,000. This indicates that the majority of the respondents had sold between Ksh. 20,001 to Ksh. 50,000.
4.2.8 Market Segment for Poultry Products

The study intended to determine the type of the market segment for poultry products among the respondents involved in the study. The findings in Figure 4.8 established that 49% of the respondents sold their poultry products to individuals, 32% sold to households, 11% were sold to hotels and 8% were sold for the export market. This indicates that the majority of the respondents sold their poultry products to individuals.

![Market Segment for Poultry Products](image)

Figure 4.8: Market Segment for Poultry Products

4.2.9 Type of Poultry Farming Products Sold

The study intended to establish the type of poultry farming products sold among the respondents involved in the study. The findings in Figure 4.9 established that 42% of the respondents sold eggs, 40% claimed to sell meat, 16% sold food grains and 2% sold egg powder. The findings show that the majority of the respondents agreed that they sold egg products.
4.3 Co-operative Influence on Farmer’s Adoption of Innovation

The section aimed to examine the roles of your cooperative society in promoting new methods in poultry farming among those who were involved in the study. The majority of participants established that the main driver of innovation was cooperative promotes new techniques in regards to the farmers’ produce at a mean of 4.46 as shown in Table 4.2. This was followed by cooperatives providing affordable farming inputs at a mean of 4.35. Third, the Cooperative supports poultry farmers with farm inputs at a mean of 4.28. Fourth, the study established that co-operatives provide the much-needed healthcare for poultry at a mean of 4.23 and fifth, the respondents acquired new skills through the cooperatives to enhance their contribution to the farm produce at a mean of 4.18.

On the other hand, few respondents agreed that they achieve excellent financial results with the help of cooperative society at a mean of 3.52. A small number of the respondents agreed that the cooperatives have introduced new products and processes at a mean of 3.37. Fewer respondents agreed that they rely heavily on cooperative information in making farming decisions at a mean of 2.67 and a small number of the respondents agreed that the technological advancements are easily available in the poultry farming at a mean of 2.15.
### Table 4.2: Co-operative Influence on Farmer’s Adoption of Innovation

<table>
<thead>
<tr>
<th>Co-operative Influence on Farmer’s Adoption of Innovation</th>
<th>Mean</th>
<th>Rankings</th>
</tr>
</thead>
<tbody>
<tr>
<td>I achieve excellent financial results with the help of my society.</td>
<td>3.52</td>
<td>11</td>
</tr>
<tr>
<td>We are encouraged to accept new ways of raising poultry by the society.</td>
<td>4.14</td>
<td>6</td>
</tr>
<tr>
<td>Poultry farmers are rewarded for the new ways of farming poultry.</td>
<td>3.71</td>
<td>9</td>
</tr>
<tr>
<td>I rely heavily on cooperative information in making my farming decisions.</td>
<td>2.67</td>
<td>13</td>
</tr>
<tr>
<td>Cooperatives provide affordable farming inputs.</td>
<td>4.35</td>
<td>2</td>
</tr>
<tr>
<td>Co-operatives provide the much-needed health care for our poultry.</td>
<td>4.23</td>
<td>4</td>
</tr>
<tr>
<td>New skills acquired by the cooperative members enhance our contribution to the farm produce.</td>
<td>4.18</td>
<td>5</td>
</tr>
<tr>
<td>Cooperatives have introduced new products and processes.</td>
<td>3.37</td>
<td>12</td>
</tr>
<tr>
<td>I need to see other people use something new before I will consider it</td>
<td>4.05</td>
<td>7</td>
</tr>
<tr>
<td>I often find myself skeptical of new ideas</td>
<td>3.61</td>
<td>10</td>
</tr>
<tr>
<td>Technological advancements are easily available in the poultry farming.</td>
<td>2.15</td>
<td>14</td>
</tr>
<tr>
<td>Cooperative promotes new techniques in regards to the farmers’ produce.</td>
<td>4.46</td>
<td>1</td>
</tr>
<tr>
<td>Cooperatives play an important role in empowering farmers to adopt new farming techniques.</td>
<td>3.74</td>
<td>8</td>
</tr>
<tr>
<td>Cooperative supports us with farm inputs.</td>
<td>4.28</td>
<td>3</td>
</tr>
</tbody>
</table>

#### 4.3.1 Correlation between Innovation and Cooperatives

This section intended to measure the correlation between innovation and the farmers being members of cooperatives. The findings in Table 4.3 suggested that there was a strong correlation between innovation and the achievement of excellent financial results with the help of the society at \((r=0.184, \ p>.01)\). The relationship was extended to farmers being encouraged to accept new ways of raising poultry by the society at \((r=0.298, \ p>.01)\). The relationship was also a significant relationship between innovation and the poultry farmers are rewarded for the new ways of farming poultry at \((r=0.237, \ p>0.01)\), cooperatives provide the much-needed health care for the poultry at \((r=0.235, \ p>.01)\), new skills acquired by the cooperative members enhance contribution to the farm produce at \((r=0.265, \ p>0.01)\), cooperatives introducing new products and processes at \((r=0.227, \ p>0.01)\), cooperative promotes new techniques in regards to the farmers’ produce \((r=0.215, \ p>0.01)\) and cooperative supports farmers with farm inputs \((r=0.233, \ p>0.01)\) to be innovative.
Table 4.3: Correlation between Innovation and Cooperatives

<table>
<thead>
<tr>
<th>Type of Innovation</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>I achieve excellent financial results with the help of my society.</td>
<td>.184**</td>
<td>.006</td>
<td>219</td>
</tr>
<tr>
<td>We are encouraged to accept new ways of raising poultry by the society.</td>
<td>.298**</td>
<td>.000</td>
<td>217</td>
</tr>
<tr>
<td>Poultry farmers are rewarded for the new ways of farming poultry.</td>
<td>.237**</td>
<td>.000</td>
<td>219</td>
</tr>
<tr>
<td>Co-operatives provide the much-needed health care for our poultry.</td>
<td>.235**</td>
<td>.000</td>
<td>219</td>
</tr>
<tr>
<td>New skills acquired by the cooperative members enhance our contribution to the farm produce.</td>
<td>.265**</td>
<td>.000</td>
<td>219</td>
</tr>
<tr>
<td>Cooperatives have introduced new products and processes.</td>
<td>.227**</td>
<td>.001</td>
<td>211</td>
</tr>
<tr>
<td>Cooperative promotes new techniques in regards to the farmers’ produce.</td>
<td>.215**</td>
<td>.001</td>
<td>217</td>
</tr>
<tr>
<td>Cooperative supports us with farm inputs.</td>
<td>.233**</td>
<td>.001</td>
<td>212</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed)
**Correlation is significant at the 0.05 level (2-tailed)

