THE ROLE OF MOBILE PHONES IN THE DEVELOPMENT OF IMPROVED CHICKEN FARMING BUSINESS BY WOMEN IN MISUNGWI DISTRICT, TANZANIA

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EXTENDED ABSTRACT

This current study on the role of mobile phone in the development of improved chicken farming business by women was carried out in Misungwi District, Mwanza Region Tanzania from April to July, 2022. Two divisions, namely Usagara and Misungwi were selected and from each division two wards were involved, while from each ward two villages participated in the study. The study aimed at establishing the role of mobile phone in the development of improved chicken farming business by women with reference to Misungwi District. Specifically, the study intended to asses socio-economic factors influencing women's use of mobile phones in the improved chicken farming business information, determining the accessibility of improved chicken farming business information to women improved chicken farmers through mobile phones, establishing the extent of mobile phone usage by women in communicating information on improved chicken farming business and analyzing the type of information improved chicken farmers seek through mobile phones along the value chain in the study area. A cross-sectional research design with mixed approach that is quantitative and qualitative was employed. Data were collected from120 respondents. A questionnaire, Focus Group Discussion, Key Informant Interviews and documentary review were used to collect data. Quantitative data were analyzed using a Statistical Package for Social Sciences (SPSS) version 20 software, while qualitative data were analyzed using content analysis. Binary logistic regression model was applied to assess socio-economic factors influencing women in using mobile phones to communicate improved chicken farming business. Firstly, the finding shows that socio-economic factors such as age, education level and occupation significantly influence the use of mobile phone in the improved chicken farming business information level. Secondly, bandwidth costs fluctuation and poor mobile phone network limited women in the accessibility of improved chicken farming business information such as availability of chicks, market and transportation in the study area.. Lastly, majority of the respondents use mobile phone to seek information from different stakeholders involved in the improved chicken farming business. Based on the findings of the study, Diffusion of innovation Theory is in conformity with this current study. However, women improved chicken farmers experienced several challenges such as market price fluctuation, poor connection between farmers and financial institutions and extension officers and veterinary officers were not working with farmers closely. The study thus recommends the District Council making campaigns on increasing the number of women engaged in farming improved chicken for business as its high agenda.. Also, the study recommends the Misungwi District authority to collaborate with mobile phones companies to increase the number of networks and advise them to have stability of bundle prices affordable to the farmers, andthe Misungwi District Council authority needs to remind the extension and veterinary officers to increase their effort in reaching and assisting the farmers than it is at the present. Furthermore, studies should be done on such areas as collaboration between farmers, Government, Public organization and other stake holders on helping women improved chicken farmers to use mobile phones in their business in order to improve their livelihood.

DECLARATION

I, HADIJA IDDI, do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my own original work done within the period of registration and that it has neither been submitted nor being concurrently submitted in any other Institution.

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The above declaration is confirmed by;

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DEDICATION

This work is dedicated to my parents Mr. Iddi Adam. Mwagilo and my late mother Halima Zuberi Ngwajala. You are my great teachers and role model in my life; your teachings made me to like education.

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LIST OF ABBREVIATIONS AND ACRONYMS

DLFO	District Livestock and Fisheries Officer
DOI	Diffusion of Innovation
et al	and others
FGDs	Focus Group Discussions
ICTs	Information and Communication Technologies
KIIs	Key Informant Interviews
SPSS	Statistical Package for Social Science
TCRA	Tanzania Communication Regulatory Authority
TTCL	Tanzania Telecommunication Company Limited
URT	United Republic of Tanzania

CHAPTER ONE

1.0 General Introduction

1.1 Background Information

Improved chicken farming has been a typical business operating in the world where women seem more involved with it. In France, Denmark, Ethiopia, Kenya, Nigeria and Malawi; women are also involved in improved chicken farming business (Getiso *et al.,* 2017; Kamau, 2018). Improved chicken is a superior crossbreed of local chicken and exotic chicken ecotypes from various selected breeds. It was developed to serve a dual purpose (meat and eggs). They are characterized by their ability to produce more eggs, early maturity, early meet market weight, good adaptability to diseases and climate, and high production compared to local chicken (Woldegiorgiss, 2015). They can survive harsh environmental conditions such as semi extensive small-scale village, semi-scavenging and organic-production systems (Maunde *at el*., 2021). The aim of improving chicken is to make local chicken business profitable and commercially oriented. Major breeds of chicken include, Sasso, Kuroiler, Leghorn, White Sussex, Kari, Rainbow rooster and Kenbrochicken. Improved chicken is used for food security, health, income generation, poverty reduction as well as social ceremonies and ornaments (Getiso *et al.,* 2017). Composting chicken manure from improved chicken has been used in garden and farms to supply nitrogen, potassium and phosphorous (Kiprop, 2020).

In Tanzania, the number of improved chickens has been increasing. In 2017/2018, there were 4.4 million of improved chickens, and 2018/2019 there were 4.7 million improved chickens, and 2019/2020 there were 5.0 million improved chickens, and by 2020/2021 the figure is estimated to be 5.4 million improved chickens (URT, 2017). The realized increase is a result of high demand in the market of improved chickens. The actual demand of improved chickens in the year 2021/2022 is 5.7 million. The number of improved chickens in the year 2026/2017 has increase by 5.7 million in the year 2021/2022 which is an increase of 37% (URT, 2017). However, the existing studies, for instance, (Muhairwa *et al*., 2000; Getiso *et al*., 2017; Kamau *et al.*, 2018; Kiprop *et al*., 2020) indicated that the sector has faced a number of challenges which hinder improved chicken production, including; limited use of modern technologies, poor access to extension services, high cost incurred in transporting chicks, feeds costs, scanty market information, low education level, insufficient knowledge and experience of improved chicken farming and Information Communication Technologies (ICTs). Other challenges include poor housing, lack of disease control mechanisms and poor feeding.

Information and Communication Technologies (ICTs) is a collective term for all technologies used to deal with information to facilitate communication (Ratheeswan, 2018). . ICTs are the potential to meet information needs of improved chicken farmers if used effectively and efficiently. ICTs involve the use of hard-wares, soft-wares, e-mail, internet computers, radio, television, and mobile phones (Asenso-Okyere *at el*., 2012; Onyeneke *et al.*, 2016). For instance, mobile phones are useful ICTs tools due to their speedy, timely dissemination of information, potentiality in storage, retrieval and feedback of the information to the source. For example, a study by (Sife *et al.,* 2010) has found that mobile phone usage has helped to improve the livelihood of mobile phone users in their business by (72.6%), transportation by over 70% and house hold income (56.5%). A mobile phone can play a significant role in the development of improved chicken farming business by women when used in the appropriate manner. It can provide new information services to its users (Onyeneke *et al.,* 2016). By using mobile phones improved chicken farmers can easily search where the market is, seek

and sort information about price of their produce and extension services. Users of mobile phones including improved chicken farmers can thus participate in the process and benefit from its usage.

However, women improved chicken farmers do not meet their felt needs by keeping improved chickens. For example, as business women improved chicken farmers do not realize profit by selling their chickens. Hence, they are not able to buy modern materials for building modern houses, transport facilities like motor cycles to solve the incurred transportation problems (Msoffe *at el*., 2018). By the use of mobile phones can overcome such economic challenges and get rid of poverty which is a common situation experienced by many women improved chicken farmers (Kaushik, 2020).

As such, the Misungwi District women improved chicken farmers are not exceptional to this case. This is due to the fact that though in other districts in Mwanza Region women keep improved chicken as a business for the purpose of developing their lives through improved chicken farming business, women in Misungwi District face many challenges compared to their counterparts of other districts (Misungwi District profile, 2020). This study, therefore, attempted to investigate the role of mobile phones in the development of improved chicken farming business by women.

