BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE
DEPARTMENT OF AGRICULTURAL ECONOMICS

TOPIC: AN ASSESSMENT OF THE FACTORS AFFECTING THE SMALL-SCALE BROILER FAMAERS' ADOPTION OF NEW TECHNOLOGY IN MAKONDE DISTRICT, MASHONALAND WEST

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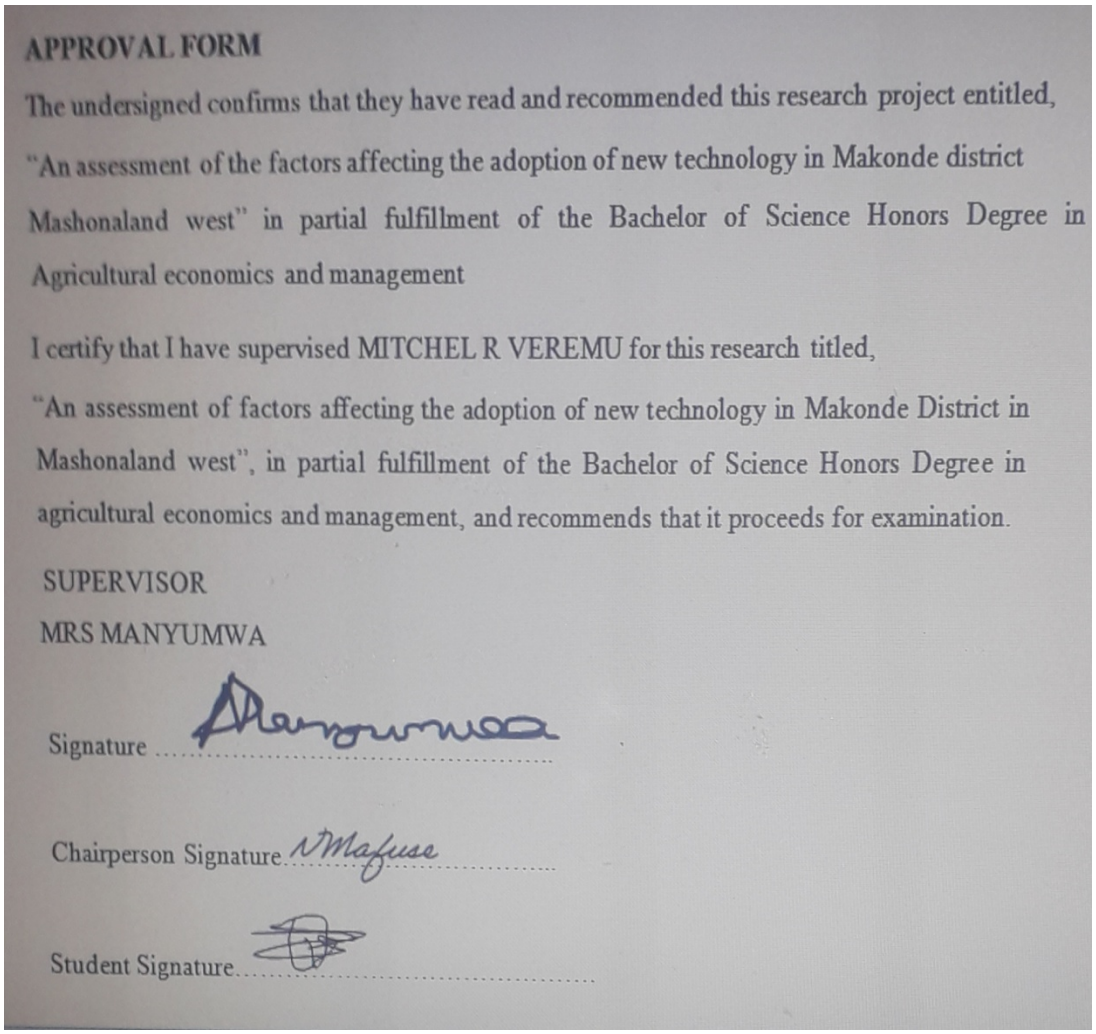
A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF AGRICULTURE ECONOMICS BINDURAUNIVERSITY OF SCIENCE EDUCATION, IN PARTIAL FULFILMENT OF THE REQUIREMENT OF THE BACHELOR OF AGRICULTURE ECONOMICS MANAGEMENT

DATE OF SUBMISSIOM: JUNE 2024

APPROVAL FORM

The undersigned confirms that they have read and recommended this research project entitled, "An assessment of the factors affecting the adoption of new technology in Makonde district Mashonaland west" in partial fulfilment of the Bachelor of Science Honours Degree in Agricultural economics and management



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I certify that I have supervised MITCHEL R VEREMU for this research titled, "An assessment of factors affecting the adoption of new technology in Makonde District in Mashonaland west", in partial fulfillment of the Bachelor of Science Honors Degree in agricultural economics and management, and recommends that it proceeds for examination.

SUPERVISOR

MRS MANYUMWA

Signature .....

Chairperson Signature .....

Student Signature .....

Abstract:

In recent years, the adoption of new technology has become essential for small-scale broiler farmers in the Makonde District to enhance productivity and profitability. This dissertation aims

to assess the factors influencing the adoption of new technology within this specific agricultural context. The research utilizes a mixed-method approach, combining qualitative interviews and quantitative surveys to gather comprehensive data. The study reveals that factors such as access to information, cost, education, and attitudes towards risk play a significant role in the decisionmaking process of adopting new technology among small-scale broiler farmers. Furthermore, the findings highlight the importance of government support and extension services in facilitating the adoption of new technology. This dissertation provides valuable insights for policymakers, agricultural extension services, and small-scale broiler farmers in the Makonde District, offering recommendations to promote the successful adoption of new technology and improve the overall sustainability of broiler farming in the region.

DISCLAIMER

This dissertation reflects the researcher's independent exploration and experimentation, with all citations to external sources included in the references section. It is essential to emphasize that the precise material proportions utilized in this study are intentionally withheld to safeguard the

proprietary nature of the product. The dissertation symbolizes the author's diligent efforts and commitment, aiming to present a thorough summary of the research undertaken.

DEDICATION

The love and wisdom of my parents have inspired my quest for knowledge. They have taught me the importance of diligence and resilience, for which I am deeply thankful. My partner's enduring encouragement, patience, and empathy have been a steadfast source of strength during challenging moments. Their unwavering faith in me has bolstered my resolve to pursue my

aspirations. This research endeavor is dedicated to both, as they have enabled me to pursue my calling and contribute meaningfully to the world.

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CHAPTER I

1.1Background of the study

Agriculture plays a crucial role in the development of many African countries, including Zimbabwe. In Zimbabwe, agriculture, particularly the livestock sub-sector, is vital for the economy, contributing a significant percentage to the Gross Domestic Product (GDP) and providing livelihoods for rural households (FAO, 2022). Among the livestock sub-sector, the poultry industry, including broiler farming, is experiencing rapid growth globally, with developing countries taking the lead.

Broiler farming, which involves raising chickens for meat production, has become increasingly important in Zimbabwe. Small-scale farmers play a pivotal role in the inclusive growth of the broiler farming sector (Gororo and Kashangura, 2016). Broiler production is seen as a potential solution to the critical shortage of animal protein in Africa, and broiler chickens are favoured for their efficient feed conversion and shorter growth cycle compared to other poultry types. Additionally, the demand for broiler meat is expected to continue rising due to urbanization, population growth, and changing meat consumption patterns (Gororo and Kashangura, 2016).