4.4 Influence of Social Factors on Farmer’s Adoption of Innovation

The section aimed to identify the social factors that influence the adoption of new farming techniques among the respondents who were involved in the study. The study identified the main social factor that hindered innovation was the lack of the required education to produce eggs using new farming techniques at a mean of 4.57. This was followed by social networking that enhanced innovation through the internet that has introduced new ideas to improve farming techniques at a mean of 4.14. Third, the participant claimed that they were innovative when they saw other people use something new before they would consider using new farming techniques at a mean of 4.00. Fourth, the study established that the respondents were innovative because they were inventive at a mean of 3.89 and fifth, the respondents adopted innovation because they were well trained to run their poultry business at a mean of 3.81.
On the other hand, few respondents agreed that education increases the understanding of the potential benefits of new technological innovation at a mean of 3.37. A small number of the respondents agreed that passing my bird onto the children for meat is important compared to adopting new technologies at mean of 3.34. Fewer respondents agreed that compared to colleagues, they have a profitable layer business as a result of introducing new farming techniques at a mean of 3.03. A very small number of the respondents agreed that they are prone to see others try new techniques and then make a decision new farming techniques when they are successful at a mean of 2.67 and very few respondents agreed that culture was an important influence in the way that they do farming at a mean of 2.64 as shown in Table 4.4.

### Table 4.4: Influence of Social Factors on Farmer’s Adoption of Innovation

<table>
<thead>
<tr>
<th>Social Factors and Adoption of Innovation</th>
<th>Mean</th>
<th>Rankings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social networking through the internet has introduced new ideas to improve my farming.</td>
<td>4.14</td>
<td>2</td>
</tr>
<tr>
<td>Poultry farmers do not have the knowledge required to produce enough eggs using new farming techniques.</td>
<td>3.72</td>
<td>6</td>
</tr>
<tr>
<td>Poultry farmers lack the required education to produce eggs using new farming techniques.</td>
<td>4.57</td>
<td>1</td>
</tr>
<tr>
<td>Compared to colleagues, I have a profitable layer business as a result of introducing new farming techniques.</td>
<td>3.03</td>
<td>10</td>
</tr>
<tr>
<td>Compared to colleagues, I achieve good financial results with layers as a result of introducing new farming techniques.</td>
<td>3.68</td>
<td>7</td>
</tr>
<tr>
<td>I am an inventive kind of person</td>
<td>3.89</td>
<td>4</td>
</tr>
<tr>
<td>I need to see other people use something new before I will consider it</td>
<td>4.00</td>
<td>3</td>
</tr>
<tr>
<td>I have well trained personnel to run our poultry business.</td>
<td>3.81</td>
<td>5</td>
</tr>
<tr>
<td>My culture is an important influencer in the way that I do my farming.</td>
<td>2.64</td>
<td>12</td>
</tr>
<tr>
<td>Education increases my ability to understand the potential benefits of new technologies.</td>
<td>3.37</td>
<td>8</td>
</tr>
<tr>
<td>Passing my bird onto my children is important for me.</td>
<td>3.34</td>
<td>9</td>
</tr>
<tr>
<td>I am prone to see others try then making a decision about my farm when they are successful.</td>
<td>2.67</td>
<td>11</td>
</tr>
</tbody>
</table>

#### 4.4.1 Correlation between Type of Innovation and Social Factors

The study measured the correlation between the farmer’s adoption of innovation and the influence of the social factors. The findings in Table 4.5 suggested that there was a strong correlation between innovation and Social networking through the internet has introduced new ideas to improve farming at (r=.294, p>.01). The relationship was extended to
poultry farmers that do not have the knowledge required to produce enough eggs using new farming techniques at \((r=0.347, p>0.01)\). The relationship was also a significant relationship between innovation and compared to colleagues, they have a profitable layer business as a result of introducing new farming techniques at \((r=0.366, p>0.01)\). Compared to colleagues, I achieve good financial results with layers as a result of introducing new farming techniques at \((r=0.252, p>0.01)\) and farmers being prone to see others try then making a decision about their farming when they are successful \((r=0.226, p>0.01)\) to be innovative.

### Table 4.5: Correlation between Innovation and Social Factors

<table>
<thead>
<tr>
<th>Social networking through the internet has introduced new ideas to improve my farming.</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.294**</td>
<td>.000</td>
<td>217</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poultry farmers do not have the knowledge required to produce enough eggs using new farming techniques.</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-.347**</td>
<td>.000</td>
<td>217</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compared to colleagues, I have a profitable layer business as a result of introducing new farming techniques.</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.366**</td>
<td>.000</td>
<td>217</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compared to colleagues, I achieve good financial results with layers as a result of introducing new farming techniques.</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.252**</td>
<td>.000</td>
<td>215</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I am prone to see others try then making a decision about my farm when they are successful.</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.226**</td>
<td>.001</td>
<td>217</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed)**

**Correlation is significant at the 0.05 level (2-tailed)**

### 4.5 Influence of Economic Factors on Farmer’s Adoption of Innovation

The section aimed to identify the main economic factors that influence the adoption of new farming techniques by poultry farmers among those who were involved in the study. The study identified the economic factor that drove innovation was the acquisition of a good income from the layer business to try new farming techniques at a mean of 4.65. Second, majority of the respondents agreed that their innovation was hindered when they had poor financial skills to expand their facilities at a mean of 4.63. Third, the respondents agreed that they relied heavily on market information in making marketing decisions at a mean of 4.39. Fourth, the existing income was insufficient to pursue new
farming techniques at a mean of 4.18 and fifth, poultry farmers producing eggs used new techniques to achieve good financial results at a mean of 4.17. The least economic driver of innovation was the participants using financial information in decision making about poultry farming at a mean of 3.96. A small number of the respondents agreed that keeping hens from diseases was very expensive using the new technique at a mean of 3.98. A few number of the respondents agreed that poultry farmers producing eggs using new techniques receive a high profit margin at a mean of 4.00 and a small number of the respondents agreed that new techniques provide an attractive bonus on chicken and egg products at a mean of 4.6.