1.2 Problem Statement

In Tanzania, the total number of mobile phone subscribers is 52 884 243 where by 22 740 655 are women (TCRA, 2021). Women engaged in improved chicken farming business in Misungwi District face amongst others a problem on the use of modern technologies for the fast delivery of information related to the improved chicken farming business (Misungwi District profile, 2020). This problem affects the growth of the improved chicken farming business in terms of accessibility to market and extension services. As a result, women in Misungwi District remain income poor.

Mobile phone technology is currently used in various business activities including in improved chicken farming (Frempong, 2009 and Sey, 2011; Folitse, 2018). Technology has appeared to be among the most effective linkage which facilitates farmers' access to services when they want to plan how to develop their improved chicken farming business for creating a better socio-economic condition (May and Hearn, 2005; Nyamba, 2017). One important thing is witnessing an increasing subscription of mobile phones in Tanzania and its distribution is strongly growing up (Oh, 2010; Nyamba, 2017). However, in the study area, there are only 45% of women who own and use mobile phones (Misungwi District Profile, 2020).

The use of mobile phones could provide a solution to women of Misungwi District on the problem of the use of the modern technologies by offering them high speed mobile network and Internet data that improve communications with clients and subsequent sales of the improved chickens. However, some women who are improved chicken farmers are not tapping the potentials surrounded in utilizing mobile phones use as they suffer from insufficient and untimely access to improved chicken farming required information (Misungwi District profile, 2020). Hence, this brings a need to support the utilization of mobile phones technology to spread information delivery and sustainability. Therefore, this study intended to investigate the roles of mobile phone in development of improved chicken farming business by women in Misungwi District, Mwanza region.

1.3 Justification of the Study

The justification for carrying this study includes; one, the study is in line with the United Nations Millennium Development Goals, particularly goal number one which emphasizes on extreme poverty and hunger alleviation for all people (URT, 2005). In this case including women engaged in improved chicken farming business. Two, this study aligns with the National Development Vision 2025 and the Tanzania National Strategy for Growth and Reduction of Poverty (URT, 2005; URT, 2010). Three, this study adds more information on the scanty data on the role of mobile phones in the development of improved chicken farming by women in the study area. Four, the study results inform policy makers to plan on how to assist on developing improved chicken farming business as part of implementing the national plan on livestock development (URT, 2017). Five, the study identified the linkage between improved chicken keepers and commercial actors, extension workers and mobile phone providers for easy information flow among these in business players.

1.4 Objectives of the Study

1.4.1 Overall objective

The overall objective of the study is to investigate the role of mobile phones in developing improved chicken farming business by women with reference to Misungwi District, Mwanza Region.

1.4.2 Specific objectives

The specific objectives of the study are:

i. To assess socio-economic factors influencing women's use of mobile phones in the improved chicken farming business information in the study area.
ii. To determine the accessibility of improved chicken farming business information to women improved chicken farmers through mobile phones in the study area.
iii. To determine the extent of mobile phone usage by women in communicating information on improved chicken farming business in the study area.
iv. To analyze the type of information improved chicken farmers seek through mobile phones along the value chain in the study area.

1.5 Research Questions

i. What are the socio-economic factors influencing women's use of mobile phones in the improved chicken farming business information needed?
ii. What are the factors that influence women access to mobile phones in communicating information on improved chicken farming business?
iii. What is the extent of mobile phones usage by women for communicating improved chicken farming business information?
iv. What type of information on improved chicken farming business is sought by women through the use of mobile phones?

1.6 Definition of Key Terms

1.6.1 Mobile phone

A mobile phone refers to a portable handset phone with a built-in rechargeable battery that can make and receive calls while the user is connected at a service point. It can also function as cellular network services for sending and receiving messages or get the information through the internet (URT, 2021). Practically it can also be defined as a device, tool or machine used in oral, written or other uses depending on the needs. It is one of the

ICTs instruments which is useful in exchanging knowledge, information and data between individuals, groups or organization.

1.6.2 Information and communication technologies.

Information and Communication Technologies (ICTs) refer to the collection of technologies used to deal with information to facilitate communication (Ratheeswan, 2018). ICTs also refers to all communication technologies, including the internet, wireless network, cell phones, computers, soft-ware, video conferencing, social networking and other media application and services enabling users to access, retrieve, store, transmit and manipulate information in a digital form (El bilali *et al.*, 2019).

1.6.3 Communication

Communication is an act of information sharing or provision between actors. It can be verbal or nonverbal in most cases communication need to have commonage, clear message or information, contextual, audience, simple, consistence, focused and intentional (Merriam, 1828). The communicated information should qualify to be retrieved for future use when well communicated. Knowledge can be communicated to others through mobile phone. Local chicken keepers in this regard can communicate to each other or in network and expert like extension workers be informed about their chicken, practice and market. To that effect improved chicken farmers can plan about trading with customers, partners and related stakeholders on livelihood improvement by using mobile phone communication.

1.6.4 Improved chicken

Improved chicken is a superior cross breed of local chicken and exotic chicken ecotypes from the various selected breeds. It was developed to serve a dual purpose (meat and eggs). They are characterized by their ability to produce more eggs, early mature, meet market weight faster, good adaptability to diseases, well adapted to climate, high production compared to local chicken (Woldegiorgiss, 2015).

1.6.5 Improved chicken farming business

It is a type of farming practice which involves keeping improved chicken commercially for the purpose of both meat and eggs production (Edmond, 2018).

1.7 Factors limiting improved Chicken Keeping

There are several constraints facing keeping improved chicken by women in Africa rural areas (Msoffe *at el*., 2018) they include disease outbreak, theft, scanty extension services, government policies, access to financial institutions, market, lack of knowledge and skills needed, expensive nutrient/feed, limited information (Salim, 2018).

1.8 Factors Limiting the Use Mobile Phone by Women improved Chicken Farmers

Studies conducted in Bangkok and Kenya by (Erickson, 2008; Sylivester, 2016) have found that the limiting factors that are facing the use of mobile phone by women are:-lack of ownership of mobile phone, lack of money to buy airtime, sharing the phones with family members, lack of strong connectivity of mobile phones network and cultural conflict. Others include, farmers characteristics; technological characteristics; resource and economics constraints; social, infrastructure, physical and policy environment.

1.8.1 Farmers characteristics

Different researchers such as Berhaun (2018); Launio *et al*. (2018); Feyisa (2020) and Massresha (2021). Asserts that age, sex, educational level, income and marital status may and may not influence the adoption of new technology. For example, a study by Feyisa (2020) found that sex of the head of the house hold has no significant influence on decision to adopt agricultural technology. However, a study by Berhanu(2018) has found that sex has significant influence on adoption of new technology. Additionally educational level has positive influence on adoption of new agricultural technology.

1.8.2 Technological characteristics

The characteristics of new technology could be adopted easily if it is easy to use (trialability) and that may has positive result (reletive advantage) and has been found to be the factor for adoption of new agricultural technology (Massresha *et al*., 2021).

1.8.3 Constraints

The constraints which may hinder adoption of new technology include resource constraints, incomplete and family responsibility. A study by Milkia and Abdullahi (2018) report that economic constraints may be a challenge for adoption of new technology.

1.8.3 Environment.

Amare and Simare (2017) urgue that social environment, infrustructure environment, physical environment and policy environment has negative influence on adoption of new technology.