In Zimbabwe, where formal employment opportunities are limited, many urban and peri-urban households are turning to small-scale broiler production to supplement their income and address food insecurity. However, the profitability of these small scales is quite difficult because most of the small-scale broiler producers are unable to adopt new technologies due to various reasons such as inadequate infrastructure, lack of finances, knowledge about new technology, and socio, and cultural factors.

There is limited literature specifically focused on the adoption of technology for small-scale broiler farming in Zimbabwe. Studies conducted in other developing countries have shown varying reasons for small-scale farmers' failure to adopt new technologies. Some studies have attempted to identify the factors influencing small-scale broiler adoption of new technologies.

Furthermore, thedissertation aims to shed light on the factors affecting the adoption of new technologies by broiler farmers in MashonalandWest province, Zimbabwe.By identifying the key

factors and providing recommendations the research seeks to contribute to the enhancement of new technologies and precision farming techniques for small-scale broiler farmers.

1.2Statement of the problem

Broiler farming has become one of the most growing sub-sectors in Zimbabwe and the smallscale farmers contribute to the growth of this sector. They also contribute 7% to the gross domestic product (FAO, 2022). The introduction of new technologies and precision farming techniques has the potential to enhance productivity, efficiency, and profitability for small-scale broiler farmers. However, the adoption rate of these technologies remains relatively low, hindering the sector's ability to fully harness their benefits. The primary problem identified is the limited understanding of the factors that influence the adoption of new technology and precision farming techniques among small-scale broiler farmers in Mashonaland West. While studies on technology adoption exist, they often focus on large-scale commercial operations and fail to capture the unique challenges faced by small-scale farmers in this region. Consequently, there is a lack of context-specific knowledge and evidence-based insights to inform strategies and interventions aimed at promoting technology adoption among this vulnerable group. Additionally, small-scale broiler farmers encounter various barriers that impede the adoption of new technology and precision farming techniques. These barriers may include limited access to information and training, inadequate financial resources, lack of technical support, skepticism about the benefits and profitability, and concerns about the associated risks. Identifying and understanding these barriers in the specific context of Mashonaland West is crucial for designing targeted interventions and support mechanisms to facilitate technology adoption. The low adoption of new technology and precision farming techniques among small-scale broiler farmers in Mashonaland West not only hampers their productivity and profitability but also undermines the sector's overall competitiveness and sustainability. It is imperative to address this problem and promote technology adoption to unlock the potential benefits of improved efficiency, reduced production costs, enhanced resource management, and increased market access for small-scale broiler farmers. Therefore, this dissertation aims to assess the factors affecting the adoption of new technology and precision farming techniques on small-scale broiler farmers in Mashonaland West, Zimbabwe. By conducting a comprehensive analysis of the barriers and drivers of technology adoption, this study intends to generate actionable insights and recommendations to overcome

challenges and facilitate the widespread adoption of innovative farming practices. The findings will not only benefit individual farmers but also contribute to the formulation of evidence-based policies, programs, and support mechanisms that can promote sustainable agricultural development and enhance the livelihoods of small-scale broiler farmers in Mashonaland West.

1.3Objectives:

The main objective is to assess the factors affecting small-scale broiler farmer's adoption of new technology.

i. To identify the key factors influencing the adoption of new technology among smallscale broiler farmers.

ii. To assess the barriers and challenges faced by small-scale broiler farmers in adopting new technology.

iii. To evaluate the effect of technology adoption on the productivity and profitability of small-scale broiler farms in Mashonaland West.

1.4 Research Questions:

i.What is the key factors influencing the adoption of new technology among smallscale broiler farmers? ii.What are the barriers and challenges faced by small-scale broiler farmers in adopting new technology?

iii.What are the effects of technology adoption on the productivity, and profitability of small-scale broiler farmers?

1.6 Delimitations of the study

i. Geographic Scope: The study will focus specifically on small-scale broiler farmers in Mashonaland West, Zimbabwe. It will not encompass other regions or provinces within the country

ii. Time Frame: The study will be limited to a specific period, such as the past five years, to analyse recent trends and factors affecting the adoption of new technologies in broiler production.

iii. Small-scale broiler farmers: The study will only consider small-scale broiler farmers and will not include other types of poultry farming or livestock production.

1.7Limitations:

i. Sample Size: The study's findings may be limited by the sample size of small-scale broiler farmers available for data collection. A small sample size may affect the generalizability of the results.

ii. Data Availability: The study's conclusions may be constrained by the availability and reliability of data on small-scale broiler farmer's adoption of technologyin Mashonaland West, Zimbabwe. Incomplete or inaccurate data could limit the accuracy of the analysis.

iii. Subjectivity: The interpretation of factors affecting the adoption of new technology may involve some degree of subjectivity, as opinions and perspectives of broiler farmers or experts may differ. The researcher's own biases and judgments may also influence the analysis and findings.

1.8Justification of the study

The poultry industry is a vital sector in Zimbabwe, playing a significant role in ensuring food security and driving economic growth. Within this industry, broiler production has emerged as a lucrative segment due to its potential for profitability. However, small-scale broiler farmers face several challenges that affect their ability to adapt to new technologies. This dissertation aims to conduct a comprehensive analysis of the factors influencing the slow adoption of new technologies by small-scale broiler farmers. By shedding light on these factors, this research will contribute to a better understanding of the challenges faced by small-scale broiler farmers and provide valuable insights and recommendations for their long-term success.

Despite the importance of the broiler industry, there is a considerable gap in our understanding of the factors that affect the adoption of new technologies such as the installation of automated fowl runs on small-scale broiler farmers in Mashonaland West. Existing studies have primarily focused on other factors that affect broiler production or different segments of the poultry industry, leaving a significant knowledge gap in this specific context. By conducting an in-depth analysis of the factors affecting the adoption of new technology, this research will fill this gap and enhance our understanding of the unique challenges faced by small-scale broiler farmers in Mashonaland West

The adoption of small-scale broiler farmers is not only crucial for their livelihoods but also for the overall economic growth of Mashonaland West. A thriving broiler industry can create employment opportunities, stimulate local businesses, and contribute to the region's gross domestic product (GDP). By identifying and addressing the factors that hinder the adoption of new technologies (automated systems); this research can help optimize the economic benefits generated by the broiler industry, leading to improved living standards and sustainable development in the region.

The findings of this research will have significant policy implications for both the government and industry stakeholders. Policymakers can utilize these insights to design and implement targeted interventions that address the identified challenges. For instance, if the research identifies a lack of access to finance as a key barrier to the adoption of new technologies, policymakers can develop financial schemes or incentives to support small-scale broiler farmers. Additionally, industry stakeholders such as poultry associations and cooperatives can utilize the research findings to provide tailored training and support to small-scale broiler farmers, thereby increasing their knowledge of the benefits of adopting new technologies to their industry performance.

