

**UNIVERSITY FOR DEVELOPMENT STUDIES**

**INFLUENCE OF KOOB-NE-GULIUK RADIO PROGRAMME ON  
LIVESTOCK FARMING IN THE BAWKU WEST DISTRICT OF GHANA**

**AUSTIN SAMSON AYARIGA**



**2022**

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LIVESTOCK FARMING IN THE BAWKU WEST DISTRICT OF GHANA**

**BY**

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**(UDS/MIC/0011/17)**

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**DECLARATION**

I, Austin Samson Ayariga, hereby declare that this dissertation is the result of my independent research work, and neither in full nor in part has this work been submitted in this university or elsewhere for the award of any degree. All forms of assistance and references to literature have been duly cited and well acknowledged.

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**Supervisors' Declaration**

We hereby declare that the preparation and presentation of the thesis was supervised in accordance with the guidelines laid down by the University for Development Studies.

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## ABSTRACT

The use of radio programmes in agricultural extension became the best strategy employed to improve access to livestock farming information. This research work was to unveil and demonstrate the level of contributions of the Koob-Ne-Guliuk Radio Programme as an effective tool in enhancing technology adoption in livestock farming and to unearth the factors that affect livestock farmers' access to and adoption of agricultural information in the Bawku West District. The study used a mixed research methodology with an instrumental case study approach. A multi-stage sampling technique was adopted in selecting three hundred and twenty (320) respondents with the use of Miller and Brewer's sample size determination formula. Interviews and questionnaires were the main methods employed in data collection. The data was analysed using descriptive statistics, Pearson correlation, and Kendall's coefficient of concordance. The study's main findings are that farmers have a high level of knowledge about livestock farming innovations thanks to the radio programme. The study also found that an increase in the dissemination of livestock farming innovations through radio programmes would lead to a moderate increase in the rate of adoption of these innovations. The radio station faced major challenges such as financial constraints and unreliable access to resource persons, whereas feed scarcity, theft, and unfavourable market prices were major issues that hampered the uptake of livestock farming innovations disseminated through the radio programme. The study, therefore, recommends that NGOs, the government, and other civil society organisations actively support the radio programme and that the government should restructure the R4FJ flagship programme and other related programmes to give priority to young people and women to increase their level of patronage in livestock farming.



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## DEDICATION

This thesis is dedicated to the almighty God, my lovely wife Mrs. Jemi Bakari Ayariga, and my son Jesse Awinpang Ayariga.



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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to Study

Sub-Saharan Africa accounts for approximately 12% of the global population, with more than 950 million people. By 2100, this rate is likely to increase to 36% (Jayne et al., 2016). Undernourishment has long been a problem in the sub-Saharan African region. Despite falling from 33% in 1990–1992 to 23% in 2014–2016, the percentage of people living in poverty remains the highest among emerging countries (Kansanga et al., 2019).

Sustainable growth of the global agricultural sector has been observed by Gassner et al. (2019) as critical in achieving food security and alleviation since most of the world's poor and food insecure population depend on agriculture for their livelihoods.

Livestock husbandry is one component of agriculture that has contributed immensely to human well-being since civilization began, starting with the domestication of animals (Thornton, 2010). Ruminants, non-ruminants, and unusual species such as grass cutters, snails, guinea pigs, and rabbits are all considered livestock (Gong, 2017).

The need for livestock development is vital to the socio-economic growth of every nation in the world (Hegde, 2019). Livestock farming offers a path out of poverty, starvation, and malnutrition, especially in developing countries, as it contributes 40% of the entire agriculture sector's output (Pawlak and Koodziejczak, 2020).



In Ghana, the livestock contribution to the agrarian sector's GDP in 2015 was 7%, despite the fact that the sub-sector had been experiencing a slow growth rate, resulting in a deficit of domestic supply of livestock products, which had been supplemented through the importation of livestock products into the country (Agricultural Sector Progress Report, 2016).

The livestock sector provides substantial household food and nutrition. It has also been an entire business for some households, particularly in rural areas. Households have also benefited from livestock, which has provided opportunities for wealth development, increased income, and coping mechanisms against crop failure, financial insecurity, and livelihood shocks (MoFA, 2016).

Ghana's demand for livestock-related commodities is predicted to rise by 70% due to population growth and other economic goals. However, this expected increase in demand will put pressure on already limited natural resources and other related problems confronting agricultural production. Livestock Farmers have to adopt improved and innovative livestock management practises to produce more to meet the growing demand (FAO, 2017).

The Northern Savanna Ecological Zone includes the Upper East Region of Ghana, which provides an optimum and suitable environment for ruminant and livestock production. Though the zone produces 50% of the country's livestock production, the region's full potential in livestock production is yet to be exploited (Adams and Ohene-Yankyera, 2014).





The use of bullocks to plough, produce manure, and provide income and food security for numerous households are some of the benefits of livestock farming in the region. With all these benefits the livestock sector provides, the Upper East Region was the second poorest region in the country as of 2016 (Guvele et al., 2016). The region is expected to have a total population of 1,273,677 people (GSS, 2020). Modern technologies that will work in all diverse circumstances in agriculture have not been adequately introduced to rural farmers, resulting in less productive farming methods (Jayne et al., 2019).

The standard of living in the region is below the national average, as people earn very little and cannot save. Also, given the unpredictable nature of weather conditions in the area and its consequences on crop farming, countless young people travel down south in search of greener pastures. Females in particular go to Accra and Kumasi, but due to a lack of employable skills, they are unable to find work. (Alatinga, 2019).

In response to these problems, governments over the years have embarked on several agricultural development policies aimed at modernising agriculture through improved technology adoption and mechanisation of agricultural practises. Some of them include the Ghana Shared Growth and Development Agenda (GSGDA) 2010–2013, the Food and Agriculture Sector Development Policy (FASDEP I and II), and the Medium-Term Agriculture Sector Investment Plan (METASIP) 2011–2015, all government strategic frameworks and plans geared towards agricultural development in the country to improve the livelihood of the very poor and vulnerable in rural areas (Ackah et al., 2019).



The recent launch of "Rearing for Food and Jobs in 2019 was to help boost the production of certain livestock, particularly poultry, cattle, sheep, and pigs (Ministry of Food and Agriculture, 2021). In addition, the Ministry of Food and Agriculture created and delivered 2,210 improved species of diverse livestock to 305 farmers around the country through the National Livestock Breeding Stations in 2018 (Kale-Dery, 2020).

Non-governmental organisations (NGOs) are equally assiduous in working on projects and programmes to enhance rural agricultural development. These include the provision and distribution of improved agricultural inputs, microcredit schemes for rural farmers, and farmer training (Annan, 2012).

Anku-Tsede (2000) have long argued that for a country to fully realise its optimum agricultural production potential, it depends on the uptake level of improved technologies and the capacity of actors along the agricultural value chain. Changing farmers' behaviour towards the uptake of modern technologies and the use of appropriate livestock farming practises depends on the farmers' awareness of such agricultural information.

For example, in China, agricultural innovation dissemination has played a role in the country's current agricultural transformation over the last three decades, transforming traditional agricultural practises into modern techniques (Zhang et al., 2016). Inadequate access to agricultural extension services and improved farm inputs in sub-Saharan African countries has resulted in low agricultural productivity (Takahashi et al., 2019).



The need for information has become a basic necessity for every society globally, as it is said that the world has moved from the industrial age into the information age (Birkinshaw, 2014). Agricultural extension delivery plays a critical role in conveying skills and knowledge to farmers. Agricultural extension agents work with farmers and other stakeholders to disseminate research findings and recommended farming methods (Adekunle, 2013).

According to the Food and Agricultural Organisation (FAO), rural communities are deprived of adequate information and knowledge on new technologies that will help increase productivity and improve their livelihoods due to inaccessible or isolated geographical areas and, most often, a high illiteracy rate among rural farmers, especially women (FAO, 2017). Mass media usage became necessary in agricultural extension and agricultural information delivery to address the information gap (Javaid, 2017). The use of mass media seems to be one of the major solutions to solving the information gap between research institutions and farmers (Stamm et al., 2000).

Agricultural information is quickly disseminated through the use of mass media rather than personal contact. A study conducted in the Asanti Region of Ghana revealed that, as of 2011, agricultural information dissemination was done mostly through mass media to reach rural farmers. This was utilised to supplement the Ministry of Agriculture's (MoFA) lack of agricultural extension agents and logistics supplies (Annan, 2012).

Campbell et al. (2011) define mass media as a medium of communication that transmits information from one end to the mass audience. Dominick (2010) also



described mass media as the varied range of communication mediums used in reaching a large audience via mass communication. The communication takes place through various outlets.

In Ghana, mass media has been a powerful tool in influencing the various sectors of the economy over the past decades. It has predominantly influenced the agricultural sector. The use of mass media in agricultural extension delivery has become very prudent in improving agricultural productivity (Abimah, 2002).

However, the combined impacts of poverty and poor literacy levels have rendered television, mobile phones, and the internet useless in reaching rural farmers with agricultural knowledge. Under such circumstances, according to Amadu and Amin (2018), radio is still the most popular, accessible, suitable, and effective way to get agricultural news.

Dastech Radio is a community radio station in Ghana's Upper East Region, Bawku West District. Since its debut on May 11, 2015, the radio station has played an important part in the district's ongoing development through educational and entertaining programs (Dastech Radio, 2019). Dastech Radio is used as a dissemination tool by institutions in agriculture to transfer agricultural information to rural farmers in the district. It has helped bridge the communication gap that exists due to geographical isolation, low AEA-farmer ratio, and high literacy (Dastech Radio, 2019).



Dastech Radio runs numerous programmes geared towards all aspects of human life. The "Koob ne Guliuk' radio programme is one of the programmes being run by the station. It was to provide agricultural information to rural farmers and educate them on animal farming, post-harvest techniques, fish farming, farm tools and equipment, improved pesticides, appropriate storage systems, product prices, modules of marketing, poultry farming, crop farming, and soil fertility improvement practises.

The radio programme has been emphasising proper livestock management practises for the past three years. The district MoFA, through the radio programme, encourages farmers to practise the semi-intensive livestock management production system (MoFA, 2020). Some of the major topics covered by the programme include proper housing, feeding, health management, record keeping, breeding selection, and marketing (Dastech Radio, 2020).

The radio programme 'Koob-Ne-Guliuk' is a magazine-formatted radio programme. It consists of interview sessions, reviews, discussions, and talk-show segments. Listeners are given the opportunity to participate through phone-in sessions. It is aired every Saturday from 12:00 p.m. to 2:00 p.m. in the Kusaal dialect (Dastech Radio, 2020).

## **1.2 Problem Statement**

Livestock farming plays a major role in the social and economic development of rural farmers in Ghana, most especially in the northern part of the country (Turkson and Naandam, 2006). Livestock and poultry rearing is the second most important agricultural sector for farmers in the Bawku West District (MoFA, 2021). Several



methods of disseminating agricultural information are used to share agricultural information with livestock farmers by the various stakeholders in the Bawku West District. However, poverty, inaccessible communities, and high illiteracy rates have rendered certain dissemination methods less effective (Amadu and Alhassan, 2018).

Despite the emergence of new technologies, reaching out to rural farmers is a challenge. Some of the farming areas are either out of network or have poor network coverage (Owusu et al., 2018). Dastech Radio introduced the 'Koob-Ne-Guliuk' Radio Programme as another source of dissemination into the district to help develop farmers' knowledge on improved livestock farming practises and ease challenges associated with agricultural information dissemination. According to Fraser and Estrada (2001), a community radio programme is more effective at improving rural farmers' access to livestock information. The community members operate it, and programmes are discussed in the local dialect, therefore eliminating the language barrier. It is also perceived as being less expensive, more participatory, and contributing to livestock farming knowledge by offering a place for a variety of viewpoints and information (Al-Hassan et al., 2011).

According to MoFA (2021), the livestock sub-sector in the country has over the years recorded an increase in production due to competent animal health care and farmers' willingness to accept routine immunizations, diagnostics, deworming, and other practices. There is no doubt that the 'Koob-Ne-Guliuk' Radio Programme, like other extension channels, has significantly contributed to farmers' knowledge of improved livestock farming. It has ideally supplemented person-to-person extension delivery to



isolated and inaccessible locations in the district. It has also been the ideal mode of communication in times of outbreaks of disease and pests. Beale & Bolen (1955) argued that knowledge of an innovation and the rate of adoption by rural farmers are highly dependent on farmers' awareness of such innovations.

Despite the significant roles the "Koob-Ne-Guliuk' Radio Programme plays in the transfer of innovative technology to livestock farming in the district, there have been no empirical studies conducted to measure the effectiveness of the Koob-Ne-Guliuk Radio Programme in the dissemination of information on livestock farming and the level of contribution made to farmers' knowledge and adoption of innovative livestock farming practises.

Additionally, there are other mediums of information dissemination on livestock farming in the district, making it difficult to attribute the level of influence made by the Koob-Ne-Guliuk Radio Programme on farmers' knowledge and rate of adoption.

Against this backdrop, this research sought to study the influence of the "Koob-Ne-Guliuk' radio programme on livestock farming practises in the Bawku West District of Ghana.

### **1.3 Main Research Questions**

At what level of influence does Koob-Ne-Guliuk Radio Programme have on the adoption of livestock farming innovation technologies in Bawku West District.



### **1.3.1 Specific Research Questions**

1. What are the innovations communicated through ‘Koob-Ne-Guliuk’ Radio Programme to livestock farmers in Bawku West District?
2. What knowledge on livestock farming have farmers in Bawku West District gained from ‘Koob-Ne-Guliuk’ Radio Programme on livestock farming?
3. To what extent are farmers’ livestock farming practices influenced by information from the ‘Koob-Ne-Guliuk’ Radio Programme?
4. What constraint affect the effectiveness of disseminating livestock information to farmers in Bawku West District?
5. What constraints do farmers face in accessing and utilizing livestock information broadcast under the Koob-Ne-Guliuk Radio Programme?

### **1.4 Research Objectives**

#### **1.4.1 Main Objective:**

To ascertain how the Koob-Ne-Guliuk Radio Program influenced the adoption of livestock farming innovative technologies in Ghana's Bawku West District.

#### **1.4.2 Specific Objectives**

1. To ascertain the innovations communicated through Koob-Ne-Guliuk Radio Programme to livestock farmers.
2. To examine the knowledge on livestock farming gained by livestock farmers in the Bawku West District through the Koob-Ne-Guliuk Radio Programme.





3. To analyse the extent to which farmers' livestock farming practices are influenced by information from the Koob-Ne-Guliuk Radio Programme on livestock.
4. To establish the Challenges that affect the effectiveness of disseminating livestock farming information to farmers in Bawku West District
5. To examine the constraints livestock farmers in Bawku West District faced in accessing and utilizing information broadcast under Koob-Ne-Guliuk Radio Programme.

### **1.5 Significance of Study**

The use of radio programmes in agricultural extension became the best strategy employed by Ghana and several institutions to improve rural farmers' access to agricultural information. This research work was to unveil and demonstrate the level of contributions of the Koob-Ne-Guliuk Radio Programme as an effective tool in enhancing access to agricultural information by rural livestock farmers. It also unearthed the factors that affect livestock farmers' access to and uptake of agricultural innovations in the Bawku West District.

Findings of this study would contribute to the literature on the contributions of community radio programmes in enhancing agricultural information access in our rural communities.

It will act as a resource document for government, non-governmental organizations, and other institutions interested in livestock production in the district, region, country, and world.



The outcomes of this study would help Koob-Ne-Guliuk radio programme producers better understand the programmes' impact on livestock farmers in the district. It could also serve as a guide for content providers and a foundation for reviewing programme production strategies.

### **1.6 Definitions and meaning of terms**

**Radio Programmes:** A radio programme can be explained as an arranged activity with a defined time frame broadcast on the radio (Apuke, 2017).

**Livestock farming** is an aspect of agriculture that has to do with the rearing of domesticated animals for consumption, the provision of labour, and urns. Ruminants (cattle, sheep, and goats), non-ruminants (pigs), poultry (chickens, guinea fowl, ducks, turkeys, and ostriches), and unusual species like grass-cutter snails, rabbits, and guinea pigs make up livestock (Gong, 2017).

**Influence of a radio programme is** the power of a radio programme to have a compelling effect on the actions, opinions, growth, and character of someone (Al-Hassan et al., 2011).

**Innovations:** Innovation is an idea, practise, or project that is perceived as new by an individual or other unit of adoption (Rogers, 2002).

**Adoption:** It is a decision to employ an idea to its maximum potential as the best course of action available.



## **1.7 Organisation of the Study**

The research is organised into five chapters. Chapter One: Constitutes the background of the study, the problem statement, the objectives and research questions, the significance of the research, and the organisation of the study.

Chapter two provides a theoretical framework and a review of relevant literature. where the research paradigm utilised is presented in the third chapter. It includes topics like the research plan, demographics, sampling methods, data collection method, and instrument(s) used to collect data. It also describes the processes for assessing the data collected and the ways for presenting the study's conclusions. It also includes a synopsis of the research area.

Chapter Four (4) covered the study's findings as well as discussions of the findings in line with research objectives and previous literature.

Chapter five (5) presents the summaries of findings and gives recommendations based on those findings as well as conclusions. In addition, recommendations for future research and the study's policy, practical, and theoretical implications are also presented.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter introduces the research's theoretical and conceptual frameworks as well as a survey of key literature on the study's themes and concepts. It further provides detailed explanations of the theories used to guide this study. The review concentrated on providing a conceptual understanding of the influence of the Koob-Ne-Guliuk Radio Programme on livestock farming in the Bawku West District of Ghana.

#### 2.1 Theoretical Framework

A theoretical framework, according to Osanloo and Grant (2016), is a structure that summarises concepts and theories developed from previously tested and published knowledge and synthesises them to provide a foundation for data analysis and the interpretation of meaning contained in research data.

Some of the relevant theories underpinning the influence of radio programmes as a communication tool on the adoption of livestock farming technologies are the uses and gratification theory, media dependency theory, agenda setting function theory, innovation diffusion theory, and the technology acceptance model.

##### 2.1.1 Theoretical Overview on the use of radio programme in disseminating livestock farming innovations.

A collection of ideas used to describe, forecast, or analyze the pattern, nature, or outcome of a communication process is known as a communication theory. It provides insight into how the process of mass communication occurs in a given situation or



what the implications of the process on society may be (Nwabueze and Okonkwo, 2018).

### **2.1.1.1 The Uses and Gratification Theory**

The uses and gratification theory was proposed by Blumler and Katz in 1974. This theory attempts to explain the media's use and purpose to individuals, groups, and society at large. It poses the question, "How do individuals use media?" (Ruggiero, 2000). One of the key goals of the uses and gratifications hypothesis, according to Katz (1974), is to explain how people utilise media to suit their needs. While the uses and gratifications hypothesis includes both positive and negative aspects of media use, it takes a more positive perspective on media in general.

Several authors have used the idea to investigate conventional media like newspapers, radio, and television (see Palmgreen & Rayburn, 1979; Kippax & Murray, 1980; Rubin, 1983). Leung (2001), Flanagin (2005), Whiting and Williams (2013), and Dunne et al. (2010) used the idea to investigate why consumers consume mainstream media, and because of its basis in communication literature, it is significant in media studies and, more specifically, radio as a sort of mass media research (Musa et al., 2015). As a result, it will aid in identifying the driving factors that drive livestock farmers to listen to the radio.

### **2.1.1.2 Media Dependency Theory**

Ball-Rokeach and DeFleur (1976) proposed the media dependency theory, which said that the impact of the media on society's perception is a function of the degree of society's reliance on mass media as sources of information. The hypothesis goes on to



say that society's ability to learn from actual life is limited, so people rely more on media to meet their knowledge demands. This establishes an internal connection between the media, the public, and the larger social order (Lin, 2015).

According to the dependency theory, the more a person relies on the media to meet their expectations, the more important and influential the media becomes to them (Dworkin et al., 2019). McQuail (1977) posits that societies in crisis or experiencing instability are more reliant on mass media for information and hence more vulnerable to its impacts.

Some media information functions are more relevant than others, according to the model, for both individuals and society. In the absence of alternatives, one's reliance on accessible information sources may increase (Halpern, 1994). "The more an individual grows to rely on a single communication channel, the greater the predictability of the outcome of communication," say Rubin and Rubin (1985). The greater the number and quality of functional options available to an individual, the less he or she will be reliant on and influenced by a single channel." (Halpern, 1994).