**Table 4.6: Influence of Economic Factors on Farmer’s Adoption of Innovation**

<table>
<thead>
<tr>
<th>Economic Factors and Adoption of Innovation</th>
<th>Mean</th>
<th>Rankings</th>
</tr>
</thead>
<tbody>
<tr>
<td>My existing income is insufficient to pursue new farming techniques.</td>
<td>4.18</td>
<td>4</td>
</tr>
<tr>
<td>I have adequate capital for expansion.</td>
<td>2.44</td>
<td>12</td>
</tr>
<tr>
<td>Poultry farmers producing eggs using new techniques achieve good financial results</td>
<td>4.17</td>
<td>5</td>
</tr>
<tr>
<td>Poultry farmers producing eggs using new techniques receive a high profit margin</td>
<td>4.00</td>
<td>9</td>
</tr>
<tr>
<td>New techniques provide an attractive bonus on chicken and egg products.</td>
<td>4.10</td>
<td>8</td>
</tr>
<tr>
<td>Keeping hens from diseases is very expensive using the new technique.</td>
<td>3.98</td>
<td>10</td>
</tr>
<tr>
<td>I acquire a good income from my layer business for me to try new techniques in farming</td>
<td>4.65</td>
<td>1</td>
</tr>
<tr>
<td>It would be difficult for me to introduce ways of doing things without losing some income</td>
<td>4.11</td>
<td>7</td>
</tr>
<tr>
<td>Poultry farmers looking forward to expand their facilities have poor financial skills</td>
<td>4.63</td>
<td>2</td>
</tr>
<tr>
<td>Growth of the chicken industry, results to new ways of doing things.</td>
<td>4.12</td>
<td>6</td>
</tr>
<tr>
<td>I rely heavily on market information in making my marketing decisions.</td>
<td>4.39</td>
<td>3</td>
</tr>
<tr>
<td>I use financial information in decision making about my poultry farm.</td>
<td>3.96</td>
<td>11</td>
</tr>
</tbody>
</table>

4.5.1 Correlation between Type of Innovation and Economic Factors

This section intended to measure the correlation between innovation and the influence of economic factors in adoption of technology. The findings in Table 4.7 suggested that there was a strong correlation between innovation and existing income is insufficient to pursue new farming techniques at \((r=.186, \ p>.01)\). The relationship was extended to
poultry farmers producing eggs using new techniques receive a high profit margin at 
\((r=.256, p>.01)\). The relationship was also a significant relationship between innovation 
and acquisition of a good income from the layer business for farmers to try new 
techniques in farming at \((r=.296, p>0.01)\), growth of the chicken industry, results to new 
ways of doing things at \((r=.199, p>.01)\) and farmers relying heavily on market 
information in making marketing decisions. \((r=.175, p>0.01)\) to be innovative.

Table 4.7: Correlation between Innovation and Economic Factors

<table>
<thead>
<tr>
<th>Type of Innovation</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>My existing income is insufficient to pursue new farming techniques.</td>
<td>-.186**</td>
<td>.007</td>
<td>213</td>
</tr>
<tr>
<td>Poultry farmers producing eggs using new techniques receive a high profit margin</td>
<td>.256**</td>
<td>.000</td>
<td>218</td>
</tr>
<tr>
<td>I acquire a good income from my layer business for me to try new techniques in farming</td>
<td>.296**</td>
<td>.000</td>
<td>218</td>
</tr>
<tr>
<td>Growth of the chicken industry, results to new ways of doing things.</td>
<td>.199**</td>
<td>.004</td>
<td>211</td>
</tr>
<tr>
<td>I rely heavily on market information in making my marketing decisions.</td>
<td>.175**</td>
<td>.010</td>
<td>218</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed)**

**Correlation is significant at the 0.05 level (2-tailed)**

4.6 Influence of Political Factors on Farmer’s Adoption of Innovation

The section aimed to identify the main political factors that influence the adoption of new 
farming techniques by poultry farmers among those who were involved in the study. The 
study identified the political factor that drove innovation was keeping hens using new 
farming techniques to fulfill all legal requirements at a mean of 4.25. This was followed 
by changes in legislation as well as competition as obstacle to the growth of poultry 
business at a mean of 4.19. Third, the participant claimed that there were high taxes that 
made it difficult for conducting poultry business at a mean of 4.17. Fourth, the study 
established that it if poultry farmers had access to credit through the help of the 
government they would adopt innovation at a mean of 4.12 and fifth, the respondents 
indicated that the government policies made it difficult to compete with foreign eggs and 
chickens at a mean of 3.96.
On the other hand, few respondents agreed that the procurement of good quality raw ingredients was the biggest problem in the poultry industry at a mean of 3.82. A small number of the respondents agreed that they have good marketing opportunities for poultry products, especially in export at a mean of 3.87. Fewer respondents agreed that the roads infrastructure is not well maintained by the government at a mean of 3.90 and a very small number of the respondents agreed that the government has created an enabling environment to engage in poultry farming at a mean of 3.93. The findings are presented in Table 4.8.

Table 4.8: Influence of Political Factors on Farmer’s Adoption of Innovation

<table>
<thead>
<tr>
<th>Political Factors and Adoption of Innovation</th>
<th>Mean</th>
<th>Rankings</th>
</tr>
</thead>
<tbody>
<tr>
<td>The government has created an enabling environment to engage in poultry farming.</td>
<td>3.93</td>
<td>7</td>
</tr>
<tr>
<td>Keeping hens using new farming techniques fulfils all legal requirements.</td>
<td>4.25</td>
<td>1</td>
</tr>
<tr>
<td>The policies we have make it difficult to compete with foreign eggs and chickens.</td>
<td>3.96</td>
<td>5</td>
</tr>
<tr>
<td>Procurement of good quality raw ingredients is the biggest problem in the poultry industry.</td>
<td>3.82</td>
<td>10</td>
</tr>
<tr>
<td>If farmer has access to credit</td>
<td>4.12</td>
<td>4</td>
</tr>
<tr>
<td>We have good marketing opportunities for our poultry products, especially in export.</td>
<td>3.87</td>
<td>9</td>
</tr>
<tr>
<td>Government support leads to the success of our poultry business.</td>
<td>3.94</td>
<td>6</td>
</tr>
<tr>
<td>Roads infrastructure is not well maintained by the government.</td>
<td>3.90</td>
<td>8</td>
</tr>
<tr>
<td>Changes in legislation as well as competition are obstacle to the growth of our poultry business.</td>
<td>4.19</td>
<td>2</td>
</tr>
<tr>
<td>High taxes are the difficulties that we face in our poultry business.</td>
<td>4.17</td>
<td>3</td>
</tr>
</tbody>
</table>

4.6.1 Correlation between Innovation and Political Factors

This section intended to measure the correlation between innovation and the influence of political factors in adoption of technology. The findings in Table 4.9 suggested that there was a strong correlation between innovation and the roads infrastructure is not well maintained by the government at \( r = .333, p > .01 \) and the relationship was extended to poultry farmers experiencing high taxes which presented difficulties in the poultry business \( r = .403, p > .01 \) for poultry farmers to be innovative.
Table 4.9: Correlation between Innovation and Political Factors