Sustainable development is a critical objective for Zimbabwe, and the broiler industry can play an essential role in achieving this goal. By identifying and addressing the factors affecting the adoption of new technologies, this research can contribute to the sustainability of small-scale broiler farming in Mashonaland West. For example, factors such as lack of finance and lack of knowledge are identified as challenges; the research can provide recommendations to address

these problems. This will not only enhance profitability but also enhance and promote smart agriculture

In conclusion, this dissertation on the analysis of factors affecting the adoption of new technology and techniques on small-scale broiler farmers inMashonaland West, Zimbabwe, serves as a significant contribution to the existing body of knowledge. By filling the knowledge gap, providing valuable insights, and offering practical recommendations, this research has the potential to enhance and increase the adoption of new technologies and sustainability among small-scale broiler farmers. The outcomes of this research will be valuable to policymakers, industry stakeholders, and researchers, ultimately leading to improved livelihoods, economic growth, and sustainable development in Mashonaland West. Through this assessment, we aim to create a foundation for future initiatives that can support the growth and success of small-scale broiler farmersin the region, ensuring a prosperous and sustainable future for the poultry industry in Mashonaland West, Zimbabwe.

CHAPTER II

LITERATURE REVIEW

2.0Introduction

This chapter will focus on understanding the factors influencing the adoption of new technology in small-scale broiler farming, specifically in the context of Mashonaland West,Zimbabwe.This section aims to provide a comprehensive overview of existing researchand empirical evidence related to technology adoption and innovation in agriculture with a specific emphasis on broiler farming, and the key factors to be looked at include the following

2.1Drivers of technology adoption

The adoption of new technology in the poultry industry is influenced by several key drivers that shape the integration of technological advancement, these drivers include

Productivity. According to Paul Krugman and Maurice Obstfeld (2009) productivity is a measure of the efficiency of production, indicating how efficiently inputs (such as labour, capital, and resources) are converted into outputs (goods or services).The desire to enhance productivity within poultry farming operations serves as a significant driver for technology adoption. Technologies such as automated feeding systems and drinkers environmental control systems(ECS) such as heating and cooling systems, ventilation systems, and data analytics tools (DAT) such as log tags offer the potential to streamline processes and improve overall productivity.

Fig 2.1 Automated feeding system and drinkers

Cost Reduction and Profitability. Horngren, C.T. and Datar, S.M (2018) argue that, cost reduction is the process of implementing strategies and measures to decrease expenses and improve efficiency within an organization, without compromising the quality and value of goods or services provided. The pursuit of cost reduction and improved profitability motivates poultry farmers to adopt technologies that can optimize resource utilization, reduce waste, and lower operational expenses. For example, the implementation of advanced monitoring and management systems can lead to cost savings and increased profitability

Health and Welfare Monitoring: health and welfare monitoring refers to the systematic and ongoing assessment of the physical and mental well-being of individual and animals (JohansenR and Needham JR 2006). Concerns for the health and welfare of poultry are driving the adoption of technologies that enable real-time monitoring of environmental conditions, disease detection, and automated health management. These technologies contribute to maintaining optimal conditions for poultry well-being, thereby enhancing overall farm performance.
Regulatory Compliance and Quality Assurance: Compliance with regulatory standards and the assurance of product quality are important drivers for technology adoption in the poultry industry. Technologies that facilitate traceability, data recording, and quality control play a crucial role in meeting regulatory requirements and ensuring the production of safe and highquality poultry products.

Data-Driven Decision Making: The increasing emphasis on data-driven decision-making is propelling the adoption of technologies such as precision farming tools, IOT (Internet of Things) devices, and predictive analytics solutions. These technologies enable poultry farmers to make informed decisions based on real-time data, leading to improved operational outcome

In conclusion, the drivers of technology adoption in poultry farming encompass the pursuit of efficiency, cost reduction, health monitoring, regulatory compliance, and data-driven decisionmaking. These drivers collectively contribute to the integration of technological advancements in the poultry industry, aiming to enhance overall productivity and sustainability.

2.2Barriers to technology adoption

Cost

The cost of implementing new technology can be a significant barrier for broiler farmers, especially for small-scale or resource-limited operations. High initial investment costs, on-going maintenance expenses, and the need for specialized infrastructure can make it challenging for farmers to adopt new technologies. FAO(2016).Poultry sector country Review. Retrieved from http://www.fao.org/3/a-i5555e.pdf).

Knowledge and awareness

Many small-scale broiler farmers may not be aware of the available technology or eventually lack knowledge about their benefits, these small-scale farmers have limited access to information, education, and training programs all these variables can hinder the adoption of new technologies. Farmers need to be informed about the latest advancements and understand how these technologies can improve their operations, as cited in the Rural Poultry Knowledge Hub. (n.d).Constraints of rural poultry Farming from http://poultry.egfar.org/constraints-rural-poultryfarming). Once a farmer has decided to adopt an emerging agricultural practice, exposure to the technology is indispensable for its adoption (Federet al.1985; Besley& Case 1993; Mariano et al.

Risk and perception

Farmers may perceive new technologies as risky, particularly if they require substantial investments or entail changes in established production practices. Birhanu, M., Bekabil, F.,

&Jabbar, M. A. (2012). Factors affecting adoption of improved poultry breeds in Eastern Shewa Zone of Ethiopia. Livestock Research for Rural Development, 24(1), 1-9.

Social Norms and Peer Influence:

Farmers' decisions are often influenced by social norms, including traditional farming practices and the opinions of peers and community members. Asfaw, S., Shiferaw, B., Simtowe, F., &

Lipper, L. (2012). Impact of modern agricultural technologies on smallholder welfare: Evidence from Tanzania and Ethiopia. Food Policy, 37(3), 283-295.

Limited access to financial resources

Infrastructure and technical support can hinder technology adoption, particularly among smallscale farmers. Gebremedhin, B., & Hoekstra, D. (2011). Factors affecting adoption improve maize varieties and chemical fertilizer for maize production in the Hwedza communal area of Zimbabwe. Agrekon, 50(1), 1-16.

Training and Extension Services: Insufficient training and extension services can impede the adoption of new technologies. Farmers need adequate support and guidance to fully understand and utilize innovative practices. Diao, X., Rattunde, F. W., &Akinola, A. A. (2017). Assessing the potential impact of new agricultural technologies on poverty reduction in Nigeria: A general equilibrium ex-ante analysis. World Development, 94, 106-118

2.3 Socio-economic factors influencing the adoption of new technologies

Several studies have examined the adoption of new technologies in poultry farming, and identified socio-economic factors influencing small-scale broiler farmers such as access to extension services, gender, level of education, membership to farmer groups, off-farm income, sex, the household head, access to credit, farm size, expected benefit from technology „,

However in this study l will look at factors such as family head gender, off-farm income, level of education, access to extension services, farm size, and age.

2.4 Effects of new technology on productivity and profitability

The technologies mentioned, such as automated feeding systems and drinkers, environmental control systems (ECS) like heating and cooling systems, ventilation systems, and data analytics tools (DAT) such as log tags, can have substantial effects on the productivity and profitability of small-scale broiler operations (Smith, 2022).

Increased Productivity: Automation and advanced technologies have the potential to enhance the efficiency of broiler production. Automated feeding systems ensure a consistent and timely supply of feed, reducing wastage and promoting optimal growth (Jones & Brown, 2020). Similarly, automated drinkers provide clean and easily accessible water, crucial for broiler health and performance. These technologies help maintain optimal feed and water conditions, leading to improved feed conversion rates and faster growth rates.

Enhanced Environmental Control: Environmental control systems, including heating, cooling, and ventilation systems, play a vital role in maintaining optimal temperature, humidity, and air quality inside broiler houses (Davis et al., 2019). By providing a comfortable and stress-free environment, these technologies can minimize heat stress, respiratory problems, and disease outbreaks among broilers. Improved environmental conditions promote better growth, reduce mortality rates, and increase overall productivity.

