ADOPTION OF RECOMMENDED MANAGEMENT PRACTICES FOR QUAIL PRODUCTION IN GWALE AND KANO MUNICIPAL LOCAL GOVERNMENT AREAS OF KANO STATE, NIGERIA

BY

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A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF SCIENCE DEGREE IN AGRICULTURAL EXTENSION AND RURAL SOCIOLOGY

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DECLARATION

I hereby declare that this dissertation **"Adoption of recommended management ractices for quail production inGwale and Kano municipal Local Government Areas of Kano state, Nigeria"** has been written by me and it is a record of my research work. No part of this dissertation has been presented in any previous application for another degree or diploma in this or any other institution. All borrowed information have been acknowledged in the text and a list of references provided.

Muhammad Kabir ALIYU **Date**

CERTIFICATION

This dissertation **"Adoption of recommended management practices for quail production in Gwale and Kano Municipal Local Government Areas of Kano State, Nigeria"** by Muhammad KabirAliyu meets the regulation governing the award of the Degree of Masters of Science in Agricultural Extension and Rural Sociology of Ahmadu Bello University, Zaria, and is approved for its contribution to scientific knowledge and literary presentation.

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DEDICATION

This dissertation is dedicated to Allah Almighty, my parents and all the members of my family.

ACKNOWLEDGEMENTS

This accomplishment has been the fruit of a long journey, during which I have incurred debts to a wide range of people who made my dream a reality. I would like to first of all express my gratitude to the members of my supervisory team Prof E. B.Tologbonse and Prof M.O. Akinola for the valuable guidance and support throughout the duration of my thesis work at the Department, and to myH.O.D in person of Prof. Z. Abdulsalam for his relentless effort in seeing to the completion of this work. Worthy of mention also, is my special appreciation to our post graduate coordinator Dr M.A Damisa, who hasalways stood on our necks to ensure we are doing the right thing and at the right time in the pursuit of all relevant academic and administrative documentation duringmy study. I will also like to appreciate all my family members for their patience and perseverance in seeing to the completion of this work. My appreciation will not be complete without mentioning all the staff (both academic and the non-academic) of my department for their role in seeing to the completion of my programme. My special homageto my Creator for sparing my life to the last moment of this work.Indeed, without His benevolent mercy this whole work would have all been in vain.

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ABSTRACT

The Studyassessed the adoption of recommended management practices for quail production in two selected Local Government Areas (Kano municipal and Gwale) of Kano state. Multi-stage samplingtechnique wasused to select 120respondentsfrom two districts each from the two local government areas.. BothDescriptive and Inferential statistics were used to analyze the data.The result of the analysis revealed that the mean age of the respondents was39 years, minimum primary level of education was found to be 37%, awareness and quail farming experiencewere significant in the adoption of recommended practicesforquail production in the study areas(72% and 75% respectively). The average rate of adoption for the recommended management practices for quail production in the study areas was 65%. The mean income of the respondents before and after adoption of recommended practices was found to be 2.18(₦30, 000) and 3.37(₦45, 000) respectively. The study therefore shows that adoption of recommended management practices for quail production has a significant impact on the farmer’s income, production output and standard of living in the study areas.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Quail (*Cortunixcortunix Japonica*) is a native of Asia and Europe. It has been farmed since ancient times, especially in the Far East. They reproduce rapidly and their rate of egg production is remarkable. They are also robust, disease resistant, and easy to keep, requiring only simple cages and equipment and little space. Yet they are not well known around the world and deserve wider testing. Quail are so precocious that they can lay eggs when hardly more than 5 weeks old. It is said that about 20 of them are sufficient to keep an average family in eggs year-round. Quail eggs are very popular in Japan, where they are packed in thin plastic cases and sold fresh in many food stores. They are also boiled, shelled, and either canned or boxed like chicken eggs (Vali, 2008).

Commercial quail farming is becoming more popular and is being increasingly promoted in number of Asian and European countries (EFSA, 2004; Vali, 2008; RSPCA, 2011) and of recent in Africa. The advantages of quail farming includes minimum floor space, low investment, comparatively sturdy birds, early market age and sexuality, high rate of egg production and less feed requirement (EFSA, 2004). Besides, Quail meat and egg are tastier than chicken and has less fat contents. It has been shown to promote body and brain development in children and nursing mothers (EFSA, 2004). Japanese quail has been used extensively as a laboratory animal as well as a commercial bird for egg and meat production. Its low maintenance cost associated with its small body size coupled with its short generation interval, resistance to diseases and high egg production rendered it an excellent laboratory animal (Oguz and Minvielle, 2001; Vali, 2008).

Quails (commonly known as Salwa/Fakara in the north region) were first introduced to Nigeria in 1992 by the National Veterinary Research Institute of Nigeria (NVRI) in Vom, Plateau State. The consumption of quail eggs and meat, and quail farming in general, has been promoted by this Institute, the Nigerian Television Authority and some national daily newspapers, especially The Nigerian Tribune. The social media are also not left out as they are rife with testimonies of those who have received some relief from certain ailments after using quail eggs (Muhammad, 2006). A religious dimension has been added to the craving for the eggs as God was reported to have fed his people with quails at a critical period in their history. See the Holy Quran- Surah Al-Baqarah (Q2:57), and the Holy Bible (Ex16:13).

The National Veterinary Research Institute (NVRI) Vom has conducted independent as well as sort for collaborative research on the medicinal properties of quail meat and eggs. Studies on the adaptability and disease management of quail species in Nigeria are ongoing and a lot has been achieved in promoting and boosting the production of the specie (NVRI, 1996). The institute has a mandate with the following objectives on quail production: to adapt the quail to all agro-ecological zones in Nigeria, to identify diseases that may hamper productivity and how to control them, to determine nutrient requirements for optimum health and productivity, to encourage quail farming in village, backyard and commercial farms, to encourage the use of quail for biomedical research and to increase animal protein intake in the diets of Nigerians (NVRI , 2011).Quail farming is a suitable occupation that can contribute to food security, wealth, and health and employment creation. It also offers an alternative means of livelihood to urban and rural farmers in addressing poverty(Arinze, 2013).

Considering the large number of poultry farmers in northern Nigeria, especially Kano and Kaduna and even downward to Southwest (Ibadan) that have embraced quail farming, it is no doubt one booming farming business that is gradually taking over chicken poultry business in most parts of the north (Arinze, 2013).

According to Arinze (2013), management is a tool of production where various combinations of labour, capital and land are employed in the least cost and most efficient manner to produce marketable commodity. In the poultry business, management abilities and practices determine the difference between success and failure.

1.2 Problem Statement

The search for cheaper source of animal protein has been a major concern in most developing countries.The FAO raised an alarm of the animal protein deficiency of Nigerians (Akinusi,2000).It thus recommends a minimum of 70g of protein daily per caput, out of which at least 35g (50%) should come from animal proteins, but the average Nigerian consumes less than 10g of protein with only 3.2g of this amount from animal protein (Abu *et al*, 2008) .Quail farming is a little known farming business but has lots of socio-economic benefits and health benefits. With minimal cost, quail farming can yield high returns to enterprise. This aspect of poultry farming has been neglected by people because of the small size of the bird and its eggs(Oladayo, 2014).Despite the immense economic and health benefits of the quail birds and eggs, little studies have been done on the extent of adoption of recommended management practices in the study areas.

Most poultry farmers have focused mainly on chicken production and thus their actual contribution to healthy food production which have been greatly ignored and or underestimated by farmers and other development workers and policy makers in the agricultural sector. In developing countries especially in Nigeria, there is little knowledge on their production, medicinal value, marketing and consumption under small holder conditions (Oladayo, 2014).

More so, quail management problems are far easier and cheaper to prevent than to solve, and the limited availability of effective disease treatments makes proper management an absolute necessity. It has been estimated that 80 percent of all health problems encountered by quail producers could have been prevented by close attention to sound management practices and details. Inexperienced growers need start with small numbers of birds, increasing flock size as experience is gained. (Muhammad, 2006).

Quails birds are hardy and resistant to most poultry diseases. However, the most delicate period of their lives is during the first 3 weeks brooding time. Inadequate heat supply could result in chicks piling and consequent death due to suffocation. Though quails are generally disease resistant, they can still be affected by several common poultry diseases. The agents responsible for these diseases could be bacteria, virus, parasites or fungi .Some of the factors which encourage the entry of these agents include, poor hygiene, poor housing and inadequate environmental conditions (Muhammad, 2006). The overall assessment of how management practices function in the activities of poultry producers was that general management practices was extremely inadequate and that poor basic hygienic practices are implemented, through either lack of knowledge or constraints to their implementation (FAO, 2008).

This study therefore answered the following research questions:

i. What are the socio-economic characteristics and the of the quail farmers in the study area?

ii. Are the farmers aware of recommended management practices for quail production?

iiiWhat are the preferred sources of information for adoption of recommended management practices for quail production,?

viWhat is the rate of adoption of recommended management practices for quail production by the farmers?

iii. What are the socio-economic and institutional factors influencing the adoption of recommended management practices for quail production by farmers?

viWhat are the effects of adoption of recommended management practices on the output, income and standard of living of the farmers?

vii. What are the constraints facing the adoption of recommended management practices for quail production by the farmers in the study areas?

1.3 Objectives of the Study.

The broad objective of the study is to assess the adoption of recommended management practices for quail production in the study areas. The specific objectives are to:

i. identify the socio-economic characteristic of quail farmers in the study area,

ii. ascertain the level of awareness of recommended management practices for raising quail birds by farmers,

iii. identify the preferred sources of information for adoption of recommended management practices for quail production,

iv. determine the rate of adoption of recommended management practices for quail production after awareness,

v. determine the socio-economic and the institutional factors influencing the adoption of recommended management practices for quail production by farmers,

vi determine the impact of adoption of recommended management practices for quail production practices on the output, income and standard of living of the farmers,

vii identify the constraints facing the adoption of recommended management practices by the farmers in the study areas.

1.4 Justification of the Study

Quail farming can serve as alternative off cropping income earning venture for unemployed youths, low income earners in the urban areas and most importantly too, the small scale rural poultry farmers in Nigeria . Quail farming has the potential of yielding high returns from the sales of its birds and its eggs with little investment and simple management skills which requires small space for its production.

It is therefore, the aim of this research to sensitize the policy makers, research institutions and Extension service providers on the need to adequately educate quail farmers on the benefits of adopting recommended management practices for quail production in the study areas.

More so, the study will contribute to the existing literatures and fill the knowledge gap on quail production, which will be useful as a reference material for further research.

1.5 Research hypotheses

i. There is no significant relationship between the farmers socioeconomic characteristics, institutional variables on their rate of adoption of recommended management practices for quail production.

ii. There is no significant impact of the farmers adoption of recommended management practices for quail production on their level of production, income and Standard of living.