1.9 Theoretical Review

This study was guided by a Diffusion of Innovation Theory (DOI), developed in 1962 and reviewed in 2003 by Everret M. Rogers. The theory has been used in different studies by different scholars such as Dibra (2015); Vecchio *et al*. (2020); Al-Rahmi *et al*. (2019); and Nyamba (2017). The theory originates from communication to explain how over time, a technology gains and spreads through individuals and groups. The theory has four major elements that influence the spread of new ideas which are; the characteristics of technological innovation (Relative advantage, complexity, trialability and observability), communication channel, time and social systems. However, in order that to occur they must undergo through five stages which are knowledge, persuasion, decision, implementation and

confirmation. There are factors which influence resistance or acceptance of a new technology. For example, individual characteristics, technological characteristics, degree of risk perceived by the individual in adopting new technology and decision-making environment of individuals. In this case, mobile phones innovation and communication channels may have a role to play in bringing development among women engaged in the improved chicken farming business.

1.10 Conceptual Framework

The conceptual framework of this study is derived from the Diffusion of Innovation Theory (DOI) and Tanzanian socio-economic context and the independent variables which result in the dependent variable (Appendix 2). The independent variables that were studied include farmers' characteristics (age, education level, income, knowledge and marital status), technological characteristics (Relative advantage, complexity, trialability and observability), constraints (resource constraint, incomplete information and family responsibilities) and the environment (social environment, infrastructure environment, physical environment and policy environment). The assumption is that these independent variables play a role in the role of mobile phones in the development of improved chicken farming business by women in the Misungwi District, Tanzania.

1.11 Research Methodology

1.11.1 Description of the study area

Misungwi District is one of the eight (8) Districts in Mwanza Region. It is situated on the southern part of the region. The district shares borders with Mwanza City to the North, Shinyanga Rural to the South, Sengerema District and Geita Regions to the West, Kwimba District to the East and Magu District to the Northeast. Administratively, the district is divided into four divisions, namely: Misungwi, Mbarika, Inonelwa and Usagara. The district had a total population of 351 607 (Male 173 997 and Female 177 610) comprising of 50 697 households according to the Population Census of 2012. The district has a total area of 2 553 sq.km of which 2 378 sq km is land and 175 sq.km is covered by water of Lake Victoria (Misungwi District council, 2020). The main economic activities of the district are agricultural (crop farming), livestock and fishing. The number of improved chicken in Mwanza Region per each district is Sengerema 12 541, Buchosa 4 217, Misungwi 23 375, Kwimba 3 038, Magu 49 573, Ilemela 20 715, Nyamagana 100 431 and Ukerewe 514 (Mwanza region profile, 2021). The district was selected for this study because despite being well covered by l networks of tarmac road and being nearby Mwanza City where improved chicken consumers are many, yet women improved chicken farmers in the Misungwi District are little benefiting from such opportunities due to scanty information in their business.

1.11.2 Research design

This study employed a cross-sectional research design as it best describes the relationship between variables (Babbie, 2020; Creswell *at el.,* 2017). The study employed both quantitative and qualitative research methods as applied by (Onghena *at el*., 2019; Maunde *at el.,* 2021).

1.11.3 Study population

The study included all women keeping improved chicken and they have mobile phones to access information in the study area.

1.11.4 Sampling Procedures and sampling determination

The study employed purposive sampling, random sampling and snowball sampling methods. Purposive sampling was used due to its freedom which allows the researcher to choose respondents who suit for the need of a research, while random sampling was employed since it allows an equal chance for an individual to be selected. Snowball sampling was employed due to its strength in identifying respondent and then referring to another one till the number of respondents needed is reached (Babbie, 2020). In this case, the identification of women engaged in improved chicken farming business after being introduced to one of them by the extension officer was done. Women improved chicken farmers were the target population. Purposive sampling was used to select two divisions among the four divisions existing in the district. These are the divisions in the district where farmers keep improved chicken as well as having smooth network communication compared to other divisions in the district. From each division, two wards were selected randomly from the existing ward register. Then from each ward, two villages were selected randomly. From each village, 15 women improved chicken farmers were selected by using the snowball method.

Based on the sampling procedure used in this study, the sample size of the study was 120. Matata *at el.* (2001) and Gbawoquiya (2019) argued that a sample size of 120 respondents is significantly enough to conduct socio-economic studies in Sub Sahara Africa. The sample size determination was based on the following criteria:
Stage one: Selection of household with chickens.
Stage two: Selection of women who owns chickens.
Stage three: Selection of respondents who own mobile phones.
Stage four: Selection of respondents who use mobile phones to access information.

1.11.5 Data collection

Tools for data collection

For the quantitative method, a questionnaire was developed and used to seek data for the study. For the qualitative method, a checklist was developed and used to seek information from the participants.

1.11.6 Primary data

Primary data were collected by using the questionnaire, Key informant interviews and Focus Group Discussions (FGDs). The study sought the following information socio economic characteristics sources of income, needs, marital status, age, ownership of mobile phone, education level, ownership of improved chicken, experience in keeping improved chicken, farm size , frequency use of mobile phone for business, knowledge of using mobile phones, knowledge of using mobile phones to obtain information about market, price, transport feeds and seeking for assistance from extension officers who are involved in delivering extension services.

1.11.7 Secondary data

Secondary data were collected about information on women improved chicken farmers about ownership of chicken and phone, and the frequency of use of mobile phone by the improved chicken farmers, phone companies' operators and number of subscribers in the study area. The information was obtained from written materials like books, articles, report, pamphlets and other library materials ownership of chicken and phone, and frequency use of mobile phone by the improved chicken farmers. The materials were primarily reviewed from Sokoine National Agricultural Library, Misungwi District profile (Table 1.1).

Table 1.1: Secondary data collected

S/N	Data to be collected	Source of data	Location
1	Quantitative data (Social economic, Mobile phone subscribers in Tanzania, Improved chicken Population in Tanzania)	Library materials Internet	Sokoine National Agriculture Library-Morogoro
2	Quantitative data (Number of women keeping Improved chicken, number Of improved chicken in Misungwi, the total population of Misungwi district)	Misungwi District profile and annual report.	Misungwi District, District Livestock and fisheries officers' office (DLFO).
3	Quantitative data (Mobile phone subscribers in Misungwi district, number of women, keeping improved chicken subscribers, mobile voice traffic by women keeping improved in Misungwi, volume and value of money transfer transactions by women improved chicken keepers in Misungwi	Witten materials of Mobile phones companies operating in Misungwi District.	Mobile phones companies Headquarters-Misungwi Town.

1.11.8 Data analysis

Quantitative data were analyzed with the aid of a soft-ware for Statistical Package for Social Science (SPSS) version 20 for specific objectives one, two, three and four.

(i) Quantitative data to achieve specific objective one were analyzed by using binary logistic regression model to assess socio-economic factors influencing women in using mobile phones to communicate improved chicken farming business information in the study area. The tested variables were; age, education level, income, marital status and knowledge of women improved chicken farmers since these variables are key and most informative related to this study.

The binary logistic regression model is expressed as;

$$\text{Logit } P(x) = \text{Log}P(x)1\text{-}P(x)] = a+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_nX_n+e$$

Where;
P(x) = Natural log of the odds of using mobile phone in the development of improved chicken business by women. P(x) Probability of using mobile phone.

1-P(x)= probability of not using mobile phone
a= Constant of the equation
β_1-X_n= Coefficient of predictor variables
X_1, X_2..... X_n = Predictor variables entered in the model
e= The precision error which is 0.05

The predictor variables are:
X_1= Age (1 if influence, 0 otherwise)
X_2= Marital status (1 if influence, 0 otherwise)
X_3= Education level (1 influence, 0 otherwise)
X_4= Occupation (1 influence, 0 otherwise)
X_5= Source of income (1 it influence, 0 otherwise)
X_6= Number of improved chicken kept (1 it influence, 0 otherwise)

~~(i)~~(ii) Qualitative data were analyzed through content analysis (for objectives two and three) whereby the key informant interview and Focus Group Discussion talk were recorded, written and translated and later extracted by themes relevant to the issue of discussion.