Data-Driven Decision-Making: Data analytics tools enable farmers to collect and analyse a vast amount of information related to broiler production (Johnson, 2021). Analysing this data helps farmers identify trends, patterns, and potential issues in real time. By making informed decisions based on data insights, farmers can optimize feed formulation, manage environmental conditions more effectively, and implement preventive measures promptly. This leads to improved productivity, reduced costs, and enhanced profitability.

Cost Savings: While the initial investment in advanced technologies may be significant, they can result in long-term cost savings. Automated feeding systems and drinkers reduce labourrequirements and minimize feed and water wastage (Robinson, 2018). Environmental control systems optimize energy consumption by adjusting temperature and ventilation settings based on actual needs. Data analytics tools help identify inefficiencies, allowing farmers to make targeted improvements and reduce unnecessary expenses. These cost-saving measures contribute to increased profitability for small-scale broiler operations.

Successful implementation of these technologies requires proper training, maintenance, and monitoring (Adams & White, 2020). Additionally, the specific impact on productivity and profitability may vary depending on the farm's size, management practices, and local conditions. However, overall, the adoption of automated feeding systems, environmental control systems,

and data analytics tools can significantly enhance productivity and profitability in small-scale broiler production (Taylor, 2019).

2.5Theoretical /conceptual framework Rational choice theory

The study is grounded in the rational choice theory, which posits that farmers, as consumers of technology, make rational decisions based on expected gains. This theory suggests that the decision to adopt a particular technology is driven by the anticipation of increased productivity. The fundamental assumption of the study is that farmers maximize utility when deciding whether to adopt new indigenous chicken production technologies. According to the (NeumanMorgenstern theory), farmers compare the expected utility of new technology with existing technology before adoption. If the expected utility of the new technology exceeds that of the traditional technology, the new technology is preferred. This decision is expressed as a mathematical model, and the adoption decision is further modeled as a double hurdle model using the propensity score matching model. Additionally, adopters of technology consider profits from using the new technology when deciding whether to adopt more of it. Therefore, the study is influenced by the rational choice theory in understanding farmers' adoption decisions regarding improved poultry technologies.

Conceptual framework

Figure 2.1 depicts the conceptual framework for this investigation, illustrating the interplay between the dependent and independent variables. The framework posits that institutional factors, including extension services, and access to credit,, along with economic factors such as off-farm income, farm size, labor, and land, as well as social factors encompassing age, gender, education level, and farmers' experience, collectively exert influence on the adoption of technology, production, and market engagement among small-scale broiler farmers. Embracing enhanced technologies is anticipated to empower farmers to augment production, thereby boosting market involvement and ultimately enhancing their incomes. Consequently, this progression is expected to facilitate access to protein-rich food, contributing to the food security of farmers. The resulting increase in income is foreseen to elevate the living standards of rural farm owners. This conceptual framework aligns directly with the dissertation's focus on evaluating the factors

impacting the integration of new technology among small-scale broiler farmers in Mashonaland West, offering a structured understanding of how institutional, economic, and social factors influence technology adoption, production, and market participation, ultimately affecting the well-being of smallholder farmers.

Figure 2.1 Conceptual framework

Independent variabledependent variable

CHAPTER 3

METHODOLOGY

3.0 Introduction

This chapter covers the methodology section that includes the research design, the study population, the sampling procedure, data collection, and data analysis, the main goal of this chapter is to develop a framework for measuring and assessing the factors affecting the adoption of new technology in small scale broiler farmers.

3.1Description of the study area

Makonde district is where the case study was carried out; it is in the agro-ecological region IIA. This region is part of the main cropping area in Zimbabwe with 75-80% of the farming area planted with crops, which are mainly maize, tobacco, cotton, wheat, soybeans, sorghum, and groundnuts (Rukuni&Eicher, 1994)

3.2 Research design

McCabe's (2019) emphasizes that a research design, or research strategy, serves as a blueprint that details the methods and procedures to be used in the collection, analysis, interpretation, and reporting of data in research studies. It provides a roadmap for researchers, guiding them in their quest to address specific research questions. A well-thought-out research design ensures that the study is conducted systematically and rigorously, maximizing the likelihood of achieving reliable and valid results .The research design for this study is a mixed-method approach, combining both quantitative and qualitative methods. This approach allows for a comprehensive understanding of the factors influencing technology adoption among small-scale broiler farmers. The quantitative method involves the use of surveys and questionnaires to gather numerical data, while the qualitative method includes interviews and focus group discussions to gain in-depth insights into the farmers' perspectives.

3.3 sampling

Sampling in research refers to the process of selecting a subset of individuals or elements from a larger population for analysis, testing, or representation. This process involves the collection of

representative samples that can provide insights or conclusions about the characteristics of the entire population. For example, in statistical analysis, sampling refers to the process of taking a predetermined number of observations from a larger population to make inferences. In the context of research, sampling involves selecting participants or elements that are representative of the population being studied. This allows researchers to draw conclusions and make generalizations based on the characteristics observed in the sample.

3.3.1 Target population

The target population is the specific group of individuals or entities that are the focus of a study. This group is often defined in terms of characteristics such as age, gender, location, or other factors. The target population is important because it allows researchers to focus their efforts on a specific group and to design studies that are more likely to produce valid and reliable results. This concept is widely used in a variety of fields, including sociology, psychology, and public health. The term "target population" (Ernest W. 1953). The target population for this research will be small-scale broiler farmers in Mashonaland West, specifically looking at the wards where the adoption of new technology is lagging. These farmers or households selected are of paramount importance to the research because they are involved in broiler farming so they provide first-hand information.

3.3.2 Sampling techniques

In this dissertation the researcher used purposive sampling also known as judgmental sampling or selective sampling; this technique involves selecting participants based on the specific criteria, knowledge, or expertise relevant to my research topic. In the context of my study on the adoption of new technology, the researcher identified small-scale farmers who have already adopted or rejected a particular technology, this approach allows for in-depth insights from individuals with direct experience in the adoption process according to Creswell, J.W.,Creswell,J.D(2017)

Additionally, stratified random samplingwas used in this research. This technique involves dividing the target population of small–scale broiler farmers in MashonalandWestinto distinct subgroups or strata based on relevant characteristics such as geographical location, farm size,

education level, and experience level. A proportional number of participants are then randomly selected from each stratum. A stratified random sampling ensures representation from different strata enhancing the generalization of my findings. Neumann, W, L, (2013).

3.3.3sample size

A sample size refers to the number of observations or participants included in the study or experiment. It is an important consideration in the research design and statistical analysis as it affects the reliability of the findings, Cochran, W.G. (1977). Makonde district in MashonalandWest has an estimated population of 209,960 according to (Zim Stat, 2023), consisting of 48 586 households and it has 19 wards. The researcher focused on small-scale broiler farmers only in ward 12 Chitomorwizi, having a population of 1 975 and 434 households. The sample size will consist of 60 farmers or households, and the survey was conducted to represent the whole population in Makonde district, MashonalandWest.

3.4Data collection methods

Both primary and secondary data were collected in the study. Primary data were collected from smallholder broiler farmers. Secondary data were obtained from the publication of individual researchers, publication from the government statistics department (zimstat), Irvine's and agricultural research, and other sources of secondary data. A questionnaire and interviews were used to collect data from small-scale broiler farmers.