Ball-Rokeach and DeFleur explained how media usage influences cognitive, affective, and behavioural outcomes (Jung, 2017). The idea was developed to describe the complicated link between individuals and the media at the micro level, as well as the social system's relationship with the media at the macro level (Lee, 2012). According to Ball-Rokeach (1985), the structurally dependent links between audiences, media, and other social groupings are addressed at the macro level. People will rely more on the mass media for information in times of uncertainty and societal upheavals, such as



natural disasters or political crises, according to this hypothesis. Individual objectives and wants are dependent on information resources controlled by social and media institutions at the micro level of analysis, resulting in an imbalanced influence (Ho et al., 2015).

Andrews (2012) posited that the media dependency theory and the uses-and-gratification theory were intertwined. Uses and gratification theory investigates how people interact with media and become reliant on it. Whereas the media dependency theory explains that the more a person relies on the media to meet their requirements, the more essential the media becomes to them. Andrews (2012) further tied the media dependency theory to agenda-setting and argued that over-dependence on the media will give more power to the media and also make it easier for individuals to be swayed by media agenda-setting.

### **2.1.1.3 Agenda Setting Theory**

Donald Shaw and Max McCombs formally formulated the agenda-setting theory, often known as the agenda-setting function of the mass media, in 1972. The theory sought to suggest that the media can influence the public by telling them what to think about rather than what they think (McCombs and Shaw, 1972). Bernard Cohen (1963) also observed that

*"The media may not be successful much of the time in telling people what to think, but it is stunningly successful in telling its readers what to think about."*

*"The world will look different to different people depending on the map that is drawn for them by writers, editors, and publishers of the paper they read."*



According to McCombs (2004), society has to deal with the second-hand reality built by the media to connect with the outside world, and due to limited space and time, the media selects issues deemed newsworthy, which in the long run become prominent in public opinion (McCombs and Valenzuela, 2007). McCombs further suggested that the media do not reflect reality; they filter and shape it to suit their agenda (Dearing and Rogers, 1988). In view of the power media possess on society, Kamau (2011) suggests that the media, through its agenda setting, can either cause an intended or unintended change. They can also reinforce what exists by preventing change or causing a minor change.

Two scholars of agenda setting theory, Dearing and Rogers (1988), segregated agenda setting into three types (Walgrave and Aelst, 2006). They explained that the public agenda setting is when the public decides which information is more important than the other, but the media agenda setting is when the media decides which information is more important (Wanta et al., 2004). When both the public and media agendas affect policymakers' decisions in a society, the policy agenda is set (Brown and Deegan, 1998).

### **2.1.2 A Theoretical Overview of Livestock Farming Technology Adoption**

This section presents a review of relevant theories to examine the level of innovation adoption by livestock farmers in the Bawku West District.

Livestock farming technologies are aimed at improving production, and technology adoption plays a fundamental role in increasing productivity (Alene and Manyong, 2007). According to Rogers and Shoemaker (1971), technology adoption is the





decision to implement and retain an innovation. Getahun et al. (2000) define technology adoption as the extent to which a new technology is adopted in a long-term equilibrium.

Akumbole (2017) is of the view that researchers and policymakers need to understand the technology adoption behaviour of farmers to be able to develop and design effective innovation dissemination methods that will encourage uptake of innovations among farmers.

### **2.1.2.1 Innovation Diffusion Theory**

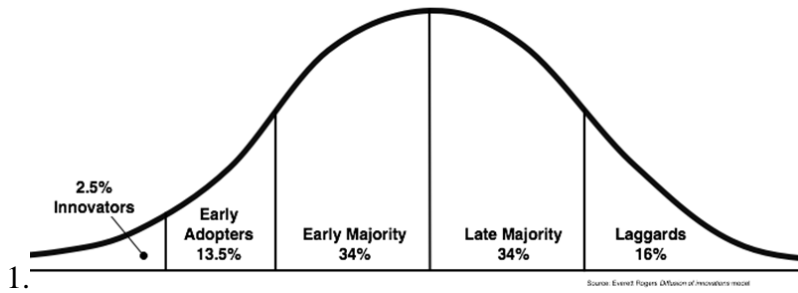
The innovation diffusion hypothesis describes the process through which an innovation is spread among members of a social system over time and via certain paths. A new thought, action, or object is perceived as innovative by an individual or other unit of adoption. The process in which people produce and share information in order to establish a common understanding can be termed communication (Rogers, 1995). The diffusion theory is one of the most commonly regarded communication ideas in marketing. The diffusion literature has developed across numerous disciplines to describe how new ideas and practises spread throughout a social system, as well as the adoption of new products and services (Gatignon and Robertson 1985). Rogers (1962) developed a diffusion model that is now widely used in marketing literature. The diffusion model is based on the standard bell-shaped normal distribution curve, which shows how frequently buyers accept a product over time. The adoption curve is normally distributed, according to Rogers (1983), due to a learning effect emerging from personal interaction within social systems. The system's interpersonal influence



on non-adopters grows as the number of system adopters grows. This adoption impact is thought to follow a binomial expansion, which is a mathematical function that follows a typical curve when plotted over time. Many human attributes are consistently distributed, whether they are physical attributes like weight or height or behavioural attributes like IQ or information learning. As a result, a variable like innovativeness is likely to be distributed in a predictable manner (Rogers, 1983).

Rogers (1995) defines innovativeness as the degree to which a single person or other unit of adoption adopts new ideas more quickly than other members of a social system. According to Rogers (1995), innovation has four stages: invention, distribution (or communication) across the social system, time, and consequences. Networks are used to share data. The nature of networks and the roles of opinion leaders have an impact on whether or not an idea will be adopted. An innovation diffusion study aims to determine what factors influence how and why people adopt new media like the Internet and radio. Opinion leaders affect audience behaviour through their contacts, but the dissemination process also involves intermediaries such as change agents and gatekeepers. The five types of adopters include innovators, early adopters, the early majority, the late majority, and laggards. The standard deviation curve for these categories looks like this: relatively few innovators (2,5%) adopt the innovation at first, early adopters account for 13,5% a short time later, early majority (34%), late majority (34%), and laggards (16%) after some time. (Rogers 1995), as seen in Figure





**Figure 2.1 the four stages of innovation adoption**

*Source: Roger, 1995*

The majority of diffusion studies concentrate on five elements: characteristics of an innovation that may influence adoption; the decision-making process that occurs when individuals consider adopting a new idea, product, or practice; individual characteristics that make them more likely to adopt innovation; adoption consequences for individuals and society; and the decision-making process that occurs when individuals consider adopting a new idea, product, or practice. Regarding the channels of communication used during the adoption process,

### **2.1.2.2 Technology Acceptance Model (TAM)**

Arbaugh (2010) posits that the technology acceptance model is one of the most commonly used frameworks among scholars of different fields. It is said to be the most influential extension of Ajzen and Fishbein's theory of reasoned action in literature (Bagozzi et al., 1992).

TAM, which was originally developed by Fred Davis in 1989, helped to model how people come to accept and utilise new technologies (Davis, 1989). It suggests two

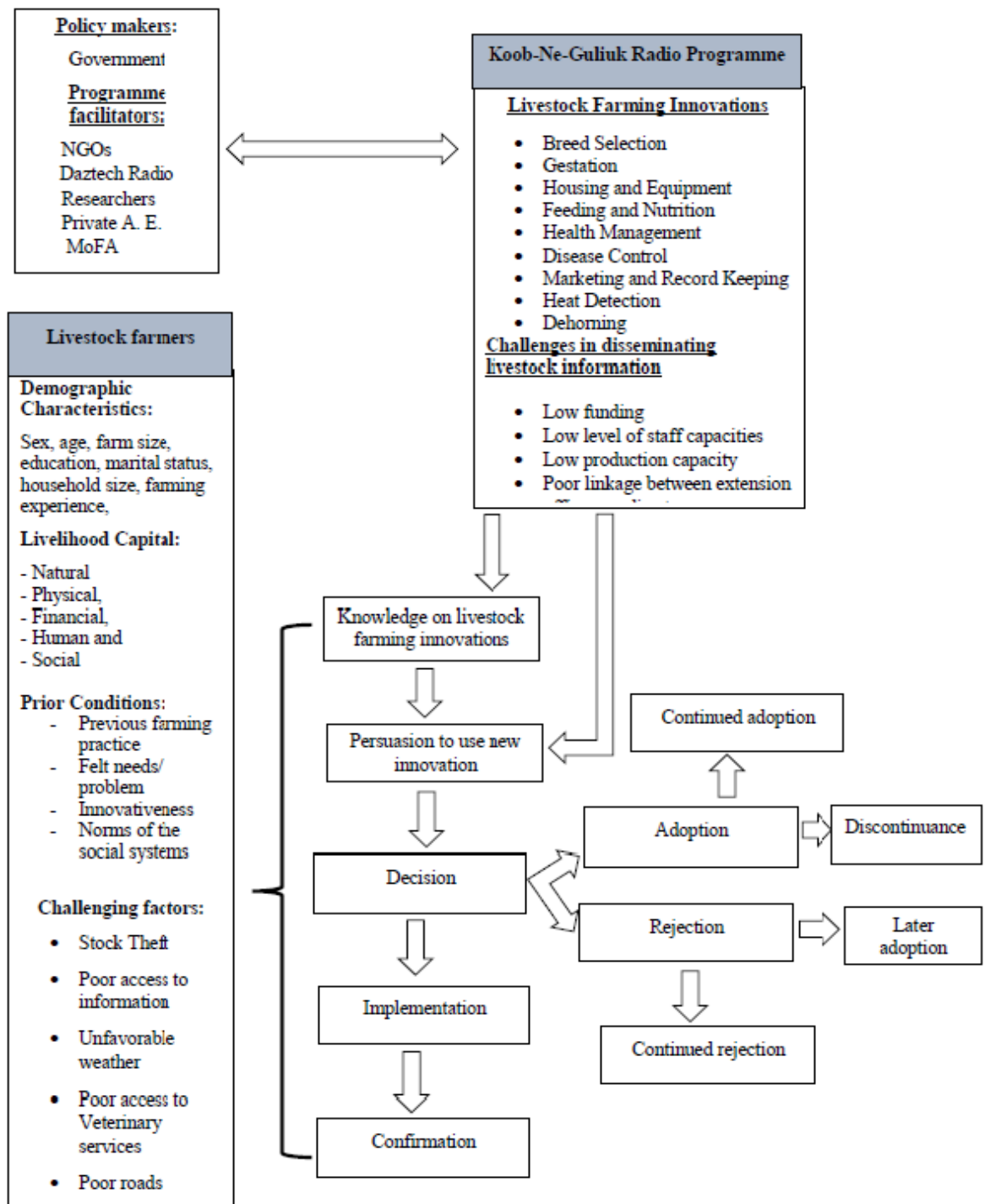


factors that determine technology uptake: perceived usefulness and perceived ease of use (Davis, 1986; Lai, 2017).

Perceived usefulness is the subjective likelihood that using a specific application system will improve a potential user's job or living performance, whereas perceived ease of use is the degree to which the target system is perceived by the prospective user to be effort-free (Davis, 1989). Further studies were done on the model in an effort to explain perceived usefulness and usage intentions in terms of social influence and cognitive instrumental processes (Venkatesh and Davis, 2000); TAM2 is the name given to Venkatesh and Davis's extended model. At three (3) points in time: pre-implementation, one month post-implementation, and three months post-implementation, the two researchers who presented the TAM2 model gave more thorough explanations for why users deemed a given system valuable. TAM2 theorises that users' mental assessments of the fit between important work goals and the consequences of using the system to perform job tasks serve as a foundation for forming perceptions about the system's usefulness (Venkatesh and Davis, 2000, as cited in Lai, 2017).



## 2.2 Conceptual Framework



**Figure 2.2: Conceptual Framework**

Source: Adopted and modified from Diffusion of Innovation (Roger, 1995)



### 2.3 The Livestock Farming Sector

Globally, 1.3 billion people are directly and indirectly engaged in the animal husbandry production value chain. Livestock directly supports about 600 million farmers' livelihoods in third-world countries, and its products contribute about 40% of the total value of world agriculture (Enahoro et al., 2019).

Livestock are kept for their numerous economic and social contributions to humanity (Rae, 2020). Livestock keeping is an important risk mitigation technique for disadvantaged people, as they provide crucial nutrients and traction for smallholder farmers to grow crops (Singh, 2019).

Livestock farming makes numerous economic and social contributions to our human society as it serves as food for consumption, raw materials to feed industries, and a business venture for some households, particularly in rural areas (Shrivastava et al., 2019).

The increase in consumption in some countries has outstripped supply, leading to significant increases in trade in livestock products since 1990. The value of trade flows globally has nearly tripled from around 59 billion United States dollars in 1990 to almost 174 billion US dollars in 2010. North America, South America, and Europe produce 90% of global meat exports (Herrero et al., 2018).



Livestock farming has a huge impact on Ghana's agricultural industry and economy. Livestock includes ruminants, non-ruminants, poultry, and other unusual species such as grass-cutter snails, rabbits, and guinea pigs (Gong, 2017).

MoFA's statistics on livestock farming presented in 2013 estimate production at 1,590,000 cattle, 4,156,000 sheep, 5,751,000 goats, 638,000 pigs, and 3,732,000 poultry, contributing 8.7% to Ghana's agricultural GDP and 3.7 to general GDP (MoFA, 2013).

The sub-sector's contribution to the country's GDP has decreased from 3.7 in 2013 to 2.7 in 2018. The sub-sector recorded its highest contribution to GDP in 2014 at a rate of 4.0 (GSS, 2019). The poor development rate of the sub-sector has resulted in the importation of livestock goods into the country to supplement the shortfall (MoFA, 2016).

In 2018, total production of meat for Ghana was 290,563 metric tonnes. Total production of meat in Ghana increased from 79,125 metric tonnes in 1969 to 290,563 metric tonnes in 2018, growing at an average annual rate of 2.74% (FOA, 2019).

Ghana presently imports over 240,000 MT of meat, such as chicken, beef, and other meats, to make up for its meat shortfall, which costs the country over USD 375 million annually, according to the Ministry of Food and Agriculture (MoFA, 2020). The national demand for poultry meat alone is roughly 400,000 Mt, with domestic output of around 57,871 Mt, implying that poultry meat imports are around 180,000 Mt, with a 162,129 Mt shortage (MoFA, 2020).



Livestock production is a major source of income for farmers in northern Ghana. It is estimated that sixty percent of rural households are engaged in livestock farming in northern Ghana (Atiime et al., 2021). Ruminants, in particular, serve as a store of wealth, a source of savings, and a buffer for the poor against agricultural disasters. Despite the escalating negative effects of climate change on crop yield, animal husbandry continues to be an important source of income for the poor and vulnerable in Northern Ghana (Aketemah, 2018).

### **2.3.1 Livestock Farming Systems**

According to the Food and Agriculture Organisation, livestock production systems are broadly classified into extensive management systems, semi-intensive management systems, and industrial or intensive management systems (Deb, 2019).

#### **2.3.1.1 Intensive Management System**

This practice is considered the safest management technique in terms of stock protection, but it is also the most expensive. In this type of system, livestock are kept in a confined area and are not allowed to roam freely. It is the most costly since it is heavily reliant on external inputs, including buying feeds, veterinary services, breeding stock, specialised labour, and finance (Hoffmann et al., 2014). Opong-Anane (2011) indicates that this management system is less practised in northern Ghana and is commercially produced.

#### **2.3.1.2 Semi-Intensive Management System:**

Animals in a semi-intensive management system are housed permanently in structures made primarily of locally available materials such as wood, bamboo, tree branches,





and mud, with roofs made of leaves, split bamboo, or metal sheets. The animals spend the night and a chunk of the day here (Adams, 2016). In the mornings, animals are released from backyard sheds to graze on their own with water and some feed supplementation, such as cassava and plantain peels. During the rainy season, animals are tethered to pegs or trees on the range to avoid grazing on farm crops (Animal Production Directorate, n.d.). The semi-intensive management approaches are commonly adopted by both rural and peri-urban farmers in Ghana. Smallholder farmers and the pure livestock agricultural system, which is centred on beef production, are more likely to have them. In Ghana's three northern regions, this style of livestock raising predominates (MoFA, 2004).

#### **2.3.1.3 Extensive/ grazing management systems:**

Standard ruminant management methods are not followed in this system. It is characterised by minimal inputs. With animals wandering around, scavenging on garbage dumps, and sleeping on verandas and in the open, there are generally no investments beyond the foundation stock (Animal Production Directorate, n.d.).

This management system aims to produce high-quality forage to feed livestock for as much of the year as possible. It's a system in which rangelands, pastures, annual forages, and purchased feeds account for more than 90% of the dry matter fed to animals. Non-livestock farming activities account for less than 10% of total production value (Snow et al., 2014).



A properly managed grazing system gives the land and forages some time to regrow and replenish their nutrients. Manure is distributed evenly, and fire hazards are reduced because grasses and potential fuel are grazed (Williamson, 2015).

Grazing systems simply describe when animals are allowed to graze and when they are not allowed to graze. Although there are many potential grazing systems, environmental, economic, and resource constraints limit the number of systems that are suitable. The most practical grazing systems fall into one of four categories: Season-long continuous grazing, rest-rotation grazing, deferred rotation grazing, and intensively controlled grazing are all examples of intensively managed grazing (Reece et al., 2008).

One of the primary bottlenecks in the cattle industry, according to the Ministry of Food and Agriculture, is access to a sustainable feed source. Due to recurring droughts, continual overgrazing, and a lack of range development initiatives, grass with reasonable nutritional content is usually scarce in the dry season for most animals housed on a free-range system (Partey et al., 2018).

### **2.3.2 Small-scale livestock management practices and innovations**

Daily tasks and routine operations such as record keeping, housing, and feeding livestock are important management practises that enable control of animal production, health, and welfare. The underproduction of livestock among small-scale livestock farmers results from poor farm management practises (Schmid et al., 2017). This aspect of the study seeks to explore the innovations that are related to systems and methods of managing small-scale livestock farming.



The global demand for livestock products keeps increasing as the global population overgrows. However, available farmlands are decreasing due to other human needs such as housing and road construction. In order for livestock farmers to meet the increasing global demand for livestock products, they will have to explore and adopt newer and improved technological innovations in their daily management practises (Reijntjes et al., 1992).

Small-scale livestock farmers have witnessed a rise in biodiversity preservation, technical innovation, and farm viability as a result of implementing indigenous breeding programs (Rivas et al. 2019).

#### **2.3.2.1 Breeding**

Livestock breeds are indigenous, exotic, or crossbreds. These categorizations are based on the genetic traits the animals inherit from their parents. Indigenous breeds are mostly considered to be resilient to climate stresses and disease outbreaks as they do not need any new adaptive techniques. In contrast, exotic species are breeds that are brought from other countries and bred within the same varieties. A crossbreed, on the other hand, is an animal with purebred parents of two different breeds, varieties, or populations (Chupin and Boyazoglu, 1998).

Animal breeding, according to Nthakheni (2006), is an action taken by farmers in order to obtain a subsequent generation of animals that will generate desired goods more efficiently under future farm economic and social conditions than the current generation of animals. Animal breed choice is very important in livestock farming as breed selection is based on animal performance (milk production, number of eggs,



growth, and sport performance), health (resilience to climate stresses and disease outbreaks), and reproduction (size and number of litters) in a certain environment (Berghof et al., 2019).

**Small-scale livestock farming system of breeding:** inbreeding is a form of livestock farming breeding technique in which animal mating is more closely linked than the average relationship within the breed or group in question (Weigel, 2001). This form of breeding method is in direct opposition to the biological goal of mating, which is the shuffle of DNA (Watson, 2004).

Outbreeding is, however, the process of continuously mating females of the herd to distinct males of the same breed. Outcrossing, grading up, line crossing, crossbreeding, and species crossing are all forms of outbreeding in animals (Dickerson, 1973). Studies have shown that crossbreeding is the best livestock breeding system to adopt for improving a population genetically. However, inbreeding can be an effective and efficient breeding system when used properly, especially when breeding genetically superior animal types (Kosgey and Okeyo, 2007).

In Ghana, most livestock farms, especially in rural areas, keep animals of various ages and sexes together with no control whatsoever over the mating behaviour of the males and females, leading to inbreeding among most flocks and reducing the fertility and viability of the inbred animals. However, some livestock owners, in their bid to improve the quality of their stock, bring in a valuable male for crossing purposes (Ockling, 1987).