1.12 Limitation of the Study

One notable study limitation can be observed, that is, the study concentrated only on improved chicken women farmers. Therefore, not gender sensitive. Thus, the study findings were only from women representing their experiences and views on the use of mobile phone in the improved chicken farming business. In such a way males were segregated though they were part of the composition of a household. This limitation could affect the relationship in the family particularly when it comes to farming improved chicken as a business which needs team work.

1.13 Organization of Dissertation

This dissertation is organized into five Chapters: The first chapter presents a general introduction of the study. Chapter two, which is the first paper, presents the socio-economic factors influencing women's use of mobile phones in the improved chicken farming business information. Chapter three presents second paper about accessibility of improved chicken farming business information to women improved chicken farmers through mobile phones. Chapter four presents third paper about analysis of types and extent of use of mobile phones information by women improved chicken farmers along the value chain. Finally general discussions, conclusions and recommendations are presented in chapter five.

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CHAPTER TWO
PAPER ONE

Socio-economic Factors Influencing Women's Use of Mobile Phones in the Improved Chicken Farming Business Information in Misungwi District, Tanzania

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CHAPTER THREE
PAPER TWO

Accessibility of Improved Chicken Farming Business Information to Women Improved Chicken Farmers through Mobile Phones in Misungwi District, Tanzania

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CHAPTER FOUR
PAPER THREE

Analysis of the Extent of Mobile Phones Information use by Women Improved Chicken Farmers along the Value Chain in Misungwi District

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Abstract

The study was conducted in Misungwi District, Tanzania and aimed to analyze the types and the extent of use of mobile phones information by women improved chicken farmers along the value chain in Misungwi District. A cross-sectional research design was employed and data were collected from 120 respondents. Quantitative and Qualitative methods of data collection were used. Quantitative data were coded entered, cleaned and analyzed by the help of a Statistical Package for Social Sciences (SPSS) version 20 Software. Qualitative data gathered were arranged into themes and analyzed using content analysis. The study found that the majority of the respondents use a mobile phone mostly to seek information from different stakeholders involved in the improved chicken farming business. The information communicated mostly include; cost for purchase one-day old chick, composition of feeds, eggs price, transportation of chicks and feeds, proper housing, treatment of sick chicken and loans and credit repayment. The study, therefore recommends that the Misungwi District authority; firstly, needs to work with the women improved chicken farmes closely inorder to help and support them in the development of their business andso solving their immediate challenges.. Secondly, the private and public sector existing in the Misungwi District should help in reaching women improved chicken farmers through mobile phone calls on regular basis, instead of waiting the farmers to initiate the communication process.The Misungwi District needs to remind the extension and veterinary officers to increase their efforts in reaching and assisting women improved chicken keepers .

Keywords: Mobile phones, improved chicken, Information, Value chain.

4.0 Introduction

Background information

Information and communication technologies (ICTs) are the major resources in developing agricultural production worldwide (Perera *et al.,* 2021). A mobile phone has particularly been applied in agriculture and livestock advancement due to its speedier delivery of information needed by farmers for improving their farming production (Folitse *et al*., 2019). Farmers engaged in using mobile phones in transforming their businesses have been struggling in obtaining the information needed by being keen in selecting the types of information they need to scale up their businesses (Shapa *et al*., 2021; Mariyono *et al*., 2021). To that end, the use a mobile phone also depends on the type of information and the extent of use of mobile phones for that matter. Studies conducted in some African countries including Ghana, Nigeria and Malawi suggest that farmers need to get information about their business immediately in order to curb their immediately challenges which affect their business (Chah *et al.,* 2015; Mango *et al.,* 2018; Alabi *et al.,* 2020; Jemere, 2020). When farmers are connected with different sources of information which enable them to solve the challenges, they, however stuck by the limitation of getting and connecting with the stake holders at different value chain stages

The improved chicken farming business in Tanzania is a fast-growing business. Improved chicken seems to be one of the major sources of protein, income generation and livelihood improvement for many families. In order to realize that farmers need to access needed information through mobile phones to develop their businesses (Omondi, 2022; Wilson *et al.,* 2022).Hence, it is anticipated that women improved chicken farmers can use mobile phone to access different information along the improved chicken value chain such as market, feeds, chicks, veterinary and extension services.

However, in order to achieve this, the types of information and the extent of use of a mobile phone is highly needed by farmers in order to obtain required information to the women improved chicken farmers. Scanty information is available in Misungwi District on the types and the extent of use of mobile phone information by the women improved chicken farmers along the value chain. This current study intends to analyze the types and the extent of use of mobile phone information by the women improved chicken farmers along the value chain in Misungwi District.

4.1 Mobile Phone Information use and Chicken Value Chain Development

The term value chain refers to a sequence of linked activities performed by chain actors to transform resources and/or raw materials to produce value added products or services ending up to market ready for consumption. Value chain is defined as a full range of activities which are required to result into a product or services from conception through different stages of production to final consumption (Kaplinsky and Morrison, 2001). In this case, the improved chicken value chain thus involves buying/ having one day old chick, transportation, feeding, housing, treatment and marketing. The actors in the value chain include producers, transporters, farmers, veterinary and extension officers, traders and consumers. Sometimes a financial institution can be part of the chain as supportive actors. In the process of connecting the value chain stages, the use of a mobile phone is significantly important. Its potentiality stands in the fact that any of the actors can call or receive information about improved chicken from any of the participants timely. The use of a mobile phone in this case facilitates the development of the improved chicken farming business.

4.2 Theoretical and Conceptual Framework

4.2.1 Theoretical framework

This current study is guided by the diffusion of innovation theory (DOI) developed in 1962 and reviewed 2003 by Everret M. Rogers and used by different scholars such as Dibra (2015); Vecchio *et al*. (2020); Al-Rahmi *et al*. (2019); and Nyamba (2017). The theory originates from communication and explains how, over time, a technology gains and spreads through individuals and groups. The theory has four major elements that influence the spread of new idea which are; the characteristics of technological innovation (Relative advantage, complexity, trialability and observability), communication channel, time and social systems. However, in order to occur they must undergo through five stages which are knowledge, persuasion, decision, implementation and confirmation. There are factors which influence resistance or acceptance of new technologies. For example, these factors include individual characteristics, Technological characteristics, degree of risk perceived by the individual in adopting new technology and decision-making environment of individuals. In this case, mobile phones innovation and communication channels may have the role to play in bringing development among women engaged in the improved chicken farming business.

4.2.2 Conceptual framework

The conceptual framework of this study is derived from the diffusion of innovation theory (DOI) and Tanzanian socio-economic context and the independent variables which result into the dependent variable. The independent variables studied were farmers' characteristics (age, education level, income, knowledge and marital status), technological characteristics (Relative advantage, complexity, trialability and observability), constraints (resource constraint, incomplete information and family responsibilities) and the Environment (social environment, infrastructure environment, physical environment and policy environment). The assumption is that these independent variables play a role in the use of mobile phones in the development of improved chicken farming business by women in Misungwi District, Tanzania.

4.3 Methodology

4.3.1 Study area, research design and sampling procedure

The study was conducted in Misungwi District Mwanza Region, Tanzania (Fig. 4.1). The district lies between latitude 2.5^0 S and 3.5^0 S and longitude 32.5^0 E and 33.5^0 E with a total area of 2 553 km^2 of which 2 378 km^2 is covered by land and 175 km^2 is covered by water of Lake Victoria (Misungwi District council profile, 2020). According to the Tanzania 2012 population and housing Census report, the district had a total population of 351 607 (Male 173 997 and Female 177 610). The main economic activities of the people in the district include agriculture, livestock and fishing. With regard to livestock keeping some of the families keep local and improved chicken for the purpose of having nutrition and income generation. The study employed a cross sectional research design. All women who were engaged in farming improved chicken for business and had mobile phones were studied. Misungwi and usagara divisions were purposively selected. These two division qulified to be included in the study due to their nearness to Misungwi town and Mwanza city, good transport and availability telecommunications networks compared to the other division within the district. Four wards namely Misungwi, Mabuki,Usagara and Idemiya were selected by using random sampling. Two villages from each selected wards were sampled. Finally by using the snowball method 15 respondents were studied from each village making a total of 120 respondents. Tools which were used to obtain data included a pretested queationnaire, key informant interwiew checklist and interview schedule for FGDs. According to Matata *at*

el. (2001) cited by Mligo *at el.* (2015) a sample of 120 respondents is quite enough to conduct a socio-economic study in Sub-sahara African countries, including Tanzania.