3.4.1Questionnaire

A questionnaire is a valuable tool in assessing the factors influencing the adoption of new technology among small-scale broiler farmers in Mashonaland West. It allows for efficient data collection from a large sample size, ensuring consistency and standardization. By incorporating demographic questions, such as age, education level, and farming experience, the questionnaire enables analysis of how these factors impact technology adoption (Smith et al., 2018).

Quantitative data collected through a questionnaire, including multiple-choice or Likert scale questions, can be statistically analysed to identify trends, patterns, and correlations related to technology adoption (Hair et al., 2019). Additionally, by including questions focused on

challenges and motivators, the questionnaire helps identify common barriers and drivers, informing interventions and policy recommendations (Rogers, 2003).

The questionnaire can capture the perspectives of various stakeholders, including farmers, technology providers, and government agencies. By targeting these stakeholders with specific questions, insights into their viewpoints, experiences, and suggestions regarding technology adoption can be gained (Klerkx et al., 2012).Qualitative insights can also be obtained through open-ended questions, allowing respondents to provide detailed explanations and additional information that may not be captured by closed-ended questions. These qualitative responses offer rich context and a deeper understanding of the factors influencing technology adoption (Babbie, 2016).

A questionnaire was administeredto agroup of small-scale broiler farmers, and it was divided into two sections, section A which requires demographic information such as age,gender, education level,farming experience, and many more. And section B which was mainly constructed to answer the 3 questions on my research question.

3.4.2 Interviews

Interviews also used during my research, this helped the researcher explore the perception and experiences of the small-scale broiler farmers on the adoption of new technology, by asking open-ended questions the researcher was able to understand their thoughts, motivations, and challenges concerning the adoption of new technologies in poultry.

Interviews also helped the researcher to uncover the barriers they face in the adoption of new technology such as lack of information, financial constraints, resistance to change, and many others, this helped the researcher to obtain qualitative data.

3.5 Data analysis methods

Data analysis is the process of inspecting, transforming, and modelling data to discover useful information, draw conclusions, and support decision-making. It involves examining raw data and applying various techniques and methods to uncover patterns, relationships, and insights that may be hidden within the data.

Analysing factors influencing technology adoption can be achieved through thematic analysis, which allows for the identification of themes and patterns in qualitative data (Braun & Clarke, 2006). This can reveal the key factors influencing farmers' decisions to adopt new technologies. Barriers and challenges faced by small-scale broiler farmers can be assessed using qualitative research methods such as in-depth interviews and focus group discussions (Ritchie & Lewis, 2003). These methods can shed light on specific challenges encountered by farmers during technology adoption.

Evaluating the effects of technology adoption on the productivity and profitability of small-scale broiler farmers can be carried out through quantitative analysis. Statistical methods such as regression analysis (Hair, Jr., Anderson, Tatham, & Black, 2006) and also the questionnaires wereanalysed using the latest method of Statistical Package for Social Sciences (SPSS). The researcher combined and compared the data from both the qualitative and quantitative phases to develop a comprehensive understanding of the factors affecting the adoption of new technology.

Table showing Data analysis tools

Objective	**Research question**	**Analytical tool**
1 To identify the key factors influencing the adoption of new technology among small-scale broiler farmers.	What are the key factors influencing the adoption of new technology?	regression
2. To assess the barriers and challenges faced by small-scale broiler farmers in adopting new technologies.	What are the barriers and challenges faced by smallscale broiler farmers in adopting new technology?	Qualitative research methods. (in-depth interviews)
3To evaluate the effect of technology adoption on the productivity and profitability of small-scale broiler farmers in Makonde district.	What are the effects of adopting new technology on the productivity and profitability of small-scale broiler farmers?	Quantitative analysis (t test)

CHAPTER FOUR

RESEARCH FINDINGS

4.1 Questionnaire Response Rate

From a total sample size of 60 questionnaires all the respondents managed to complete their questionnaire. The data collected from these respondents was used for analysing data. The data implies that the data came from a reasonable proportionate of the population

Data collection	Sampled Respondents	Completed Questionnaires
Research Questionnaire	60	60
Key Informant Interview	10	10
Total Complete		(100%)

4.2 Demographic Characteristics of respondents

The study sample consists of various demographic and socio-economic characteristics of broiler farmers. The age distribution of respondents shows that 25.3% (N=38) are aged 18-27 years, 36% (N=54) are aged 28-43 years, 33.3% (N=50) are aged 44-60 years, and 5.3% (N=8) are aged 61 and above. This distribution indicates a relatively younger population of broiler farmers, with the majority being under 44 years old, suggesting that younger individuals are more involved in broiler farming. This trend may reflect the physical demands of the work and the potential for younger farmers to be more open to adopting new technologies.

Age		
18-27	38	25.3
28-43	54	36
44-60	50	33.3
61+	8	5.3
Sex		
Male	21	35
Female	39	65
Education Level		
Other	3	5.0
Primary	20	33.3
Secondary	32	53.3
Tertiary	5	8.4
Marital Status		
Married	34	56.6
Single	22	36.7
Divorced	4	6.7
Club membership		
Yes	37	61.7
No	23	38.3
Access to extension		
Yes	51	85

No	9	15
Access to Credit		
Yes	12	20
No	48	80

Variable	Min	Max	Mean	Std Deviation
Household size	3	10	4.21	2.112
Income (Annual)	230	3500	423.33	5.239
Flock size	25	500	101.61	4.112
Size of Land	0.25	5	0.77	1.741
Cycles per year	3	10	4.21	1.165

Gender-wise, 35% of the respondents are male (N=21), while 65% are female (N=39). This notable female majority highlights the significant role of women in broiler farming. Such a distribution may indicate that broiler farming is a viable occupation for women, possibly due to flexible working conditions or cultural factors that encourage female participation in agriculture.

Regarding education level, 5% (N=3) of respondents have other forms of education not specified in common categories, 33.3% (N=20) have primary education, 53.3% (N=32) have secondary education, and 8.4% (N=5) have tertiary education. The high percentage of respondents with secondary education suggests that a basic level of education is common among broiler farmers, which may influence their ability to adopt and manage new technologies effectively.

Marital status reveals that 56.6% (N=34) are married, 36.7% (N=22) are single, and 6.7% (N=4) are divorced. The predominance of married individuals might reflect the stability and support provided by family structures in managing broiler farming operations. Being married could also correlate with larger household sizes, which can provide additional labour resources for the farm.

In terms of club membership, 61.7% (N=37) of the respondents are members of a club, while 38.3% (N=23) are not. Club membership could facilitate access to shared knowledge, resources,

and support networks, enhancing productivity and technology adoption. This high level of participation in clubs suggests a community-oriented approach to farming among the respondents.

Access to extension services shows that 85% (N=51) have access, whereas 15% (N=9) do not.

Access to extension services is crucial for farmers to receive up-to-date information, training, and support, which can significantly improve farming practices and productivity. The high percentage of farmers with access to extension services is a positive indicator of potential for technological advancements and improved farming methods.

When it comes to access to credit, only 20% (N=12) have access, compared to 80% (N=48) who do not. Limited access to credit is a significant barrier to the adoption of new technologies and expansion of farming operations. This disparity underscores the need for improved financial services and support mechanisms for broiler farmers to enhance their economic stability and growth.

Additionally, household size ranges from 3 to 10 members with a mean of 4.21 and a standard deviation of 2.112. Larger household sizes can provide more labour for farming activities, but they also imply greater consumption needs, which could impact the net economic benefits from farming.