**Common breeds in Ghana:** The Ministry of Food and Agriculture, the Faculties of Agriculture, and the Animal Research Institute are the main organizations in Ghana concerned with cattle breed evaluation and genetic development (Okantah, 2009). Ghana Shorthorn, Sanga, White Fulani, Sokoto Gudali, N'Dama, and Muturu (Dwarf Shorthorn) are locally adapted cattle breeds in Ghana. There are many breeds of sheep and goats in the country, but the common ones are the West African Dwarf or the Djallonke, long-legged Sahelian sheep, while the goats are Ashanti Black, Large White, and crossbreeds (MoFA, 2016). The Ashanti Black Pig and Ashanti Dwarf Pig are some local pig breeds in Ghana (Ayizanga et al., 2016).

**Selection of breeding stock:** Livestock farmers need to consider the following factors before and during the selection of breeding stock:

1. Younger animals live and produce longer than older animals as production and breeding efficiency decline with age (Terrill, 1986). Also, female animals with fewer than three cycles of parturition should be selected. Animals with bright eyes that are very alert and free from limping should be selected (Addo, 2002).
2. A small-scale livestock farmer should select a known breed type that has the highest production level. In Ghana, crossbreeds that inherit good traits are known to have high performance (MOFA, 2004).
3. The animal should have bright eyes and be alert and free from limping or abscesses. These animals should also be free of sour tastes in the mouth, sores, pink eyes, and discharge from any natural openings, as well as respiratory ailments, skin lesions, and parasites (Danelle 2016).



4. Farmers are advised to always choose an animal with good body conformation to fit their farming objectives. A wedge-shaped dairy cow should have a large udder, slender legs, and a long neck (Adegoke and Abioye, 2016). In Ghana, livestock farmers are always encouraged to ask to see the parents' records when selecting breeding stock. This ensures that the breeding stock has mothering ability, large litter size, or high milk production. Offspring from parent animals that produce less should not be considered for breeding stock (Bennett-Lartey and Oteng-Yeboah, 2008). Also, animals that practise cannibalism or egg-eating with a lot of aggressiveness are classified as animals with bad behaviour and should not be considered for breeding stock (Eppink et al., 2018).

#### **2.3.2.2 Heat Detection**

Heat, also known as estrus, is a phase of the reproductive cycle in which female animals become sexually receptive, suggesting that they are ready to mate (Ajayi and Akhigbe, 2020).

The accurate and efficient detection of heat in livestock farming is an important and essential component of good reproductive management practice. Modern automatic heat detection technologies have made it easier to detect animals on fire; however, many fires are still spotted visually. Mounting and being mounted, a rise in body temperature, vulval swells, and clear or slimy mucus from the vulva are all signs of ruminants on heat (Adegoke and Abioye, 2016). Poor reproductive performance and low reproductive efficiency are caused by two basic causes: failure to detect heat and errors in heat detection (Ajayi and Akhigbe, 2020).



### **2.3.2.3 Gestation**

Gestation is the period from the time of conception after a successful mating or through other artificial methods such as artificial insemination. Through to the point of giving birth (Wright, 1920). Table 2.1 presents a summary of the gestation or incubation periods of some selected livestock:

According to studies, animals should not be bothered during this time. This is to prevent an abortion. As a result, animals should receive a lot of attention at this time (Ali et al., 2019).

### **2.3.2.4 Parturition**

Parturition is the process by which the foetus expels through the birth canal, also known as giving birth (Neary, 2005). According to Goodling (2018), the following are signs and symptoms of parturition:

- Swelling of the vulva and udder for 2–3 days
- Restlessness standing and lying down intermittently
- It goes off feed and water.
- very tense udder
- Sniffing at kids around
- Birds prepare nests by plucking off hair from their bellies.
- Isolation from the herd Slimy vaginal secretion

During parturition, the offspring comes out first, with the front feet and the head outstretching before the remaining body. This should last within two to three hours



after the above signs. Any other presentation called a "breech presentation requires assistance (Neary, 2005).

### **2.3.2.5 Housing and equipment**

According to Tuyttens (2005), livestock housing plays a significant role in livestock production. A structure or a facility in which animals are kept or grown to provide a level of environmental control, production, and comfort to maximise productivity is referred to as housing. Aland et al. (2013) affirm the importance of housing in sustainable animal production. They further posit that providing appropriate buildings in livestock farming generates an environmental condition that enhances the health and welfare of livestock.

Before the Second World War, industrialised countries practised an extensive or semi-intensive system of keeping livestock (Steinfeld and Mäki-Hokkonen, 1995). However, intensive or complete confinement of livestock system technology emerged during post-World War II. Poultry and swine are kept in confinement in modern industrialised countries, but dairy cattle are often kept in semi-intensive systems with access to a paddock, cement yard, or pasture for at least part of the year (Fraser and Estrada, 2001).

Putting up a housing facility for livestock farming should adhere to certain basic requirements. Site selection and the positioning of the housing facility should be paramount (Danelle, 2016). According to Hirning (1970), the construction should be positioned longitudinally in the east-west direction, which is the opposite of dawn and sunset. This provides adequate shade, ventilation, and air circulation inside the home.





The structure should have different apartments where new animals, sick animals, adults (breeders), or growing animals (fatteners) are isolated from the rest of the stock. Sick animals are likely to contaminate the other healthy animals if provision is not made for isolation. In a group with established social order, the common response to aggressive behaviour is for the inferior animal to flee. The layout of the building must allow for this; therefore, in pens and yards, tight corridors and corners where one animal could be trapped by another should be avoided (Mbuza et al., 2016).

Small-scale livestock farmers in rural areas can boost their production if they work with the right equipment. Irrespective of the farming system one is practising, certain equipment is essential to the farm's success (David, 2012).

#### **2.3.2.6 Feeding and Nutrition**

The rate of growth, production capacity, and health of livestock are all affected by feeding. Feed management is a vital component of effective livestock production because the majority of small-scale livestock farmers in rural areas manage their herds extensively on local pastures with few inputs to intensify productivity. (Sansoucy, 1995).

Sheep and goats' major and most cost-effective source of nutrients is usually pasture, forbs, and browsing plants. In certain circumstances, small ruminants only require grass to meet their nutritional needs (Madsen, 1942). However, studies have shown that feeding animals their essential dietary requirements during their various life stages helps prevent malnutrition, deficiencies, and diseases and improves breeding. Salt, calcium, and phosphorus are essential minerals required by younger animals (Salem,



2010). According to Gong (2017), most livestock farmers in Northern Ghana do not practise proper feeding management practises. Livestock in these areas is left to find feed on its own and is only fed with agro-by-products during lean seasons as feed supplements.

### **2.3.2.7 Livestock health management and disease control**

Animal illness prevention and management, as well as animal health promotion and protection, are critical components of any successful animal breeding and production program. Ensuring good animal health and disease prevention helps to avoid production losses through deaths and stunted growth. It also helps to prevent disease transmission to other animals or humans (FAO, 2020).

Experts advise that livestock farmers should have animal disease prevention and control measures to serve as guidelines for eliminating infectious diseases. Farmers should prevent environmental contamination by isolating sick animals from the healthy ones, controlling arthropod pests, internal parasites, intermediate hosts, and vectors, ensuring frequent vaccination of farm animals, and deworming farm animals (Walker and Stachecki, 1996).

### **2.3.2.8 Livestock Marketing and Record-Keeping**

Livestock marketing has to do with the entire production process, promotion, and pricing. It's also referred to as a necessary action towards the end of a conventional production chain. The initial stage of livestock marketing is selecting a stock type that meets the market target (Mathias et al., 2010).



According to DFID Market Development, very few livestock farmers are commercially oriented in their production. This is making it difficult for these farmers to fully enjoy the benefits of keeping livestock (MADE, 2014).

A study conducted by Jari and Fraser (2009) confirmed the difficulty smallholder farmers face in marketing their livestock produce as they compete individually against commercial farmers. Therefore, it is advisable that smallholder livestock farmers form co-operatives or other groups to actively market their produce (Rapsomanikis, 2015).

Livestock marketing plays a significant role in an economy whose resources are primarily agricultural. An improved livestock marketing system will help stimulate the growth of the livestock sector and increase farmers' income (Mathias et al. 2010).

Also, livestock record keeping is an important management practise that keeps track of all activities on the farm and plays a crucial role in ensuring successful livestock farming. Livestock health and treatments, livestock bought or sold, identifications, and other important management practises should be recorded (Epafras, 2019). The farmer should keep several different types of records. Daily stock records, health records, financial records, production records, and sales records are just a few examples (Yadeta and Fetene, 2020).

### **2.3.3 Challenges in livestock farming and innovation adoption**

According to MoFA (2004), livestock farming challenges are caused by decisions made by farmers, researchers, and the government regarding processes and methods; shortfalls in supporting institutional structures (particularly institutional procedures of



service delivery and marketing); limited resources; poor infrastructure; as well as environmental interrelationships.

Gong (2017) recognised livestock farmers' issues in livestock production as insufficient quantities and quality of livestock feed and nutrition, animal diseases, dangerous plants, veld (bush) fires, availability of water, and stock theft.

### **2.3.3.1 Livestock feed and nutrition**

In Ghana and other developing nations, insufficient amounts and quality of livestock feed and nutrition are key issues. Farmers do not have adequate structures to store fodder to feed their animals throughout the year. In addition, there is a lack of baling equipment that might minimise feed bulkiness for easier transport and storage, as well as permanent markets for animal feeds (Makkar, 2011). These difficulties have made extension workers unable to recommend accurate standards of feeding to livestock farmers.

### **2.3.3.2 Animal Diseases**

Infectious diseases are the greatest threat to livestock farming in Ghana. Most farmers, especially in rural areas, have limited access to effective diagnosis of diseases, appropriate vaccines, and therapeutic drugs. Farmers and untrained veterinary officers use hit-or-miss methods to treat animals, which sometimes results in their death (Nuvey et al., 2020). Animal illnesses, according to Gong (2017), are one of the major barriers to smallholder livestock production in developing countries. He also claimed in his study that irregularities can lead to weight loss, delayed growth, lower productivity, and decreased hunger and metabolism of body reserves.



### **2.3.3.3 Stock theft**

A report by Jonas Biawurbi, published by zaaradio.com on the 27th of January, 2020, in Tamale, revealed that cattle theft is one of the major threats facing pastoralists in Ghana. The report further indicated that pastoralists, farmers, and robbers were those engaged in so many incidents of livestock theft (Biawurbi, 2020).

Livestock theft is a contributing factor to poverty, according to Khoabane and Black (2009). Theft of livestock is mostly caused by increased poverty among unemployed people and drought-stricken agricultural growers. This has the impact of lowering the afflicted households' consumption of wealth returns. It makes it more difficult for households to sell their pets and utilise the earnings to purchase food and non-food items.

### **2.3.3.4 Poor access to livestock production information and services**

Over the last three decades, information processing and dissemination have played a vital role in the current agricultural transformation in China (Zhang et al., 2016). Inadequate access to agricultural extension services and improved farm inputs in sub-Saharan African countries has resulted in low agricultural yields (Dormon et al., 2004). In view of the above, efforts need to be made to convey skills and knowledge through effective extension service delivery.

## **2.4. Agricultural Information Needs of Livestock Farmers**

There is a growing recognition that access to timely and high-quality information is essential for any meaningful and long-term advancement and development in any field. For example, governments' sound policy strategies, planning, execution,



monitoring, and assessment are based on high-quality data. Various institutions, companies, and researchers, among others, require fast, accurate, and relevant data in order to make informed decisions (Yeganegi et al., 2021).

Agriculture has long been recognised as a crucial industry that may help developing economies accomplish the much-needed worldwide goal of poverty reduction in a more sustainable manner. Farmers want reliable, relevant, and accurate information to guide policy direction and decision-making for long-term agricultural growth (Chisenga, 2012; MoFA, 2016).

However, FAO et al. (2017) contend that probably the biggest challenge that most developing countries like Ghana face today is educating the growers about quality issues through the use of ICT platforms and portals to aid farmers and growers on best farming and handling practises. For example, according to Chisenga (2012), while access to global agricultural information resources and advances is relatively straightforward, local agricultural material is often hidden and difficult to find. The efforts of three programmes in Ghana, Kenya, and Zambia to deliver information to farmers' doorsteps were noted as some of the significant obstacles uncovered from his study.

1. "Lack of motivation and incentives for researchers to submit their work to institutional repositories;
2. Absence of institutional policies and strategies to support the open sharing of information resources;
3. absence of clear copyright and guidelines for licencing digital content and



4. Lack of knowledge about publishers' policies on open access and self-archiving" (p. 9).

Mtega (2012) defined information as the data that is available to a person or group of people to inform or influence their decision-making process. Mahindaratne and Min (2018) suggest that the information needs and information-seeking patterns of farmers were location-specific, and some of the major sources of information for farmers were predominantly local. Some of these local sources of information include neighbours, friends, and family, and these were closely followed by public extension services. However, with the exception of radio and cell phones, advanced technologies including the internet, e-mail, and print materials had low patronage despite their existence in most communities in Africa (Acquah, 2012).

Extant literature suggests that much of the current state of agriculture information access in Ghana has to do with the farmers information needs, the sources of information available to them, and the type of information available (Rapsomanikis, 2014). Farmers in Ghana have numerous hurdles when it comes to accessing agricultural information (Naamwintome and Bagson, 2013).

Folitse et al. (2018) found that a skill shortage to obtain information, insufficient information resources, inadequate veterinary services, a lack of information hubs, and inappropriate airing times of agricultural programmes on radio stations were some of the limiting factors faced by poultry farmers when accessing information in Selected Communities in the Greater Accra Region.



The majority of urban vegetable farmers in Accra utilise radio as a source of agricultural knowledge, according to a comparable study on the sources of information for urban vegetable farmers. Farmers also needed information on the agrochemicals used in fertiliser, weedicide, and pest control applications. However, poor public relations on the part of agricultural extension workers posed a significant obstacle to Accra's urban vegetable producers. (Folitse et al., 2016). The findings agree that extension services, which were expected to play a key role in facilitating smallholder farmers' access to and use of agricultural resources by providing adequate and relevant agricultural information, have failed to materialise due to a variety of technical and institutional challenges, according to Tetteh (2013). Furthermore, Ellen claims that weak information infrastructure or communication facilities cause physical impediments to information accessibility (Masuki et al., 2010). In this information age, Cogburn and Adeya (2001) argue that information and communication infrastructure are necessary requirements for widespread socio-economic development. However, most African countries' information and communication infrastructure is inadequate. As a result, internet usage is at an all-time low. Africa, according to Adeya and Cogburn (2000), has a poor telephone penetration rate, insufficient broadcasting facilities, computing infrastructure, and other consumer uses. Psychological barriers, on the other hand, are caused by people's failure to recognise their information needs or their difficulty getting needed knowledge from acceptable sources.

For example, Abdallah (2016) observed that several practices, customs, religious beliefs, and social conventions restricted women's activities both on and off the farm, limiting their capacity to obtain new information and use technologies.





For example, gender-related attitudes and practices such as those that do not permit women to participate in meetings due to their increased workload contribute largely to their lack of access to information. Tetteh (2013) shares similar views when he asserts that women's dual domestic and production roles take up their entire day. As a result, they are frequently too tired to listen to radio programmes, which hinders them from taking advantage of extension services.

#### **2.4.1 The Use of Rural Radio Programmes in Dissemination of Agricultural Information**

The success of agricultural improvement programmes in building developing economies to a great extent depends upon the nature and degree of utilisation of the mass media in the mobilisation of individuals for improvement in farming (Rivera and Qamar, 2003).

During the postwar period, the media became one of the most effective empowerment instruments for facilitating and encouraging people to engage in the development process. Community radio is defined by Mahanan and Akut (2016) as "a type of radio service that caters to the interests of a certain area, broadcasting content that is popular with a local audience but which may often be overlooked by commercial or mass-media broadcasters" (p. 108).

Radio and TV have been acclaimed as the best media for diffusing information to the majority of the population. In most African countries where illiteracy is high, the choice of media for correspondence is indispensable. Presently, TV and radio are noteworthy, as they convey current agricultural information to literate and illiterate



farmers alike, even in the interior or rural areas, within a short time (Christiaensen, 2016).

According to Chapman et al. (2003), radio has demonstrated the potential for agricultural extension to gain from both the reach and relevance that local broadcasting may achieve through participatory communication tactics. He believes that community radio might be utilised to:

- Improve agricultural information sharing among isolated rural farming communities.
- Encourage the use of participatory communication strategies to aid agricultural extension activities, particularly the use of local languages and rural radio to interact directly with farmers and listening groups.
- Pair a drama presented by local actors with a conversation on a related theme. broadcast schedules and preferences of listeners in the form of information and education.

In evaluating the function of rural radio in agricultural and rural development, Nakabugu (2018) points out that radio is a complementary component in supporting agriculture and rural development. She further adds that community radio has proved to be the best medium for agricultural development in our rural areas. However, the controversy over whether radio could really effect the needed change was of grave concern. Her study also brought to light the fact that if radio were properly combined with other methods of promoting agriculture and development, the impact could have been greater.



## 2.5 Community Radio

Al-Hassan et al. (2011) described community radio as radio in the community, for the community, about the community, and by the community. Nafiz (2012), in an attempt to describe community radio, breaks it into three facets. They include the fact that community radios are non-profit and are managed by the community that owns them. They involve and revolve around community participation.

Radio has played a tremendous role in building capacities and improving the living standards of people in rural areas. Community radio is becoming increasingly recognizable, loved, and used by local residents, according to the Food and Agricultural Organization (FAO). It encourages the interchange of ideas, brings people closer together, stimulates information, and increases the value of local knowledge, all of which contribute to change for the better (FAO, 2005). Community radio is "a simple, effective solution" to achieve development goals (Population and Media Centre, 2005).

There have been a plethora of reports on the emergence of community radios. For example, in an attempt to give a brief history of community radio Fogg, Korbel, and Brooks, 2005, p. 10 (as cited in Kuyucu, 2014), indicate that the world's first community radio emerged in Bolivia during a 1947 labour strike. According to Amarc (1998), the first community radio station in the world began broadcasting in the United States in 1949 with Lewis Hell.

Da Costa (2012) is, however, of the view that community radio first emerged in Colombia during a movement of political struggle opposing repressive governments



in 1947. The second community radio station was established in 1949 to advocate for better working conditions for tin miners. Fraser and Restrepo-Estrada (2002) (as cited in Da Costa, 2012) indicate that "the backdrop to the emergence of these radio stations was poverty and social injustice" (p. 13-22).

The importance of community radio in empowering the very vulnerable and less privileged was acknowledged globally and introduced in Africa in May 1982 by a joint initiative of UNESCO and the Kenyan government, 35 years after the first community radio station was established (Githethwa, 2010).

Many developing countries like Ghana are harnessing the potentials of community radio in their developmental processes. As the international community's focus shifted away from traditional radio broadcast media systems and towards community-based radio stations as a means of fostering rural development, this was discovered (Chapman et al., 2003).

White (2007) reports that Radio Ada was the first community radio station to be officially registered and launched in Ghana in 1999. However, Radio Progress, according to Amadu and Amin (2018), was the first community radio to commence broadcasting in Ghana, and this was in the year 1997.

According to the National Communication Authority (NCA), eighty-one (81) community radios are duly registered to operate as community radio stations throughout the country as of 2021. Thirty (30) of these community radio stations are situated in northern Ghana. Seven community radio stations are stationed in the



Northern Region, four in the Savannah Region, four in the North-East Region, seven in the Upper West Region, and eight in the Upper East Region. The Upper East Region records the highest number of community radio stations among the regions in northern Ghana (NCA, 2020).

### **2.5.1 Characteristics of Community Radio**

In an attempt to distinguish community radio from commercial and public radio (AMARC, 1998; Mtinde et al., 1998; Fraser and Estrada, 2001) (as cited in Mhagama, 2015), the authors identified three key characteristics of community radio to include community ownership, participation, and operation as a non-profit entity. Banda (2004) also argues that community radios are managed by the people and are resourced and financed by taxes paid by people within the community. It is therefore a non-profit venture. They are often located in the community they serve, and they serve the interests of the community. Gumucio-Dagron (2006) also added that community radio allows community participation. Members of the community therefore become the planners, producers, and performers of these radio stations.