CHAPTER TWO

LITERATURE REVIEW

2.1 Origin of Quails

Japanese quail (*Cortunixcortunix Japonica*) belongs to the order Galiformes and the family phasianidae. Like the chicken, intensive production of Japanese quails started in the 1920s in Japan, and the first egg lines were than developed by selection (Haruna*et al.*, 1997).

Japanese quails were successfully introduced from Japan to America, Europe and the near Middle East between the 1930s and the 1950s. Extensive research on Japanese quail carried out at that time showed that Japanese quail was a valuable animal for avian researchand it produced the technical information needed to start production of quail's worldwide (Haruna*et al.*, 1997) .In Nigeria, quail birds were first introduced to Nigeria in 1992 when DFRRI imported 300 quail eggs from Benin Republic and sent to the NationalVeterinary Research Institute (NVRI) for multiplication (NVRI, 2011).This became a challenge to the institute .The eggs were hatched and thus the introduction and adoption of quail into the Nigeria environment. Gradually farmers across all the agro ecological zones came to know about the quail and its advantages as a good source of quality protein. Some decided to venture into rearing themafterwards (Muhammad, 2006).

2.2 Quail farming in Nigeria: An over view

The search for cheaper sources of animal protein brings poultry birds into focus. Haruna*et al,*(1997) suggested that the quickest potential for bridging protein supply-demand gap lies in the production of highly prolific animals that are efficient converters of feed to flesh, have short generation interval such as poultry birds which includes quails and the integration of the wide array of cheap and locally available non-conventional feedstuffs at our disposal into well-defined feeding systems to reduce cost.

Quail bird farming is a type of poultry farming that specializes on the rearing of small birds called quail for the purpose of egg, meat production or for other uses. Quail birds are healthy and have strong immunity system and so do not need injection and vaccine unlike other birds. They do not die easily and are resistant to diseases. They are poor feeder and excellent layers.

Before 1984 quail sounded foreign or exotic to most Nigerians giving the impression that only people who traveled abroad might have the opportunity to see or taste the meat and eggs .Others might have only read about quail in the holy Books as part of the diet of the Israelis as they wandered in the wilderness. In the past 15 years over 800,000 quail birds have been produced by National Veterinary Research Institute, Vom and distributed to farmers (NVRI,2011). At present, quails have been acclimatized and adapted in places like Kano, Benue, Lagos, Oyo, Yobe, Enugu, AkwaIbom, Kaduna, Kebbi, Borno, Abuja, Niger, Kwara, Jigawa and Plateau States (Musa *et al*, 2008). Quail production has now become a household name after massive enlightenment campaign carried out by the institute through several workshops held to create awareness and to expose the public to the production and management. The message is that quail birds are very easy to manage and could be raised in any part of the Nigeria (Muhammad,2006).

Quail farming is an uncommon farming business in Nigeria but with lots of potentials for the few people that have embraced it, they are not only smiling to banks, they are also enjoying both the nutritional and health values derived from consuming it. Considering the large number of poultry farmers in northern Nigeria or specifically Kano and Kaduna and even downward to southwest(Ibadan) that have embraced quail farming, it is no doubt one booming farming business that is gradually taking over chicken poultry business in most parts of the north. The high rate of returns and low cost of investment as well as rearing them are some of the reasons many farmers are fast resorting to quail farming. Kaduna alone, there are more than 50 farms where quail are reared and sold. The fact that the birds grow and reach maturity stage faster and lay eggs within two months, compared with the six-month maturity period of chickens for whether egg-laying or consumption, attract them to farmers who see the business as a better and more sustainable investment to explore (Olatoye,2011).

Market surveys in Zaria, Kano and Kaduna, a female quail bird sells for ₦500 while the male goes for between ₦250 and ₦300. Its speckled eggs go for between ₦20 and ₦25. The bird's high nutritional and market value encourage many chicken poultry farmers to abandon the business for quail farming. The news gathered that these financial and health benefits, especially the high and quick returns on investment, largely explained farmers' rush into the business in Jos where it first started, and in Kano, Kaduna and other states in the north where it is booming now. But it is very difficult for people in the southwest who wish to go into quail farming due to the problem of getting quail chicks for starting (Olatoye, 2011).

2.3 Prospects of Quail Business in Nigeria

Japanese quail is an interesting domesticated economic species for commercial egg and meat production beside chickens. They are relatively small in body size. They are adaptable to intensive systems of poultry husbandry. Because of their low volume, they are fit for high density rearing. It is blessed with the unique characteristics of fast growth, early sexual maturity, high rate of egg production, short generation interval and shorter incubation period that make it very suitable as a alternative farming animal. They are fairly resistant to disease, and less worries for vaccination. Because of low volume, low weight, less feed and space requirements, quail farming can be started with much lower capital investment as compared to chicken and duck with almost the same profit margin. Their laying prolificacy is very high, able to produce more than 300 eggs per year. With shorter reproduction cycle and earlier marketing age, it offers fast monetary circulation ultimately yielding quicker returns.(Shim,1985).

Ani and Adiegwu (2005) suggest that a solution to the problem of inadequate consumption of animal by an average Nigerian is to increase the level of highly reproductive animals with short generation intervals such as poultry, pigs and rabbits (Fielding, 1991 and Smith, 2001). Poultry is the quickest source of meat and its production involves the least hazardous and arduous process in relation to other livestock enterprises (Obioha,1992). Poultry are able to adapt to most areas of the world, have a low economic value, rapid generation time and a high rate of productivity (Smith, 2001). The genus of poultry being studied is the Japanese quail (*Coturnixcoturnix japonica*) which was introduced into Nigeria to expand the poultry sub-sector and help supplement the domestic chicken production through meat and eggs (Ani, *et al.*,2009). Commercialization of quail bird production is a recent development in Nigeria. Emphasis has been on domestic fowl production, whereas nutritive and economic benefits can be derived from quail production since the quail is fast growing and resistant to many diseasesthan domestic fowls (Akpan and Nsa, 2009) . Japanese quails are hardy birds that thrive in small cages and are inexpensive to produce. They require less floor space; about 8 – 10 adult quails can be reared in a space meant for one adult chicken (Haruna*et al.*, 1997). They are said to have less feed requirement, according to Ani, Okeke and Emeh., (2009) an adult quail requires only 20 – 25g feed per day compared to chicken (120 –130g) per day.

Quails begin egg laying at about six weeks and reach market weight at about 5 – 6 weeks. Some authors affirm that they are also more efficient converters of feed to eggs than chickens. Their small size, rapid growth and early onset of egg production enable quail enterprise to be established with a low capital outlay, and to start generating income quite quickly. Quails can be used as experimental birds and for the biological production of vaccines, especially Newcastle disease vaccine to which they are resistant (NVRI,2011).

2.4 The Role of National Veterinary Research Institute (NVRI) Vom and National Agricultural Extension And Liaison service (NAERLS) Zaria, in Boosting Quail production in Nigeria.

Extensive research work is being carried out on the Quail birds by the (NVRI) and it has recorded tremendous breakthroughs in its quest to boost the production of the bird throughout the nation. Mortality pattern of quail birds from day old to adult stage has been identified. Research on protein and energy requirements of Japanese quail has been completed and the hatchability performances of quail eggs incubated at different positions have been studied. The Japanese quails (Coturnix c. japonicus) introduced into Nigeria by DFFRI and managed by the Institute in the late 1990's is in high demand across the country. Breeding and multiplication centers for quails have been established in some States. Annual (NVRI,2011).

The NVRI appreciates that more people will adopt quail production from across the geopolitical regions of the country to carter for demands by the public. This will enable the Institute focus more on her core mandate. The Institute will conduct independent as well as seek for collaborative research on the medicinal properties of quail meat and eggs. Studies on the adaptability and disease management of quail species (coturnixcoturnix japonica) in Nigeria is ongoing and a lot has been achieved in promoting and boosting the production of the specie.(NVRI, 2011). The institute has a mandate with the following objectives on quail production:

i. To adapt the quail to all agro-ecological zones in Nigeria.

ii. To identify diseases that may hamper productivity and how to control them.

iii. To determine nutrient requirements for optimum health and productivity.

iv. To encourage quail farming in village, backyard and commercial farms.

v. To encourage the use of quail for biomedical research.

vi. To increase animal protein intake in the diets of Nigerians.

In the same vein, the National Agricultural Extension and Liaison Service (NAERLS) Zaria has organized several training/workshops sessions to educate quail farmers on how to boost Quail Production for sustainable household Animal Protein intake . The broad objectives of the workshops were to popularize quail production as a cheap source of animal protein in family diets. The Course Contents included : The place and Role of Quail Production in Sustainable Animal Protein Intake, Sourcing, Mating and General Care of Good Quality Laying Quails, Nutrient Requirements and Feeding Regime in Quail Production, Practical Feed Formulations and Mixing for Quails, Management and Housing of Japanese Quails, Egg Hatching Practices in Quail Production and Care and Management of Quails(Muhammad, 2006).

2.5 Some Recommended Management Practices for Quail Production.

Raising Quail however does require more than just feed and equipment. It also requires a commitment by the farmer, to keep to recommended management practices. When raising quail, disease is the biggest enemy. Studies in this area have found that 80% of all quail mortality could have been prevented with proper management. Beginners should start with the Coturnix quail. The Japanese or

Coturnix quail are the fastest growing and reproducing birds. They are also the best specie of quail to raise for meat and eggs. These quail possess a remarkable resistance to disease, start laying at six weeks of age, and can be consumed at four to five weeks of age. Coturnix and many other types of quail and their eggs are marketed the year round by game bird farms all over the world(Nigeria inclusive). Maintaining the same number of hours under lights will keep Coturnix quail laying eggs throughout the year. When starting any type of business, your goals are to keep overhead as low as possible and get a quick turn around on your investment. Raising the Coturnix quail in my opinion is the best way to accomplish this and start your quail raising business. Raising quail requires an investment in equipment and time.(Blogger/Quailproduction.com 2011).

Anon (1997) revealed that Japanese quails are managed the same as chicken except for their size and nutritional requirements, the need to be protected from predators like cats rodents, predatory birds like kite etc. Excessive handling of quail may result in mortality. Moving Laying quails from one house to another may cause a pause in egg production for 2-3 weeks. Housing should be designed to ensure comfort for the birds to make food and water readily accessible and to permit easy and effective sanitation. Regular hygiene of cleaning and disinfection can help in preventing diseases. Here are some basic management practices suggested by Maurice and Gerry(2005) and Mississippi State University (2010).

i. Use of moisture-absorbing litter
ii. Brooding area should be kept clean always
iii. De-beaking should be done at intervals
iv. Quail birds should be kept away from other birds, rodents and vermin’s.

v. Dead birds be removed immediately and properly disposed off.

vi. Sick birds should be isolated .

vii. Ensure adequate supply of lighting

viii. Proper records of inputs and output

2.6 Bio-security in Quail Production.

This is very important in any livestock enterprise not quails alone to safeguard against disease outbreaks. Bio-security involves purchasing stocks from disease free sources, keep buildings and surroundings clean, restrict human access to the farm, isolate the birds by age group and properly Dispose dead birds and litter. To prevent diseases only introduce new stocks as chicks or eggs .If it is necessary to introduce adult birds isolate them from the existing flock for at least one month.(Muhammad, 2006).