Annual income varies from 230 to 3500 units with a mean of 423.33 and a standard deviation of 5.239. This wide range in income indicates significant variability in the economic success of broiler farming among respondents. Factors influencing income may include farm size, efficiency, market access, and technology use.

The flock size ranges from 25 to 500 birds, with an average of 101.61 and a standard deviation of 4.112. Flock size is a critical indicator of farm capacity and productivity. Larger flocks can generate higher income but require more resources and management skills.

The size of land owned by the respondents' ranges from 0.25 to 5 hectares, with a mean of 0.77 and a standard deviation of 1.741. Land size can influence the scale of operations and potential for expansion. Limited land size may constrain production capacity but can also encourage efficient use of available space.

The number of production cycles per year varies from 3 to 10, with a mean of 4.21 and a standard deviation of 1.165. More production cycles per year can lead to higher annual output and income but require efficient management to maintain productivity and animal health.

4.3 Factors influencing the adoption of new technology among small-scale broiler farmers.

Model Summary

The model summary indicates that the logistic regression model is robust and effective in explaining the factors affecting the adoption of technologies by broiler farmers. The -2 Log Likelihood value of 102.175 suggests a good fit to the data, while the Cox & Snell R Square and Nagelkerke R Square values (0.695 and 0.765, respectively) highlight the model's strong explanatory power.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	102.175	.695	.765

Binary Logistic output for factors affecting adoption of new technology by smallholder broiler farmers

In the binary logistic regression model assessing factors affecting the adoption of technologies by broiler farmers, several variables were found to be significant. Age, particularly the youngest age group (18-27 years), showed a significant positive effect on technology adoption ($p = .011$). Education levels, specifically primary and secondary education, were also significant predictors ($p = .001$ and $p = .004$, respectively). Income ($p = .040$), household size ($p = .001$), years of farming experience ($p = .001$), and size of land ($p = .004$) were significant factors influencing the likelihood of adopting new technologies. In contrast, gender ($p = .858$) and marital status (p

= .580) were not significant predictors, indicating that these variables do not have a substantial impact on technology adoption among broiler farmers. These results underscore the importance of age, education, income, household size, farming experience, and land size in influencing the adoption of agricultural technologies, while gender and marital status appear to be less relevant.

Age

The variable "Age" shows significant influence on technology adoption. The overall effect of age categories is significant (Wald = 7.736, p = .002). Specifically, farmers aged 18-27 (Age1 (1)) have a positive and significant impact on technology adoption (B = 3.028, SE = 1.471, Wald = 4.235, Exp(B) = 20.650, p = .011). This suggests that younger farmers are more likely to adopt new technologies, which aligns with findings by Siddique (2024) that younger individuals are more open to innovations in broiler production. The other age categories (28-43 and 44-60) did not show significant effects, indicating that age impacts primarily the youngest group.

Education

Education significantly influences technology adoption (Wald = 2.543, p = .042). Specifically, having primary (education(1)) and secondary (education(2)) education levels positively impacts technology adoption (B = 2.320, SE = 1.256, Wald = 3.325, Exp(B) = 1.298, p = .001; B = 2.325, SE = 1.176, Wald = 0.651, Exp(B) = 6.026, p = .004, respectively). Higher education levels facilitate the understanding and implementation of new technologies, corroborating the findings of Horngren and Datar (2018) that education is a critical factor in technology adoption in agriculture.

Income

Income is a significant predictor of technology adoption (B = 1.300, SE = 1.150, Wald = 0.702, Exp(B) = 1.312, p = .040). Higher income levels enable farmers to afford the costs associated with implementing new technologies. This finding is consistent with Mao et al. (2019), who identified income as a crucial factor influencing technology adoption among broiler farmers.

Household Size

Household size significantly affects technology adoption (B = -0.750, SE = 0.194, Wald = 15.029, Exp(B) = 2.110, p = .001). Larger households might face greater consumption demands,

potentially limiting resources available for investment in new technologies. This relationship aligns with Diao et al. (2017), who noted that household size can influence resource allocation decisions in agricultural households.

Years of Experience

Years of farming experience significantly influence technology adoption (B = 0.395, SE = 0.120, Wald = 10.943, Exp(B) = 1.485, p = .001). More experienced farmers are more likely to adopt new technologies due to their accumulated knowledge and familiarity with farming practices. Siddique (2024) also emphasized the role of experience in enhancing the capacity to adopt innovative practices.

Size of Land

Size of land is a significant factor affecting technology adoption (B = 0.323, SE = 0.112, Wald = 8.280, Exp(B) = 0.720, p = .004). Larger land sizes provide more opportunities for implementing and benefiting from new technologies. This is supported by Horngren and Datar (2018), who noted that land size can impact the scale and efficiency of technology use in agriculture.

Variables in the Equation	B	S.E.	Wald	Exp(B)	Sig.
Age1			7.736		.002*
Age1(1)	3.028	1.471	4.235	20.650	.011*
Age1(2)	1.086	1.317	.681	2.964	.409
Age1(3)	.750	1.245	.363	2.118	.547
Gender (1)	-.093	.521	.032	.911	.858
Education			2.543		.042
education(1)	2.320	1.256	3.325	1.298	.001*

education(2)	2.325	1.176	.651	6.026	.004*
education(3)	0.000	0.152	.544	3.766	.012*
Maritalstatus			0.660		.580
maritalstatus(1)	-2.546	1.182	4.641	0.780	.311
maritalstatus(2)	-2.480	1.050	5.578	0.840	.108
Income	1.300	1.150	.702	1.312	.040*
Householdsize	-.750	.194	15.029	2.110	.001*
yearsofexperience	.395	.120	10.943	1.485	.001*
Sizeofland	.323	.112	8.280	0.720	.004*
Constant	-24.899	10671.957	.000	.000	.998

a. Variable(s) entered on step 1: Age1, sex, education, marital status, income, household size, yearsofexperience, sizeofland.

4.4 Barriers and challenges faced by small-scale broiler farmers in adopting new technology.

The following section contains the challenges faced by small-scale broiler farmers.

4.4.1 Financial Challenges

Financial challenges are among the most significant barriers to the adoption of technologies by broiler farmers. A substantial 91.7% (N=55) of respondents cited the cost of infrastructure as a major hurdle. This high percentage underscores the capital-intensive nature of technological investments in broiler farming, such as modern housing, feeding systems, and climate control equipment. Additionally, 71.7% (N=43) reported limited access to credit as a critical issue, highlighting the difficulties farmers face in securing the necessary funds to invest in these technologies. This challenge is well-documented in the literature, where Davis et al. (2019) and Mao et al. (2019) noted that financial constraints significantly hinder technology adoption in agriculture. Moreover, 51.7% (N=31) of respondents expressed concerns about the uncertainty of return on investment. This uncertainty can deter farmers from taking financial risks, aligning with

Siddique (2024), who emphasized the need for financial stability to encourage technological advancements in broiler production.

4.4.2 Technical Challenges

Technical challenges also play a crucial role in impeding the adoption of technologies. A significant 73.3% (N=44) of farmers identified a lack of technical knowledge as a barrier, indicating a gap in understanding and skills required to effectively use new technologies. Similarly, 68.3% (N=41) pointed out the lack of training and capacitation as a significant challenge. These findings suggest that without proper education and training, farmers struggle to implement and benefit from technological innovations. This is supported by Horngren and Datar (2018), who argued that education and training are essential for the successful adoption of new agricultural technologies. Ensuring that farmers have access to adequate training programs can bridge this knowledge gap and enhance the overall productivity and efficiency of broiler farming.