#### **2.5.1.1 Participatory Tool**

Community radio is the most efficient empowering tool in facilitating and encouraging people to participate in development processes (Mhagama, 2015). Creating a platform for participation in live events and programmes is a significant component of community radio stations (Faisal & Alhassan, 2018). Alumuku (2006) also affirms that community radio, as part of its core mandate, provides all levels of participatory groups in public discussion.



According to Diedong and Naaikuur (2012), one remarkable strength of community radio stations in Ghana is that they give voice to the voiceless by empowering the grassroots to participate in decision-making as the beginning of social change and problem-solving. They recount how community members in Ada were trained on producing radio drama by the University of Ghana.

Unlike private or commercial broadcasting radio stations, which design their programmes primarily for profit-making, community radio is a not-for-profit radio station designed to serve the interests of the community in which it is located through its programmes (Al-hassan et al., 2011). Revenue-generation activities are vital for the survival and sustainability of radio stations, including community radios. However, the main objective of community radios is not to generate revenue, unlike commercial radio (UNESCO, 2015).

Community radio, according to Sauls, does not have the same financial resources as commercial radio stations. In the creation of its programmes, it is committed to societal norms, values, and interests (Al-Hassan et al., 2011). Mefalopulos (2008) found that community radios are unable to compete effectively for announcements because of their small coverage area. This makes them rely primarily on external agencies and donors to fund their operating expenses.

#### **2.5.1.2 Low-Power Transmissions**

Community radio stations mostly have low-power equipment to transmit, hence covering smaller areas. According to Tabing (2002), community radio stations serve a distance of up to an approximate 30 kilometre radius with a power design between



5 and 200 watts. They further stated that the customary transmitter available and often suitable for a town-level community is a 20-watt FM [frequency modulation] transmitter.

In Ghana, NCA guidelines for applications for community radio stations indicate that "community radio stations should be designed to cover an area of 5km radius unless the said community exceeds that area, in which case a justification for an expanded coverage area should be provided in the feasibility report. The requirement is for the signal strength not to exceed +54 dBV/m at the periphery of the coverage area" (NCA, 2020).

#### **2.5.1.3 Inadequately trained, professionally qualified staff**

Howley (2010, p. 4) reveals that "community media operate with relatively little paid staff, relying instead on volunteers to perform the tasks and functions associated with media production and distribution". Community radio stations are often characterised by untrained staff who work at the station as volunteers. This is due to the non-profit nature of these types of radios (Dunaway, 1998). Bosch (2014) affirmed that most community radios do not have professionally trained journalists to manage them.

Ananthakrishnan (1994) viewed volunteerism as the strength of community radio stations' staff and believed it to have both positive and negative impact.

#### **2.5.1.4 Community radio is owned and managed by the community**

According to Mhagama (2015), community radio has two types of ownership: one that is entirely owned and operated by community members, and the other that is owned



and supported by an entity outside the community. Mhagama, on the other hand, believes that in order for members to participate in decision-making and operation, community radio stations do not have to be wholly owned by the community.

### **2.5.2 Community Radio Programmes**

A radio programme can be described as a segment of content or meaningful sounds produced by human beings or recorded sounds intended for broadcast on radio. Radio programmes are categorised into formats such as documentaries, features, magazines, discussions, and news programmes (Idebi, 2008). The quality of programmes aired by community radio is as important as the set-up of the station.

This positive impact of radio programmes in providing information to farmers places a professional obligation on media houses. In Iran's Fars province (2010), Nazari and Hasbullah evaluated the impact of radio as an educational media source on agricultural development and found that educational intervention via radio resulted in a significant gain in knowledge. Based on the information supplied, they believe that radio plays an important role in the development of farming systems and farmer awareness.

Kolar and Kakade (2013) looked into the impact of a radio programme on increasing farmers' knowledge of organic agricultural practises in India's Karnataka province. According to the findings of their research, farmers' knowledge of organic farming has increased significantly as a result of the efforts of the "Negila Yogi" radio programme. This, by implication, meant that the "Negila Yogi" radio programme contributed immensely to popularising organic farming practises, leading to increased production.





Most farmers in Nigeria's Benue State recognised that listening to radio programmes provided them with fresh information, which had a substantial positive impact on them, according to Okwu et al. (2007).

Despite the impact of radio in contributing to increased information access by farmers, as found by previous studies, this was often bereft of challenges as a result of the fact that some measures were often not put in place to mitigate these challenges (Chapman et al. 2003). Okwu et al. (2007) discovered that the time of broadcasting radio programmes affected listenership in their study. Based on the above, they advocated for some modifications with regards to the way and manner in which the programme was often carried out. Stemming from the above, it is prudent that some factors be considered when designing effective radio programmes geared towards the provision of agricultural information.

Rao (2018) highlights a plethora of criteria that enable radio stations to evaluate critical factors such as the form of implementation, capacities necessary, cost, and best fit considerations while writing extensively on what works in rural advisory services in using radio for agricultural extension. Consistency, relevance, and ease of use, for example, can aid in the development of high-quality farmer programs. "Radio broadcasters may play an active role in extension, beyond simply facilitating information sharing, through training and coordination with other agricultural actors," they continue (p. 100).

For instance, to address the challenge of time of airing, which was a challenge found in the study of Okwu, Kuku, and Aba, the Global Forum for Rural Advisory Services



(GFRA) suggests that in planning and developing broadcasting programmes, timing, duration, and schedules of the programmes need to be carefully considered. Farmers benefit from specified days and time slots, such as weekends and evenings, they add. Similarly, if they don't have access to a radio at home, ladies may prefer pre-recorded programmes to allow them to engage as a group (Rao, 2015).

Nyareza and Dick (2012) also intimate that, at the initial setting up of a community radio station, some factors need to be considered. They include the Board of Trustees, the Management Committee, the Station Manager, and the Presenters, and they take into account crucial factors including financial viability, target audience, radio listening clubs, and a review of community radio clubs.

Some respondents to a study on using community radio to transmit agricultural information to Zimbabwean peasant farmers, for example, noted that while they supported the creation of a community radio station, they were concerned about its financial feasibility. The original start-up cash, the cost of equipment, and the manpower needed to manage the station were all major considerations (Nyareza and Dick, 2012).

### **2.5.3 Potentials of Community Radio**

Studies show that there are several potential benefits to be derived from community radio. As a result, the importance of community to people's access to information in agriculture cannot be overstated. According to existing data based on farmer experiences, access to information aids farmers in making educated decisions.



Despite the fact that the majority of peasant farmers were aware of extension service programmes, they did not meet their agricultural information needs. Community radio was the most favoured method of communication for rural peasant farmers in Zimbabwe. This was due to a lack of extension staff, in addition to other issues (Nyareza and Dick, 2012).

Other challenges include a shortage of transportation to visit all homes, a lack of communication skills to interact effectively with peasant farmers, and a lack of passion among extension workers. Furthermore, the programmes were carried out according to relevance to their own agricultural activities and languages, which enabled them to contribute meaningfully (Nyareza and Archie, 2012).

Mahanan and Akut (2016), in discussing the potential of community radio, conclude that community radio has the potential to serve as a mouthpiece for the community it is located within with programmes in local dialects while considering the culture, traditions, norms, and interest in facilitating dialogue within the community. Relevant stakeholders within the agricultural sector could utilise this opportunity provided by community radios to disseminate usable farm information that can help boost food sufficiency efforts in the country.

Similarly, Sanga, Kalungwizi, and Msuya (2013) also set out to determine the impact of a small farmer-driven extension service system through radio programmes in Tanzania. The findings suggest that the Farmer Voice Radio (FVR) project had massive success in introducing new technologies. This took the form of giving integrated agricultural extension services to farmers and livestock keepers from



various sources. It was used to supplement traditional extension services in order to reach a larger number of farmers with the limited resources available.

#### **2.5.4 Challenges of Community Radio**

Community radios are bereft of some challenges. Mahanan and Akut (2016), in extensively discussing the challenges of community radio, note that active participation is key to the survival of community radio. In the view of Sharma (2011), community radio requires the active participation of 70% of persons within the community. Sharma (2011) believes that in order to ensure people's participation, the community's leaders, including elected leaders, must work together and "the elected and the religious authorities, as well as the informal but also influential opinion leaders, must be part of the consultation process. But equally important is a consultation process that involves the community at large" (p. 110).

In addition, governments' reluctance, delay, or refusal to issue licences for the operations of community radios could serve as a major inhibition to achieving the purpose of establishing them. This ultimately discourages individuals who are ready to establish community radios for their intended purposes, thereby denying communities the opportunity to benefit from such laudable initiatives (Seidu et al., 2011).

Invariably linked to this is the issue of politicians and religious extremists, who tend to capitalise on such laudable initiatives to promote their selfish motives and parochial interests. This, in the view of Mahanan and Akut (2016), if not discouraged by a clear



regulatory framework and policy, may thwart the efforts of community radios in the provision of socio-economic development inclusion.

Furthermore, issues regarding the effectiveness and quality of programme production, in terms of timing of radio programmes, content, production quality, and community involvement, pose some challenges. Okwu, Kuku, and Aba (2007) found that time of airing of programmes and encouragement of group listenership were found to affect listenership. Based on the above, they advocated for some modifications regarding the way and manner in which radio programmes were often carried out. This, they indicate, had the tendency not to achieve the purpose for which these programmes were organised.

Sanga, Kalungwizi, and Msuya (2013) also outlined the following as challenges for community radios:

1. Farmers' illiteracy
2. There is a lack of communication between extension officers, researchers from higher education institutions, and farmers.
3. Due to poverty, some farmers lack access to radio and other ICT equipment (e.g., mobile phones and desktop computers).
4. Lack of training tailored towards the needs of different groups with diverse needs often requires a lot of capital for the training production team, presenters, and listeners.



Lack of regulation on the use of ICT in extension services through the initiation and review of existing policies for extension services and ICT.

## **2.6 Community Radio and Agriculture in the Bawku West District**

Dastech Radio is the first radio station to get authorization under the National Communication Authority of Ghana on the 11<sup>th</sup> of May, 2015, to operate as a community radio station in the Bawku West District (NCA, 2016).

The station has made a significant contribution to the district's growth, particularly in the agricultural sector. ADVANCE in the Third Quarter 2016 Report stated the significant role Dastech Radio played in successfully implementing its project, as it was one of the stations profiled to collaborate with the project on the ICT outreach for production technology dissemination. (Dormon, 2016).

The radio programme that was run by the station during the ADVANCE project was designed and geared towards women farmers. This was to enable them to easily access agricultural information.



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.0 Introduction**

There are two sections to this chapter. The first half of the chapter dealt with the selection and description of the study area, while the second portion dealt with the methods. The second part concentrated on the research design, demographics, sampling methods, data sources, data collection instruments to be utilised, including their validity and reliability, and data analysis methodologies.

#### **3.1 Study Area**

The Bawku West District was chosen because it is one of the Upper East Region's four districts and a large portion of its population is engaged in livestock production activities. It also has a vibrant community radio station that runs agriculture-related programmes targeted for empirical study.

##### **3.1.1 Location and size**

In 1988, the new local government system broke up Bawku West district from the previous Bawku district. In terms of land area, it is the fifth largest district in the Upper East Region, encompassing around 1,070 square kilometers. This accounts for around 12% of the Upper East Region's total land area. Between latitudes 10° 30'N and 11° 10'N and longitudes 0° 20'E and 0° 35'E, the district is located (MoFA, 2020).



Bawku West District is covered by the Sudan savannah, which is made up of short, drought- and fire-resistant deciduous trees mixed with open savannah grassland (Nti, 2012). In the less eroded sections, *Andropogon gayanus* (Northern Gamber Grass) grows, as do *Hyparrhenia* spp., *Aristida* spp., and *Heteropogon* spp. (Spear Grass) in the relentlessly worn areas. *Anogeissus* spp., *Acacia* spp. (thorn tree), and *Triplochiton* spp. are all common trees. *Parkia filicoidea* (Dawadawa), *Butyrospermum parkii* (Sheanut), *Andansonia digitata* (Baobab), and *Ceiba pentandra* are some of the district's economic trees (Kapok). Along the eastern and southern portions of the Red and White Volta, from the Widnaba-Tilli area through Binaba-Kusanaba and Zongoyiri to East Mamprusi, the district has a sparsely inhabited Oncho-freed woodland and forest belt and an uninhabited forest reserve, stretching from the Widnaba-Tilli area through Binaba-Kusanaba and Zongoyiri to East Mamprusi (MoFA, 2020).

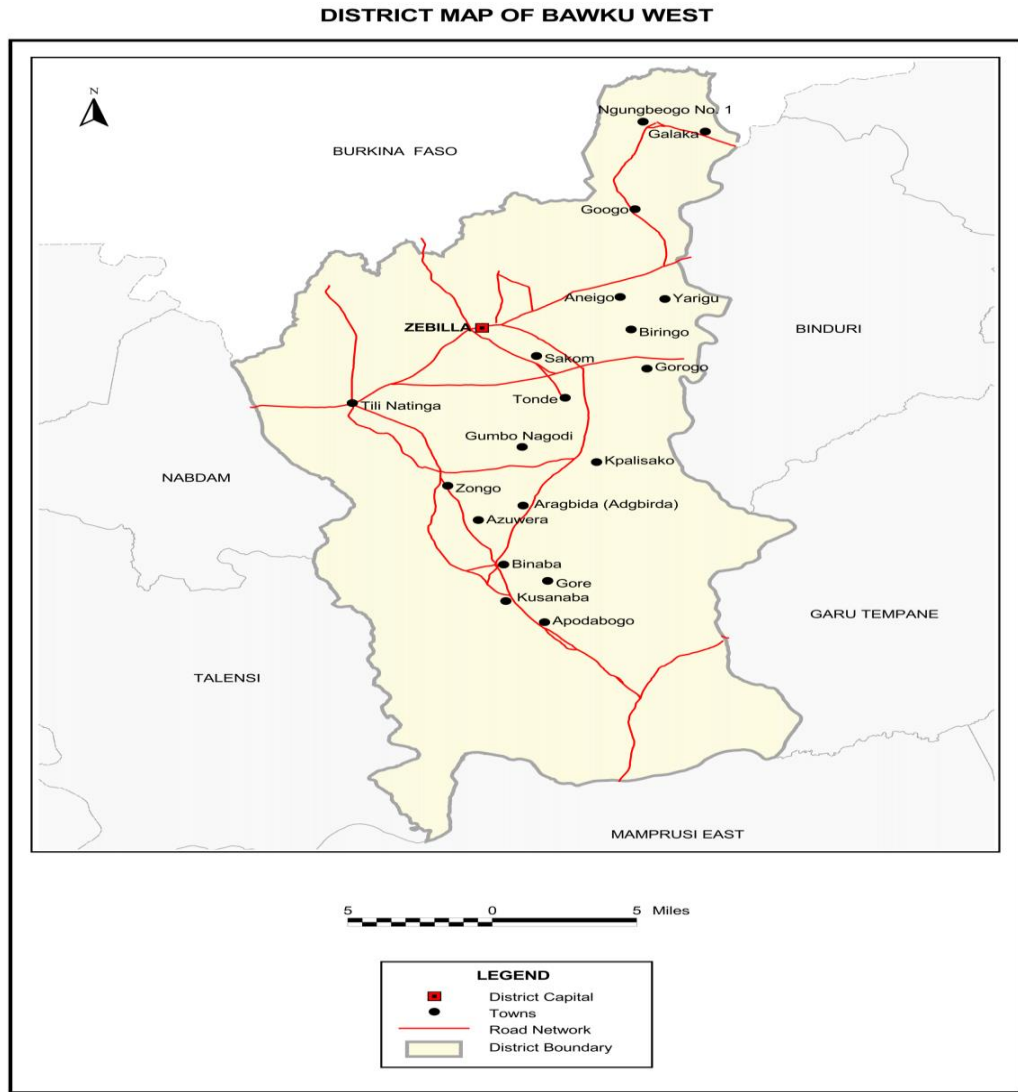
The district is drained by the White and Red Voltas, as well as their tributaries, which run parallel to its eastern and western borders. The rivers overrun their banks from April to October, when the rainy season is at its peak. During the dry season, there is a continual stream of water from the Bagre dam, allowing farmers to pump water for irrigation (MoFA, 2020).

The District is bordered on the north by the Province of Zabre in Burkina Faso, on the east by the Binduri District, on the west by the Talensi and Nabdam District, and on the south by the East Mamprusi District. Zebilla is the district's capital. The district's





largest towns are Teshie-Soogo, Binaba-Kusanaba, Sapelliga, Tilli-Widnaba, Saaka, Kobore, Tanga-Timonde, Gbantongo, and Zongoire (GSS, 2019).



**Figure 3.1 Map of Bawku West District**

**Source: Ghana Statistical Service, 2014**



### **3.1.2 Agricultural operational Areas**

In order to facilitate extension delivery, the district's Department of Agriculture has divided the district into 4 zones, each with 24 operational regions. "Galaka, Sapeliga, Komaka, Googo, Saaka-Yikurugu, and Kubore-Yarogu" are the operational regions in Zone 1. "Zebilla Central, Teshie-Soogu, Kansoogo-Lamboya, Widnaba, and Tilli" are the five operational areas in Zone 2. "Tanga, Timonde, Kamega-Yelwoko, Gbantogo, Boya Central, and Boya-Zuyanga" are among the six (6) operational areas in Zone 3, while "Binaba Central, Kusanaba, Zongoire, Apotdabogo, Kopella-Agargo, Gabulga, and Gumbare-Aragbira" are among the six (6) operational areas in Zone 4 (GSS, 2019).

### **3.2 Research Design**

The study made use of mixed research methods, which combined the strengths of both qualitative and quantitative approaches (Creswell, 2008). Philosophical assumptions, the use of qualitative and quantitative methodologies, and a combination of the two were all part of the methodology. By triangulating data sources, this method can help negate or cancel the biases inherent in any single method (Jick, 1979, cited in Creswell 2008).

This study took the form of an instrumental case study. Instrumental case studies are those that are used to get a deeper understanding of a topic, generate generalisations, or construct theories (Bassegy, 1999, cited in Creswell 2008). In this regard, the research focused on the Koob-Ne-Guliuk Radio Programme of Dastech Radio. The instrumental case study method was used to provide a focal point for gaining a deeper



knowledge of the problem. This understanding was achieved through the systematic gathering of information using multiple sources.

### **3.3 Population and Sampling Procedure**

The Ghana Statistical Service 2020 population projections indicate that the current total population of the Bawku West District of Ghana is 117,036. This current population figure consists of 57,103 males and 59,933 females (GSS, 2020).

The 2020 Multi-Round Agricultural Crops and Livestock Survey by the Bawku West Agricultural Development Unit stated a total projected household of 14,802. Out of 1,070 households registered during the survey within the enumeration areas, 668 households engaged in agricultural activities, and 1,043 individuals, made up of 516 males and 536 females, were engaged in agricultural activities (District Agricultural Department, 2020).

#### **3.3.1 Sample Size Determination**

In determining the sample size for this study, a list of farmers registered under the 2020 Multi-Round Agricultural Crops and Livestock Survey by the Bawku West Agricultural Development Unit was sourced from the district agricultural department. This list became the sample of farmers deemed suitable for the study. Miller and Brewer (2003) published a sample size calculation formula, which was used to calculate the sample size. The formula Miller and Brewer use for sample size determination is as follows:

$$n = \frac{N}{1 + N(\alpha)^2}$$

, where n = sample size, N= sample frame and  $\alpha$ = the margin of error.



According to MoFA, the total number of farmers registered under the 2020 Multi-Round Agricultural Crops and Livestock Survey by the Bawku West Agricultural Development Unit was 1,043.

To determine the sample size from the sample frame of 1,043;

$N= 1,043$ ,  $\alpha= 0.05$  with a confidence level of 95%

$\therefore n$  (sample size) = 289.1

However, the study made 10 percent (28.9 respondents) provision for contingencies. This resulted in a total sample size of  $289.1 + 28.9 = 318$  targeted farmers in the district. Also, two (2) key informants are the programme manager of Dastech Radio and the livestock officer of the Bawku West District Agriculture Department. The total number of participants in the study was three hundred and twenty (320).

### 3.3.2 Sampling Procedure

The district, villages, and respondents were chosen using a multi-stage (three-stage) sampling design. This approach was chosen because it allows larger clusters to be broken down into smaller, more targeted groupings (Taherdoost, 2016).