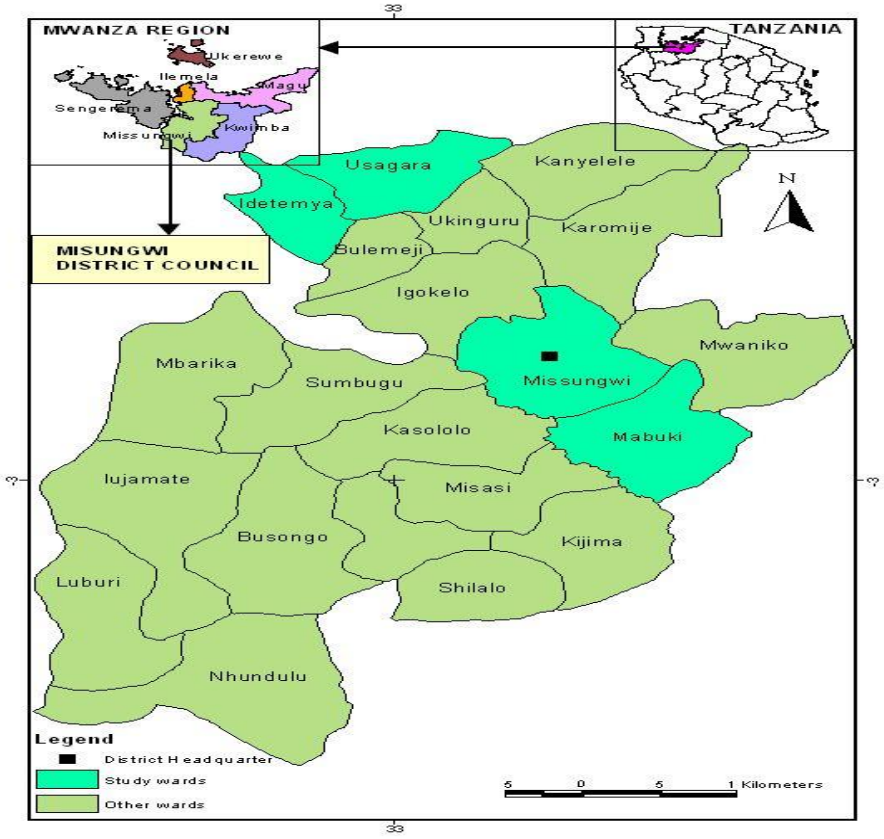

Figure 4.1: **Map showing locations of the study area**

4.3.2 Data processing and analysis

The collected quantitative data were coded, entered, cleaned and analyzed by the help of SPSS Version 20 software.This process gave a chance to draw tables and percentages. The interview and FGDs data collected were read for familiarization, coded, arranged into themes, themes were reviewed; themes were defined and named; finaly the results were written up (Braun and Clarke, 2012). They were also analyzed by using content analysis.

4.4 Results and Discussion

4.4.1 Types of information required by women improved chicken farmers

The results in Table 4.1 show over two thirds (80.0%) of the respondents used mobile phones for information regarding cost for purchase of one day old chicks. Furthermore, the majority (80.0%) of the respondents from Idetemiya use mobile phones in collecting information regarding cost of one day old chicks. In the same view, the majority (76.7%) of respondents from Mabuki (70.0%) from Misungwi and (93.3%) from Usagara Wards used mobile phones to collect information about cost of one day old chicks. The findings imply that information about the cost of one-day old chick was a priority to know for women improved chicken farmers. This was useful for them to gauge themselves about their financial capability and plan for each of the future cost along the value chain. This helps them to make decisions pertaining the business. The findings are in line with Bah *et al*. (2019), who found that cost of one-day old chick was the most important information farmers wanted for operating the business in the value chain.

Table 4.1: Types of information about improved chicken chicks required by women improved chicken farmers

	Idetemiya		Mabuki		Misungwi		Usagara		Overall	
Information required for chicks	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**N**	**%**
Cost of 1-day old chicks	24	80.0	23	76.7	21	70.0	2	93.3	96	80.0
Types of vaccine	6	20.0	7	23.3	8	26.7	2	6.7	23	19.2
Amount of feed (in grams) per day	0	0.0	0	0.0	1	3.3	0	0.0	1	0.8
Total	**30**	**100**	**30**	**100**	**30**	**100**	**30**	**100**	**120**	**100**

4.4.1.1 Information about feed types at all stages in improved chicken farming

The results in Table 4.2 show that (49.2%) of the respondents needed information about the composition of feeds. In considering individual Wards, results in Table 4.2 show some variations. While about half 50.0%, 60.0% and 53.3% from Idetemiya, Misungwi and Usagara respectively preferred the information about feed composition, few (36.7%) required information about feed types. The findings implied that feeds and feeds composition are the information which they needed most at this stage along the value chain, since the majority of them are probably illiterate in the area on feed formulation for improved chicken keeping. The findings are in line with (Chah *et al*., 2015; Msoffe *et al.,* 2018), who found that farmers sought information about feed preparation and feed formulation through a mobile phone.

Table 4.2: Information needed about feed types at all stages in improved chicken farming

	Idetemiya (n=30)		Mabuki (n=30)		Misungwi (n=30)		Usagara (n=30)		Overall (N=120)	
Information type at all stages	**Yes**	**%**	**Yes**	**%**	**Yes**	**%**	**Yes**	**%**	**n**	**%**
Type of feed	7	23.3	11	36.7	14	46.7	4	13.3	36	30.0
Composition of feed	15	50.0	10	33.3	18	60.0	16	53.3	59	49.2
Amount of feed in Kgs	1	3.3	5	16.7	8	26.7	1	3.3	15	12.5
Price of feed	10	33.3	19	63.3	15	50.0	8	26.7	52	43.3

4.4.1.2 Information about the market in improved chicken farming business

The results in Table 4.3 show information about egg price was important information type considered through mobile phone communication. The majority (67.5%) of the respondents from the Misungwi District seek information regarding egg price. This finding implies that eggs price is the most needed information by women improved chicken farmers through mobile phones due to egg price fluctuation in the market. Thus, farmers may decide to sell the eggs by the current market price or not. These findings are in line with those of Nyamba (2017) and Folitse *et al*. (2019), who found that in their studies that farmers sought market information using mobile phones.

Table 4.3: Information about market in improved chicken farming business

	Idetemiya		Mabuki		Misungwi		Usagara		Overall	
Market Information required	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**N**	**%**
Eggs price	24	80.0	20	66.7	17	56.7	20	66.7	81	67.5
Price of live chicken selling	3	10.0	1	3.3	3	10.0	1	3.3	8	6.7
Price of chicken meat	0	0.0	1	3.3	0	0.0	1	3.3	2	1.7
Transportation cost	3	10.0	4	13.3	7	23.3	5	16.7	19	15.8
Where to get the market	0	0.0	4	13.3	3	10.0	3	10.0	10	8.3
Total	**30**	**100**	**30**	**100**	**30**	**100**	**30**	**100**	**120**	**100.0**

4.4.5 Transportation information required along the value chain

The results in Table 4.4 show that (72.5%), (57.5%), (30.8%) and (29.2%) of the respondents sought information about the transportation of chicken feeds, chicken chicks, chicken drugs and chicken eggs, respectively. The findings imply that women improved chicken farmers know the importance of feeds to their improved chicken. Thus, they give it a priority since it leads to fast growth, attaining of market weight early, quality meat and eggs which all were required by customers. The findings are in line with Atiso *et al*. (2021), who found that farmers sought information about transport.