<table>
<thead>
<tr>
<th>Type of Innovation</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads infrastructure is not well maintained by the government.</td>
<td>-.333**</td>
<td>.000</td>
<td>216</td>
</tr>
<tr>
<td>Changes in legislation as well as competition are obstacle to the growth of our poultry business.</td>
<td>-.084</td>
<td>.220</td>
<td>213</td>
</tr>
<tr>
<td>High taxes are the difficulties that we face in our poultry business.</td>
<td>-.403**</td>
<td>.000</td>
<td>215</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed)
**Correlation is significant at the 0.05 level (2-tailed)

4.7 Chapter Summary

The findings revealed that co-operatives are able to engage members in different ways to explore and design improved methods of poultry farming. On the social factors, the findings established that low education levels also limit the farmers’ capacity to access and use existing information and knowledge about agriculture. On the economic factors, the findings revealed that a good income is a source of diffusion and adoption of new innovation. On the political factors, the findings revealed that the government policies made it difficult to compete with foreign eggs and chickens. High taxes make it difficult for conducting poultry business. The next chapter is on the discussion, conclusion and recommendation of the study.
CHAPTER FIVE

5.0 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction
This segment outlined the summary of the findings by specifying the specific research objectives. The main objective of the study is outlined as well as the specific objectives, the research methodology has been provided, a summary of each research objectives outlined as well, the study delves into the discussion of the study, the conclusion of the study were based on the discussion and recommendations made on each specific objective. The chapter ends with recommendations for improvement.

5.2 Summary
The main objective of this study was to investigate Roger’s diffusion of innovation and the factors that influence the farmers’ adoption of poultry farming innovations in Kwale, Kenya. The specific objectives was as follows: To establish how cooperatives influence the farmers’ adoption of poultry farming innovations, to establish how the economic factors influence the farmers’ adoption of poultry farming innovations, to examine how the social factors influence the farmers’ adoption of poultry farming innovations and to identify how the political factors influence the farmers’ adoption of poultry farming innovations.

The research design used was descriptive in nature. The target population in this study was 3,200 indigenous poultry farmers and the sample was 346 farmers who were randomly sampled. The data collection technique that was employed for the research included the use of a survey method in the form of questionnaires and focussed group interviews. A few questionnaires were administered to five respondents with the aim of achieving objectivity and clarity of the questionnaires. Descriptive analysis such as frequency distribution was used to measure the respondents’ demographic information and the means measured the weights of the independent variables (such as cooperative, economic, social and political factors). Inferential statistics was used on the relationship between the dependent (such as adoption of Poultry farming innovation) and the independent variables (such as cooperative, economic, social and political factors).
The findings revealed that co-operatives are able to engage members in different ways to explore and design improved methods of poultry farming. Cooperative societies provide the inputs, expertise, and services needed for poultry production and the markets for the produce. The results indicated that the cooperatives provide affordable farming inputs. Cooperative societies are the key actor involved in providing innovation in the poultry industry. Many cooperative have adopted new ways of doing business in response to existing market opportunities and threats to the operating environment of agribusiness firms. The role of cooperative societies is significant in fostering a strong link for an active innovative system.

On the social factors, the findings established that low education levels also limit the farmers’ capacity to access and use existing information and knowledge about agriculture. Social networks encourage the development of innovation and creative ideas for new products. Social networks can create an effective drive to innovation diffusion. Other people influence other decision-making process through spreading positive word of mouth. Without proper entrepreneurial education and management skills, farmers may only learn the practical aspect of properly taking good care of the poultry. Increased profitability is an incentive for adoption. Diffusion of innovation exists in cultures but very few respondents agreed that culture was an important influence in the way that they do farming.

On the economic factors, the findings revealed that a good income is a source of diffusion and adoption of new innovation. The lack of sufficient income is a limiting factor among poultry farmers to adopt new innovation. The farmers also lacked adequate capital for expansion and adoption of new farming techniques. The availability of market information is crucial for innovation of poultry farmers. The least economic driver of innovation was financial information in decision making about poultry farming. This is due to the inability to interpret the statistical data. Failed initiatives among farmers are usually due to high innovation costs which can be offset by future profits if the innovation is sustainable.

On the political factors, the findings revealed that the government policies made it difficult to compete with foreign eggs and chickens. High taxes make it difficult for
conducting poultry business. The public sector plays an important role in establishing an enabling environment. The lack of access to an enabling environment hampers vital factors of production, including inputs for farmers or technology for the processing industry. The lack of effective enforcement or implementation of standards and certification systems or other supportive governmental policies hinders poultry farming business efforts to compete in export markets with higher profit margins.

5.3 Discussion

5.3.1 Co-operative Influence on Farmer’s Adoption of Innovation

The co-operatives are able to engage members in different ways to explore and design improved methods of poultry farming. The majority of participants established that that the main driver of innovation was cooperative promotes new techniques in regards to the farmers’ produce. Cooperative societies provide the inputs, expertise, and services needed for poultry production and the markets for the produce. The results indicated that the cooperatives provide affordable farming inputs. The price of poultry inputs are a major expense for small scale farmers. Improving input supply is more than introducing new feeds and shelter for poultry; it includes innovative ways to incorporate input supply into the value chain and make the chain itself more competitive (Cardoso de Sousa, 2012). Also, the results revealed that the cooperative support poultry farmers with farm inputs. Similarly, Enweze (2015), farm inputs provide entrepreneurial opportunities for poultry farmers in rural and urban areas though the establishment of market links and diffusion of innovation. OECD (2007) also argues that cooperative societies are the key actors involved in providing innovation in the poultry industry. Linking small farmers to input suppliers is mutually beneficial because the small-scale producer gains access to improved inputs and the input supplier enjoys greater business through a new role and farming techniques (Nwakwo, Peters and Bolkemann, 2009).

Cooperative societies engaged in in-house R & D in collaboration with other research institution to develop improved feed and health for poultry. The findings established that the co-operatives provided the much-needed health care for poultry. Cooperative societies often fill the vacuum in delivering essential services to its members (Enweze, 2015). In addition, the farmers acquire new skills through the cooperatives to enhance their contribution to the farm produce. Similarly, Royer (2014) explains that cooperatives have
improved the education, business knowledge, and skills of small scale poultry farmers. In addition, Cardoso de Sousa (2012) suggests that many cooperative have adopted new ways of doing business in response to existing market opportunities and threats to the operating environment of agribusiness firms. To achieve excellent financial results by introducing new products and processes, cooperatives provide farmers with new in regards to farming decisions. Langyintuo and Mungoma (2008) explain that cooperatives incorporate major agents of innovation by tapping global knowledge and assimilate to local needs so as to create new technology and products.