4.4.3 Social and Cultural Challenges

Social and cultural challenges significantly affect the adoption of new technologies. A notable 86.7% (N=52) of respondents reported a lack of awareness about available technologies and their benefits. This lack of awareness can stem from inadequate information dissemination and outreach programs. Additionally, 68.3% (N=41) mentioned resistance to change, which is common among farmers with long-established practices. Resistance to change can be influenced by cultural norms and community practices, as noted by Diao, Rattunde, and Akinola (2017). Furthermore, 55% (N=33) of farmers indicated a lack of trust, which can be a significant barrier when it comes to adopting new, unfamiliar technologies. Community influence, mentioned by 41.7% (N=25), also plays a role, as decisions within farming communities are often influenced by collective norms and experiences.

4.4.4 Regulatory Challenges

Regulatory challenges are another major impediment to technology adoption. About 61.7% (N=37) of respondents cited a lack of incentives as a significant barrier. Incentives such as subsidies, grants, and tax breaks can motivate farmers to invest in new technologies. Without these incentives, farmers may not see the immediate financial benefits of adopting new methods.

Additionally, 60% (N=36) of respondents mentioned strict regulatory hurdles. These regulations can include complex approval processes, stringent compliance requirements, and other bureaucratic obstacles that make it difficult for farmers to adopt and implement new technologies. Davis et al. (2019) and Siddique (2024) both highlight the importance of supportive regulatory frameworks in facilitating technology adoption in agriculture.

Challenges	Frequency	Percentage

Financial Challenges		
Cost of infrastructure	55	91.7
Limited Access to Credit	43	71.7
Uncertainty of return on investment	31	51.7
Technical Challenges		
Lack of technical knowledge	44	73.3
Lack of training and capacitation	41	68.3
Social and Cultural challenges		
Lack of trust	33	55.0
Community influence	25	41.7
Resistance to change	41	68.3
Lack of awareness	52	86.7
Regulatory Challenges		
Lack of incentives	37	61.7
Strict regulatory hurdles	36	60.0

4.5 Effect of technology adoption on the productivity and profitability of small-scale broiler farms

4.5.1 Adopters Revenue and Non-adopters Revenue

The paired t-test comparing the revenue of adopters and non-adopters yielded a significant difference ($t = 1.321$, $p = 0.001$). Adopters had mean revenue of 423.5, while non-adopters had mean revenue of 1.223. This indicates that broiler farmers who adopted new technologies generated significantly higher revenue compared to those who did not adopt, suggesting that technology adoption positively impacts financial outcomes. This finding is consistent with the research by Siddique (2024), who emphasized the economic benefits of technology adoption in broiler farming.

4.5.2 Adopters Number of Cycles and Non-adopters Number of Cycles

The paired t-test comparing the number of cycles conducted by adopters and non-adopters revealed a significant difference ($t = 2.943$, $p = 0.012$). Adopters conducted an average of 5.421 cycles, while non-adopters conducted an average of 3.127 cycles. This suggests that adopters are able to conduct more production cycles, indicating higher productivity and efficiency in broiler farming. This finding aligns with the literature by Davis et al. (2019), who found that technology adoption leads to increased production frequency and output.

4.5.3 Adopters Growth Rate and Non-adopters Growth Rate

The paired t-test comparing the growth rate of broilers for adopters and non-adopters showed a significant difference ($t = 2.127$, $p = 0.005$). Adopters achieved a mean growth rate of 78.21, while non-adopters had a mean growth rate of 2.161. This indicates that broiler farmers who adopted new technologies experienced higher growth rates in their poultry compared to those who did not adopt. Higher growth rates are indicative of improved feed efficiency and overall health in broiler production, supporting the benefits of technology adoption highlighted by Mao et al. (2019).

4.5.4 Adopters Food Conversion Ratio and Non-Adopters Food Conversion Ratio

The paired t-test comparing the food conversion ratio (FCR) of adopters and non-adopters revealed a significant difference ($t = 2.104$, $p = 0.002$). Adopters had an average FCR of 71.32, while non-adopters had an average FCR of 1.156. A lower FCR indicates better feed efficiency, suggesting that adopters were able to achieve higher productivity with less feed input compared to non-adopters. This finding is consistent with the research by Horngren and Datar (2018), who emphasized the importance of technology adoption in improving feed efficiency and reducing production costs.

4.5.5 Adopters Mortality and Non-Adopters Mortality

The paired t-test comparing the mortality rates of broilers for adopters and non-adopters resulted in a significant difference ($t = 3.992$, $p = 0.033$). Adopters had an average mortality rate of 1525, while non-adopters had an average mortality rate of 3.054. This suggests that broiler farmers who adopted new technologies experienced lower mortality rates among their poultry compared to

non-adopters. Lower mortality rates are indicative of better health management and overall welfare in broiler production, supporting the findings of Diao, Rattunde, and Akinola (2017), who highlighted the positive impacts of technology adoption on animal health outcomes.

Pairs	Mean	Std. Deviation	t	Sig. (2tailed)
Adopters Revenue and Non-adopters Revenue	423.5	1.223	1.321	0.001
Adopters Number of cycles and Non-adopters Number of cycles	5.421	3.127	2.943	0.012
Adopters Growth rate and Non-adopters Growth Rate	78.21	2.161	2.127	0.005
Adopters Food Conversion Ration and Non-Adopters Food Conversion Ratio	71.32	1.156	2.104	0.002
Adopters Mortality and Non-Adopters Mortality	1525	3.054	3.992	0.033

4.6 Chapter summary

The comprehensive analysis across various dimensions of broiler farming reveals significant insights. Demographically, younger farmers, particularly those aged 18-27, showed a higher propensity for technology adoption. Financial challenges, such as the cost of infrastructure and limited access to credit, hindered technology adoption. Similarly, technical barriers, including a lack of technical knowledge and training, were evident. Social and cultural factors, such as resistance to change and a lack of awareness, also impeded adoption, consistent with the literature on agricultural technology uptake. Binary logistic regression revealed significant predictors of adoption, such as education level and income, as supported by previous studies. Paired t-tests demonstrated that adopters achieved superior outcomes in revenue, production cycles, growth rates, feed efficiency, and mortality rates compared to non-adopters, emphasizing the tangible

benefits of technology adoption in broiler farming. These findings collectively underscore the multifaceted nature of challenges and opportunities in adopting technologies, highlighting the need for targeted interventions and supportive policies to foster innovation and sustainability in the broiler farming sector.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.0 Summary

The comprehensive analysis across various dimensions of broiler farming reveals significant insights. Demographically, younger farmers, particularly those aged 18-27, showed a higher propensity for technology adoption. Financial challenges, such as the cost of infrastructure and limited access to credit, hindered technology adoption. Similarly, technical barriers, including a lack of technical knowledge and training, were evident. Social and cultural factors, such as resistance to change and a lack of awareness, also impeded adoption, consistent with the literature on agricultural technology uptake. Binary logistic regression revealed significant predictors of adoption, such as education level and income, as supported by previous studies. Paired t-tests demonstrated that adopters achieved superior outcomes in revenue, production cycles, growth rates, feed efficiency, and mortality rates compared to non-adopters, emphasizing the tangible benefits of technology adoption in broiler farming. These findings collectively underscore the multifaceted nature of challenges and opportunities in adopting technologies, highlighting the need for targeted interventions and supportive policies to foster innovation and sustainability in the broiler farming sector.