2.7 Disease Prevention and Control in Quail Production

Sanitary management practices are the best guarantee against disease. Equipment such as cages, feeders, waters and tools should be cleaned and sanitized frequently. A commercial disinfectant is recommended.A commercial disinfectant is recommended. Japanese quail suffer from some of the diseases that affect domestic chickens. However, if housing, nutrition, husbandry and hygiene are of a high standard, mortality should not be a problem. Birds that are appearing sick should be isolated from healthy birds. A veterinary diagnosis is desirable before initiating treatment (Musa, 1996).

2.8 Advantages of Raising Quail Birds.

i. Requires minimum floor space.
ii. Need Low Investment .
iii. Quails are comparatively sturdy birds .
iv. It can be marketed at an early age . (i,e: five to six weeks)
v. Early sexual maturity starts laying eggs in about six- seven weeks of age.
vi. High rate of egg laying 280 to 295 eggs per year compared to
vii. Quail meat is tastier than chicken and has less fat content.
viii. It promotes body and brain development in children.
ix. Naturally, the quail eggs are on par with that of children, moreover, they contain less cholesterol .
x. Quail meat and eggs are a nutritious diet for pregnant mothers.

(Oladayo,2014).

2.9 Challenges of Quail Bird Farming

Quail farming is so easy and there may be little challenges or no challenge at all. The most common challenge of this business is marketing at the initial stage of the business but with more awareness of the health and nutritional value of quail eggs and meat, the challenge has been overcome and the challenge many quail farmers are facing now is how the demand that is growing at exponential rate will be met (Oladayo,2014).

Another little challenge faced is if you go for a day old quail bird isthe mortality. The birds suffer from respiratory disorder in their first week and that may cause high mortality but the challenge is overcome after the first week with proper management practices (Oladayo, 2014).

Other challenges include; their having a particularly high ammonia content in their droppings and thus the odour may be objectionable (may be reduced by proper ventilation); a rapid decline in reproductive efficiency occurs after approximately 8 months of age; shell damage occurs frequently in the quail eggs; the colored egg shells of *coturnix* may make candling or writing on the shells difficult; fertility and hatchability percentages generally are lower than those of commercial strains of chickens or turkeys; newly hatched chicks are sensitive to drafts and must be given special care during the first week or two of age; and Japanese quail are more easily excited by sudden noises than other types of poultry. These disadvantages must be avoided or compensated for if Japanese quail propagation is to be successful (George, 2002).

2.9.1 Sources of Information for a Agricultural Practices

The importance of sustainable agriculture practices for the farmers to a large extent depends upon the effective sources of information. It is believed that farmers do not often make visit to the research stations, however, they obtained required knowledge from different sources like mass media, fertilizer agency, fellow farmers, radio, television, extension personnel and contact farmers. It is imperative to communicate sustainable agriculture practices through various sources of information (Venkatesan, 1995).

Ani (2007) implied that a variety of media use pattern is discernible if maximum impacts is to be made. This is because people learn and acquire information in different ways. Based on the level of felt need, some will attend educational meetings, some will attend tours or field days, some will read materials given or sent to them, while others will watch programmes on television, video tapes, or listen to radio programmes and still others prefer individual consultation. Venkatesan (1995) notes that the mass media are particularly effective in making farmers aware of new practices and thereafter they can always approach the extension agent for further information .

2.9.2 Marketing of quail products.

Marketing should always be a number one consideration, when going into the business of raising quail. The love, pride and pleasure of producing a top quail bird will certainly contribute to success, but unless one market the product. Many producers contract a year or two ahead for the sale of their birds or eggs. Such contracts are excellent, but usually come only to those who have proved they will provide the quality bird desired. If one expect customers to patronize, one must provide what they want, or else convince them they have a need for what have been produced.Ending the production year with mature birds on hand, other than selected breeders, is not desirable. Producer cannot justify the expense of carrying these birds over to next season. Too many producers are losing money because of failure to market all of their birds Mississippi State University (2010). Some suggestion to build marketing strength (Olukosi, 1988)

- Keep a neat farm. A prospective customer judges you by the appearance of the farm.
- Make the first impression a good one. Know the business thoroughly.
- Show interest in the customer and answer all questions with enthusiasm. Require employees also to present neat appearances and pleasing personalities.
- Present the prospective customer with advantages you offer, but do not run down fellow competitors.
- Make every attempt to have a satisfied customer. and then be sure to offer them the

best and just a little more is expected, those customer of today will return and bring new customers.

- Never force a customer to accept birds not wanted. Even though there may be a prior agreement, if the customer does not feel you have produced what is desired, it is best not to force the issue. Accept the refusal gracefully, and if the customer is worth keeping, attempt to produce what is wanted next time. Locate someone else who would be satisfied with the birds that were refused.
- Everyone does not desire the same type of bird; what one refuses another may want. If you receive two consecutive refusals from a prospective customer and are satisfied you have produced a desirable bird, you may be dealing with bargain hunters.
- Produce a good bird and demand a good price with a clear conscience. Don't give a prospective buyer the impression you are apologizing for your asking price: let the customer feel an apology is due for paying so little.
- Always be honest with customers. Lies may sell a few birds, but they do not tend to build future business. Your reputation gets around; be sure it's a good one.

2.9.3 Adoption and Diffusion of Innovation

The adoption of an innovation is defined as a decision of individuals or groups to make a sustainable use of an innovation or technology .It is a dynamic process, which consists of district but closely related sub-processes. The rate of adoption of any technology depends on the perceived technology characteristics type of innovation decision, channels of communication, social system and the extent of change agent promotion strategies. However, the relative advantage of a technology is regarded as the one with the strongest influence on the adoption rate (Rogers, 1995).

Efficacy of any agricultural extension is judged by the level of mass adoption and spread of modern and scientific practices among farmers in the rural neighborhood. In his study of the factors affecting adoption of improved practices by goat farmers in Southeastern Nigeria.Ajala (1992) reported that age, sex, education, herd size, nature of farming, organizational participation, experience and management system were positively related to adoption. Apart from the above, information is relevant in adoption, particularly designing geographically targeted programmes for addressing disparities. Information sources are stimulants for adoption (Rogers, 1995), implying hopes for greater adoption in this time of information and communication technology (Venkatesan, 1995).

One of the factors which has contributed to the growth of the world Agricultural out-put is new or improved technology .However, generation of a new technology is not a sufficient condition for increased agricultural output and productivity, a new technology must be disseminated and adopted by farmers .Hence , adoption and spread of any technology innovation in a given farming system depend on the benefit they offer (Rogers, 1995).

The origins of the diffusion of innovation theory are varied and span multiple disciplines. Diffusion is the process by which an innovation spread from the source of its invention to the ultimate users or adopters. Whereas adoption process deals with adoption of a new idea by an individual, diffusion process deals with the spread of new ideas in a social system or the spread of innovations between social systems or societies (Rogers, 1995). The segments of the social system in a study area under reference can influence individual farmers to display varying degrees of innovativeness from innovators to laggards. Opinion leaders who are generally early adopters enhanced diffusion of innovations, while late majorities and laggards hinder it.

2.9.4 Theory of rate of adoption and perceived attributes

The theory of rate of adoption suggests that the adoption of innovations is best represented by a s-curve on a graph. The theory holds that adoption of an innovation grows slowly and gradually in the beginning. It will then have a period of rapid growth that will taper off and become stable and eventually decline (Rogers, 1995). The theory of perceived attributes is based on the notion that individuals will adopt an innovation if they perceive that the innovation has the following attributes. First, the innovation must have some relative advantage over an existing innovation or the status quo. Second, it is important the innovation be compatible with existing values and practices. Third, the innovation cannot be too complex. Fourth, the innovation must have trial ability. This means the innovation can be tested for a limited time without adoption. Fifth, the innovation must offer observable results (Rogers, 1995).

2.9.5 The role of change agents in the adoption of innovations.

Smith (2001) asserts that despite recognizing the relevance of supply-side factors in explaining the adoption of innovations, diffusion theory and research have too often taken an adopter-side perspective, ignoring the influence of the supplier on diffusion. Even scholars specifically interested in social interactions as drivers of diffusion have generally omitted innovation suppliers (change agents) in their models, as if the only relevant interactions were those existing among farmers. Such omissions and simplifications can lead to misleading interpretations. This observation suggests the need for assessing the role played by all types of actors interacting in innovation diffusion processes, particularly change agents active at the local level. This is reminiscent of the central arguments posited by innovation system scholars who highlight the active role played by public and private providers of information and technical advice, input sellers, product buyers, and other external agents in the network of interactions within those systems. Those “external” actors are in frequent contact with each other and with “local” actors of the system, thus impinging farmers’ attitudes and behavior. Rogers (1995) defines a change agent as “an on individual who influences clients’ innovation decision in a direction deemed desirable by a change agency” .According to this definition, change agents are external actors of an organizational origin.

The classic diffusion literature in agriculture uses the term change agent as almost synonymous with extension agent. Nonetheless, change agent can be applied to the wider variety of actors approaching farmers to promote adoption of specific innovations (e.g., input sellers) and those providing farmers with or giving them access to information and inputs that are fundamental determinants of adoption (e.g., credit providers or product buyers who inform farmers on market requirements). Farmers’ interactions with change agents can be described as unbalanced: almost vertical in terms of the status and information endowments of the concurrent actors and almost unidirectional given its explicitly persuasive nature. The vertical and persuasive nature of this interaction is in part responsible for the impersonal treatment that has characterized the analysis of change agents’ influence in diffusion processes. Most early studies conducted by rural sociologists treated farmers’ contacts with extension agents as equivalent to their contacts with the mass media, considering both indifferently as the effect of “external information sources.” Only a few researchers characterized this relationship as falling between interpersonal communication and access to the mass media. Subsequently, most diffusion studies in agriculture, both by sociologists and economists, have regularly included farmers' interactions with extension agents among the set of explanatory variables for adoption but have considered only the existence or frequency of such interactions. In most cases, those studies have found that it is a significant factor positively affecting adoption timing and intensity (Rogers, 1995).