Table 4.4: Information regarding transport required using mobile phones for improved chicken farming business

	Idetemiya (n=30)		Mabuki (n=30)		Misungwi (n=30)		Usagara (n=30)		Overall (N=120)	
Transport Information required	**Yes**	**%**	**Yes**	**%**	**Yes**	**%**	**Yes**	**%**	**N**	**%**
Chicken chicks	20	66.7	19	63.3	23	76.7	7	23.3	69	57.5
Drugs	5	16.7	18	60.0	9	30.0	5	16.7	37	30.8
Feeds	15	50.0	25	83.3	26	86.7	21	70.0	87	72.5
Chicken eggs	5	16.7	17	56.7	8	26.7	5	16.7	35	29.2

4.4.6 Extension service information needed by women improved chicken farmers along the value chain

The results in Table 4.5 show that the majority of the respondents (76.7%) sought information from extension agents through mobile phones about proper housing for keeping improved chicken. The finding implied that proper housing for improved chicken was helpful to prevent improved chicken chicks from predators and adverse weather conditions. This will reduce death rate of chicks and finally realize profit. These findings are in line with the findings reported by Chande (2018) that the construction of chicken house needs a high communication between farmers and extension agent by using mobile phones. A similar finding was reported by Msoffe *et al*. (2018) who found that farmers seek information about characteristics of chicken house and space requirements in order to avoid cannibalism to chicken which may result into deaths of chicken.

Table 4.5: Type of information regarding extension service required using mobile phones in chicken farming

	Idetemiya (n=30)		Mabuki (n=30)		Misungwi (n=30)		Usagara (n=30)		Overall (N=120)	
Extension Information required	**Yes**	**%**	**Yes**	**%**	**Yes**	**%**	**Yes**	**%**	**Yes**	**%**
Building of proper housing	25	83.3	23	76.7	24	80.0	20	66.7	92	76.7
Space for keeping chicken	5	16.7	17	56.7	10	33.3	8	26.7	40	33.3
Farm management	7	23.3	17	56.7	9	30.0	8	26.7	41	34.2
Farm records keeping	4	13.3	14	46.7	9	30.0	6	20.0	33	27.5
Market identification	5	16.7	16	53.3	8	26.7	7	23.3	36	30.0

4.4.7 Veterinary service information needed by women improved chicken farmers using mobile phone along the value chain

The results in Table 4.6 show (65.0%) of the respondents from the four wards reported treatment of sick chicken as most useful information that women improved chicken farmers sought compared to others. The findings showed that for the farmers curbing diseases for their improved chicken is a priority. If they fail to do that, their business will realize loss due to a large amount of deaths of chicken, which they depend for the development of their improved chicken. The findings are in line with Temba *et al*. (2017); Chande (2018) and

Folitse *et al*. (2019) who found in their studies that the majority of farmers sought most information about treatment of diseased chicken and drug to use.

Table 4.6: Veterinary service information needed by women improved chicken farmers through mobile phone along the value chain

	Idetemiya (n=30)		Mabuki (n=30)		Misungwi (n=30)		Usagara (n=30)		Overall (N=120)	
Veterinary Information required	**Yes**	**%**	**Yes**	**%**	**Yes**	**%**	**Yes**	**%**	**Yes**	**%**
Types of vaccination	14	46.7	15	50.0	10	33.3	21	70.0	60	50.0
Vaccine Time regime	10	33.3	15	50.0	15	50.0	13	43.3	53	44.2
Treatment of sick chicken	16	53.3	20	66.7	20	66.7	22	73.3	78	65.0

4.4.8 Type of information regarding financial institutions using mobile phones in improved chicken faming business

The results in Table 4.7 show that (56.7%) of the respondents communicated using mobile phones about loan credit and repayment. These findings show that women improved chicken farmers need to know such information. The finding was in line with the observation made by Kamau (2018) and Folitse *et al*. (2019), who found that farmers improved chicken keepers could be connected to financial institution through mobile phone and be informed on the current status of obtaining credit from various financial institution.

Table 4.7: Type of information regarding financial institutions using mobile phones in improved chicken faming business

	Idetemiya (n=30)		Mabuki (n=30)		Misungwi (n=30)		Usagara (n=30)		Overall (N=120)	
Financial institution information required	**Yes**	**%**	**Yes**	**%**	**Yes**	**%**	**Yes**	**%**	**Yes**	**%**
Loans credit and repayment	16	53.3	18	60.0	14	46.7	20	66.7	68	56.7
Conditions for getting loans	11	36.7	12	40.0	15	50.0	22	73.3	60	50.0
Membership for financial institution	12	40.0	4	13.3	12	40.0	13	43.3	41	34.2

4.5 The Extent of Mobile Phone Usage by Women in Communicating Information on Improved Chicken Farming Business

This section aimed to assess the extent to which mobile phones use in improved chicken farming business in terms of frequency of making and receiving calls to and from the improved chicken farming business stakeholders. The stakeholders in question include extension officers, feed companies, transporters, financial institutions and veterinary officers.

4.5.1 Frequency of using mobile phones to call in improved chicken farming business

The results in Table 4.8 show the majority 81.7% of the respondents were made calls once per day while 18.3% of the respondents were making phone calls in the frequency of two to three times per day. This finding implied that the majority of women improved chicken farmers used their mobile phones for seeking help from extension officers on addressing the challenges affecting their improved chicken. The findings are in line with Atiso *et al*. (2021) who found that farmers find easier to make phone calls to seek useful information.

Table 4.8: Frequency of using mobile phones to call on improved chicken farming business

	Idetemiya		Mabuki		Misungwi		Usagara		Overall	
Frequency per day	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**N**	**%**
1 time	30	100.0	23	76.7	19	63.3	26	86.7	98	81.7
2 to 3 times	0	0.0	7	23.3	11	36.7	4	13.3	22	18.3
Total	**30**	**100**	**30**	**100**	**30**	**100**	**30**	**100**	**120**	**100**

4.5.2 Frequency of receiving mobile phones calls by women in improved chicken farming business

The results in Table 4.9 show that the majority of respondents (77.5%) were received phone calls once per day, while few (22.5%) of the respondents received phone calls in the frequency from 2 to 7 times per day. This finding implied that agency such as agricultural extension officers, feed companies, veterinary services and financial institutions communicate new current information regarding improved chicken farming business to farmers like disease outbreak or new prices of the product. The findings are similar to that of Atiso *et al.* (2021) who found that calling for agricultural purpose is highly preferred by agricultural agencies due to its completeness of information sent to the farmers.

Table 4.9: Frequency of receiving mobile phones calls for improved chicken farming business

	Idetemiya		Mabuki		Misungwi		Usagara		Overall	
Frequency per day	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**N**	**%**
1 time	28	93.3	22	73.3	16	53.3	27	90.0	93	77.5
2 to 3 times	1	3.3	8	26.7	14	46.7	3	10.0	26	21.7
4 to 7 times	1	3.3	0	0.0	0	0.0	0	0.0	1	0.8
Total	**30**	**100**	**30**	**100**	**30**	**100**	**30**	**100**	**120**	**100**

4.5.3 Type of people to whom respondents made mobile phone calls in the chicken farming business

The result in Table 4.10 shows that of the 120 respondents most 98(81.7%) reported to making phone calls once per day to different stakeholders and of these 85(70.83%), 5(4.17%), 4(3.33%), 3(2.50%) and 1(0.80%) feed companies, extension officers, veterinary services, transporters and financial institutions, respectively. The remaining 22(18.3%) reported to make phone two to four times per day. The findings imply that in order to realize profit from improved chicken farming business, it is crucial to get information about feeds at all stages of improved chicken keeping since such information is useful. This finding is in line with Fue *et al*. (2017) and Msoffe *et al*. (2018), who found that feed formulation, feed preparation, feeding and nutrition are the most needed information by poultry farmers through mobile phones at different stages.