A small number of the respondents agreed that the technological advancements are easily available in the poultry farming. This is contrast to Bello (2010) argument that cooperatives borrow valuable ideas from new organizations and partnerships, processes, products, and marketing in different places to boost productivity of its members. The role of cooperative societies is significant in promoting innovations in agriculture that also requires coordinated support to agricultural research, extension, and education, while fostering innovation partnerships and links along and beyond agricultural value chains, and enabling agricultural development. This fosters a strong link for an active innovative system. The lack of sufficient market information poses a great challenge to the innovation of small poultry farmers (Orodho, 2015). Despite the vast amount of trade related information available and the possibility of accessing national and international database, many poultry farmers continue to rely on private or even physical contacts for market related information.

5.3.2 Influence of Social Factors on Farmer’s Adoption of Innovation

Poultry farmers may have entrepreneurial skills but without knowledge and technology, they may resort to traditional way of poultry farming which is costly. The results indicated that the main social factor that hindered innovation was the lack of the required education to produce eggs using new farming techniques. Similarly, Tanui, Feng, Li, Wang and Kipsat (2014) argues that low education levels also limit the farmers’ capacity to access and use existing information and knowledge about agriculture. Use of information and communication technology (ICT) is severely curtailed by low levels of education. Also, the low level of education also inhibits compliance with the Global Gap
requirements for export products, including requirements to new farming methods to improve poultry farm produce.

Communicability is crucial to the innovation adoption process, as it incorporates the role of word-of-mouth through both lead users and opinion leaders, along with other interpersonal networks. The results revealed that social networking enhanced innovation through the internet that has introduced new ideas to improve farming techniques. Social networks are communities where people come together around a common goal and share common interest using internet channels like email, chat rooms or internet user group (Williams and Cothrel, 2000). Online communities’ participants exchange information, knowledge and reviews around service, product or a common interest. Social networks create a new medium where like-minded strangers come together regardless of their physical location and not constrained by time. Through virtual communities people have the chance to share experience and learn from each others, meeting their social and commercial needs (Patterson, Mugera and Burton, 2015). Social networks encourage the development of innovation and creative ideas for new products. Social networks can create an effective drive to innovation diffusion (Orodho, 2015).

Other people influence other decision-making process through spreading positive word of mouth. The findings established that the participants were innovative when they saw other people use something new before they would consider using new farming techniques. Early innovation adopters have greater access to creative ideas as compared to the followers (Dearing, 2009). Followers are normal consumers who do not buy the products until other consumers try them. Finally, Champions are characterized by both lead users’ and opinion leaders’ characteristics. These are very important consumers to target as they both help in the design and modification processes to ensure innovation acceptance; and at the same time they are willing to spread positive word-of-mouth to help in innovation diffusion among followers (Patterson, Mugera and Burton, 2015). Inventors also are lead users characterized by a high level of innovation and willingness to contribute ideas for new product development. The results indicated that the respondents were innovative because they were inventive at a mean of 3.89. Inventors try new innovations and are willing to spread word-of-mouth to convince other consumers to try them (Portsmouth, 2013). Lead users could act as opinion leaders and hence spread positive word of mouth about the product, which will positively affect the rate of
diffusion (Franke et al., 2006). This is possible if these lead users possess social influence capabilities. Poultry farmers should utilize lead users and opinion leaders effectively in different cultures, depending on the urgency of the situation.

Without proper entrepreneurial education and management skills, farmers may only learn the practical aspect of properly taking good care of the poultry (Poole and Donovan, 2014). The results revealed that the respondents adopted innovation because they were well trained to run their poultry business. With proper bookkeeping, activity log books, budget and cost management, farmers can have an easy time in assessing innovation in their farms (Reij, 2015). Seminars and on-the-job training aim at identifying and developing both their managerial and entrepreneurial capabilities, which in turn will help sharpen their decision making skills concerning their operations and help them come out with innovative ways that will help them further expand their operations and positively affect their performance (Chand, 2013). Low education levels also limit the farmers’ capacity to access and use existing information and knowledge about agriculture. The findings established that few respondents agreed that education increases the understanding of the potential benefits of new technological innovation. Similarly, Royer (2014) argue that education is the key to the adoption of poultry innovation.

Increased profitability is an incentive for adoption. However, the findings established that fewer respondents agreed that compared to colleagues, they have a profitable layer business as a result of introducing new farming techniques. Several studies find that increased profitability is an incentive for adoption (Contant and Korshing, 2013; Fuglie and Kascak, 2014; Griliches, Sturm and Smith, 2015). Relative advantage can also take the form of incentive payments and subsidies, which encourage adoption of conservation agricultural practices (Cooper and Keim, 2015). However, profitability and payments ultimately contribute to utility. Other costs and benefits, such as the presence of externalities and the social costs and benefits associated with them, personal satisfaction, convenience, environmental quality and discomfort are other factors that affect a person’s utility and have been found to affect the adoption decision (Nowak and Rogers, 2012).

Diffusion of innovation exists in cultures. The results indicated that very few respondents agreed that culture was an important influence in the way that they do farming. Soh and Sia (2004) suggest that the adoption of IT products is not fully understood; partially because of the lack of fit between technology and culture. It is claimed that the value
system of the individual is critical to innovation adoption (Daghfous, 1999). Accordingly, it is argued that Innovation Acceptance at the early stage of the innovation is fostered in collectivist societies, where in-groups are influential. On the other hand, Innovation Diffusion is influenced by the various out-groups in individualist societies (Dwyer et al., 2005).

5.3.3 Influence of Economic Factors on Farmer’s Adoption of Innovation

A good income is a source of diffusion and adoption of new innovation. The findings established that the economic factor that drove innovation was the acquisition of a good income from the layer business to try new farming techniques. The potential for a good income is a major driver for farmers to adopt new technology (Reij, 2015). But the results revealed that the existing income was insufficient to pursue new farming techniques. The lack of sufficient income is a limiting factor among poultry farmers to adopt new innovation. The lack of sustainable income is also not an attractive proposition for formal financial institutions because the farmers cannot meet the minimum requirements and are perceived as high risk borrowers (Onumah, 2013). Similarly, Adegbite (2009), citing Ezike (1984), Nweke and Onyia (2001) and Kodieche (2002) stated that financial lending Institutions often shy away from giving loans to farmers because of the high cost of administering such loans and the perceived high default rates among farmers. Ghosh et al. (2000), believe that it is largely because poorer farmers lack sufficient assets to put up as collateral, a usual prerequisite for borrowing from banks.