Another factor that has limited a more detailed assessment of the specific effects of change agent–farmer interactions on diffusion is one of the basic generalizations derived from early diffusion studies, according to which external sources are basically relevant to spreading information about innovations at the earlier stages of diffusion. According to this argument, those interactions would be relevant mostly for persuading the minority of pioneers and early adopters, playing just a secondary role in the decisions of most farmers who rely on earlier adopters as sources of influence (Smith 2001). However, this may be an oversimplified picture of the complex network of influences that various actors exert along the adoption–decision process.

2.9.5 Factors influencing adoption of recommended practices

Researches carried out by some researchers such as (Atala, 1980), have revealed that some socio-economic characteristics such as (age ,level of education, household size , farming size and availability of labor and institutional variables such as (access to credit, community status, joining cooperative groups, and contact with extension workers) influence adoption of recommended agricultural practices.

More so, the extent of adoption of recommended practice is the percentage of the farmers that adopted a particular recommended practice. It also shows how many components of the recommended practice majority of the farmer in a given area adopt. It is a presumption that farmers will adopt any improved and proven technology. This is not true because the new innovation must meet the following conditions before farmers can adopt it (Onyenwaku , 1991):

i. The new recommended practice does not increase farmers' risks. Farmers generally avert risks whenever possible .Therefore, the lesser the risk involved in the practice, the greater its adoption by farmers.
ii. The new practice does not depart radically from the current practices of the farmers .Consequently, the new practice must be easily learned and understood by the farmers.
iii. The potential gains ,that is , the cost –benefit from the adoption of the improved practice must exceed the added costs.
iv. All the needed inputs and associated service involved with the new practice must be readily obtained and affordable by the farmers.
v. The new practice must confirm to the norms values and culture of the farmers.

vi. There must be readily market for the produce obtained by the farmers after adopting the new practice.
vii. The new practice must address the farmers felt needs.

According to Ani*et al* . (2009), several factors influence the adoption of agricultural technologies. These include, among others, the needs of the farmers, their level of awareness, level of income and education. It is believed that all things being equal;

i. The higher the relative advantage of the technology, the higher or faster the rate of its adoption by farmers.
ii. When a new practice is in agreement with the farmers' beliefs and values,

the practice will be highly and speedily adopted.

iii. The less complex he practice, the easier it is for farmers to understand and adopt it.

v. If the farmers are able to first apply or practice on a small-scale, the more readily will it be adopted in full; and

vi. If the result of a practice is visible to the farmers, the more they will be convinced and encouraged to adopt it (Ani*et al* 2009).

2.9.6 Awareness Creation.

Awareness creation is a key component of adoption process of new idea or technology. It is also the fundamental stage where people (participants) are introduced to new practice or technology exists but lack of details about it. This like seeing something without attaching meaning or importance to it, before any farmer can adopt any new technology or practice, the individual must first know about it. It is therefore the major task practice or technology to the knowledge of the farmer (Oduntan, 2010).

2.9.7 Constraints to Adoption of Improved Technologies by Farmers.

The process of increasing the efficiency of agricultural production through agriculture modernization depends mainly on the extent to which farmers can incorporate improved agricultural practices or technologies into their farming operations (Ani and Adiegwe,2005). Ani (1998) has shown that acceptance of new farming techniques takes place over time. Some characteristics may speed up the rate of adoption while some serves as constraint to adoption process(Tologbonseand Adekunle 2008).

(2008) shows the distribution of respondents according to nature of constraints they encounter .Major constraints included lack of funds to obtain information (54.3%) and language barrier (50.5%). Other constraints encountered are outdated information (36%) and presentation/poor format of information (33.9%).

According to Rogers (1995), several factors influence the adoption of agricultural technologies or innovations. These include, among others , the needs or wants of the farmers, their level of income .Onyenwaku (1991) discovered that lack of awareness of technology is the most limiting factor to adoption. As reported by Ekong (2003) awareness of improved agricultural technologies is the first stage in the adoption process. It is the stage where an individual or group first learns about the existence of a technology.

2.9.8 The rate of adoption of agricultural innovations

Bagozzi(2006) argued that predicting the rate of adoption of agricultural innovations, and how this might be influenced, requires an in-depth, detailed understanding of the adoption process; more so than is the case in regard to predicting the extent of adoption. This is because the extent of adoption merely requires understanding the circumstances in which an innovation will create a net relative advantage whereas the rate of adoption depends on the strength of the motivation of producers to adopt, which may partly be a function of the magnitude of relative advantage, as well as the actions necessary to implement adoption. As a consequence, and because producers cannot be regarded as professional purchasers, the case was made by Bagozzi, (2006) that the adoption of agricultural innovations should be treated as an individual purchase decision rather than an organizational purchase decision. In dual-process models goal desire plays the key role in determining the urgency that is attached to considering the possibility of adoption, both in terms of promptness and persistence of attention. In these models, goal desire can be influenced by anticipated emotions, anticipatory emotions, and preferences about the means of achieving goals. These factors may be relatively trivial in the case of quite simple innovations; hence for simple agricultural innovations goal setting would depend primarily on producers' evaluations of the time paths, and reliability of the costs and benefits of adoption(Bagozzi, 2006).

2.9.9.1 Theoretical framework .

This work was based on the theories of social change and Adoption of innovation theories. Social change can be defined as state of dynamism that precludes stagnation which if well managed and directed always implies progress, development and functioning of a social system (Ekong, 2003). Also, Ekong (2003) further summed up social change is a significant modification in human attitudes and behavior pattern as a result of education, and alteration in social condition as a result of changes in the policies of a social organization, including consequences and manifestation of such changes.

Rogers (1995), said social change can be planned or unplanned. Planned change is a conscious , -deliberate and intended attempt to bring about the change by one or more agents. The use of different sources of information on recommended quail production techniques and its subsequent adoption is a planned social change because it deliberately seek to introduce recommended management practices for quail production for the benefit of the areas where the birds are being reared. The farmers will use this perspective to explain their sources of extension information, the socio-economic characteristic of quail farmers and assisting them in determining factors affecting adoption of recommended management practices for quail production. Furthermore, this perspective will be used to explain the adoption of recommended management practices for quail through different sourcesof information aimed at improving the production capacity,

Change occurs daily in the social system and this change affects the behavior of people. Social change theorist believe that for change to take place, societies have to move from traditional ways of the doing things to the model levels, Similarly, adoption – diffusion theory was the dominant approach in 1960s (Rogers, 1995). Diffusion theorists accepted the products of agricultural research as wholly desirable. Hence, their work focused almost exclusively on the fate of innovations designed for farm use. They employed a communications' model adopted from engineering in which message were seen to be transmitted from sender to receiver, later adding the "feedback" to describe the receivers responses to the message sent to them. They argued that adoption could best understood as base on the psychosocial characteristics of adopters and non-adopters. Early adopters were found to be more cosmopolitan better educated less risk averse, and more willing to invest in new technologies than late adopters, pejorative labeled 'laggards.

The idea of quail management practices approach in the study area is to improve the perceptions of quail farmers on adoption of recommended management practices which is expected to reduce the running cost of production , increase output and consequently improve their standard of living through the raising their income level.

2.9.9.2 Conceptual Model.

A model is figurative representation of a perceived object used to guide one in pursuit of knowledge. A model is also seen as a construction that shows relationship existing among variables. These relationships are depicted schematically or mathematically. Theoretical model is therefore , a broad system of explanation that is founded not so much on prior research findings but largely on untested and unproved assumptions about social realities (Ekong, 2003).In this model (Figure 1) , it is expected that these variables will influence adoption recommended practices for quail production through different source of information by the farmers. These will in turn be expected to create some effects such as change in production capacity and income levels as well as the standard of living of the quail farmers. Therefore, in this model, the first arrow explains the relationship between the independent variables and the dependent variable while the dotted arrow shows the likely outcome or effect of the relationship.

Independent variable	**Dependent variable**	**Effects**
Socio-economic characteristics. -Age -Education -Quail farming Experience -Marital status. -Size of pen/birds **Institutional variables** -Extension contact -Membership of cooperative societies -Access and use of credit. **Sources of information** Radio Extension Agents Television Training/workshop Agro dealers Newspapers/Bulletins Friends and Relatives	**Recommended** **management practices** 1. Use of moisture absorbing litter 2. Brooding area kept clean always 3. De-beaking done at intervals 4. Quail birds kept away from other birds, rodents and vermin's. 5. Dead birds removed immediately and properly disposed off. 6. Sick birds isolated. 7. Adequate supply of lighting 8. Proper records of inputs and output	**Adoption influence on** -Out put (Egg and Bird production. - Income. - Standard of living

Figure 2.1: A model showing socio-economic and institutional variables influence on the adoption of recommended quail production practices.

CHAPTER THREE

METHODOLOGY

3.1 The study Area

This study was conducted in two selected Local Government areas in Kano State. Kano State has 44 Local Government Areas. It is a state located in North-Western Nigeria. Created on May 27, 1967 from part of the Northern Region, Kano state borders Katsina State to the north-west, Jigawa State to the north-east, Bauchi State to the south-east and Kaduna State to the south-west. The capital of Kano State is Kano. According to the 2006 census figures from Nigeria, Kano State had a population totaling 9,383,682 (NPC 2006). The projected population figure of the State for 2014 using an annual growth of 3.2% is therefore 11,698,526.

The State is mostly populated by Hausa people who are with other ethnic groups .Historically, Kano State has been a commercial and agricultural state, which is known for the production of groundnuts as well as for its solid mineral deposits. The state has more than 18,684 square kilometres (7,214 sq m) of cultivable land and is the most extensively irrigated state in the country. Its location on the globe is on coordinates 11” 30’N and 8”30’E(Manrkano.gov.ng).Subsistence and commercial agriculture is mostly practiced in the outlying districts of the state. Some of the food crops cultivated are millet, cowpeas, sorghum, maize and rice for local consumption while groundnuts and cotton are produced for export and industrial purposes. During the colonial period and several years after the country’s independence, the groundnuts produced in the State constituted one of the major sources revenue of the country. Kano State is a major producer of hides and skins, sesame, soybean, cotton, garlic, gum arabic and chili pepper. It has some of the largest infrastructure networks in Nigeria(Manrkano.gov.ng). It has a well-serviced roads connecting to Abuja and neighboring states .A rail link from Lagos to the North, an international airport and the largest irrigation network in the country. Kano is the third largest commercial center in Nigeria, acting as a major hub for trade, and the third largest non-oil economy.More recently,Kano State Government established a Poultry Training Institute in TukuiMakoda LGA**.**The Project is aimed at empowering women and youth in the state to engage in income generation activities; reduce unemployment, boost production of poultry meat(quail birds inclusive) and eggs, to improve the nutritional and health status of the populace. The Institute was designed to offer formal and informal trainings in Basic Requirements for Poultry Production and Management Practices.(Manrkano.gov.ng)