The first level of the multi-stage sampling involved purposively sampling the Bawku West District. Bawku West District was purposively sampled because the district has a large population of livestock farmers and a community radio station with a wide range of coverage that extends throughout the district and works assiduously towards promoting agriculture in the district. The district livestock officer of the district



agricultural department and the programme manager of Dastech Radio Station were purposefully selected for the study. These two were selected because, in the view of the researcher, they possess the requisite knowledge that was deemed significant to the research objectives.

In the second stage, a stratified sample technique was used to divide the MoFA-sourced list of livestock farmers into strata (various enumeration areas). The survey areas covered by the 2020 Multi-Round Agricultural Crops and Livestock Survey. A simple random sampling procedure was utilised to choose ten (10) enumeration areas from the twelve (12) enumeration areas of the 2020 Multi-Round Agricultural Crops and Livestock Survey.

In the third step, simple random sampling procedures to sample registered farmers from each enumeration area. To ensure proportional representation, a simple proportion formula was employed to calculate the number of registered holders (farmers) selected in each enumeration region.

Table 3.1 shows a summary of enumeration areas selected and the number of holders (farmers) selected for the study.



**Table 3.1. Sample frame and Sample Size used in the study**

<b>S/N</b>	<b>Names Of Selected Enumeration Areas</b>	<b>Total Farmer Population</b>	<b>Sampled Farmer Population</b>
1	Zongoyire Primary School	70	25
2	Zongoyire Area Council	121	43
3	Bulinga Health Centre	82	29
4	Bulinga Chief's Palace	80	28
5	Tetako	96	33
6	Gumbare # 1	102	37
7	Gore Primary and Junior Sec. Sch.	102	37
8	Kopella Tidaanbongo	108	39
9	Namoogo	67	24
10	Zokpaliga	65	23
<b>Totals</b>		<b>888</b>	<b>318</b>

**Source: Ministry of Food and Agriculture District Department, 2020**

### **3.4 Sources of Data**

Primary Sources of Data, also known as ‘Raw Data’, is a term for materials used based on records of eyewitness accounts of events (Baker, 2011). Personal interviews and surveys using a semi-structured questionnaire were used to acquire this type of information from the field. The information gathered allowed the research team to get firsthand information on the study area and people.



### 3.5 Data Collection Techniques

- **Questionnaire:** The questionnaires were administered to selected farmers in the study after they had gone through evaluation for fundamental rectifications by the supervisors. The questions were mainly closed-ended and were translated for farmers in Kusaal, which happens to be the main local dialect of the people of the Bawku West district.
- **Key-Informants Interviews:** The district livestock officer, who was the main resource person for the livestock farming segment of the Koob-Ne-Guliuk Radio Programme, and the programmes manager of Dastech Radio, who also served as the main host of the radio programme, were purposefully selected as the key informants. These two (2) were selected because, in the view of the researcher, they possessed the requisite knowledge that was deemed significant to the research objectives. They provided valuable insight on the types of innovations transmitted to farmers via the radio show as well as the problems involved with agricultural information dissemination to livestock farmers.

### 3.6 Techniques of Data Analysis

For the first objective, which seeks to ascertain the innovations communicated through the Koob-Ne-Guliuk Radio Programme, the narrative analysis technique was used to interpret data from the key informant interviews conducted. Narrative analysis is a type of analytic framework in which researchers interpret stories that have been presented in the context of a study or in everyday life (Papakitsou, 2020). Narrative analysis, often known as inquiry, is a qualitative research method in which a researcher



examines the tales individuals tell by asking a specific question of the narrative 'texts' for a specific aim (Polkinghorne, 1995).

In this study, the narrative analysis was used to interpret qualitative data obtained from the district livestock officer and the programmes manager of Dastech Radio on the innovations communicated and the constraints associated with the dissemination and uptake of innovation in livestock farming through the radio programme.

The essential aspects of the quantitative data received from farmers through the administration of questionnaires employing tables were analysed using descriptive statistics. This was used to assess the livestock farming knowledge gained by farmers in the Bawku West District from the Koob-Ne-Guliuk Radio.

A descriptive statistical analysis was used to ascertain the extent of adoption influenced by the radio programme. Results from the analysis were presented on frequency distribution tables. Also, Pearson Correlation was used to reveal the correlation between the radio programme and the adoption of the various levels of livestock farming innovations by respondents.

**Analysis of constraints associated with the adoption of livestock farming innovations:** The challenges related to adoption were ranked in order of importance. Kendall's coefficient of concordance was then applied to test for agreement among the rankings by livestock farmers. Kendall's coefficient of concordance  $W$  is a non-parametric statistic used to assess agreement in rankings of multiple stimuli made by multiple raters.





The ratio of observed variation of the sum of ranks to the maximum potential variance of the ranks is measured by W. The goal is to calculate the sum of the ranks for each task. The heterogeneity among these sums will be greatest if the rankings are in perfect agreement (Mattson, 1986). The Kendall's concordance coefficient (W) is given by the equation:

$$W = 12S/p^2 (n^3 - n) - pT$$

Where W denotes Kendall's Concordance Coefficient, p denotes the number of constraints, n denotes the number of respondents (sample size), T denotes correlation factor for tied ranks, and S denotes the sum of square statistics. The sum of square statistic (S) is given as:

$$S = \sum (R_i - R)^2$$

Where:  $R_i$  = rows sum of ranks

R = the mean of  $R_i$

The correlation factor for tied ranks (T) is also given as:

$$T = \sum (t_k^3 - t_k)$$

Where:  $t_k$  = the number of ranks in each (k) of m groups of ties.

The hypothesis to be tested is stated as follows:

$H_0$ : There is no agreement among the rankings of the constraints

$H_1$ : There is agreement of the Kendall's concordance, using the  $X^2$  statistic which is computed using the formula;

$$X^2 = p (n - 1) W$$

p = number of constraints

w = Kendall's coefficients of concordance



The null hypothesis is rejected in favor of the alternate hypothesis that there is agreement among rankings of the constraints if the calculated chi-square is greater than the critical value.

### **3.7 Ethical Considerations**

Well-conducted research must have successfully gone through the principles and values of what is good or bad in human affairs and must be ethically approved (Resnik, 2015). Ethical issues are the principles and values that a researcher must adhere to in conducting research (Craig & Douglas, 2005).

This study adhered to all the principles that guide the process of conducting research. The University for Development Studies code of ethics for conducting research was duly adhered to. Also, all COVID-19 safety protocols from the Ghana Health Service (GHS) and the World Health Organisation (WHO) were completely followed. There were no instances where the researcher or the research participants were exposed to any risk or danger.



## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.0 Introduction

This chapter presents the analysis and discussion of the data collected for the purpose of this study. The chapter consists of seven main sections. In the first section, the demographic and agricultural features of the livestock farmers surveyed for the study are described. The second section presents information on the listenership of Koob-Ne-Guliuk Radio Programme, whereas the third section presents the innovations communicated through Koob-Ne-Guliuk Radio Programme. Also, the fourth and fifth sections of this chapter present results and discussion on respondents' knowledge gained on livestock farming through the Koob-Ne-Guliuk Radio Programme and their current livestock farming practises, level of innovations adopted, and level of influence by the Koob-Ne-Guliuk Radio Programme, respectively. The sixth and seventh sections presented findings and discussed the various constraints and challenges associated with the dissemination and adoption of livestock farming innovation.

#### 4.1 Respondents' Socio-Demographic

This section of the chapter discusses the demographic characteristics of respondents and the respondents' farm characteristics.



#### **4.1.1 The socio-demographic characteristics**

The social and demographic characteristics of livestock farmers were covered in this section of the chapter, including their gender distribution, age, level of education, marital status, religion, family size, sources of income, and occupation.

##### **4.1.1.1 Sex of Respondents**

The study interviewed 318 livestock farmers in the district, and of the total interviewed, 260 (81.8%) respondents were male, whereas the remaining 58 (18.2%) respondents were female. The labour-intensive nature of livestock rearing could account for the male dominance (FAO, 2018; Kidido, 2020). Also, gender-biased land tenure systems that limit women's access to land have been established in much literature and have been cited for women's low participation in livestock farming. For example, Ahmed, Lawson, Mensah, Gordon, and Padgham (2016) discovered that patriarchal norms led to gender inequity in land decision-making, which also included farming resources. This helps explain why only a few women work in the Bawku West District's livestock industry.

##### **4.1.1.2 Age of the Respondents**

Age is a significant factor in determining the labour force for livestock farming in the district. Results from the study, as depicted in Table 4.1, suggest that the majority (34%) of respondents are between 46 and 60 years old. 78, representing 24.5% of the respondents surveyed, are older than 60 years, and they constitute the second majority. However, respondents aged 25 and under make up the smallest age range (7.9%), while respondents aged 25 to 35 years make up the smallest majority (14.5%). This



means that the majority of respondents were aged 46 and up. This supports the World Farmers' Organization's (WFO) assertion that young people are increasingly flocking towards non-agricultural jobs (WFO, 2017). This finding supports previous research by Amponsah, Addo, Dzisi, Asante, and Afona (2018), which found that livestock production in Ghana was dominated by men and that the farmer population was ageing. Several studies have found a positive link between age and livestock production (cite). However, this is in sharp contrast to the average livestock farmer population in Ghana, where agriculture appears to be unattractive to the youthful population. The Ministry of Food and Agriculture (MoFA) conducted an assessment of Ghana's agricultural sector performance between 2010 and 2015 and found that the country's farmer population is ageing, with the majority of farmers being over 50 years old. (MOFA, 2010; 2015).

#### **4.1.1.3 Respondents' Education Status**

Education has been identified as a key component of human empowerment and a means of increasing both men's and women's human capital in order to increase production and productivity (Ogundele, Akingbade, and Akinlabi, 2012). Findings in Table 4.1 suggest that the majority (45%) of respondents had no formal education, and the second majority (25.2%) of respondents had attained some level of basic education. This finding indicates that the district's livestock producers have a high level of illiteracy. Implementing technology in animal production may be problematic due to the low level of formal education among rice farmers in the district.



#### **4.1.1.4 Marital Status of Respondents**

As an essential institution in most Ghanaian societies, marriage continues to play a crucial role in shaping and influencing power and access to household resources (Baada, Baruah, and Isaac Luginaah, 2019). The study, therefore, sought to find out the marital status of respondents. As may be observed in Table 4.1, the majority (66%) of respondents who constitute the majority are married; widows were 26.4% of respondents; divorcées were 3.5% of respondents; and 4.1% were never single (never married).



**Table 4.1: Livestock Farmers’ Socio-Demographic Profile**

		<b>Frequency</b>	<b>Percent%</b>
<b>Sex of respondent</b>	Male	260	81.8
	Female	58	18.2
	<b>Total</b>	<b>318</b>	<b>100.0</b>
<b>Age of respondent (Years)</b>	< 25	25	7.9
	25-35	46	14.5
	36- 45	59	18.6
	46- 60	110	34.6
	Above 60	78	24.5
	<b>Total</b>	<b>318</b>	<b>100.0</b>
<b>Respondent level of education</b>	No formal education	143	45.0
	Primary school	80	25.2
	Middle School/ JHS	46	14.5
	Secondary school	23	7.2
	Tertiary institution	20	6.3
	Others	6	1.9
	<b>Total</b>	<b>318</b>	<b>100.0</b>
<b>Marital status of respondent</b>	Married	210	66.0
	Single	13	4.1
	Widow	84	26.4
	divorced	11	3.5
	<b>Total</b>	<b>318</b>	<b>100.0</b>

Source: Field Survey, 2021



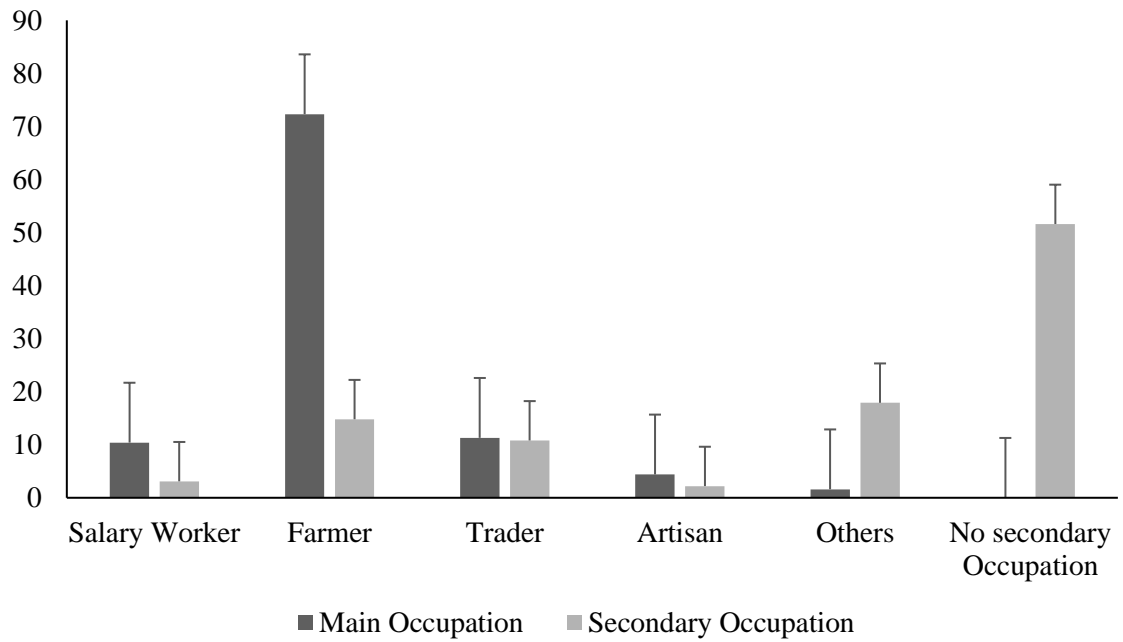
#### **4.1.1.5 Occupation of Respondents**

The study also sought to find out if respondents had other occupations besides livestock production. Results showed that the majority (72.2%) of the livestock farmers were sole farmers, whereas 14.8% of respondents engaged in agriculture as a secondary occupation. 11.3% of the respondents were traders, while 10.8% indicated they only engaged in trading as a part-time job. Thirty-three (33) respondents were full-time salary workers, representing 10.4%, and only 10 respondents (3.1%) were part-time salary workers. This goes to confirm the Ghana Statistical Services' (2015) Labour Force Report that indicated that out of the total rural population above 14 years (4,548,838) in Ghana, 2,537,466 (representing 55.8% of the said population) are engaged in skilled agriculture, forestry, and fishery works, and the remaining 44.2% of the population are in the service and industrial sectors (GSS, 2016).

One hundred and sixty-four (164) respondents, representing 51.6 percent, had no secondary occupation.







**Figure 4.1: Respondents Occupational Distribution**

#### 4.1.1.6 Household Size

The size of each home was determined by counting the number of people who lived there. The average household size was discovered to be approximately ten individuals, with a minimum of four and a maximum of 22 people. The average household size of respondents is more than twice as large as the national average of 4.5 individuals (World Bank, 2021).

It is said that household size determines farm size in rural countries. The larger the family size, the bigger the labour force, hence a bigger farm. It was, however, observed that some smaller households had large livestock farms.



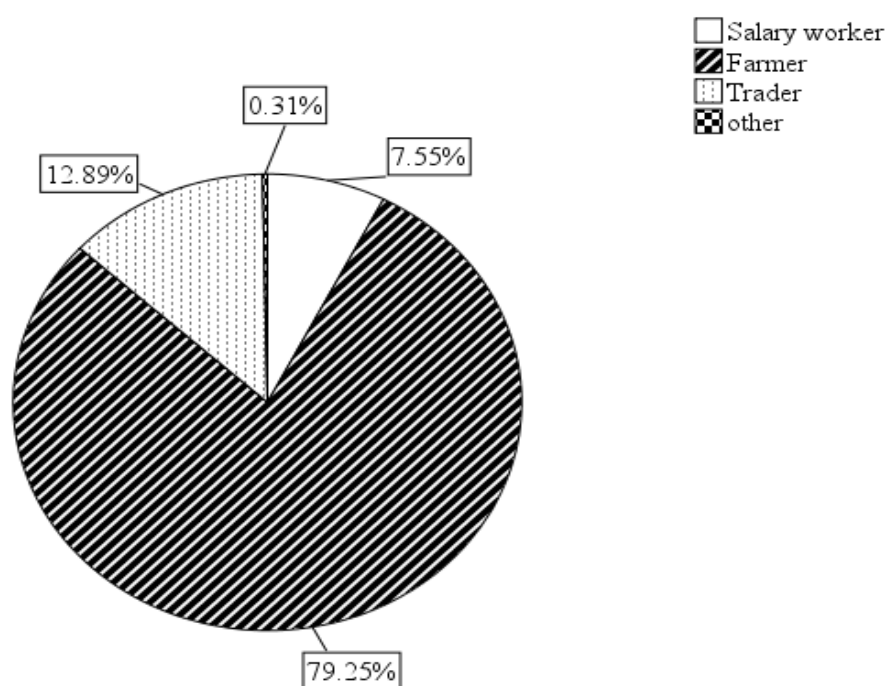
**Table 4.2 Household Size of Respondents**

N	Minimum	Maximum	Mean	Std. Deviation
318	4	22	9.92	3.561

Source: Field Survey Data, 2021

#### 4.1.1.7 Source of Income of Respondents

Results from the study further revealed that 79.25% of respondents rely on agriculture as their major source of income. 12.89% of respondents engaged in trading as their main source of income, whereas respondents who rely mainly on salary were at 7.55%. This suggests that 20.75% of the respondents rely on other sources of income.



**Figure 4.2 Source of Income of Respondents**



#### **4.1.2. Farmers' Current Livestock Size and Livestock Rearing Experience**

According to the data in Table 4.3, poultry was the most commonly reared animal, with a total of 5,811 chickens and an average of 18.27 per farmer. Guinea fowl was the second most raised livestock with a total of 5,078 and an average of 15.97 per farmer. According to the survey, the least reared livestock is the grass cutter, with a sum of 104 and an average ownership of 0.33 per farmer.

However, it was realised in the study that no farmer reared snails, and this could be attributed to the unfavourable weather conditions in the northern part of the country (Parden, 2011). The findings from the study therefore suggest that the minimum number of animals reared per respondent was 0 and the maximum number per respondent ranged from 0 to 78. Chicken was the most expensive type of livestock raised by a farmer, and the least expensive was an ostrich.

Also, the study took an interest in knowing the framers' years of experience in rearing the various types of livestock. From Table 4.4, farmers in cattle rearing had a higher average rearing experience of 20.42 years, whereas farmers in sheep, goat, pig, chicken, guinea fowl, and duck rearing had an average of over ten (10) years experience in production. However, farmers who were engaged in raising turkeys, ostriches, grass cutters, rabbits, and guinea pigs had an average year of less than 10 years. Guinea-pig keepers had the least experience.



It was also observed that no respondent owned all the listed types of livestock, and some of the respondents had experience rearing certain livestock they did not own at the time of the study.

**Table 4.3 Farmers' Current Livestock Size**

	Minimum	Maximum	Sum	Mean	Std. Deviation
Cattle	0	21	798	2.51	2.905
Sheep	0	41	1377	4.33	4.523
Goat	0	36	1826	5.74	4.703
Pig	0	24	1747	5.49	4.362
Chicken	0	78	5811	18.27	8.700
Guinea Fowl	0	48	5078	15.97	14.715
Ducks	0	30	973	3.06	6.345
Turkey	0	21	450	1.42	4.216
Ostrich	0	17	144	0.45	2.021
Grass-cutter	0	70	104	0.33	4.083
Snail	0	0	0	0.00	0.000
Rabbit	0	45	185	0.58	3.395
Guinea Pig	0	26	134	0.42	2.458
Others	0	12	183	0.58	1.849

Source: Field Survey, 2021



**Table 4.4 Number of Years of Farmers' Livestock Rearing Experience**

	Minimum	Maximum	Mean	Std. Deviation
Cattle	0	51	20.42	12.226
Sheep	0	59	19.74	12.075
Goat	0	59	19.79	12.273
Pig	0	51	15.47	12.164
Chicken	0	59	19.45	12.487
Guinea Fowl	0	49	15.43	13.266
Ducks	0	54	12.92	13.053
Turkey	0	34	5.04	5.955
Ostrich	0	26	0.80	3.372
Grass-cutter	0	40	1.11	3.778
Snail	0	0	0.00	.000
Rabbit	0	47	5.54	8.319
Guinea Pig	0	24	0.58	2.686

Source: Field Survey, 2021

## **4.2 Listenership of Koob-Ne-Guliuk Radio Programme**

This phase of the study aimed to determine respondents' sources of agricultural knowledge, the number of study participants who listened to the Koob-Ne-Guliuk Radio Program, the frequency with which they listened to the radio program, and the manner in which they participated in the radio program.