The farmers also lacked adequate capital for expansion and adoption of new farming techniques. This exposes poultry farmers to unfavorable terms or faces the exploitation of commercial banks, which charge unrealistic interest rates for genuine business. For instance, some poultry factories have either closed or are under receivership because of the failure to pay back loans obtained from commercial banks. Lack of credit facilities has discouraged innovation in the poultry industry (Poole and Donovan, 2014). This situation is complicated by structural adjustment policies that make inputs too expensive for resource-poor farmers. Microfinance institutions (MFIs) have proliferated to provide credit facilities to small and medium-size poultry enterprises, but their conditions, interest rates, and repayment schedules are not favorable to agricultural-related businesses whose markets are not reliable (Reij and Waters-Bayer, 2011). There is need for a reliable source
of favorable credit to agribusinesses to enable the flow of income in the value chain that extends to the producers who happen to be among the poorest workers in the population.

The results revealed that the majority of the respondents agreed that their innovation was hindered when they had poor financial skills to expand their facilities. Similarly, Portsmouth (2013) argues that in present times, being a talented farmer is not enough to help grow one’s farm and increase profitability but also being a good financial manager helps to increase one’s success of operating a farm profitably. In order to be a good financial manager, a farmer has to keep records of activities which are undertaken at the farm daily. This helps to track the growth of the farm through accessing and analyzing these activities, measuring their impact and concluding if some practices are good or not (Patterson, Mugera and Burton, 2015).

The lack of sufficient market information poses a great challenge to small scale farmers. The findings established that the respondents agreed that they relied heavily on market information in making marketing decisions. Reij (2015) explains that despite the vast amount of trade related information available and the possibility of accessing national and international database, many small scale poultry farmers continue to rely heavily on private or even physical contacts for market related information (Reij, 2015). But the results revealed that the least economic driver of innovation was the participants using financial information in decision making about poultry farming. This is due to the inability to interpret the statistical data and poor connectivity especially in rural areas. Since there is vast amount of information and only lack of statistical knowledge to interpret and internet connectivity, small enterprises entrepreneurs need to be supported (Muteti, 2005).

The findings established that the poultry farmers producing eggs used new techniques to achieve good financial results. The results also revealed that a few number of the respondents agreed that poultry farmers producing eggs using new techniques receive a high profit margin. In this case, sufficient profit margins are critical for the development of innovation. Failed initiatives among farmers are usually due to high innovation costs, insufficient infrastructure, long distances, and medium-term climate change effects which can be offset by future profits if the innovation is sustainable (Patterson, Mugera and Burton, 2015). Similarly, sufficient profit margins in export and regional markets are
drivers for innovation by poultry farmers. Export markets and regional markets with higher profit margins are sufficient drivers for the private sector, especially on the processing scale, to assume a major coordination role (Royer, 2014). But, the findings established that a small number of the respondents agreed that new techniques provide an attractive bonus on chicken and egg products.

5.3.4 Influence of Political Factors on Farmer’s Adoption of Innovation

The government needs to build institutional capacity to provide a functioning enabling environment for poultry farming innovation. The results identified that political factor that drove innovation was keeping hens using new farming techniques to fulfill all legal requirements. The results also revealed that the changes in legislation as well as competition were obstacle to the growth of poultry business. However, different actors in the innovation system rarely benefit (Royer, 2014). The findings also established that the government policies made it difficult to compete with foreign eggs and chickens. The lack of effective enforcement or implementation of standards and certification systems or other supportive governmental policies hinders poultry farming business efforts to compete in export markets with higher profit margins (Sidibe, 2015). In the absence of effective state implementation capacity, poultry business establishes its own enabling environment. The government should strive to close those gaps, and, in the event of scarce resources, legitimize and support private sector institutions for quality management and regulations enforcement (Orodho, 2015).

One element to innovation of poultry industry is the tax regime. The findings established that the participant claimed that there were high taxes that made it difficult for conducting poultry business. Tax policies are not always aligned with broader growth strategies in the poultry industry and agricultural sector as a whole. Tax policies may be pivotal to the incubation phase of poultry businesses (Patterson, Mugera and Burton, 2015). Poultry companies face significant barriers to entry as they are taxed before production and receive fewer investment incentives, including tax holidays, foreign exchange retention, and access to utilities, than international companies (Essegbey, 2009). In some cases, small scale poultry farmers sell their products below market prices leading to lower profit margins which are a clear disincentive to poultry production. When devising tax increases, governments must consider the actual profits made by poultry companies and
inflation, so that tax policies do not impede competitiveness and innovation as it is the case (Portsmouth, 2013).

The results revealed that poultry farmers had access to credit through the help of the government they would adopt innovation. For the poultry business, limited access to finance is the most common barriers to innovation (Royer, 2014). Innovative financial services provision in Kenya’s poultry industry lags behind innovation in other service areas. High risks, the uncertainty of collateral, and high transaction costs for small scale poultry farmers or community-based processors have limited the extension of financial services into rural areas (Biggs and Matsaert, 2014). Another important aspect of the establishment of an enabling environment is that the private and public sectors need to provide more access to finance for poultry business.

Infrastructure put a premium on organizational innovation for poultry business. The findings established that fewer respondents agreed that the roads infrastructure is not well maintained by the government. Spielman, Ekboir, Davis and Ochieng (2015) also argues that the governments must focus on investment in infrastructure, with some investments sector specific and others geared toward the whole economy. Economists identify poor transport facilities as a particular problem, especially poor quality and low density road networks (Portsmouth, 2013). Investment in improved feeder roads is critical for improving farmers’ access to markets and reducing trader and farmer marketing costs. Access to power and water is also difficult, and public investment in utilities is not adequate (Spielman, Ekboir, Davis and Ochieng, 2015).

The public sector plays an important role in establishing an enabling environment. The results revealed that a very small number of the respondents agreed that the government has created an enabling environment to engage in poultry farming. The lack of access to an enabling environment hampers vital factors of production, including inputs for farmers or technology for the processing industry (Biggs and Matsaert, 2014). The government needs to build institutional capacity to provide a functioning enabling environment for poultry farming innovation (Royer, 2014). The lack of effective enforcement or implementation of standards and certification systems or other supportive governmental policies hinders poultry farming business efforts to compete in export markets with higher profit margins (Sidibe, 2015). In the absence of effective state implementation capacity,
poultry business establishes its own enabling environment. The government should strive to close those gaps, and, in the event of scarce resources, legitimize and support private sector institutions for quality management and regulations enforcement (Orodho, 2015).