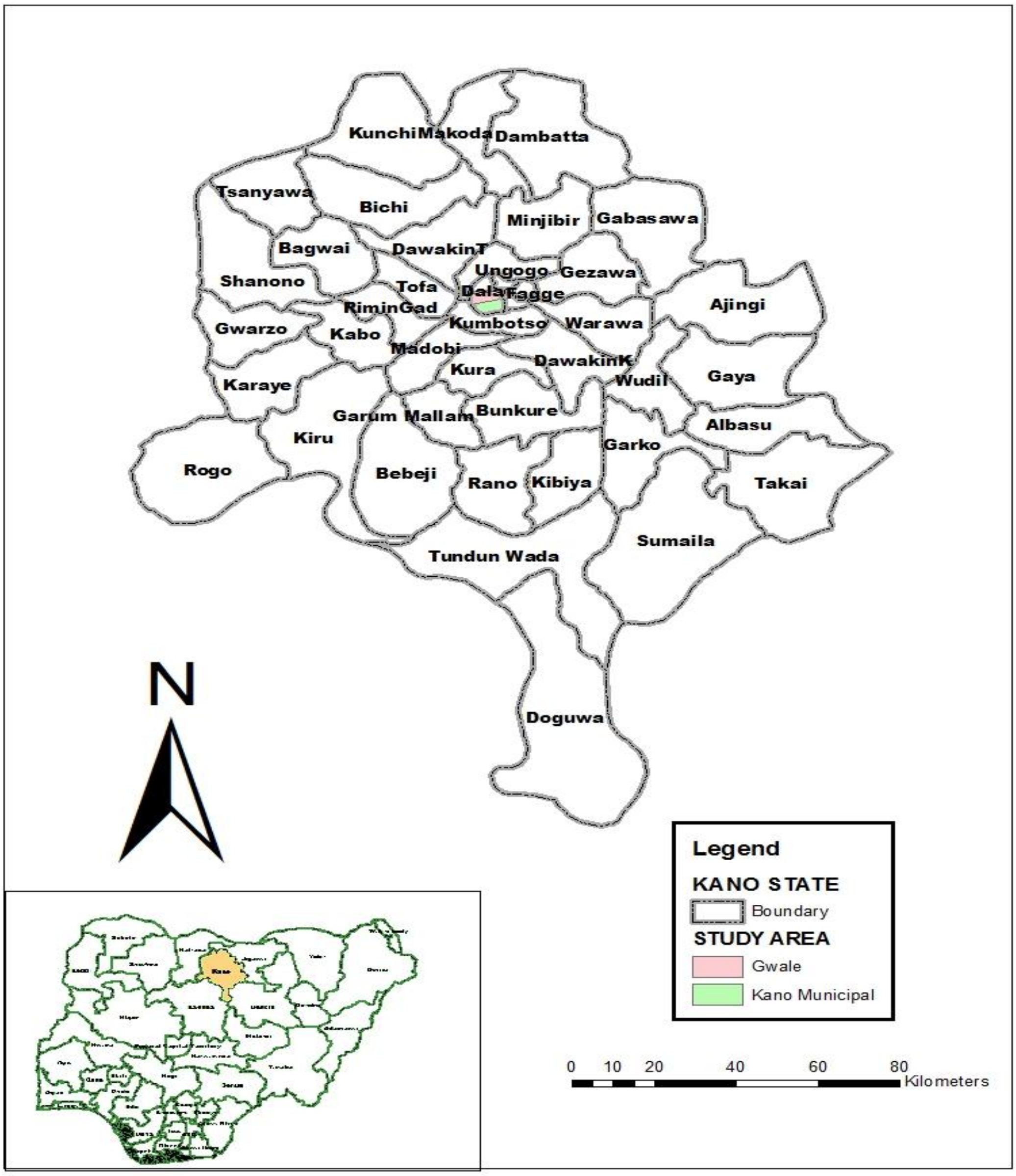

Fig 3.2 A map of Nigeria showing Kano state and the study areas.

3.2 Sample Size and Sampling Technique

A multistage sampling procedure was used. The target population of the study were quail farmers in two selected Local Government Areas (Kano municipal and Gwale) of Kano state. Purposive sampling procedure was used in selecting 2 districts from each LGA known to be intensively involved in quail production .These districts included Dorayi,Kofarruwa,Kofar kudu and Duruminiyan.This was achieved with the efforts of an enumerator who is very familiar with the quail farmers in the study areas.

Simple random sampling technique was then used to select 11% of the population of quail farmers from each of the four districts thus giving a sample size of one hundred and twenty respondents.

Table 3.1: Selected L.G.A'S and the population of thefarmers from each of four districts selected for the study.

L.G.A	Districts	Sample frame	SampleSize (11%)
Gwale	Dorayi	360	40
	Kofarruwa	190	21
Kano municipal	Kofar kudu	310	34
	Duruminiyan	230	25
Total		**1090**	**120**

3.3 Data Collection

Primary data were collected from quail farmers in the study area through the use of interview schedule with the assistance of a well-trained enumerator from for the two selected Local Government Areas. The Primary data collected included; socioeconomic characteristics of the respondents, level of awareness and adoption of recommended management practices for quail production, factors influencing the adoption of recommended management practices and the constraints to the adoption of recommended management practices for quail production in the study. The secondary data sources was from review of literature from official documents, Journals, libraries, research institutes, internet, as well as reports kept by Kano State Agricultural and Rural Development Agency(KNARDA).

3.4 Analytical Techniques

Descriptive statistics, Z-test and multiple regression analysis were used as tools of analysis.

3.4.1 Descriptive statistics

Descriptive statistics such as frequencies, percentages, means, ranking and tables were used to achieve objectives (i) (ii) (iii) and (vi) and (vii).

3.4.2 Z-test

The Z-test was used to test objective (v) i.e. to determine the effects of adopting recommended practices for quail production on thefarmers income, output and Standard of living. The Z-test was also used to test for hypothesis (II) i.e. Adoption of recommended management practices has no effect on the farmers output, income and Standard of living.

This was done using the formula:

$$z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\dfrac{S_1^2 + S_2^2}{n_1 + n_2}}} \quad \text{...(1)}$$

Where:

$\bar{x}_1$ = mean value before adoption

$\bar{x}_2$ = mean value after adoption

S_1^2 *and* S_2^2 = variance before adoption and after adoption

n_1 *and* n_2 =corresponding sample size associated with respondent before and after adoption.

3.4.3 Multiple regression

Multiple regression model was used to achieve objective (iv) i.e. to estimate the contributions of each independent variables (age, sex, marital status, level of education, pen size, farming experience, household size, membership of co-operative and access to credit) to the dependent variable (adoption of recommended management practices for quail production).The multiple regression analysis was also used to test hypothesis 1.

This will be carried out using the formula below:

$Y = a+b_1X_1+b_2X_2+b_3X_3$ ……….. $+b_{10}X_{10}+U$………………………………..(2)

Where:

Y = number of recommended management practices adopted.

$X_{1=}$ age (years)

X_2 = gender (male = 1, female = O)

X_3 = marital status (married = l, single = 2, divorced3, widowed 4)

X_4 = level of education (school years)

X_5= Size of flock (Total number of birds per pen)

X_6 =Awareness level (yes=1,No=0)

X_7 = Quail farming experience (number of years in production)

X_8 = membership of co-operative societies (yes=1,no=0)

X_9 = extension contacts (number of contacts in year 2013)

X_{10} = access to credit (l = accessible; O = inaccessible)

a = constant term

b_1-b_{13} = regression co-efficient

U = error term (variable not included in the model)

3.5 Definition and Measurement of Variables

3.5.1 Independent variables

Age: refers to the chronological age of the respondent as given at the time of data collection. Age was measured as the total number of years of the farmers.

Sex: this is the sex of the quail farmers that was used as respondents in the study area. This was measured by scoring all the male respondents (1) and female respondents(0) and then counting the total number of the two groups.

Marital status: this was made up of married, single and divorced individuals.These was measured by scoring the married 1, singles 2, divorced 3 and widowed 4.

Level of education: this refers to the number of years of farmers exposure to formal education. This was measured as the total number of years of formal education of the farmers.

Number of Quail birds/flock size: This refers to the number of quail birds the farmer possess and the size of the pen. The total number of birds /flock size was measured as the number of quail birds the farmer owns in figures, while the pen size was measured in Sq/ft.

Quail farming experience: Thiswas the number of years the respondents have been involved in quail production. This was measured in years.

Membership of cooperative societies: this refers to the number of groups the farmer belongs to as at the time the study was conducted. Each group was scored as one point and the total number was counted to form the score.

Extension Contacts: this was defined as the frequency of contacts of the respondent with the extension personal. It was measured by the total number of times a farmer receives training or information from extension workers on quail production.

Access to credit: this was the amount of money received in naira from any institutional or non-institutional organizations for the purpose of acquiring inputs for quail production and marketing. For those that have access to credit (I) and for those not able to access (0).

Sources of Information: This was the preferred sources of information for recommended management practices for quail production. This was measured by the mean score in which the respondents received information from a particular source.

3.6 Dependent Variable

The dependent variable for the study is the rate of adoption of recommended practices for quail production. Adoption rate was measured as the average of percentages of respondents adoption over the total number of recommended management practices. The was given as :

$$(Y) = \frac{\text{Number of Recommended quail management practices adopted}}{\text{Total number of Recommended quail management practices}} \times 100$$

A respondent who scored 50% and above was regarded as an adopter (having adopted at least five out of eight practices as recommended) and one who scored less than 50% was a non-adopter.

3.7 Effects of Adoption on Output, Income and Standard of Living

Output. The output in quail birds/egg production in 2012 after adoption was compared to the previous year before adoption. This was measured by the number of quail birds/pen raised and eggs per/crates produced for the period of the study.

Income from Sale of quail products: This was the amount of money in naira realized from quail products (eggs and meat) by each of the respondents. The income earned in Naira in 2012 after adoption was compared to the income earned the previous year before adoption.

Standard of living. The Standard of living was measured by comparing the durable material assets the farmers were able to purchase in the year before and after adoption. These assets were valued in Naira, summed up and compared. The inflationary trend was considered and added to the net worth of the assets to the year before adoption.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

Thischapterfocusesonthedescriptionofthesocio-economiccharacteristicsofthequailfarmers,institutional variables, sources of information for recommended management practices,awarenessofrecommendedmanagement practicesforquailproduction,adoptionofrecommendedmanagement practices,effectsofadoptiononfarmersoutput,incomeandstandardofliving,theproblemsfacedbyquailfarmersandthe Z-test and regression analysis of the variables..

4.1 Socio-economicCharacteristics of the Respondents.

4.1.1 Age:

Table 4.1 shows the distribution of the respondents according to their age. About 39.2% percent of the respondents fall within the age range of 41-50 years. This shows that most of the respondents are relatively middle aged, which could be regarded as active and productive age group and so have the energy to cope with the demand of quail production and also willing to exploit new areas of economic empowerment. This age distribution among farmers suggests high level of vitality for agricultural activities and play central role in productive enterprises (Durston, 1996).