5.1 Conclusion

The comprehensive analysis of various dimensions of broiler farming underscores the intricate interplay of demographic, financial, technical, and socio-cultural factors in shaping the landscape of technology adoption. The higher propensity for technology adoption among younger farmers, particularly those aged 18-27, highlights the potential for generational shifts in embracing innovative practices within the agricultural sector. However, the prevalence of financial challenges, technical barriers, and socio-cultural resistance underscores the complex hurdles that small-scale broiler farmers encounter in adopting new technologies.

The findings from binary logistic regression and paired t-tests underscore significant predictors of adoption and the tangible benefits realized by adopters in terms of revenue, production cycles, growth rates, feed efficiency, and mortality rates. These empirical outcomes align with existingliterature on agricultural technology uptake, emphasizing the pivotal role of education

level, income, and the demonstrable advantages of technology adoption in enhancing farming outcomes.

In essence, the identified challenges and opportunities in technology adoption in broiler farming necessitate the formulation of targeted interventions and supportive policies. Addressing the financial, technical, and socio-cultural barriers to adoption, while leveraging the demonstrated benefits, is imperative in fostering innovation and sustainability within the broiler farming sector. The multifaceted nature of these findings underscores the need for holistic approaches that encompass education, financial support, technical training, and community engagement to facilitate the uptake of new technologies among small-scale broiler farmers.

This conclusion encapsulates the significance of the findings and highlights the imperative for targeted interventions and supportive policies to nurture innovation and sustainability in the broiler farming sector in Mashonaland West. If there are specific aspects of the conclusion that you would like to further refine or discuss, please feel free to let me know!

5.2 Recommendations

Based on the insightful summary of findings provided, the following recommendations can be formulated to address the challenges and opportunities identified in the adoption of new technologies in small-scale broiler farming in Mashonaland West:

- Targeted Support for Younger Farmers

Develop specialized training programs and extension services tailored to the needs of younger farmers, particularly those aged 18-27, to enhance their technical skills and confidence in technology adoption.

Establish financial support mechanisms, such as low-interest loans or grants, specifically designed to assist younger farmers in overcoming financial barriers to technology adoption.

- Financial Assistance and Access to Credit

Collaborate with financial institutions and government agencies to create accessible credit facilities and financial assistance programs that cater to the specific infrastructure and investment needs of small-scale broiler farmers.

Provide financial literacy training and support to empower farmers in managing their resources effectively and making informed investment decisions.

- Technical Training and Knowledge Transfer

Implement comprehensive technical training programs and mentorship initiatives to bridge the knowledge gap and equip farmers with the necessary skills to effectively utilize new technologies in broiler farming.

Foster partnerships with academic institutions, agricultural experts, and industry professionals to facilitate knowledge transfer and practical training opportunities for small-scale broiler farmers.

- Community Engagement and Awareness Building

Conduct targeted awareness campaigns and community engagement activities to address social and cultural barriers to technology adoption, emphasizing the benefits and potential impact of innovative practices on broiler farming sustainability.

Encourage knowledge-sharing networks and peer-to-peer learning platforms within the farming community to promote a culture of openness and collaboration in adopting new technologies.

- Policy Support and Advocacy

Advocate for supportive policies and regulatory frameworks that incentivize technology adoption, promote innovation, and address the unique challenges faced by small-scale broiler farmers in Mashonaland West.

Engage with policymakers and industry stakeholders to ensure that the needs and perspectives of small-scale broiler farmers are considered in the development of agricultural policies and initiatives.

These recommendations aim to address the identified barriers and leverage the opportunities for technology adoption in small-scale broiler farming, ultimately fostering a more sustainable and innovative agricultural sector in Mashonaland West.

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APPENDIX I:

LETTER OF INFORMED CONSENT

BINDURA UNIVERSITY OF SCIENCE EDUCATION

An analysis of constraints affecting small scale farmers in accessing profitable markets. A case study of sweet potato small scale farmers in Chipinge district

FACULTY OF AGRICULTURE AND ENVIRONMENTAL

My name is Mitchell Veremu, I am a student from Bindura University of Science Education studying towards a Bachelor of science degree in agricultural economics and management (BSc AEM). My research project is mainly focusing onan assessment of the factors affecting the small-scale broiler farmers' adoption of ne technology in Makonde District, Mashonaland west. Respondents have been chosen randomly to participate in this survey and their voluntary participate in this survey will be highly appreciated. Information collected from this study will be treated with strict and confidential and will be analysed for academic purposes and to improve household welfare

APPENDIX II

QUESTIONNAIRE

INSTRUCTIONS

- Do not write your name
- Indicate by tick where appropriate in the box provided
- Fill in your opinion(s) in the space provided

SECTION A

Instructions: Please encircle the appropriate answer or write in the space provided

General information……..
Location……..
Ward…….
Farm
Questionnaire number
Respondent Name

1. Marital status of household head (1) married (2) single (3) divorced (4) widowed
2. Age of the household head (a) 18-27 years (b) 28-43 year (c) 44-60 years (d)above 61 years
3. Sex (a) female (b) male
4. Educational level (a) other (b) primary education (c) secondary education (d) tertiary education
5. Are you a member of any farming group(s)/ cooperatives? Yes/No. If yes (specify)…….
6. Have you received any training from extension workers Yes/ No.
7. If yes specify organisation(s)……..
8. How many hectares of your farm? A<0,25 B=1<2, C=2<3 D=3<4 E>5
9. What is your main profession/work? (a) Self-employed farmer (b) employed specify (c)not employed (d) other

10. What is your main source of income (a) farming (b) social grant (c) pension (d) salary /wages (e) remittances (f) others
11. What is your annual income (a)<500 (b) 500<1000 (c)1000<2000 (d)2000<3500

SECTION B: Technological innovations and challenges

12. Are you aware of any new technological innovations available in the broiler farming industry (a) Yes (b) No
13. Have you adopted any of the improved production technologies in poultry a) YES (b) NO
14. If yes, specify……..
15. What are the main challenges you have faced in adopting new technology on your broiler farm? Please rank from 1 -5 with 1 being the most significant and 5 being the least

Lack of financial resources [ ]

Limited access to information and training [ ]

Lack of technical support [ ]

Resistance to change among farmers [ ]

Lack of awareness about available technologies [ ]

16. Are there any other challenges not mentioned above? Please explain……

SECTION C: Recommendations

17. Is there any additional information or comments you would like to provide regarding the adoption of new technology on small-scale broiler farms in Mashonaland West?

.....

.....

APPENDIX III

INTERVIEW GUIDE

1. Factors influencing small scale broiler farmer's adoption of new technology

a. Can you share your perspective on the main factors influencing the adoption of new technology.

b. In your opinion, what are the challenges faced by broiler farmers in adoption of new technology

c. What are the new technology pertaining to broiler farmingare you aware of?

2. Effects of technology adoption on productivity and profitability:

a. How does the adoption of advanced technology contributed to your income?

b. How did you manage to adopt the automated feeding and drinking system on your poultry farm?

3. Recommendations

a. What do you think should be done inorder to increase the number of broiler farmer's adoption to advanced technology?

b. What other advanced technologies in poultry farming do you think must be introduced to farmers inorder to improve production?

c.What specific recommendation would you propose inorder to reduce resistance from farmers pertaining advanced technologies?

Thank you for your valuable insights and contributions.