5.4 Conclusion

5.4.1 Co-operative Influence on Farmer’s Adoption of Innovation

The co-operatives are able to engage members in different ways to explore and design improved methods of poultry farming. Cooperative societies provide the inputs, expertise, and services needed for poultry production and the markets for the produce. The results indicated that the cooperatives provide affordable farming inputs. Cooperative societies are the key actor involved in providing innovation in the poultry industry. Cooperative societies engaged in in-house R & D in collaboration with other research institution to develop improved feed and health for poultry. Farmers acquire new skills through the cooperatives to enhance their contribution to the farm produce. Many cooperative have adopted new ways of doing business in response to existing market opportunities and threats to the operating environment of agribusiness firms. The role of cooperative societies is significant in fostering a strong link for an active innovative system.

5.4.2 Influence of Social Factors on Farmer’s Adoption of Innovation

Low education levels also limit the farmers’ capacity to access and use existing information and knowledge about agriculture. Social networks encourage the development of innovation and creative ideas for new products. Social networks can create an effective drive to innovation diffusion. Other people influence other decision-making process through spreading positive word of mouth. Early innovation adopters have greater access to creative ideas as compared to the followers. Inventors also are lead users characterized by a high level of innovation and willingness to contribute ideas for new product development. Without proper entrepreneurial education and management skills, farmers may only learn the practical aspect of properly taking good care of the poultry. Increased profitability is an incentive for adoption. Diffusion of innovation exists in cultures but very few respondents agreed that culture was an important influence in the way that they do farming.
5.4.3 Influence of Economic Factors on Farmer’s Adoption of Innovation

A good income is a source of diffusion and adoption of new innovation. The lack of sufficient income is a limiting factor among poultry farmers to adopt new innovation. The lack of sustainable income is also not an attractive proposition for formal financial institutions because the farmers cannot meet the minimum requirements and are perceived as high risk borrowers. The farmers also lacked adequate capital for expansion and adoption of new farming techniques. Lack of credit facilities has discouraged innovation in the poultry industry. Innovation is hindered when they are poor financial skills to expand their facilities. The lack of sufficient market information poses a great challenge to small scale farmers. The availability of market information is crucial for innovation of poultry farmers. The least economic driver of innovation was financial information in decision making about poultry farming. This is due to the inability to interpret the statistical data. Poultry farmers producing eggs used new techniques to achieve good financial results. Sufficient profit margins are critical for the development of innovation. Failed initiatives among farmers are usually due to high innovation costs which can be offset by future profits if the innovation is sustainable.

5.4.4 Influence of Political Factors on Farmer’s Adoption of Innovation

Government policies made it difficult to compete with foreign eggs and chickens. The lack of effective enforcement or implementation of standards and certification systems or other supportive governmental policies hinders poultry farming business efforts to compete in export markets with higher profit margins. High taxes make it difficult for conducting poultry business. Infrastructure put a premium on organizational innovation for poultry business. Investment in improved feeder roads is critical for improving farmers’ access to markets and reducing trader and farmer marketing costs. The public sector plays an important role in establishing an enabling environment. The lack of access to an enabling environment hampers vital factors of production, including inputs for farmers or technology for the processing industry. The lack of effective enforcement or implementation of standards and certification systems or other supportive governmental policies hinders poultry farming business efforts to compete in export markets with higher profit margins.
5.5 Recommendations

5.5.1 Recommendations for Improvement

5.5.1.1 Co-operative Influence on Farmer’s Adoption of Innovation

The study recommends that cooperative societies should contribute significantly to poultry farming development while building social capital. Cooperative societies should provide the inputs, expertise, and services needed for poultry production and innovation. Cooperatives should provide affordable farming inputs and improve the farming techniques. Cooperative should adopt new ways of doing business in response to existing market opportunities and threats to the operating environment of poultry firms. Cooperatives should borrow valuable ideas from new organizations and partnerships, processes, products, and marketing in different places to boost productivity of its members. There should be sufficient market information to boost innovation of small poultry farmers.

5.5.1.2 Influence of Social Factors on Farmer’s Adoption of Innovation

Poultry farmers should have the knowledge and technology to adopt new poultry farming practices. Adequate education levels can boost the farmers’ capacity to access and use existing information for innovation. Social networking should be enhanced to improve new farming techniques. Early innovation adopters should be willing to spread positive word-of-mouth to help in innovation diffusion among followers. Poultry farmers should utilize lead users and opinion leaders effectively in different cultures, depending on the urgency of the situation. There should be proper entrepreneurial education and management skills for farmers to learn the practical aspect of properly taking good care of the poultry. Adequate education should increase the understanding of the potential benefits of new technological innovation.

5.5.1.3 Influence of Economic Factors on Farmer’s Adoption of Innovation

The study recommends that there should be a good income as a source of diffusion and adoption of new innovation. Sustainable income is an attractive proposition for formal financial institutions. The availability of credit facilities should encourage innovation in the poultry industry. A good financial manager should keep records of the farm activities. New farming techniques should help achieve good financial results. Sufficient profit margins are critical for the development of innovation. Higher profit margins should be
drivers for innovation. New farming techniques should provide an attractive bonus on chicken and egg products.

5.5.1.4 Influence of Political Factors on Farmer’s Adoption of Innovation
The government needs to build institutional capacity to provide a functioning enabling environment for poultry farming innovation. Government policies should make it simpler to compete with foreign eggs and chickens. There should be lack of effective implementation of standards and certification systems among other supportive governmental policies to promote innovative poultry farming. Effective state implementation capacity, poultry business establishes its own enabling environment. Tax policies should always be aligned with broader growth strategies in the poultry industry and agricultural sector as a whole. Poultry companies should have investment incentives through tax holidays, foreign exchange retention and access to utilities to promote competitiveness and innovation. Poultry farmers should have access to credit through the help of the government. The government needs to build institutional capacity to provide a functioning enabling environment for poultry farming innovation.

5.5.2 Suggestions for Further Studies
As a recommendation for further studies, the future researchers can investigate Roger’s diffusion of innovation and the factors that influence the farmers’ adoption of livestock farming innovations in Kwale County and other parts of Kenya.
REFERENCES


67


inspiration for agricultural development (Eds.). London: Earthscan.


APPENDICES

APPENDIX A: INTRODUCTORY LETTER

To Whom It May Concern

Dear Sir/Madam,

As partial fulfillment of my degree, I am conducting a research on Roger’s diffusion of innovation and the factors that influence the farmers’ adoption of poultry farming innovations in Kwale County.