Table 4.1: Age of Respondents

Age (Yrs)	**Frequency**	**Percentage (%)**	**Mean**
20-30	23	19.2	38.57
31-40	43	35.8	
41-50	47	39.2	
51-60	7	5.8	
Total	**120**	**100**	

4.1.2 Sex

The results in table 4.2 show the distribution of the respondents by their sex. The findings revealed that 71.7% of the respondents were males while 28.3% were females. This connotes that the male folks show more interest in the quail farming business than the female counterparts. This could be due to the 'Pudah'culture of the people which confines a woman to her house. This limits her ability to source information and capital to start the venture as they depend on their men folk to cater for their needs

Table 4.2: Sex of Respondents

Sex	Frequency	Percentage (%)
Male	86	71.7
female	34	28.3
Total	**120**	**100**

4.1.3 Marital status: The results in table 4.3 shows that 55% of the respondents were married, 19.2% were single, 12.5% divorced, 13.3% were widowed. This shows that more than half of the respondents were married and probably ventured into quail farming to earn some extra money to augment for their household expenses and improve their standard of living.

Table 4.3: Marital Status

Marital Status	Frequency	Percentage (%)
Single	23	19.2
married	66	55.0
Divorced	15	12.5
Widowed	16	13.3
Total	**120**	**100**

4.1.4 Education: The results in table 4.4 also shows that 36.7% of the respondents had attended primary school education, while 33.3% have secondary school education,11.7% had islamiyya education,10% had attended a higher institution and 8.3% had no formal education. This depicts that a great proportion of the respondents had at least gone through primary school education provided by the local community. This is in agreement with (Ekong 2003) who reported that nearly all villages in the present day Nigeria has a western type primary school as a result of the Federal Government universal free Education scheme instituted in 1976 and the U.B.E in year 2000.

Table 4.4: Level of Education

Level of Education	Frequency	Percentage (%)
Primary	44	36.7
Secondary	40	33.3
higher Institution	12	10.0
Islamiyya	10	8.30
No formal education	14	11.7
Total	**120**	**100**

(**4.1.5**) **Size of flock**: Table 4.5 shows that 5% of the respondents kept 40 birds and below,33.3% of the respondents kept between 41-80 birds, 8.3% represented the respondents who had 81-120 birds, 121-160 and 241-280 number of birds respectively. 6.7% of the respondents kept 161-200 birds,9.2% of the respondents kept between 201-240 birds.28.8% represented the respondents who reared quail birds from the range of 281 and above. This indicates that majority of the respondents kept between 41-80 birds followed by those who kept 281 birds and above. This agreed with the classification of Abubakar and Oni (2002) which classified small scale poultry farmers as drawing up to 1,000 birds.The other reason could be that most of the respondents do not have enough funds and the technical exposure to expand their production.

Table 4.5: Size of flock

Size of Birds	Frequency	Percentage (%)	
40 birds and below	6	5.00	154.53
41-80	40	33.3	
81-120	10	8.30	
121-160	10	8.30	
161-200	8	6.70	
201-240	11	9.20	
241-280	10	8.30	
280 and above	25	28.8	
Total	**120**	**100**	

4.1.6 Quail farming Experience: Table 4.6 also shows that 20.8% of the respondents have quail farming experience of one year and below,29.2% with two years,30.8% have 3 years' experience,12.5% have 4 years and 6.7% of the respondents have no quail farming experience. The results confirm that most of the respondents have up to 3years quail farming experience. Quail farming is still a very new form of poultry venture in the study areas and so not very many people have experience about the business.

Table 4.6: Quail Farming Experience

No. of Years.	Frequency	Percentage (%)
1 year and above	25	20.8
2 years	35	29.2
3 years	37	30.8
4 years and above	15	12.5
No quail farming experience	8	6.7
Total	**120**	**100**

4.2 InstitutionalVariables.

4.2.1 Membership of cooperatives: Table 4.2 shows the distribution of the respondents in their membership to cooperatives.59.2% of the respondents indicated that they do not belong to any cooperative association while 40.8% affirmed their membership to a cooperative association.37.5% of the respondents frequently participated at the activities of cooperatices, 55.8% said that they seldom attend, while 6.7% had never participated in cooperative activities. This low percentage of membership and participation of the respondents indicates that the farmers are not well oriented on the benefits of joining cooperative associations.

Table: 4.7 Distribution of respondents based on their membership of cooperative associations and level of participation in cooperatives activities(n=120)

Membership	Frequency (n=120)	Percentage
Yes	49	40.8
No	71	59.2
Level of participation		
Frequently	45	37.5
Seldom	67	55.8
Never	8	6.7

4.2.2 Attendance at training workshop/extension contact.

Attendance at training: Table 4.8 shows the distribution of the respondents according to their attendance at training workshops on quail production.63.3% of the respondents said that they have attendant at least a training workshop on quail production.36.7% affirmed that they have not attended any training workshop. This shows that the respondents who attend training workshops are more and thus are likely to equip themselves with more practical knowledge on quail production.

Extension contact: Table 4.8 also shows that majority 75% of the respondents had no contact with extension agents, while 25% had extension contacts over the period of this study. According to (Ekong 2003), identified that agricultural agents are the most important source of information to farmers on agricultural innovations. Ogunbemeru, B. O,(2008), also stressed improving extension services as a need to stir the minds of poultry farmers in these areas through investment by government or producers towards adopting the best poultry management system.

There is a glaring indication that extension services are not well coordinated in the study area.

Table 4.8: Distribution of respondents based on their attendance at training workshop/Extension contact

Attendance at training	Frequency (n=120)	Percentage
Yes	76	63.3
No	44	36.7
Extension contact		
Yes	30	25
No	90	75

4.2.3 Respondents on their Access to Credit and Sources of Credit

The result in Table 4.4 shows the distribution of the respondents on their access to credit and sources of credits. The table shows that 60% of the respondents do not have access to credit while 40% affirm that they have access to credit. On the sources of credit by the respondents 17.5% of the respondents got their funds from banks, 24.2% got theirs from cooperative society,18.3% from family and friends,35.8% got their funds from commercial money lenders and 4.2% said they got theirs from Government financial institution. This shows that majority of the quail farmers do not have access to credits. It also shows that most of quail farmers get their funds from community money lenders closely followed by the funds from cooperative organizations. The results show that probably the farmers are not aware of agricultural loan scheme for small scale agricultural production. This is largely due to small volume of their investment and their inability to provide credit worthy guarantors.

Table 4.9: Distribution of respondents based on their access to credit and sources of credit.

Access to credit	Frequency(n=120)	Percentage
Yes	48	40
No	72	60
Sources of credit		
Commercial banks	21	17.5
Cooperative society	29	24.2
Family and friends	22	18.3
Community money lenders	43	35.8
Government financial institution	5	4.2

4.3 Awareness of Recommended Management Practices for Quail Production

Farmers were asked to indicate their awareness of recommended management practices for quail production. Eight recommended management practices were made available for the farmers to indicate their level of awareness out of two options of Yes or No for each of eight recommended practices. The result of the analysis presented in Table 4.5 shows that farmers have high awareness for all the recommended technologies as 75% of the farmers indicated awareness of provision of clean water daily,71.60 % claimed the awareness of removing dead birds immediately and properly disposed off, 70% of the farmers claimed awareness of buying their day old chicks only from certified hatchery, 66.66% claimed the disinfect between batches , 62.50% keep quail birds away from other birds and rodents and supply adequate lighting for the birds,65% isolate sick birds from healthy birds and 63.33% of the respondents claimed that they are aware of keeping proper records of input and output. Though there is high level of awareness of the recommended practices not all of them were adopted. This might be as a result of the farmers preference of the farmers to adopt a particular practice and not knowing the benefits of others.This is in agreement withRoger 1995, who opine that though there is high level of awareness of technology but however cautioned on the use of awareness to determine adoption of innovation in that it is not always certain that farmers who are aware of innovation will adopt.

Table 4.10: Distribution of respondents based on the level awareness of the recommended practices for quail production.

	Awareness			
	Yes		No	
Recommended practices	**Freq (n=120)***	**Percentage**	**Freq**	**Percentage**
Use of moisture-absorbing litter	84	70	36	16.66
Brooding area kept clean always	90	75	30	14.16
De-beaking should be done at intervals	80	66.66	40	15.00
Quail birds should be kept away from other birds, rodents and vermin's.	75	62.50	45	20.83
Dead birds be removed immediately and properly disposedoff.	78	75.00	42	10.00
Sick birds should be isolated	76	63.33	44	12.50
Ensure adequate supply of lighting	62	51.66	58	15.83
Proper records of inputs and output	86	71.60	34	18.33

*Number greater than n due to multiple response

4.6Rate of Adoption of Recommended Management Practices for Quail Production.

The study revealed the average rate of adoption of the recommended was 63.47%. The study further revealed that the adoption of recommended practices was not uniform but in varying degrees(Table 4.11). Brooding areas are kept clean always 79.16%, de-beaking of the birds should be done at regular intervals , proper disposal of dead birds 70.83%,adequate supply of lighting 63.33% ,isolation of sick birds

60%.The least adopted recommended management practices were adequate supply of lighting 58.33% and proper keeping of records 45%.

Table 4.11: Distribution of the respondents on the bases of Rate of Adoption of recommended management practices.

Recommended practices	Frequency	Percentage
Use of moisture-absorbing litter	66	55
Brooding area should be kept clean always	95	79.16
De-beaking should be done at intervals	86	71.66
Quail birds should be kept away from other birds, rodents and vermin’s.	76	63.33
Dead birds be removed immediately and properly Disposedoff.	58	70.86
Sick birds are isolated	72	60
Ensure adequate supply of lighting	70	58.33
Proper records of inputs and output	54	45

*Number greater than n(120) due to multiple response

4.7 Sources of Information for Recommended Management Practices.

The result in Table 4.12revealed that the sources of information preference by the Quail farmers. Out of the eight (8) sources of information presented to the respondents, four (4) of these sources were prominently preferred. Using mean scores to rank the information sources according to their order of preference as indicated by the poultry farmers, Poultry farmers association ranked 1st (MS = 2.91), Extension agents was 2nd (MS =2.83), Input suppliers, Veterinary agents, Neighbors and friends both were ranked 3rd (MS = 2.68) and Radio ranked 5th (MS = 2.55). The other sources of information with mean score less than 2.5 which includes Print media, Television, and Internet and Social media with mean score 1.81, 1.73, and 1.40 respectively were less preferred. This reveals that these five information sources were accessible, trusted and adjudged effective sources which the farmers would prefer to be used in diffusing and disseminating innovations on poultry including quail production in this area. Oladeji (2011) reported a similar trend by revealing that sources used by poultry farmers to access information on poultry practices include poultry association, extension officers, and family and friends among others. The implication of this is that government and all other stakeholders should focus more attention on the usage of these four sources of information when making efforts on awareness and capacity building on quail production among the poultry farmers in the study area.