### **4.2.1 Respondents' Sources of Agricultural Information**

From Table 4.5, 78.3% of farmers indicated that they had access to agricultural information from agricultural extension agents. Farmers in Sub-Saharan Africa rely on extension workers for agricultural knowledge and advisory services (Davis, 2008). However, it came to light that these extension agents were demand-driven and only



attended to them after an outbreak, suggesting that extension officers were not proactive. They lacked early warning signs of outbreaks and new technological inventions. 302 (95%) of the respondents indicated that their co-farmers served as a major source of agricultural information. Workshops on agriculture, on the other hand, were the least popular source of agricultural information for these farmers, according to only 4.4 percent of those who took part in the survey.

Similarly, 89.6% of the respondents sampled said that radio was their primary source of information. In the view of respondents, radio is the fastest and cheapest means of receiving agricultural information. This confirms the 2012 EFA Global Monitoring Report, which indicates that radio is the most effective way of delivering information in remote corners where having the right knowledge can mean the difference between a harvest and hunger, between feeling confident or humiliated, or even between life and death, as 75% of households in developing countries have access to radio (UNESCO, 2012).



**Table 4.5 Source of Agricultural Information**

	Responses		Percent of Cases
	N	Percent	
Radio	285	21.0%	89.6%
Co-Farmers	302	22.3%	95.0%
Co-Operative Society	36	2.7%	11.3%
Workshop on Agriculture	14	1.0%	4.4%
Agriculture Extension Agents	249	18.4%	78.3%
Friends	291	21.5%	91.5%
Family Relations	126	9.3%	39.6%
Any other	52	3.8%	16.4%
Total	1355	100.0%	447.8%

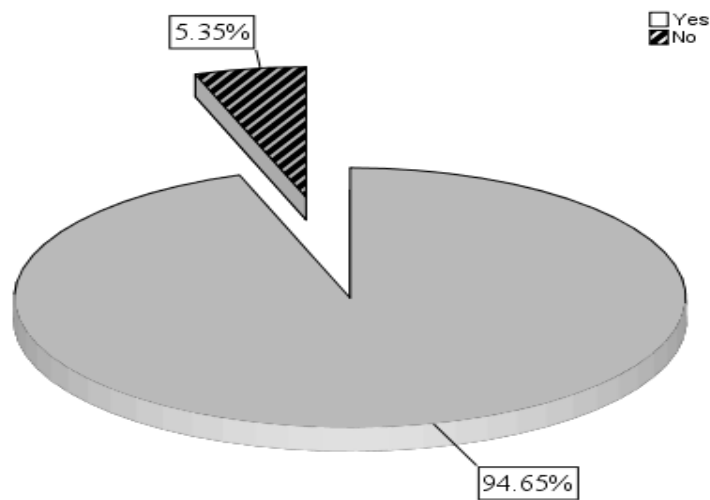
**Source: Field Survey Data, 2021 \* multiple responses**

#### **4.2.2 Koob-Ne-Guliuk Radio Programme Listenership among Respondents**

To establish the influence of the Kob-Ne-Guliuk Radio Programme on livestock farming in the Bawku West District, the study deemed it necessary to investigate the number of farmers that listened to the Kob-Ne-Guliuk Radio Programme.



As depicted in Figure 4.3, 94.65% of the total selected livestock farmers in the district listened to the Koob-Ne-Guliuk Radio programme. Amadu and Amin (2018) believe that radio is still the most popular, accessible, acceptable, and effective medium for agricultural information distribution, and this high listenership rate backs up their argument.



**Figure 4.3 Koob-Ne-Guliuk Radio Programme Listenership among Respondents**

#### **4.2.3 Respondents' Frequency of Listening to Koob-Ne-Guliuk Radio Programme**

Aside from investigating the number of respondents who listened to the Koob-Ne-Guliuk radio programme, the respondents' frequency of listening to the radio programme was also assessed. Table 4.6 presents the frequency with which respondents' listened to the Koob-Ne-Guliuk radio programme. The measurement was done on a Likert scale, with respondents being asked to identify how often they listened to the radio programme.





**Table 4.6 Respondent’s Frequency of listening to Koob-Ne-Guliuk Radio**

**Programme**

	Frequency	Percent %
Very often	199	62.6
Often	72	22.6
Seldom	30	9.4
Not at all	0	0
Total	301	94.7
Missing System	17	5.3
Total	318	100.0

Source: Field Survey Data, 2021

As observed in Table 4.6, the majority (62.6%) of respondents indicated that they listened to the Koob-Ne-Guliuk radio programme very often. 22.6% of respondents also stated that they often listen to radio programmes. Very few (9.4%) of respondents said they rarely listened to the programme. From the findings, 85.2% of frequent listeners to the radio programme show that agricultural radio programmes are effective means of disseminating information within the district, and this has the potency to significantly complement the face-to-face or field-visit extension methods.

However, respondents who did not listen to the radio programme at all were 17, representing 5.3%. The researcher did not probe further to find out how often they listened to radio programmes, stemming from the fact they had already indicated they did not listen to radio programmes.



#### **4.2.4 Respondents' Mode of Participation in the Koob-Ne-Guliuk Radio**

##### **Programme**

According to Hudson et al. (2017), rural farmers increase their knowledge and rate of adopting newer agricultural innovations when participating in agricultural radio programmes. Community members must actively participate in a development-related radio programme for it to be successful (Asuman, 2018).

Koob-Ne-Guliuk Radio Programme had 90.8% of total respondents actively participating in the programme through various channels. The results of the study further revealed that most (84.7%) of the farmers participated in the radio programme by calling in to either inquire about or make a contribution to the programme. Participation in these radio programmes was conducted through different mediums. Interviews, grants, and other forms of indirect participation summed up to 43.1%. The least (1.5% of modes of participation) was joining the discussion team as a panellist. This low percentage can be attributed to the distance from where the radio station is situated, which is the district capital, to the communities in which the farmers reside.

Respondents who did not participate at all were only 14.6%. However, farmers' participation in the radio programme was not frequent. Rashid (2018), in his study, recommends that rural farmers participate regularly in radio discussion programmes. According to his research, rural farmers have a lot of experience with community engagement, which makes them capable of making a strong and positive contribution to matters concerning their growth.



**Table 4.7 Mode of Participation by Respondents**

	Responses		Percent of Cases
	N	Percent	
SMS	21	9.6%	15.3%
Call-In	116	53.2%	84.7%
Panel Member	2	0.9%	1.5%
Others	59	27.1%	43.1%
Not at all	20	9.2%	14.6%
Total	218	100.0%	159.1%

a. Dichotomy group tabulated at value 1.

Source: Field Survey, 2021

#### **4.3 Innovations Communicated through Koob-Ne-Guliuk Radio Programme to Livestock Farmers in the District**

An objective of the study was to ascertain the innovations communicated through the Koob-Ne-Guluik Radio Programme to livestock farmers in the Bawku West District. Qualitative data was obtained from an in-depth interview conducted with the district livestock officer, who happened to be a key informant. The researcher sought to find out the innovations communicated and the possible impacts these innovations would have had on livestock farmers who implemented them properly.

According to the key informant, the inception of the Koob-Ne-Guliuk radio programme began with his predecessor a year before he took over as the district livestock officer. He explained that his predecessor handled quality breeding stock



selection and the importance of cross breeding. He further indicated that he had educated the audience of the Koob-Ne-Guliuk radio programme on feed and feeding, disease control and routine vaccination, housing of animals, recording, marketing, and other general livestock management practises. Quotes from the key informant are used to illustrate the emerging themes. These innovations are discussed extensively in subsections 4.3.1–4.3.6.

#### **4.3.1 Quality Livestock Selection and Breeding**

As initially stated, an interview with the key informant on innovations communicated to livestock farmers revealed that quality livestock breeding was a dominant activity communicated to farmers. The researcher probed further to find out what is meant by quality breeding stock and selection. The key informant in responding to this question stated that selection of breeding stock is essential, and it is prudent for every livestock farmer in the district to be aware of the need to carefully select breeds that can withstand the local weather, cost less to feed, and can reproduce more. He however lamented the unavailability of specialised breeders.

*Unfortunately, the district does not have any reputable breeders who specialise in breeding stock for local farmers to purchase from. However, farmers who can afford to travel to Prong-Tamale Agriculture College can get good and recommended breeds to buy (Key informant, Bawku West District, Ghana, 2021).*

It also came up in the interview that farmers who could not afford to buy certified breeds from Pong-Tamale could buy them from the local market. However, farmers



were often admonished to look out for certain qualities when selecting stock locally. Some of the qualities include bright eyes, good posture, good historical background if available, well-developed teats, the presence of well-developed testes, and strong legs to withstand the weight of the male during mating.

#### **4.3.2 Housing and Accommodation of Livestock**

Another theme that emerged from the interview conducted with the key informant on the innovations communicated through the Koob-Ne-Guliuk programme was the issue of housing, its importance in livestock production, the types of housing, and the criteria for the selection of sites for housing livestock. He explained that an improved housing structure is the one that adequately provides shelter and shade for the protection of livestock against adverse weather conditions like direct solar radiation and wet conditions. According to him, housing not only protects the animals from adverse climate conditions but also protects them from predators and makes it easier for a farmer to handle a large number of animals.

*The traditional housing system was to prevent livestock theft and other related issues, but farmers should note that improved housing technology with a raised, perforated platform separating animals from direct contact with the ground helps to reduce diseases and parasite menace. (Key informant, Bawku West District, Ghana, 2021).*

He advised the audience to build on a well-drained site or on higher ground to prevent flooding, and it should also be close to a permanent source of drinking water, he added.



### 4.3.3 Livestock Feeding Practices

Good feed, according to the key informant, promotes healthy animal growth. The feed should contain protein, carbohydrates, and minerals to enhance growth in the animal. For example, haulms come from groundnuts; fodder comes from ceuceunias; concentrates come from maize; and minerals come from salt. They need clean, cool, drinkable water to perform. He indicated that the audience was taken through:

The various components of feeds are water, minerals, carbohydrates, and vitamins. He added that minerals as a component in feed are very important as they help eliminate deficiency and reduce disease outbreaks. Salt and molasses are the two main sources of minerals for livestock.

*Carbohydrates are a major component of livestock feed, and they are the livestock's energy source. And also encourage farmers to also feed their animals a vitamin-based diet and morning sunlight. Enough vitamins help to reduce diseases and improve productivity and animal welfare (Key informant, Bawku West District, Ghana, 2021).*

During the interviews, it was also revealed that the district had a lot of agriculture. Feed was a serious issue in the district, particularly during the dry season. However, it was revealed that farmers can reduce the impact of the lean season by conserving animal feed.

*Farmers should always make it a point to gather enough agro-by-products for feeding, like rice straw, groundnut halves, soy beans, etc. Farmers can also dry household food waste or make hay and silage (Key informant, Bawku West District, Ghana, 2021).*



#### **4.3.4 Proper Records Keeping**

Another innovation communicated through the Koob-Ne-Guliuk radio programme. According to the key informant, proper record keeping was an activity he was very much passionate about. In his submission, he indicated that record keeping in agriculture is essential and as such extension officers have been tasked to encourage farmers to keep accurate and useful records since it aids in making informed decisions. He however, lamented that it was very difficult to get farmers to adopt record keeping in livestock rearing. He attributed this to the district's preponderance of livestock keepers having low literacy levels. He advised farmers to keep good records to help track farm animals for proper identification, track treatment and also ascertain if the farm is making profits or losses. Elaborating on the benefits of proper records keeping, he intimated.

*Due to the high rate of illiteracy in the district, farmer were only taken through some basic bookkeeping of livestock. They include identification of livestock, herd size, health status of individual animals and sales and expenditure. Topics like breeding and feeding were not considered. (Key informant, Bawku West District, Ghana, 2021).*

#### **4.3.5 Sales and Marketing of Livestock Produce**

Within the livestock industry, there are two business functions: sales and marketing. Both have an impact on revenue generation. All acts that lead to the sale of products and services are referred to as sales. And marketing is the process of attracting customers to the products and services being offered. In interviews with the key



informant, it came to light that farmers were also taken through the importance of marketing and the economic benefits of effectively marketing livestock products. Through the radio programme, farmers were admonished not to just see livestock farming as a process of producing and selling but as a means to economic freedom.

*To me, if farmers in the district want to develop through livestock farming, they should put in place proper structures that will help them promote their products and receive a good price for them. (Key informant, Bawku West District, Ghana, 2021)*

The key informant reemphasized the need to rear proper breeds that are in high demand in the market. He further indicated that farmers in the district were advised during programmes to come together to form cooperative groups, through which they could strengthen their bargaining power.

*So far, we have been successful with the guinea fowl producers, and the pig farmers in the district are now forming a group. Little success has been achieved with the other ruminant producers. (Key informant, Bawku West District, Ghana, 2021)*

#### **4.3.6 Health Practices of Livestock**

A significant issue that was raised during the interview was the recommended health practises farmers should adopt in managing their livestock. The key informant indicated that farmers were often concerned about animals' health. This includes the





signs of healthy and unhealthy animals. There are four main groups of diseases, causes, and prevention of disease in animals.

- Healthy animals should be alert, clean, and have clear eyes with a good appetite and regular rumination. When an animal loses its ability to eat well and drink water and also loses its coordination in movement, it is not healthy.
- A healthy animal should have unbroken teeth and pelleted faeces. Small ruminants like goats and sheep should be active, jump up, and run when approached.
- Frequent scratching was a sign of external parasites on the animal, while frequent sneezing, coughing, and diarrhoea were signs of ill health.

Farmers were educated on the four main groups of livestock diseases. He explained that the first group, which is categorised as external parasites, are parasites that live on the outer skin of animals (the host) and feed on the animal (the host). Examples that are noteworthy to farmers are flies, lice, and ticks. The second group of diseases taught to farmers are the internal parasites. He explained that farmers were to understand that these parasites live on the inner organs of the host animal. Worms, liver flukes, and coccidian are some examples of the internal parasites.

Farmers were further educated on the third and fourth groups of diseases, which he described as infectious and non-infectious diseases, respectively. Anthrax and rabies are some examples of infectious diseases in livestock, whereas gout, arthritis, trauma, and other nutritional deficiencies are examples of non-infectious diseases.



The audience of the Koob-Ne-Guliuk radio programme was also taught how to prevent these diseases that affect their animals. They were told that routine prophylaxis (regular de-worming, vaccination, and spraying) can help prevent diseases in animals, and bathing animals can also help to remove mites, mange, ticks, and other ectoparasites.

*Farmers should rotate grazing grounds as often as possible to prevent diseases, and they were also cautioned that feed that is contaminated with manure should not be given to the animals as feed because that act will predispose the animal to gastro-intestinal worms.*

Farmers were advised to report major animal health issues to a trained veterinary expert for diagnosis and treatment. In concluding, the key informant mentioned the removal of overgrown hooves to enable the animal's easy movement. Removal of overgrown hooves was treated on the radio programme as part of the general livestock management practices. In his submission on general management practises, he said that overgrown hooves can cause lameness when an animal with overgrown hooves walks essentially on the balls of its feet. This could lead to the stretching of their tendons.

Castration in animals was also one of the general management topics treated during radio programmes. According to the key informant, castration in animals is one of the technologies that has to do with the removal or inactivating of the testicles of a male animal. This is mostly done to get rid of undesirable breeds or undesirable genetic characteristics.



He spoke about heat detection in livestock as one of the topics treated. He said that knowing when your animal is in heat is very essential in livestock production. Farmers were taken through the signs to look out for animals in their stock. The importance of early detection of an animal's heat period and the modern equipment that helps detect an animal's heat period

His last topic discussed during the interview was gestational period management practises. He said this is equally essential as feeding and disease-control practises. Farmers were told to be very vigilant during these periods of livestock production.

*If proper care is not given to animals during this period, both mother and unborn child could die. The audience was thoroughly taken through this topic as it is one of the main causes of low productivity in livestock in the district.*

#### **4.4 Respondents' Knowledge gained on Livestock farming through Koob-Ne-Guliuk Radio Programme**

One of the objectives of this study was to ascertain farmers' knowledge on innovative livestock farming gained through Koob-Ne-Guliuk Radio Programme. However, to achieve this objective, the study, first of all took an interest in knowing the respondents' knowledge of agricultural information disseminated through the radio programme.

The study surveyed farmers' general knowledge of livestock management practises and innovations. The results from the study indicated (as shown in Table 4.8) that the rate of respondents who knew each of these livestock management practises and



innovations ranged from as high as 83.0% to 99.4%. This high level of knowledge on livestock management practises and innovations was a good reason why the district was regarded as one of the best in livestock farming. Bakker et al., (2021) opined that farmers' knowledge plays a significant role in ensuring sustainable innovation adoption and a high level of production.

Selection of Breeding Stock, Proper Livestock Housing, Livestock Health Management, Livestock Disease Control, Heat Detection in Livestock Farming, Gestation Period, and Feeding and Nutrition were each mentioned by over 90% of respondents as livestock management practises and innovations they had knowledge on.

Record-keeping and Livestock Marketing were the only two management practises and innovations for which less than 90% of respondents indicated they had knowledge. Respondents were again asked to indicate the period during which they acquired their knowledge on livestock management practises and innovations. The study intended to establish whether knowledge on each management practise was gained before or during the airing of the Koob-Ne-Guliuk Radio programme. As indicated in the table below (Table 4.9), most respondents had pre-existing knowledge of livestock management practises and innovations before the radio programme aired. Out of the 301 respondents who participated in the survey, only 2.5% of respondents were newly introduced to Livestock Selection and breeding, while 97.5% of total respondents had the knowledge before the introduction of the radio programme.



The study also revealed that 99.1% of farmers were already aware of the need to provide proper housing before the initiation of the radio programme. Only 0.9% of the respondents acquired this knowledge through the radio programme. Livestock Health Management, Livestock Disease Control, and Feeding and Nutrition had the same rating of 94.3% of respondents who indicated they knew about these management practises and innovations before the radio programme.

However, over 20% of respondents gained knowledge on Heat Detection in Livestock, Record Keeping, and Marketing of livestock products. The majority of respondents (74.2%) gained knowledge on the marketing of livestock products through the Koob-Ne-Guliuk Radio Programme.

Table 4.10 shows the level of knowledge contribution made by the Koob-Ne-Guliuk Radio programme on livestock management practises and innovations. Farmers were asked to rank on a five-point Likert scale (very high, high, somewhat low, and very low) the level of knowledge gained from the radio programme on the various livestock farming practises and innovations. Generally, respondents perceived a high level of knowledge gained from the radio programme.

Respondents who had listened to the Koob-Ne-Guliuk radio programme were asked to measure the level of knowledge gained from the programme. Out of the 301 respondents who participated in the study, 117 respondents, representing 38.9%, stated that they gained a very high level of knowledge on breeding stock, whereas 97 respondents, representing the second majority (32.2%), rated the knowledge gained from the radio programme on breeding stock as high. However, 65 respondents



representing 21.6%) rated the knowledge acquired through the radio programme as fair, while 22 respondents (7.3%) rated the knowledge acquired as low. The study realised that all respondents gained some level of knowledge on livestock farming through the Koob-Ne-Guliuk Radio Programme.

The majority of the respondents highly rated the level of knowledge gained from the radio programme on breeding stock, the provision of proper livestock housing, livestock health management, livestock disease control, record keeping, and the marketing of livestock products. However, the trend of ratings by the respondents on the level of knowledge contributed by the radio programme decreased on heat detection, gestational period, and feeding and nutrition.

Most of the respondents rated gestation period and heat-detection as the least useful knowledge acquired from the radio programme. 101 respondents rated low on gestational period, and 21% of respondents also rated it very low, whereas 32.5% rated it fairly. Similarly, heat detection was also rated very low by 62 respondents (20.6%), and 58 respondents (19.3%) indicated they had acquired some fair knowledge from the radio programme.