Please note that any information you give will be treated with confidentiality and at no instance will it be used for any other purpose other than for this project. Your assistance will be highly appreciated. I look forward to your prompt response.

Yours Faithfully,

Johnson Kithendu (Researcher)
APPENDIX B: QUESTIONNAIRE

Section A: Demographic Profile of Respondents

1. Gender: Male [ ] Female [ ]


3. What is the highest level of schooling you have attained?
   None [ ] Some primary education [ ] Completed Primary [ ] Secondary [ ]
   College [ ] University [ ]
   Other (specify) _______________

4. What is your MAIN source of income? (Only one answer is possible. Record the principal income sector)
   None [ ] Poultry farming [ ] Crop farming [ ]
   Business [ ] Pastoralism [ ] Salary [ ]
   Wages [ ] Remittance [ ]
   Other (Specify) _______________

5. How long has your poultry enterprise been in operation? _______

6. Please indicate your monthly sales category
   Below 5,000 [ ] 5,001-10,000 [ ] 10,001-20,000 [ ]
   20,001-50,000 [ ] 50,001-100,000 [ ] 100,001-200,000 [ ]
   200,001-500,000 [ ] Above 500,001 [ ]

7. What is your main market segment for your poultry products?
   Individuals [ ] Hotels [ ] Households [ ] Exports [ ]

8. What type of poultry farming products do you sell?
   Meat [ ] Eggs [ ] Food grains [ ] Egg powder [ ]

9. What type of innovation are you engaged in?
   Production-level [ ] Process innovations [ ]
   Market innovations [ ] Other ____________
**Section B: Cooperative and Farmer’s Adoption of Innovation**
What are the roles of your cooperative society in promoting new methods in poultry farming? (Indicate your level of agreement with the following aspects of your firm by ticking in the appropriate box where 1= strongly disagree and 5 = strongly agree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. I achieve excellent financial results with the help of my society.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. We are encouraged to accept new ways of raising poultry by the society.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. Poultry farmers are rewarded for the new ways of farming poultry.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. I rely heavily on cooperative information in making my farming decisions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. Cooperatives provide affordable farming inputs.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. Co-operatives provide the much-needed health care for our poultry.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. New skills acquired by the cooperative members enhance our contribution to the farm produce.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. Cooperatives have introduced new products and processes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. I need to see other people use something new before I will consider it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. I often find myself skeptical of new ideas</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21. Technological advancements are easily available in the poultry farming.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22. Cooperative promotes new techniques in regards to the farmers’ produce.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23. Cooperatives play an important role in empowering farmers to adopt new farming techniques.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24. Cooperative supports us with farm inputs.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

25. What other factors lead to the adoption of new poultry farming techniques?
### Section C: Social Factors and Adoption of Innovation

What are the main social factors that influence your adoption of new farming techniques? (Indicate your level of agreement with the following aspects of your firm by ticking in the appropriate box where 1= strongly disagree and 5 = strongly agree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>25. Social networking through the internet has introduced new ideas to improve my farming.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Poultry farmers do not have the knowledge required to produce enough eggs using new farming techniques.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Poultry farmers lack the required education to produce eggs using new farming techniques.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. Compared to colleagues, I have a profitable layer business as a result of introducing new farming techniques.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. Compared to colleagues, I achieve good financial results with layers as a result of introducing new farming techniques.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. I am an inventive kind of person</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. I need to see other people use something new before I will consider it</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. I have well trained personnel to run our poultry business.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. My culture is an important influence in the way that I do my farming.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34. Education increases my ability to understand the potential benefits of new technologies.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35. Passing my bird onto my children is important for me.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36. I am prone to see others try then making a decision about my farm when they are successful.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

37. What other social factors influence the adoption of new poultry techniques?

_____________________________________________________________
Section D: Economic Factors and Adoption of Innovation

What are the main economic factors that influence your adoption of new farming techniques? (Indicate your level of agreement with the following aspects of your firm by ticking in the appropriate box where 1= strongly disagree and 5 = strongly agree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>38. My existing income is insufficient to pursue new farming techniques.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>39. I have adequate capital for expansion.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>40. Poultry farmers producing eggs using new techniques achieve good financial results</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>41. Poultry farmers producing eggs using new techniques receive a high profit margin</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>42. New techniques provide an attractive bonus on chicken and egg products.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>43. Keeping hens from diseases is very expensive using the new technique.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>44. I acquire a good income from my layer business for me to try new techniques in farming</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>45. It would be difficult for me to introduce ways of doing things without losing some income</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>46. Poultry farmers looking forward to expand their facilities have poor financial skills</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>47. Growth of the chicken industry, results to new ways of doing things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>48. I rely heavily on market information in making my marketing decisions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>49. I use financial information in decision making about my poultry farm.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

50. What other economic factors influence the adoption of new poultry techniques?
Section D: Political Factors and Adoption of Innovation

What are the main political factors that influence your adoption of new farming techniques? (Indicate your level of agreement with the following aspects of your firm by ticking in the appropriate box where 1 = strongly disagree and 5 = strongly agree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>51. The government has created an enabling environment to engage in poultry farming.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52. Keeping hens using new farming techniques fulfils all legal requirements.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53. The policies we have make it difficult to compete with foreign eggs and chickens.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54. Procurement of good quality raw ingredients is the biggest problem in the poultry industry.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55. If farmer has access to credit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>56. We have good marketing opportunities for our poultry products, especially in export.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>57. Government support leads to the success of our poultry business.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>58. Roads infrastructure is not well maintained by the government.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>59. Changes in legislation as well as competition are obstacle to the growth of our poultry business.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60. High taxes are the difficulties that we face in our poultry business.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

61. What other political factors influence the adoption of new poultry techniques?

_____________________________________________________________
APPENDIX C: INTERVIEW QUESTIONS

Do you rely on cooperative information in making my farming decisions?

Do Cooperatives provide affordable farming inputs?

Are new skills acquired by the cooperative members in enhancing their contribution to the farm produce?

Are technological advancements are easily available in the poultry farming?

Does Cooperative promote new techniques in regards to the farmers’ produce?

Do Cooperatives play an important role in empowering farmers to adopt new farming techniques?

Is your culture an important influence in the way you do your farming?

Does education increase your ability to understand the potential benefits of new technologies?

Is your existing income is insufficient to pursue new farming techniques?

Does using the new techniques achieve good financial results?

Has the government created an enabling environment to engage in poultry farming?

Is the procurement of good quality raw ingredients is the biggest problem in the poultry industry?