Table 4.12: Distribution of the Respondents based on their preferred Source of information for Recommended Practices.

Sources of Information	Most Preferred	Preferred	Not Preferred	Mean Score (MS)	Rank
Extension Agents	68(85.0)	10(12.5)	2(2.5)	2.83	2nd
Print Media	15(18.6)	35(43.8)	30(37.5)	1.81	6th
Radio	48(60.0)	28(35.0)	4(5.0)	2.55	5th
Television	10(12.5)	48(60.0)	12(15.0)	1.73	7th
Poultry Farmers Association	75(93.8)	3(3.8)	2(2.5)	2.91	1st
Neighbours and Friends	58(72.5)	18(22.5)	4(5.0)	2.68	3rd
Input Suppliers and Veterinary agents	60(75.0)	14(17.5)	6(7.5)	2.68	3rd
Computer/Internet/Social Media	10(12.5)	12(15.0)	58(72.5)	1.40	8th

MS derived from Most Preferred = 3, Preferred = 2, and Not Preferred = 1. n = 120
Note: The values in parenthesis represent the percentage while the value outside represent the frequency
Source: Field Survey, 2012

4.8Effects of adoption on farmers output, income and Standard of living.

(a) Egg production(Output)

Table 4.13shows the empirical result of the t-test for egg production before and after adoption of recommended management practices .The result shows that the mean before adoption was 1.38 while the mean after adoption was found to be 3.67.The standard deviation before adoption was 0.537,while the standard deviation after adoption was 1.12 .The Calculated t-value was 19.88 which exceeds the critical value (t-critical two tail) of 1.98. The null hypothesis (H_o) which stated that there are no significant differences between adoption of recommended management practices and out-put(egg production), was therefore rejected at 10% level of significance and the alternative hypothesis accepted. The result of the analysis indicates that adoption recommended management practices have significant effect on the output of egg production for the respondents who adopted the recommended practices.

Table 4.13 The Empirical result of the t-test for egg production before and after .

	Before Adoption	**After adoption**
Mean	1.383333333	3.666666667
Variance	0.288795518	1.24929972
Observations	120	120
Pearson Correlation	-0.037307249	
Hypothesized Mean Difference	0	
Df	119	
t Stat	-19.88068729	
P(T<=t) one-tail	6.29349E-40	
t Critical one-tail	1.657759285	
P(T<=t) two-tail	1.2587E-39	
t Critical two-tail	1.980099853	

Table 4.14shows the empirical result of the t-test for meat production before and after adoption of recommended management practices .The result shows that the mean before adoption was 1.99 while the mean after adoption was found to be 3.46.The standard deviation before adoption was 1.67,while the standard deviation after adoption was 1.16 .The Calculated t-value was 12.79 which exceeds the critical value (t-critical two tail) of 1.98. The null hypothesis (H_o) which stated that there is no significant differences between adoption of recommended management practices and out-put(egg production), was therefore rejected at 10% level of significance and the alternative hypothesis accepted. The result of the analysis indicates that adoption of recommended management practices has significant impact on the meat production for the respondents who adopted the practices.

t-Test: Paired Two Sample for Means

(b) Table 4.14: Meat production

	Before Adoption	*After Adoption*
Mean	1.991666667	3.458333333
Variance	2.781442577	1.342787115
Observations	120	120
Pearson Correlation	0.658578548	
Hypothesized Mean Difference	0	
Df	119	
t Stat	-12.78705875	
P(T<=t) one-tail	2.17285E-24	
t Critical one-tail	1.657759285	
P(T<=t) two-tail	4.3457E-24	
t Critical two-tail	1.980099853	

(c)**Income**

Table 4.15 shows the empirical result of the t-test for income before and after adoption of recommended management practices .The result shows that the mean for the income before adoption was 2.18 i.e (₦30,000)8.3% of the respondents. While the mean after adoption was found to be 3.37 i.e (₦45, 000 and above)22.5%.

of the respondents .The standard deviation before adoption was 1.33, while the standard deviation after adoption was 1.22 .The Calculated t-value was 20.86 which exceeds the critical value (t-critical two tail) of 1.98. The null hypothesis (H_o) which stated that there is no significant difference between adoption of recommended management practices and income, was therefore rejected at 10% level of significance and the alternative hypothesis accepted. The result of the analysis indicates that adoption of recommended management practices has a significant effect on the income of the respondents who adopted the recommended practices.

Table 4.15 Empirical result of income before and after adoption.

	Before Adoption	**After Adoption**
Mean	2.175	3.366666667
Variance	1.759033613	1.494677871
Observations	120	120
Pearson Correlation	0.882585554	
Hypothesized Mean Difference	0	
Df	119	
t Stat	-20.86242421	
P(T<=t) one-tail	7.22303E-42	
t Critical one-tail	1.657759285	
P(T<=t) two-tail	1.44461E-41	
t Critical two-tail	1.980099853	

Table 4.16 shows the empirical result of the t-test for the standard of living before and after adoption of recommended management practices .The result shows that the mean before adoption was 1.61 while the mean after adoption was found to be 4.0.The standard deviation before adoption was 1.13,while the standard deviation after adoption was 1.46 .The Calculated t-value was 23.14. Which exceeds the critical value (t-critical two tail) of 1.98. The null hypothesis (H_o) which stated that there are no significant differences between adoption of recommended management

practices and level of living, was therefore rejected at 10% level of significance and the alternative hypothesis accepted. The result of the analysis indicates that adoption of recommended management practices has effect on the standard of living of the respondents. Therefore their standard of living was enhanced through acquiring of materials items from the proceeds of their sales.

Table 4.16: Standard of Living

t-Test: Paired Two Sample for Means

	Before Adoption	**After Adoption**
Mean	1.608333333	4
Variance	1.282282913	2.134453782
Observations	120	120
Pearson Correlation	0.6450917	
Hypothesized Mean Difference	0	
Df	119	
t Stat	-23.13658976	
P(T<=t) one-tail	3.64138E-46	
t Critical one-tail	1.657759285	
P(T<=t) two-tail	7.28277E-46	
t Critical two-tail	1.980099853	

Table 4.16 shows the empirical result of the t-test for the standard of living before and after adoption of recommended management practices

4.9 Factors influencing the adoption of recommended management practices for quail production.

The empirical results of the logistic regression are presented in table 4.18. Age of the respondents was found to be positive and significant 1% level of probability. This implies that the respondent age affects the level of adoption of the recommended practices.Which means the older the respondents are more matured and willing to adopt new ideas? Their level of education was also found to be negative but significant at 5% level of probability. This implies the farmer's level of education has an inverse effect on the adoption of the recommended management practices for quail production. This indicates that having a formal education does not necessary influence their level of adoption as they are able acquire the knowledge about business by attending trainings sessions and learning from friends who are experienced in the quail business.

The level of awareness was found to be positive and significant at 1% level of probability. This means that the more aware the farmers are the more readilythey are willing to adopt the recommended practises. Quail farming experience was found to be positive and significant at 5% level of probability. This implies that the longer the farmer stays in the business of quail production the more experience he or she will acquire from it. The respondents Gender, size of birds, membership of cooperative societies, and access to credit were found to be insignificant from the analysis. This implies that, one unit increase in their variable coefficient will not affect the level of adoption of the recommended management practices for quail production.

Furthermore, the variables marital status, level of education and membership of cooperative societies are negative and inversely related to adoption of recommended practices .This implies that a unit increase in their variables coefficients will result in a decrease in level of adoption of the recommended practices.

Table 4.17: The empirical results of the logistic regression are presented in the table below

Variable	Coefficient	Standard error	T-value
Constant	-1.467	0.434	-3.378***
Respond Age	0.649	0.167	3.885***
Gender	0.091	0.148	0.613NS
Marital status	-0.080	0.072	-1.105 NS
Level of Education	-0.069	0.030	-2.295**
Awareness of practices	0.097	0.036	2.666***
size of flocks	0.011	0.019	0.584 NS
member of cooperatives	-0.115	0.101	-1.137 NS
Extension contact	0.158	0.141	1.125 NS
access to credit	0.028	0.099	0.283 NS
Quail Farming Experience	0.095	0.042	2.278**

R-Squared=0.569,Adjusted R-Squared=0.520,*** P<0.01,** P<0.05

Hypothesis 1

The value of coefficient of determination,R^2 was 0.569 with an adjusted R^2 of 0.520.This implies that about 57% of the variations in the adoption of recommended management practices for quail production was explained by the selected independent variables. This implies that the model gave a good fit for the data. The null hypothesis was rejected and the alternate hypothesis accepted i.e. the respondent's socioeconomic characteristics and institutional variables have significant influence on the adoption of recommended management practices for quail production.

4.9 Constraints to the Adoption of Recommendation Practices for Quail Production

Table 4.18 shows the distribution of the farmers according the problems encountered in the course of the quail production business.59.2% of the respondents indicated that access to credit which ranks as the most crucial problems they face in the quail business. This is followed by problems of diseases (50.8%) which rank second in the problems encountered.14.2% of the respondent indicated that inadequate extension services as the 3rd most pressing problems encountered. This is followed by the problem of technical skills for quail production which ranks 4th and accounts for 10.8% of the respondents. Poor marketing system and getting certified hybrid birds accounts for 8.3% respectively and both rank as the 5th problems mostly faced by the respondents from the study. Lack of improvised hatcheries and inadequate space for production accounts for 10% and 4.2% (6th and 7th problems in ranking) respectively. This table shows the greatest problem is that of inadequate contact with extension workers. This concur with the findings of Atala (1988) who observed that the role of extension is particularly important primarily because of the low productivity of farmers arising mainly from the use of traditional technologies, as such the introduction of improved inputs and agricultural practices are requisite for increased production in agricultural development in general.

Table 4.18 .Distribution of the Respondents based on their constraints to the adoption of Recommended practices for Quail production.