**Table 4.8 General Knowledge on Livestock Management Practices**

	Responses		Percent of Cases
	N	Percent	
Selection of Breeding Stock	301	11.5%	97.8%
Proper Livestock Housing	301	11.6%	99.1%
Livestock Health Management	301	11.5%	98.1%
Livestock Disease Control	301	11.7%	99.4%
Heat Detection in Livestock Farming	301	11.6%	98.4%
Gestation Period in Livestock farming	301	10.7%	90.9%
Feeding and nutrition	301	11.4%	96.9%
Record keeping	301	10.3%	87.7%
livestock Marketing	301	9.8%	83.0%
Total		100.0%	851.3%

Source: Field Survey Data, 2021 \* multiple response



**Table 4.9 Respondents' Source of Knowledge on Livestock Management**

**Practices**

	N	Before	During
Selection of Breeding Stock	301	97.5%	2.5%
Proper Livestock Housing	301	99.1%	0.9%
Livestock Health management	301	94.3%	5.7%
Livestock Disease Control	301	94.3%	5.7%
Heat Detection	301	75.0%	25.0%
Gestation Period	301	82.2%	17.8%
Feeding and Nutrition	301	94.3%	5.7%
Record Keeping	301	56.9%	43.1%
Marketing of livestock Products	301	25.8%	74.2%

Source: Field Survey Data, 2021





**Table 4.10 Respondents' Level of Knowledge Contributed by Koob-Ne-Guliuk Radio Programme on Livestock Management Practices and Innovation**

Livestock Farming Innovations	Level of Knowledge Contribution					Totals
	Very High	High	Somewhat	Low	Very Low	
Selection of Breeding Stock	117(38.9%)	97(32.2%)	65(21.6%)	22(7.3%)	0(0%)	301
Proper Livestock Housing	110(36.5%)	125(41.5%)	10(3.3%)	42(14.0%)	14(4.7%)	301
Livestock Health management	176(58.5%)	125(41.5%)	0(0%)	0(0%)	0(0%)	301
Livestock Disease Control	239(79.4%)	53(17.6%)	9(3.0%)	0(0%)	0(0%)	301
Heat Detection	26(8.6%)	97(32.2%)	58(19.3%)	62(20.6%)	58(19.3%)	301
Gestation Period	1(0.3%)	80(26.6%)	98(32.5%)	101(33.6%)	21(7.0%)	301
Feeding and Nutrition	0(0%)	121(40.2%)	36(12.0%)	54(17.9%)	90(29.9%)	301
Record Keeping	239(79.4%)	52(17.3%)	6(2.0%)	4(1.3%)	0(0%)	301
Marketing of livestock Products	15(5.0%)	184(61.2%)	24(8.1%)	73(24%)	5(1.7%)	301

Source: Field Survey Data, 2021

#### 4.5 Respondents Current Livestock Farming Practices, Level of Innovations

##### Adoption and the Level of Influence by Koob-Ne-Guliuk Radio programme.

As part of its objectives, this study sought "to ascertain the extent to which farmers' livestock practices are influenced by information from the Koob-Ne-Guliuk Radio Programme on livestock farming. This section presents findings on the current farming practices of farmers, their level of innovation adoption, and their level of influence by the Koob-Ne-Guliuk Radio Programme.



#### **4.5.1 Respondents Current Livestock Management Practices**

Respondents were asked to indicate their current livestock management practices, and the results are shown in Table 4.11. From Table 4.11, it may be observed that all 301 respondents indicated that they practice Breeding Stock selection and Livestock Disease Controlling. Proper Housing and Livestock Health Management practices had great percentages of 97.7% and 84.1%, respectively. Also, respondents who indicated that they took particular interest in the heat periods of their livestock and that they had sufficient knowledge about the marketing of their livestock were a little above 50%. However, respondents who indicated that they keep records of their livestock were as low as 8.3%, while respondents who monitored and took the needed steps to ensure safe delivery were 39.9%.



**Table 4.11 Respondents Current Livestock Management Practices**

	Responses		Percent of Cases
	N	Percent	
Breeding Stock	301	17.8%	100.0%
Proper Housing	301	17.4%	97.7%
Health management	301	14.9%	84.1%
Livestock Disease Control	301	17.8%	100.0%
Heat Detection	301	9.1%	51.2%
Gestation Period	301	7.1%	39.9%
Feeding and Nutrition	301	5.5%	30.9%
Record Keeping	301	1.5%	8.3%
Marketing of livestock	301	9.0%	50.8%
Total	2709	100.0%	562.8%

#### **4.5.2 Respondents' Current Level of Adoption of Livestock Management**

##### **Practices and Innovations.**

Respondents were also asked to rate their current level of innovation adoption from one (1) to five (5), where "1" is very low, "2" is low, "3" is somewhat high, "4" is high, and "5" is very high. The mean was very significant in interpreting the five-point Likert scale data below.



As indicated in Table 4.12, none of the livestock farming innovations communicated through the radio programme scored a very high adoption rate as none of the mean scores fell between 4.21 to 5.

All the 301 farmers who listened to the radio programme practiced the selection of breeding stock and livestock disease control. However, proper livestock breeding was moderately practiced (mean of 3.17), whereas respondents highly adopted livestock disease control practices with a mean value of 3.58. Of the 301 farmers who listened to the radio programme adopted proper livestock housing practices. The level of adoption, however, was low, with a mean score of 1.98.

Table 4.12 also shows that livestock health management practices were moderately adopted among the 253 farmers that practiced them. Monitoring, detecting, and making good use of the animal's heat period was moderately practiced by respondents, with a mean score of 2.82 among the 153 farmers who practiced it.

Proper marketing of livestock produce, gestation period's rituals, and feeding and nutrition innovations were moderately adopted by respondents with mean scores of 2.67, 3.06, and 3.32, respectively. The study finally realized that record keeping was highly practiced and adopted by the very few respondents.



**Table 4.12 Descriptive Statistics on Current Level of Adoption**

	N	Minimum	Maximum	Mean	Std. Deviation
Selection of Breeding Stock	301	1	5	3.17	1.166
Proper Livestock Housing	301	1	5	1.98	1.159
Livestock Health management	301	1	5	2.67	0.890
Livestock Disease Control	301	1	5	3.58	0.904
Heat Detection	301	1	4	2.82	1.046
Gestation Period	301	1	5	3.06	1.239
Feeding and Nutrition	301	1	5	3.32	1.144
Record Keeping	301	1	5	3.44	0.917
Marketing of livestock Products	301	1	4	2.67	0.707
Valid N (listwise)	25				

*Note:* A mean of 1 to 1.8 = very low, 1.81 to 2.60= low, 2.61 to 3.40=moderate, 3.41 to 4.20 = high and 4.21 to 5= very high.

#### **4.5.3 Koob-Ne-Guliuk Radio Programme's Level of Influence on the Adoption of Innovations in Livestock Farming**

Table 4.13 presents data collected from respondents on their perceived level of influence of the Koob-Ne-Guliuk Radio Programme on their livestock farming innovation adoption. Respondents indicated that the radio programme had a very high influence on their decision to adopt livestock record keeping. The livestock record keeping practice had a mean score of 4.5, which meant that the few farmers (25 respondents) that practiced this act perceived the Koob-Ne-Guliuk Radio Programme as the main contributory factor.



The study also revealed that livestock disease control, detecting an animal's heat period, feeding and nutrition, and marketing livestock products were highly influenced by the radio programme with a mean score of 3.52, 3.50, 3.49, and 3.74, respectively.

Selecting a good breeding stock, providing proper housing, livestock health management and gestation period's rituals were moderately influenced by the radio programme. It was also detected that the radio programme had a moderate influence on respondents' adoption of breed selection, with a mean score of 3.26, but with an influence on a larger group of people (301 respondents) similar to the radio programme's influence on livestock disease control.



**Table 4.13 Descriptive Statistics on the Perceived Influence of Radio Programme on Level of Adoption.**

	N	Minimum	Maximum	Mean	Std. Deviation
Selection of Breeding Stock	301	1	5	3.26	1.022
Proper Livestock Housing	301	1	5	2.71	1.537
Livestock Health management	301	1	5	3.24	1.031
Livestock Disease Control	301	1	5	3.52	1.380
Heat Detection	301	1	5	3.50	1.159
Gestation Period	301	1	5	3.30	1.376
Feeding and Nutrition	301	1	5	3.49	1.340
Record Keeping	301	2	5	4.5	1.115
Marketing of livestock Products	301	1	5	3.74	1.337
Valid N (listwise)	25				

**Note:** A mean of 1 to 1.8 = very low, 1.81 to 2.60= low, 2.61 to 3.40=moderate, 3.41 to 4.20 = high and 4.21 to 5= very high.



#### **4.5.4 Pearson Correlation on Koob-Ne-Guliuk Radio Programme and the adoption of livestock farming innovations.**

Table 4.14 below shows the correlation between the radio programme and the adoption of the various levels of adopted livestock farming innovations by respondents.

From Table 4.14, it was revealed that the Koob-Ne-Guliuk Radio Programme and Record Keeping Practices in livestock farming were positive and significantly different than zero ( $r = .527, p < .012$ ). whereas, Koob-Ne-Guliuk Radio Programme and the remaining livestock farming practices (Breeding stock, Proper livestock housing, Livestock health management, Disease control, Heat detection, Gestation Period, Feeding and nutrition and Marketing of livestock Products) were not significantly correlated, but were positively correlated. That showed that an increase in livestock farming innovations dissemination through Koob-Ne-Guliuk Radio Programme would lead to a moderate increase in the rate of adoption of livestock farming innovations.





**Table 4.14: Correlation among Variables**

	Breeding Stock	Proper Livestock Housing	Health management	Disease Control	Heat Detection	Gestation Period	Feeding and Nutrition	Record Keeping	Marketing of livestock Products
Pearson Correlation	0.077	0.086	0.080	0.077	0.049	0.061	0.029	0.527*	0.098
Radio Programme Sig.(2-tailed)	0.193	0.155	0.222	0.194	0.574	0.543	0.805	0.012	0.257
N	301 284	278	236	284	136	103	76	22	136

Note: \*P<.05; \*\*P<.01



#### **4.6 Constraints Associated with Disseminating Livestock Farming Information under Koob-Ne-Guliuk Radio Programme.**

This portion of the study establishes the challenges faced by stakeholders in disseminating livestock information to farmers under the Koob-Ne-Guliuk Radio Programme. The district livestock officer and the Dastech Radio programme manager provided qualitative data on the challenges associated with disseminating livestock farming innovations to farmers.

The programs manager of Dastech Radio disclosed during the in-depth interview that the radio station was a key ally in the quest to promote livestock farming in the district. He, however, complained of numerous challenges that impeded the station's efforts. According to the program's manager, the station is not able to raise funds to run the program successfully.

*I have personally written several letters for sponsorship for this program, but no organisation has shown interest. The main source of income for the radio station is proceeds from funeral announcements and other advertisements. Not only is this source of funds inadequate, it fundamentally shifts the station's attention from its key social obligations (Source: In-depth Interview, September, 2021).*



The program's manager further lamented that it is sometimes difficult to get a resource person for the program. He had this to say:

*I sometimes believe that because of our inability to get money for the resource people to buy fuel, they are not frequent participants in the program, and this boils down to getting funds to run the program (Source: In-depth Interview, September, 2021).*

He also disclosed that the radio station lacked the necessary logistics to run the Koob-Ne-Guliuk Radio Program effectively. The station has no means of transport, so staff would have to use their own means of transport for official activities, and also, staff of the station use their mobile phones for recording. The programme's manager at Dastech Radio had this to say:

*Because of the nature of our phones, it is difficult to obtain quality recordings for the program. I know that some smartphones can record high-quality sounds, but not our types of phones. Again, the station does not have a powerful computer that can run modern software used in editing and other related works, "he added (Source: In-depth Interview, September, 2021).*

The district livestock officer had this to say:



*Making time to always attend the radio program is very difficult, especially during the rainy season when I have to visit farmers frequently* (Source: In-depth Interview, September, 2021).

#### **4.7 Farmers' Constraints Associated with Accessing and Utilizing Livestock Farming Innovations under Koob-Ne-Guliuk Radio Programme**

Under this last objective, a list of challenges associated with livestock farming was presented to the respondents, who were asked to rank them from 1 to 5, where 1 is "strongly agree and 5 is strongly disagree," in descending order.

A list of twenty-four (24) challenges associated with livestock farming was presented to the respondents to rank them, and after the data was collected and analyzed, the study realized that out of the twenty-six challenges presented to the respondents, scarcity of livestock feed was ranked as the most pressing challenge that negatively affects their proper livestock farming innovation adoption, with 309 respondents out of 318 respondents rating it as the most severe constraint with a mean rank of 5.42 (see Table 4.15). This goes to confirm the Konlan et al. (2015) study, which stated that the unavailability of livestock feed is a major challenge in livestock production, most especially in the northern part of Ghana. It was also affirmed by the key informant from the MoFA office during the in-depth interview. The district's livestock officer lamented the scarcity of livestock feed in the district.

*Due to the unavailability of feed, most farmers in the district practice an extensive system of keeping livestock. Natural pasture, crop residue, agro by-products, browse plants, and household waste are the sources of feed farmers rely on, which are*



*mostly scarce during the dry season. Wide use of farmlands also makes fodder scarce during the rainy season. Also, fodder becomes a challenge during the rainy season due to the wide use of the area as farmland. (Key informant, Bawku West District, Ghana, 2021)*

With a mean score of 5.51, 295 respondents who strongly agreed identified theft as the second most severe impediment to the adoption of livestock agricultural innovation. The district's livestock officer again lamented on the rampant livestock theft cases recorded in the district. He said:

*For the past four to five years now, there have been a series of livestock theft cases in the district, though livestock theft is not a new phenomenon. However, the recent cases are worrying. These escalating livestock theft syndicate activities are compelling farmers to sell their livestock completely, irrespective of its market demand level.*

This conclusion is consistent with recent and previous articles by many news organizations and polls. On March 29, 2021, Modern Ghana News announced the arrest of the leader of a major cattle-stealing ring. According to the article, the Akumadan Police have decried the increasing number of livestock thefts that have plagued the Akumadan people over the years (Modern Ghana New, 2021).

3news.com also reported on the arrest of two men in the Savanah Region of Ghana for stealing 300 cattle from Kete-Krachi in the Oti Region on the 27th of January, 2020 (YEN news, 2020). These are two of so many cases reported to the police. According to the United Nations Office on Drugs and Crime (UNODC) (2010), a victimization



survey in Ghana by GSS revealed that livestock thefts scored 65% of all the domestic crimes in Ghana in 2010.

The remaining top ten rankings were unfavourable market prices with a mean rank of 5.67 as the 3<sup>rd</sup> most severe constraint, inadequate housing to isolate sick animals was also ranked 4<sup>th</sup> with a mean rank of 6.7, whereas unfavourable weather conditions to keep good breeds scored the 5<sup>th</sup> most severe constraint with a mean rank of 7.42. Poor government commitment also scored the 6<sup>th</sup> position; the 7<sup>th</sup> severe constraint was the expensive cost of buying and keeping good breeds; the high cost of vaccines; and inadequate access to veterinary service delivery was ranked 8<sup>th</sup>. Also, the high cost of acquiring farming equipment was ranked 9<sup>th</sup>, and the 10<sup>th</sup> most severe constraint to adopting livestock farming innovations was poor roads and inadequate means of transport.

The least constraint identified by respondents was unfamiliar language in broadcasting, with a mean rank of 24.45, followed by lack of interest in the radio programme. It was observed that challenges that were directly associated with the dissemination process through the Koob-Ne-Guliuk Radio Programme were least ranked as constraints in adopting livestock farming innovations. The unfavorable timing of presenting the Koob-Ne-Guliuk Radio Programme was ranked high among all the challenges associated with only the dissemination process, with a mean rank of 14.7. Kendall's coefficient of concordance (W) was used to test the level of agreement among the ranked challenges with regards to livestock farming innovations and adoption



**Table 4.15 Descriptive Statistics**

	N	Mean	Std. Deviation	Mini	Max
Unfamiliar Expensive Innovation	318	3.49	1.364	1	5
Inability to ask questions	318	3.77	1.056	1	5
Lack of interest	318	4.56	.803	1	5
Unfamiliar Language	318	4.70	.716	2	5
Poor reception of radio signals	318	3.87	.902	1	5
Unfavourable time of presentation	318	2.56	1.385	1	5
Short duration of programme	318	4.08	.747	2	5
Non availability of good breeds	318	2.22	1.116	1	5
Expensive cost of buying and keeping good breed	318	1.56	.815	1	5
Unfavorable weather condition to keep good breed	318	1.47	.816	1	5
High cost of acquiring a farming equipment	318	1.88	1.199	1	5
Suitable equipment for livestock farming is unavailable	318	2.69	1.191	1	5
complicated livestock farming equipment	318	3.07	.889	1	5
Unfavorable conditions for equipment usage	318	2.70	.834	1	5
High cost of vaccines and inadequate access to veterinary service	318	1.60	.927	1	5
Inadequate housing to isolate sick animals	318	1.36	.740	1	5
Bush fires	318	2.86	1.302	1	5
theft	318	1.07	.259	1	2
Feed Scarcity	318	1.03	.166	1	2
High taxes	318	2.33	1.555	1	5
Poor of government commitment	318	1.47	.634	1	3
Illiteracy	318	3.04	1.281	1	5
Poor roads and inadequate means of transport	318	1.98	1.253	1	5
Unfavourable market prices	318	1.12	.373	1	3

*Source: Field Survey*



**Table 4.16 Kendall's W Test**

	<i>Ranks</i>	
	Mean Rank	Position
Unfamiliar Expensive Innovation	20.16	19 <sup>th</sup>
Inability to ask questions	21.46	21 <sup>st</sup>
Lack of interest	24	23 <sup>th</sup>
Unfamiliar Language	24.45	24 <sup>th</sup>
Poor reception of radio signals	21.45	20 <sup>th</sup>
Unfavourable time of presentation	14.7	13 <sup>th</sup>
Short duration of programme	22.78	22 <sup>nd</sup>
Non availability of good breeds	12.24	11 <sup>th</sup>
Expensive cost of buying and keeping good breed	7.99	7 <sup>th</sup>
Unfavorable weather condition to keep good breed	7.42	5 <sup>th</sup>
High cost of acquiring a farming equipment	9.72	9 <sup>th</sup>
Suitable equipment for livestock farming is unavailable	15.33	14 <sup>th</sup>
Complicated livestock farming equipment	18	18 <sup>th</sup>
Unfavorable conditions for equipment usage	16.45	15 <sup>th</sup>
High cost of vaccines and inadequate access to veterinary service delivery	8.12	8 <sup>th</sup>
Inadequate housing to isolate sick animals	6.7	4 <sup>th</sup>
Bush fires	16.6	16 <sup>th</sup>
Theft	5.51	2 <sup>nd</sup>
Feed Scarcity	5.42	1 <sup>st</sup>
High taxes on farm inputs	12.63	12 <sup>th</sup>
Poor government commitment toward the livestock sub-sector	7.5	6 <sup>th</sup>
Illiteracy	17.87	17 <sup>th</sup>
Poor roads and inadequate means of transport	10.35	10 <sup>th</sup>
Unfavourable market prices	5.67	3 <sup>rd</sup>

*Source: Field Survey*





**Table 4.17 Test Statistics**

N	318
Kendall's W <sup>a</sup>	.813
Chi-Square	6466.893
Df	25
Asymp. Sig.	.000

a. Kendall's Coefficient of Concordance

**Table 4.18 Ranks of Constraints**

Constraints	Rank of Constraints											
	1		2		3		4		5		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Expensive cost of buying and keeping good breed	181	56.9	118	37.1	3	9	11	3.5	5	1.6	318	100
Unfavorable weather condition	207	65.1	96	30.2	0	0	8	2.5	7	2.2	318	100
High cost of acquiring farming equipment	169	53.1	81	25.5	22	6.9	29	9.1	17	5.3	318	100
High cost of vaccines and inadequate access to veterinary service delivery	189	59.4	97	30.5	11	3.5	13	4.1	8	2.5	318	100
Inadequate housing to isolate sick animals	234	73.6	67	21.1	5	1.6	9	2.8	3	0.9	318	100
theft	309	97.8	23	7.2	0	0	0	0	0	0	318	100
Feed Scarcity	309	97.2	9	2.8	0	0	0	0	0	0	318	100
Poor government commitment	191	60.1	103	32.4	24	7.5	0	0	0	0	318	100
Poor roads and inadequate means of transport	159	50	82	25.8	18	5.7	42	13.2	17	5.3	318	100
Unfavourable market prices	284	89.3	29	9.1	5	1.6	0	0	0	0	318	100



## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

The primary findings based on the study objectives are summarized in this chapter. The study's conclusions and recommendations to fix the program's inadequacies are also covered in this chapter. Following that, a discussion of the study's contribution to knowledge is held, with rich insights and particular implications for research, policy, and practice being drawn. There have also been suggested areas for further research, which is crucial not only for livestock farmers but also for district livestock officers and Dastech Radio station managers.