During FGDs held at Mwasonge and Bukumbi villages participants agreed that though it was expensive to make calls they did it since they received information on proper feeding for their chicken. Proper feeding of the improved chicken helps to reduce risk of improved chicken to get nutrition deficiency and malnutrition. Proper feeding also helps fast growth and attainment of early market weight, and quality eggs and meat as demanded by customers.

Table 4.10: Type of people to whom respondents make mobile phone calls in the chicken farming business

	One time		2 to 4 times		Overall	
To whom one calls	**n**	**%**	**n**	**%**	**N**	**%**
Extension officers.	5	4.17	2	1.7	7	5.80
Feed companies	85	70.83	17	14.2	102	85.0
Transporters	3	2.50	1	0.8	4	3.33
Financial institutions	1	0.80	1	0.8	2	1.67
Veterinary services	4	3.33	1	0.8	5	4.17
Total	**98**	**81.7**	**22**	**18.3**	**120**	**100.0**

4.5.4 Type of peoplefrom whom respondents received phone calls for improved chicken farming business

The study found that most 77.6% of the respondents received phone call per day from different stake holders. The majority of them (69.2%) received phone calls once per day from feed companies. Those who received phone calls two to seven times per day were 22.45%. Thus, the overall results show that the majority of women improved chicken farmers (85.0%) received phone calls from feed companies per day, followed by few (5.80%), (4.17%), (2.50%) and (2.50%) from extension officers, veterinary services, transporters and financial institutions, respectively (Table 4.11). Similarly, during FGDs participants at Mbela and Masawe villages agreed that they received phone calls from feed companies' agents regularly informing them on availability of feed, price and place order of the feeds bags they want to buy. They do that because sometimes there is a shortage of feed in town so the agent calls them to inform whether there is scarcity or not. Additionally, FGDs participants at Misungwi and Nyanghomango added that it is sometime disappointing that they only have to depend on calling the feed companies which is expensive to do so. Furthermore, participants complained that they did not get much support from village extension and veterinarian officers. For example, they did not call them regularly so they depended on private agencies whose services were extremely expensive.

This finding implied that there was a good connection and information flow between feedd companies and women improved chicken farmers resulting into close ties in improved chicken farming business.

Table 4.11: Type of peoplefrom whom respondents receive phone calls in the improved farming business

	One time		2 to 4 times		4 to 7 times		Overall	
To whom one calls	**n**	**%**	**n**	**%**			**n**	**%**
Extension officers	3	2.5	4	3.33	0	0.0		5.80
Feed companies	83	69.2	19	15.80	0	0.0	102	85.0
Transporters.	2	1.7	1	0.83	0	0.0	3	2.50
Financial institutions	2	1.7	1	0.83	0	0.0	3	2.50
Veterinary services	3	2.5	1	0.83	1	0.83	5	4.17
Total	**93**	**77.6**	**26**	**21.62**	**1**	**0.83**	**120**	**100.0**

4.6 Conclusions

Based on the findings, the study concludes that;

i. Women improved chicken farmers in the study area needed information to solve the immediate problems they face in running improved chicken farming business. Such information is also needed to curb challenges happening at different stages of the value chain in order to realize profit.
ii. Mobile phone calls to seek infrmation or to receive information from farmers and the agents are reciprocal in nature.
iii. Women improved chicken farmers call and receive information about their businesses frequently when seeking information.

4.7 Reccomendations

Based on conclusions made in this current study, it is therefore reccommended that;

i. Misungwi District council authority should consult financial institutions and request them to help improved chicken farmers to get loans as well request them to reduce interest to manageable conditions.. Such a collaboration can help the women the improved chicken farmers to improve their livelihoods.
ii. The private and public sectors existing in the Misungwi District should help in reaching women improved chicken farmers through phone calls on regular basis instead of waiting the farmers to initiate the communication process. As such, the Misungwi District needs to remind the extension and veterinarian officers to increase their effort in reaching and assisting the farmers than it is currently.

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CHAPTER FIVE

5.0 General Discussion, Conclusions and Recommendations

5.1 Overview

This chapter gives a summary, conclusions and recommendations of the study based on the major findings. Finally, it puts forward suggestions for further studies on the role of mobile phones in the development of the improved chicken farming business by women in Misungwi District.

5.2 General Discussion of the Major Findings

This section presents a summary of the major findings based on study objectives and research questions the study attempted to address.

5.2.1 Socio-economic factors influencing women's use of mobile phones in the improved chicken farming business information

The first objective of the study aimed to assess socio-economic factors influencing women use of mobile phone in the improved chicken farming business. The results show that socio-economic factors such as age, education level and occupation significantly influence the use of mobile phones in the improved chicken farming business. .Also, respondents with an occupation other than farming improved chicken had a high chance of using mobile phones technology in the improvement of a chicken farming business information. In this case, they used a mobile phones in order to search information related to their improved chicken farming business. Additionally, the study found that older age of a farmer matters in using mobile phone to seek information related to the improved chicken farming business than the younger one because of the experience in using mobile phone in fostering their businesses.

5.2.2 Accessibility of improved chicken farming business information to women improved chicken farmers through mobile phones

The specific object two intended to study accessibility of improved chicken farming business information by women improved chicken farmers through mobile phones. The results for this objective show that the majority of the respondents who owned mobile phones had knowledgeable in using them to access information on improved chicken farming business. Other findings show that the availability of network and stability of cost of bandwidth were some of the major reasons for the improved chicken farmers to use mobile phone company for their businesses and not otherwise.

5.2.3 Analysis of types and the extent of use of mobile phones information by women improved chicken farmers along the value chain

Objective three and four intended to analyze the types and the extent of use of mobile phones information by women improved chicken farmers long the value chain. The major findings show that the majority of respondents sought information along the value chain about cost of purchasing one day old chicks, composition of feeds, egg price, transportation of chicken chicks and feeds, proper housing, treatment of sick chicken and loans credit and repayment.. Additionally, the study findings show that the majority of farmers make phone calls and received one time per day from feed companies. Thus, there is a good communication between feed companies and women improved chicken farmers in exchanging information about improved chicken farming business.

5.3 Conclusion

Based on the major findings of the study, the following conclusions are made:

i. Farmers with advanced age (29-50 years) have been participating in farming improved chicken. The more the age advances, the more the experience in using mobile phones for improved chicken farming business. Experience in carrying the business has gone concurrently with mobile phones usage because the farmers have learnt about its usefulness in their businesses. Likewise, farmers with high level of education use mobile phones than other with low level of education because they are knowledgeable with the technology than those with less education. This means that farmers with high level of education can fast learning and adopt new technology. Furthermore, farmers with good income can adopt new technology easily than those with low-income. Since they can afford cost of having and using mobile phone.

ii. Women improved chicken farmers use of mobile phone in accessing information about their business is crucial and beneficial. However, challenges such as poor network, costs of bandwidth and fluctuation of bandwidth cost are some of the challenges faced by women in running their businesses.

iii. In establishing and running improved chicken farming business, all agents involved in the business need to work together like threaded knot in order to solve the farmers' challenges and realize a profit. In this way, each agent needs to play her/his role for the stability and growth of the business.