Constraints	Freq(n=120)*	Percent	Rank
Access to credit to boost production	72	59.2.	1st
Getting certified hybrid birds	28	2.33	5th
inadequate space for production	18	15.0	7th
lack of technical know how	30	25.0	4th
lack of contact with extension agent	49	40.8	3rd
lack of improvised hatcheries	21	17.50	6th
Disease problems	61	50.8	2nd
poor marketing system	10	8.3	8th

*Multiple response was allowed hence frequency exceeded sample size

CHAPTER FIVE

SUMMARY,CONCLUSION AND RECOMMENDATION

5.1 Summary

This study was designed to access the adoption of recommended management practices in two selected local government (Kano municipal and Gwale) areas of Kanostate . A multi-stage sampling technique was used in the study area. Random sampling was used to select two districts from each of the two local government areas. This districts were Dorayi,Kofarruwa,Kofar kudu and Duruminiyan .The sample size of 120 respondents were randomly selected and data were collected from the farmers between 2011(before adoption) and 2012(after adoption).Descriptive statistics, multiple regression and t-test were used to analyze the data. About 39.2% percent of the respondents fall within the age range of 41-50 years and their mean age was 39years. 71.7% of the respondents were males while 28.3% were females. 55% of the respondents were married,19.2% were single, 12.5% divorced,13.3% were widowed. 36.7% of the respondents had attended primary school education, while 33.3% have secondary school education,11.7% had islamiyya education,10% had attended a higher institution and 8.3% had no formal education. 33.3% of the respondents kept between 41-80 birds, 28.8% represented the respondents who reared quail birds from the range of 281 and above The mean range of birds for all the respondents was found to be 155 birds. Similarly, the results shows that 30.8% of the respondents had 3 years quail farming experience.59.2% of the respondents indicated that they do not belong to any cooperative association.

About 63.3% of the respondents said that they have attendentat least a training workshop on quail production. Majority (75%) of the respondents had no contact with extension agents, while 25% had extension contacts over the period of this study. About 60% of the respondents do not have access to credit while 40% affirm that they have access to credit. The farmers have high awareness for most of the recommended management practices as 75% . The study revealed the average rate of adoption of the recommended was 63.47%. The study shows that the mean before adoption was 1.99 while the mean after adoption was found to be 3.46 for egg production. The result also shows that the mean before adoption was 1.38 while the mean after adoption was found to be 3.67 for meat production.

The study shows that the mean for the income before adoption was 2.18 i.e (₦30,000)8.3% of the respondents. while the mean after adoption was found to be 3.37 i.e(₦45,000 and above)22.5%. It shows that the mean for the standard ofliving before adoption was 1.61 while the mean after adoption was found to be 4.0.For the multiple regression analysis, Age of the respondents was found to be positive and significant 1% level of probability. The level of awareness was found to be positive and significant at 1% level of probability. . Quail farming experience was found to be positive and significant at 5% level of probability. The null hypothesis was rejected and the alternate hypothesis accepted i.e the respondent’s socioeconomic characteristics and institutional variables have significant influence on the adoption of recommended management practices for quail production. In terms problems encountered, 59.2% of the respondents indicated that access to credit which ranks as the most crucial problems they face in the quail business. This is followed by problems of diseases (50.8%) which ranks second in the problems encountered.

5.2 Conclusion

This study revealed that adoption recommended management practices for Quail production is significantly affected by awareness, quail rearing experience, age of respondent and Education in the study areas. It is therefore concluded that the promotion of recommended practice for quail production is a worthwhile effort and should continue to be promoted by all stake holders in agricultural production. Those significant factors that positively affected adoption need to be harmonized and given due credence for the promotion of quail production in the study areas and in the country in general. The study revealed that the respondents who adopted most of the recommended management practices had a significant increase in their output, income and standard of living over the period of the study.

5.3Recommendations

Sequel to the findings from this study the following recommendation has been made:

(i) The study revealed that there was low level of adoption in the study areas despite the high level of awareness of recommended management practices. It is therefore recommending that more efforts should be made towards encouraging quail farmers to adopt these practices for their own productive benefit.

(ii) It is also recommending that quail farmers should endeavour to join cooperative societies and to attend training sessions as this would facilitate access to vital information on the latest management practices of improving their output. More so, it will also avail the farmersthe platform to access funds from financial institutions to improve their production capacity and thus bettering their standard of living.

(iii) There is a need for the State Ministry of Agriculture through the Local government areas, to re-enforceand motivate agricultural extension agents in their various units toenable them discharge their duty adequately and to reach out to the quail farmers in their respectivelocalities.

5.4 Contribution of the study to knowledge.

(i) The study revealed that the level of awareness for most of the recommended management practices for quail production in the study area was high and fell within range of 75% for most of the respondents.

(ii) The study also revealed that the average rate of adoption for the recommended management practices for quail production in the study area was 65%.

(iii). The study also revealed that the most preferred sourceof information for most of the respondents was the poultry farmers association in the study area.

(iv) The study also revealed that the means of the production output ,income and standard of living after adoption of recommended management practices was higher than the means before adoption of the recommended practices .These were given thus as;(a) production output for Egg before adoption and after adoption as 1.38 and 3.66 respectively,(b) Meat production before and after adoption of recommended practices was found to be 1.99 and 3.46 respectively.(c) The mean income of the respondents before and after adoption of recommended practices was found to be 2.18(₦30,000) and 3.37(₦45,000) respectively.(d) The mean for standard of living for respondents before and after adoption of recommended management practices was found to be 1.6 and 4 respectively.

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DEPARTMENT OF AGRICULTURAL EXTENSION AND RURAL SOCIOLOGY

FACULTY OF AGRICULTURE AHMA0U BELLO UNIVERSITY, ZARIA

QUESTIONNAIRE FOR RESEARCH PURPOSE ON ADOPTION OF RECOMMENDED MANAGEMENT PRACTICES FOR QUAIL PRODUCTION IN SOME SELECTED LOCAL GOVERNMENTS IN KANO STATE

SECTION A: Socio-economic characteristics of quail farmers in the study area

Name: ____

Age:____

Sex: (a) Male [ ] (b) Female [ ]

Marital Status: (a) Married [ ] (b) Single [ ]

State: Local Government Area:______________________________

Education level: (a) Primary[ ] (b) secondary {] (c) Higher Institution] (d) Islamiyya [ ] (e) No formal education [ ] (d) others specify

SECTION B: Level of Awareness and Adoption

Recommended practices	**Aware**	**Not aware**	**Adopted**	**Not adopted**
Provision of clean water daily				
Keeping pen floor dry				
Keeping the quail from other birds, rodents and vermin's				
Removal of dead birds immediately and proper disposal technique			-	
Isolation of sick birds				

Consulting of veterinarian for any serious disease				

SECTION C: Factors influencing *level* of adoption of recommended management practices far Quail production in the study area

8. Size of Birds: How many birds are you keeping?________________________________

9. Membership of cooperatives: Do you belong to any cooperative group that deals with quail production, (a) Yes [ ] (b) No [ ]

10. Level of participation at the cooperative activities:

(i) Frequently [ ] (ii) Seldom [ ] (&) Never [ ]

11. Attendance at any training/workshop/seminar on quail production. Yes [ ] No [ ]

12. Did you apply the knowledge you acquired from the training

13. If yes, why?____

14. If No, why?____

15. Extension contact: Is there any extension agent in your locality? Yes [ ] (b) No [ ]

16. If yes, how many times did he visit you?

(i)Once [ ] (ii) Twice [ ] (iii) Thrice [ ] (v) Others specify_______________

17. How many times did you visit him?

(i)Once [ ] (ii) Twice [ ] 0") Thrice [ ] (v) Others specify___________________

18. Innovation attributes: did you use any recommended practices for your quail production? (a) Yes [ ] No [ ] indifferent [ ]

SECTION D: Effects of Adoption

22. Production: Which of the following production output ranges, before and after adoption of recommended practices in your last production reflect your level production

EGG PRODUCTION

BEFORE			AFTER		
(a)	Less than 2 crates/pen	[ ]	(a)	Less than 2 crates/pen	[ ]
(b)	2-4 crates/pen	[ ]	(b)	2-4 crates/pen	[ ]
(c)	5-7 crates/pen	[ ]	(c)	5-7 crates/pen	[ ]
(d)	8-10crates/pen	[ ]	(d)	8-10 crates/pen	[ ]
(e)	11-13crates/pen	[ ]	(e)	11-13 crates/pen	[ ]
(f)	14 crates/pen and above	[ ]	(f)	14 crates/pen and above	[ ]

MEAT PRODUCTION

BEFORE			**AFTER**		
(a)	Less than 100 birds/pen	[ ]	(a)	Less than 100 birds/pen	[ ]
(b)	101-400 birds/pen	[ ]	(b)	101-400 birds/pen	[ ]
(c)	401-700 birds/pen	[ ]	(c)	401-700 birds/pen	[ ]
(d)	701-1000 birds/pen	[ ]	(d)	701-1000 birds/pen	[ ]
(e)	1001-1500 birds/pen	[ ]	(e)	1001-1500 birds/pen	[ ]
(f)	1501 birds/pen and above	[ ]	(f)	1501 birds/pen and above	[ ]

Income: Which of the following income ranges, before and after adoption of recommended practices for quail production adequately **reflect** your level of income.

	BEFORE			AFTER	
(a)	Less than Nl0,000	[ ]	(a)	Less than N10,000	[ ]
(b)	N10,001-N15,000	[ ]	(b)	N10,001-N15,000	[ ]
(c)	N15,001-N20,000	[ ]	(c)	N15,001-N20,000	[ ]
(d)	N20,000-N25,000	[ ]	(d)	N20,000-N25,000	[ ]
(e)	N25,001-N30,000	[ ]	(e)	N25,001-N30,000	[ ]
(f)	N30,001 and above	[ ]	(f)	N30,001- N30,000	[ ]

24. Standard of living: Which of the following items did you acquire before and after adopting recommended management practices for quail production.

Before After

yes ( ) no ( ) number owned ( ) yes ( ) no ( ) number owned ( )

i. Radio

ii. Television

iii. Bicycle

iv. Motor bicycle

v. Car

vi VCD/DVD

vii Refrigerator

viii Quail egg Incubator

Others specify____

25. Perceived: How satisfied were you with you production enterprise before and after adopting recommended management practices for quail production?

	BEFORE			AFTER	
(i)	Very satisfied	[ ]	(i)	Very satisfied	[ ]
(ii)	Satisfied	[ ]	(ii)	Satisfied	[ ]
(iii)	Unsatisfied	[ ]	(iii)	Unsatisfied	[ ]
(iv)	Very unsatisfied	[ ]	(iv)	Very unsatisfied	[ ]
(v)	Undecided	[ ]	(v)	Undecided	[ ]

SECTON E: ADOPTION CONSTRAINTS

26. Do you experience any problem in adopting recommended quail production practices? (a)Yes[ ] (b)No[ ]

27. If yes, please rank in other of priority (Ranking 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th

	Problems	Ranking 1st, 2nd, 3rd, 4* 5th, 6th, 8m
1.	Access to credit to boost production	
2.	Getting certified hybrid birds	
3.	Inadequate space for production	
4.	Lack of technical know how	
5.	Lack of contact with extension agent	
6.	Lack improvised hatcheries	
7.	Disease and pests problems	
8.	Poor marketing system	

28. What is your suggestion or recommendations on how to boost quail production in your area____?

____

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Thank you for your cooperation.