#### 5.2 Summary of Major Findings

The following is a summary of some of the study's significant findings, as seen solely through the eyes of the respondents:

The study found that the majority of livestock farmers were within the age brackets of 46–60 years, while the least age range of respondents (7.9%) fell below the age of 25 years, reinforcing the view that very few youth go into agriculture, especially livestock rearing, because of their desire to work in the government sectors. This was further buttressed by the educational status of respondents, where it came to light that the majority (45%) of respondents had no formal education. The survey revealed that 72.2% of livestock farmers in the district were fully engaged in farming as their main occupation, which also served as their main source of income. The district had large household sizes, with an average of ten (10) persons per household. Chicken was the



most reared livestock in the district, with a total of 5,811 chickens and an average of 18.27 per farmer. The study also took an interest in knowing the farmers' years of experience, and it was revealed that farmers in cattle rearing had a higher average rearing experience of 20.42 years.

The first objective of this study was to ascertain the listenership of the Koob-Ne-Guliuk. From the analysis, it was realized that, despite the diverse sources of information available to livestock farmers, the majority of 309 (95%) respondents relied on their colleague farmers for information, possibly because they were more readily accessible or because they considered them to be much more trusted sources of information. However, it could also be attributed to the low awareness of the existence of agricultural extension agencies that exist to cater to their information needs. Considering the distance of the radio station, farmers could not participate as panelists on the show.

The study also set out to find out the kinds of innovations communicated through the Koob-Ne-Guliuk radio programme organized by Dastech radio station for livestock farmers in the Bawku West District. Interviews with a key informant revealed that through collaborations, a number of innovations were communicated through the Koob-Ne-Guliuk programme organized by the Dastech radio station. Some of the innovations communicated through the radio programme on livestock farming include livestock breeding and selection, housing and accommodation of livestock, livestock feeding practices, proper record keeping, sales and marketing of livestock produce, health practices for livestock, and other general livestock management practices.



One of the study objectives sought to corroborate the responses of key informants on the kind of innovative information communicated by the Koob-Ne-Guliuk programme organized by the Dastech radio station from the perspective of livestock farmers in the Bawku West district. The study therefore sought to ascertain the knowledge gained by livestock farmers through the Koob-Ne-Guliuk Radio Programme. Findings on farmers knowledge of agricultural information disseminated in relation to livestock management practices and innovation suggest that their knowledge ranged from as high as 83.0% to 99.4%, making the district to be regarded as one of the best in terms of livestock farming. It further emerged that from these farm management practices that were mentioned by farmers, Selection of Breeding Stock, Proper Livestock Housing, Livestock Health Management, Livestock Disease Control, Heat Detection in livestock farming, Gestation Period and Feeding and Nutrition were the most dominant recurring themes in about 90% of responses by respondents.

A probe was further conducted to establish whether the knowledge on each management practice was gained before or during the airing of the Koob-Ne-Guliuk Radio programme. It came to light that a significant number of respondents had preexisting knowledge of livestock farming innovations before listening to the radio program. However, a good number of respondents indicated that knowledge of these innovations was newly introduced to them through the radio program. The study further revealed that the majority of respondents (74.2%) had newly gained knowledge on the marketing of livestock products. This high level of preexisting knowledge on livestock farming innovations can be attributed to the existing agricultural information channels. Results on respondents' level of knowledge on livestock farming



innovations contributed by the Koob-Ne-Guliuk Radio Programme were found to be highly significant. Majority of the respondents rated the level of knowledge gained from the radio programme on breeding stock, provision of proper livestock housing, livestock health management, livestock disease control, record keeping, and marketing of livestock products as high. However, the trend of ratings by the respondents on the level of knowledge contributed by the radio programme decreased on heat-detection, gestational period, and feeding and nutrition.

There was a significant number of respondents who practiced selection of breeding stock, proper housing, livestock health management, and livestock disease control. Heat detection periods and marketing of livestock were averagely practiced, whereas gestation period rituals, record keeping, and feeding and nutrition were poorly practiced among respondents. However, it was realized in the study that the level of adoption of these innovations was fairly above average. Record keeping and livestock disease control were the only innovations that were highly adopted among respondents. Respondents indicated that the radio programme had a very high influence on their decision to adopt livestock record keeping, livestock disease control, detecting animals' heat periods, feeding and nutrition, and marketing livestock products. However, it was revealed that selecting a good breeding stock, providing proper housing, livestock health management, and the gestation period's rituals were moderately influenced by the radio programme. Koob-Ne-Guliuk Radio Programme and Record Keeping Practices in Livestock Farming were positive and significantly different than zero ( $r = .527$ ,  $p < .012$ ). whereas, Koob-Ne-Guliuk Radio Programme and the remaining livestock farming practices (Breeding stock, Proper livestock



housing, livestock health management, disease control, heat detection, Gestation Period, Feeding and nutrition and Marketing of livestock products) were not significantly correlated, but were positively correlated. That shows that an increase in livestock farming innovation dissemination through the Koob-Ne-Guliuk Radio Programme would lead to a moderate increase in the rate of adoption of livestock farming innovations.

In this study, challenges faced by stakeholders in disseminating livestock information under the Koob-Ne-Guliuk Radio Programme were established through interviews with key informants. The programmes manager of Dastech Radio outlined the following as the major challenges: inadequate equipment available, unreliable access to resource persons for the programme, high operating costs, and the inability to secure funds to run the programme.

A myriad of challenges were identified as affecting the effectiveness of the Koob-Ne-Guliuk programme. From the list of factors that were presented to farmers to choose from, each farmer mentioned at least one of each of the factors. However, in terms of ranking, the majority of farmers believed that the three biggest challenges were feed scarcity, theft, and unfavorable market prices for livestock. As may have already been observed, livestock marketing was one of only two management practices and innovations for which less than 90% of respondents indicated they had knowledge. It therefore did not come as a surprise to the researcher that unfavorable market prices were identified as a huge impediment to the Koob-Ne-Guliuk programme accomplishing its mission.



### 5.3 Conclusion

Based on the summary of the study's findings, the following conclusions are made:

Demographic variables of farmers were found to greatly influence the adoption of livestock farming in the district. The educational background of farmers was found to influence the kind of information consumed by livestock farmers in the district. Age was also found to influence the number of youth involved in livestock farming in the district.

The study could not establish a causal relation between farmers' occupation and their level of adoption of livestock farming innovations. However, household size of livestock farmers, source of income, livestock farm size, and rearing experience have an influence on the level of innovation adoption in livestock farming.

The listenership of the Koob-Ne-Guliuk Radio Programme among farmers in the district was found to be high, but participation in the radio programme was basically through phone calls, which in the view of the researcher is not participatory enough.

Farmers' level of knowledge on livestock farming innovations contributed by the Koob-Ne-Guliuk Radio Programme was found to be highly significant. Majority of the respondents rated the level of knowledge gained from the radio programme on breeding stock, provision of proper livestock housing, livestock health management, livestock disease control, record keeping, and marketing of livestock products as high.



However, the trend of ratings by the respondents on the level of knowledge contributed by the radio programme decreased on heat-detection, gestational period, and feeding and nutrition.

There was a significant relationship between the Koob-Ne-Guliuk Radio Programme and the adoption of livestock Record Keeping. However, there was no significant relationship between the radio programme and the adoption of the remaining livestock farming practices (Breeding stock, Proper livestock housing, Livestock health management, Disease control, Heat detection, Gestation Period, Feeding and nutrition and Marketing of livestock Products). This means that an increase in livestock farming innovations dissemination through Koob-Ne-Guliuk Radio Programme would lead to some increase in the rate of adoption of livestock farming innovations on Breeding stock, Proper livestock housing, Livestock health management, Disease control, Heat detection, Gestation Period, Feeding and nutrition and Marketing of livestock products. This increase is not very significant, but there is a significant increase in adoption of livestock Record Keeping.

Inadequate equipment available, unreliable access to resource persons for the programme, high operating costs, and the inability to secure funds to run the programme were the major challenges identified by the key informants as stakeholders in disseminating livestock information under the Koob-Ne-Guliuk Radio Programme.

Also, farmers were presented with twenty-four key issues that negatively affected the uptake of livestock farming innovations disseminated through the Koob-Ne-Guliuk Radio Programme. Feed scarcity, theft, and unfavorable market prices for livestock





were found to be the main constraints that affect the uptake of livestock farming innovations disseminated through the Koob-Ne-Guliuk Radio Programme.

#### **5.4 Recommendations**

Based on the findings from the study, the researcher wishes to make the following recommendations:

1. The demographic details of livestock farmers revealed low patronage of young persons and women in the livestock rearing business in the district. The study recommends that major stakeholders like the government and non-governmental organizations offer stimulus packages to women and young people who are interested in going into livestock farming. The government and the Ministry of Food and Agriculture should restructure the implementation of the Rearing for Food and Jobs flagship programme and other related programmes to give priority to young persons and women to increase their level of patronage in livestock farming.
2. NGO's, the government, and other civil society organizations could actively support the radio programme to help ensure that the program is effective and the radio station can solely focus on addressing the social problems in their communities of broadcast so as to contribute to food security, farmers' sustainable livelihoods, and improved livestock productivity.
3. Also, beyond the radio discussion, managers of the radio station and district agriculture officers should encourage the creation of more radio listenership clubs among livestock farmers in the district. Such an initiative should be replicated in all neighboring communities within the district, at least with



supportive policies and measures to increase the growth in agriculture, especially within the livestock sector. Practical demonstrations could be done once in a while to physically demonstrate some of these technologies to farmers.

4. In addition, if the government's Rearing for Food and Jobs aim is to be realized, resolving the political will and political capability constraints for scaling-up finance is critical to the Koob-Ne-Guliuk program's sustainability. As a result, the study recommends that the Ghanaian government examine community radio programs as a means of modernizing agriculture by allocating enough money to such programs.
5. Policy makers need to address potential risks in the Ghanaian livestock market by strengthening relevant institutions. For instance, the government of Ghana, through the district assemblies, should adequately equip the Ghana Police Service and other security agencies to help eradicate livestock theft. Livestock farmers should be taught to brand their stock for easy identification.
6. The study recommends that the district agriculture extension officers collaborate and partner with knowledgeable livestock farmers in the district. By so doing, MoFA could liaise with farmers and identify livestock farmers who could ultimately be trained as lead livestock farmers, whose sole responsibility would be to serve as the first source of information to their colleagues in the communities. Such persons could be invited to join the Koob-Ne-Guliuk programme as resource persons, where they could share their experiences with their colleagues. In so doing, information from non-



authoritative sources on innovative livestock rearing could be streamlined based on the experiences of lead livestock farmers and existing knowledge from district agriculture officers.

7. The radio stations could also organize agricultural field days accompanied by experts in the field of agriculture to demonstrate practically what they broadcast on radio that could be more complex to farmers. This approach could be more participatory, thereby making a huge impact aside from the radio broadcast shows.
8. The Koob-Ne-Guliuk programme focus should be placed on educating and sensitizing livestock farmers about the vast untapped information at their disposal, which could go a long way toward improving the business aspect of livestock farming. Records keeping, sales, and marketing are essentially modern-day techniques in farming and permeate every stage of the agriculture value chain. As such, livestock farmers need to be taught how to keep records, market, and sell the livestock they produce.
9. Aside from the radio debate, radio station managers and district agriculture administrators should urge livestock producers in the district to form radio listenership clubs. Farmers might be shown some of these technologies through practical demonstrations every now and then. However, in order to attract farmers, these contents must be well packaged. In doing so, the report recommends the development of content committees comprised of dealers of main cash and food crops from the district's major catchment areas, as well as



experts in animal husbandry and other important stakeholders such as input dealers and suppliers.

The expectation is that an effective implementation of the comprehensive and coherent recommendations proffered will lead to a rapid increase in the growth and development of the livestock sub-sector within the Bawku West district and the country as a whole.

### **5.5. Areas for Further Study**

The study was limited to just one district in the Upper East Region, thereby making it difficult to generalize to radio stations running similar programs in other districts within the region and in Ghana. The study suggests a wider study by including more districts from the Upper East Region that run similar innovative radio programs for livestock farmers.



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**APPENDICES**

**Appendix 1: Questionnaire For Livestock Farmers**

**QUESTIONNAIRE**

**UNIVERSITY FOR DEVELOPMENT STUDIES**

**FACULTY OF AGRICULTURE, FOOD AND CONSUMER SCIENCES**

**DEPARTMENT OF AGRICULTURAL INNOVATION COMMUNICATION**

**TOPIC**

“THE INFLUENCE OF KOOB-NE-GULIUK RADIO PROGRAMME ON  
LIVESTOCK FARMING IN THE BAWKU WEST DISTRICT OF GHANA”

Name of Enumerator.....Tel.....
Community..... Agriculture Zone.....

The information is strictly confidential and will be used by the researcher in drawing conclusions on how radio programmes influence livestock farming which may assist in the design of the intervention programmes geared toward effective dissemination methods on innovational practices in livestock farming. The information will also assist to identify the challenges associated with adoption of livestock farming innovations in the study area.

THANK YOU

NOTE:

- If a question is not applicable please indicate with N/A.
- Multiple choice questions should be answered by circling the answer.



**Section 1: Personal Information**

1. Sex of respondent (Record without asking)
  - a. Male
  - b. Female
2. What is your age range?
  - a. less than 25
  - b. 25 – 35
  - c. 36 – 45
  - d. 46 – 60
  - e. above 60
3. Level of education.
  - a. No formal education
  - b. Basic level
  - c. Middle School/JHS
  - d. Senior high level
  - e. Tertiary
  - f. Other (Specify).....
4. Marital Status:
  - a. Married
  - b. Single
  - c. Widow
  - d. Divorced
5. What is/are your main occupation(s)?
  - a. Salary worker
  - b. Farmer
  - c. Trader
  - d. Artisan
  - e. Other (specify)..... NB: Multiple choices possible
7. Secondary occupation(s).
  - a. Salary worker
  - b. Farmer
  - c. Trader
  - d. Artisan
  - e. Non above NB: Multiple choices possible
8. Household size .....
9. What is your main source of your income?
  - a. Salary work
  - b. farming
  - c. Trading
  - d. Artisanry
  - e. Other (specify).....
10. Please select the type(s) of livestock you rear and indicate the current number and years of experience of rearing the corresponding stock.



S/n	Type of livestock	Stock (current number)	Experience of rearing type of livestock (Number of years)
-----	-------------------	---------------------------	--

1	Cattle		
---	--------	--	--

2	Sheep		
---	-------	--	--

3	Goat		
---	------	--	--

4	Pig		
---	-----	--	--

5	Chicken		
---	---------	--	--

6	Guinea Fowl		
---	-------------	--	--

7	Ducks		
---	-------	--	--

8	Turkey		
---	--------	--	--

9	Ostrich		
---	---------	--	--

10	Grass-Cutter		
----	--------------	--	--

11	Snail		
----	-------	--	--

12	Rabbit		
----	--------	--	--

13	Guinea Pig		
----	------------	--	--

14	Others (specify)		
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**Totals**





**Section2: Listenership to Koob-Ne-Guliuk Radio Programme**

11. What are your major sources of agricultural information? a. Radio b. colleague farmers c. Co-operative Society d. Farmers’ Forum e. Agriculture farming f. Extension agent g. Friends h. Family Relations i. Any other, Please specify..... NB: Multiple choices possible
12. Do you listen to Koob-Ne-Guliuk Radio Programme? a. yes b. No
13. How often do you listen to Koob-Ne-Guliuk Radio Programme? a. Very Frequently b. Frequently c.Seldom d. don’t listen
14. How do you participate in the programme? a. SMS b. Call- in c. Panel member d. Others..... e. Not at all

**Section 3: To examine the knowledge gained on livestock farming through Koob -Ne- Guliuk Radio Programme**

16. Which of these following livestock management practices do you know? Please tick “Yes” or “No”
17. Indicate whether you knew the under listed practices “Before” or “During” Koob-Ne-Guluik Radio Programme.
18. To what extent has Koob-Ne-Guliuk Radio programme contributed to your knowledge on the underlisted management practices?
- Where: 5 is Very High, 4 is High, 3 is Somewhat, 2 is Low and 1 is Very low. Please tick [√] the appropriate ratings in the table below using the above information



Management practices	Question 16		Question 17		Question 18				
	Yes	No	Before	During	Very High	High	Somewhat	Low	Very Low

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Selection of									
Breeding Stock									
Proper Livestock									
Housing									
Livestock Health									
Management									
Livestock Disease									
Control									
Heat Detection in									
Livestock Farming									
Gestation Perion in									
Livestock farming									
Feeding and									
Nutrition in									
Livestock Farming									
Record Keeping in									
Livestock farming									
Marketing of									
Livestock Products									



**Section 4: to ascertain the extent to which farmer’s livestock practices are influenced by information from the Koob-Ne-Guliuk Radio Programme**

19. Which of the following livestock management practices are you practicing? Please indicate your answers by ticking “Yes” or “No” (If no, skip to Section 5 of the questionnaire)

20. To what extent can you rate your current level of adoption on recommended livestock management practices and innovations?

Where: 5 is Very High, 4 is High, 3 is Somewhat, 2 is Low and 1 is Very low. Please tick [√] the appropriate ratings in the table below using the above information

21. To what extent has Koob-Ne-Guliuk Radio Programme Influenced your Adoption of the underlisted Livestock Farming Innovations?

Where: 5 is Very High, 4 is High, 3 is Somewhat, 2 is Low and 1 is Very low. Please tick [√] the appropriate ratings in the table below using the above information



	Question19			Question 20				Question 21				
	Yes	No	Very High	High	Somewhat	Low	Very Low	High	Somewhat	Low	Very Low	
<b>Management practices</b>												
Selection of Breeding Stock												
Proper Livestock Housing												
Livestock Health Management												
Livestock Disease Control												
Heat Detection in Livestock Farming												
Gestation Perion in Livestock farming												
Feeding and Nutrition in Livestock Farming												
Record Keeping in Livestock farming												
Marketing of Livestock Products												



**Section 5: To identify the challenges associated with the adoption of livestock farming innovations under Koob-Ne-Guliuk Radio Programme?**

Please rate the following underlisted challenges associated to your inability to adopt innovations communicated to you through Koob-Ne-Guluik Radio.

Challenges	Ratings				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
<b>Question (24) challenges from Koob-Ne-Guliuk Radio Programme</b>					
Unfamiliar and expensive innovations					
Very difficult to ask relevant question and getting feedback.					
Lack of interest					
Unfamiliar language used					
Poor reception of radio signal					
Unfavorable time of programme presentation					
Short duration of programme					
Non availability of good breeds					
Expensive cost of buying and keeping good breed					
Unfavorable weather condition to keep good breed					
High cost of acquiring a farming equipment					
Suitable equipment for livestock farming is unavailable					



complicated livestock farming  
equipments

Unfavorable conditions for  
equipment usage

High cost and inadequate access  
to veterinary service delivery

Inadequate housing to isolate sick  
animals

High cost of drugs or vaccines for  
prevention or treatment

High cost of feed

Bush fires

Theft

Feed scarcity

Taxes on marketing

Poor government commitment

inability to keep records  
(illiteracy)

Poor roads and inadequate means  
of transport to marketing centers

Unfavourable market prices

THANK YOU



## **Appendix 2: Interview Guide For Key Informants**

**INSTRUCTIONS:** The information is strictly confidential and will be used by the researcher in drawing conclusions on how radio programmes influence livestock farming which may assist in the design of the intervention programmes geared toward effective dissemination methods on innovational practices in livestock farming.

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### **Check List:**

#### **Interview guide for key informant (District Livestock Officer)**

1. What are the innovations communicated to livestock farmers in the district since the start of Koob-Ne-Guliuk Radio Programme? (list the innovations)
2. Please explain each innovation mentioned
3. What are their possible impacts on livestock farming in the district if adopted properly?
4. What are the challenges associated disseminating agricultural innovations to livestock farmers in the district?

#### **Interview guide for key informant (Programmes Manager of Daztech Radio)**

1. Please, what challenges do you encounter in disseminating agricultural innovations to livestock farmers?
2. What are the possible solutions to these challenges?