5.4 Recommendations

Based on the conclusions above, the study recommends the following:

i. The Misungwi District authority through DALFO's office should mobilize and register all women improved chicken farmers and form communication groups by using their mobile phone's numbers and avail them new information on improved chicken farming business through Short Message Service (SMS).

ii. The Misungwi District should collaborate with mobile phone companies to install strong network, increase desk services and reduce cost and price fluctuation of bandwidth so as to increase subscribers including women improved chicken farmers to easy communication to farmers.

iii. Furthermore, the Misungwi District authority should work with other agents along the value chain to improved chicken farming business. There is a need to facilitate team work in helping women improved chicken farmers to minimize challenges they face in their business.

5.5 Suggestion for Further Studies

This current study has not fully exhausted all issues about mobile phones use in the development of improved chicken farming business by women in Misungwi District. More studies need to be conducted in this respect. It is therefore suggested that:

i. Other studies include males who are involved in improved chicken farming business.

ii. The study further suggests that future studies should be conducted on the use of smartphone in the development of improved chicken farming business. This suggestion is based on the fact that a smart mobile phone is speedier and can be used for advertisement

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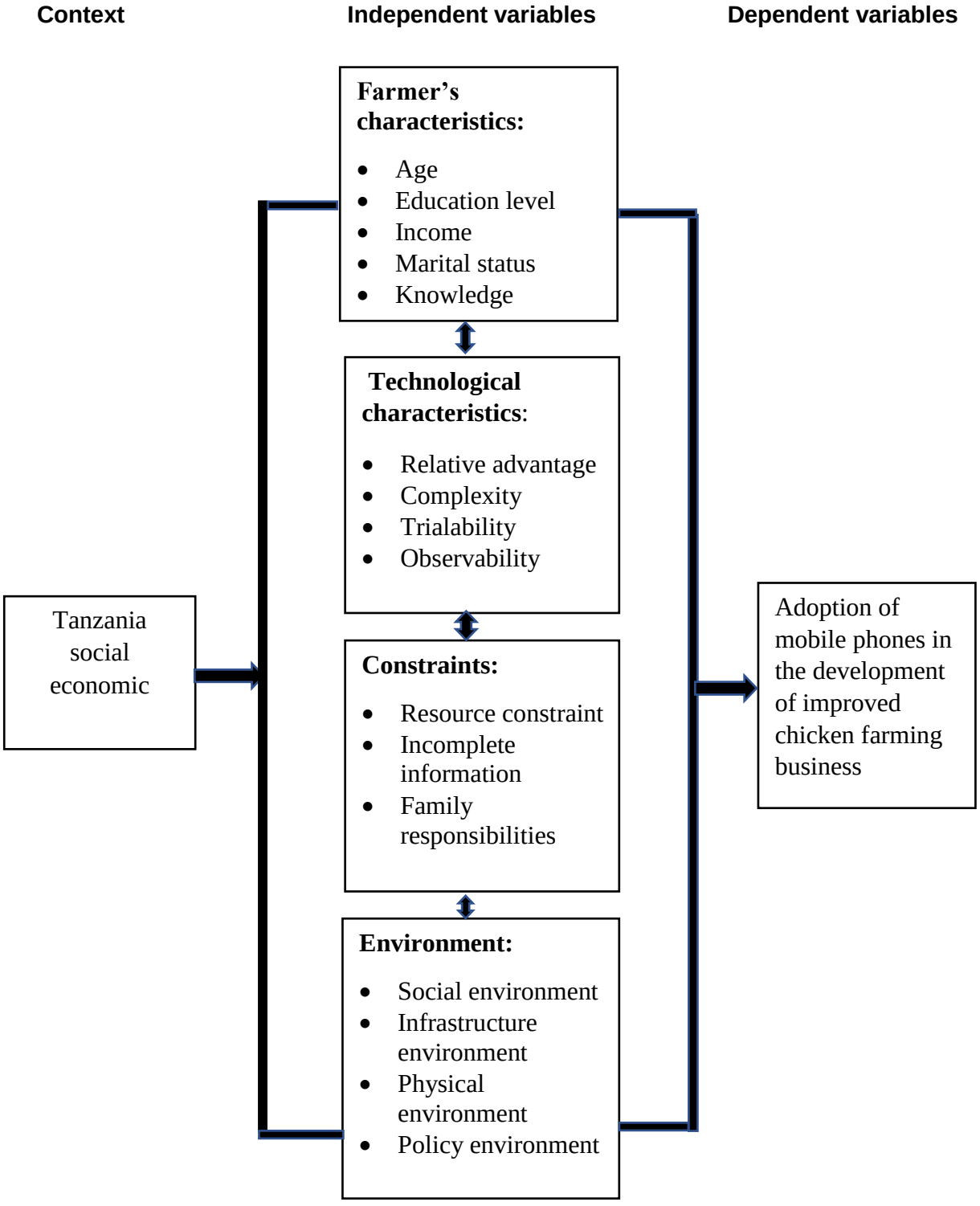
APPENDICES

Appendix 1: Summary of methodology

SN	Objectives	Types of data to be collected	Source of data	Method of data collection	Analysis
1	To assess socio-economic factors limiting women in using mobile phones to communicate improved chicken farming business information in the study area.	-Age. -Marital status. -Income. -Education level. -Family size. -Farm size.	-120 Women Improved chicken farmers.	-Questionnaire	Descriptive statistics on frequency, percentage and multiple regression model. (SPSS Version 20).
2	To determine the accessibility of mobile phones for use by women in communicating information on improved chicken farming business in the study area.	-Ownership of mobile phone. -Availability of network. -Information flow. -Availability of airtime. -Capability to buy airtime.	-120 Women Improved chicken farmers. -15 FGD's -18 KI's	-Questionnaire -Interview guide -Focus Group Discussion checklist	Content analysis of qualitative data.
3	To determine the extent of mobile phone usage by women in communicating information on improved chicken farming business in the study area	-Frequency of using mobile phone. -Experience of using mobile phone. -Benefit of using mobile phones. -Difficulties of using mobile phones.	-120 Women Improved chicken farmers. -15 FGD's	-Interview guide -Focus Group Discussion checklist	Content /Thematic analysis -SPSS
4	To identify type of information improved chicken farmers, seek through mobile phones along the value chain in the study area.	-Market -Price Feeds. -Access to financial institutions. -Transport. -Extension services. -Veterinary services.	-120 Women Improved chicken farmers.	-Questionnaire	Descriptive statistics on frequency, percentage, (SPSS Version 20)

Appendix 2: Conceptual Framework of the Role of Mobile Phones in the Development of Improved Chicken Farming Business by Women



Appendix 3: A Questionnaire for Women Improved Chicken Farmers

Research title: The Role of Mobile Phones in the Development of Improved Chicken Farming Business by Women in Misungwi District, Mwanza.

Questionnaire for women improved chicken farmers.

Dear respondent,
I am a student pursuing Master of Science in Agricultural Extension (MSc.) in the Department of Agricultural Extension and Community Development at Sokoine University of Agriculture, Morogoro, Tanzania. Currently, I am collecting data for my study titled "***Role of Mobile Phones in the Development of Improved Chicken Farming Business by Women in Misungwi District, Mwanza Region*"**. Therefore, I humbly ask you to participate in this study by providing me with the information needed through the questionnaire. The information provided will be treated with great care and confidentiality. The exercise will take not more than 30 minutes of your time.

Respondent's Questionnaire

1. Division…….
2. Ward…….
3. Village……

SECTION A: Socio-economic factors influencing women in using mobile phones to communicate improved chicken farming business information.

1. Respondent's age (Tick√)
   i. 18 – 28 [ ]
   ii. 29- 39 [ ]
   iii. 40- 50 [ ]
   iv. 51- 61 [ ]
   v. 62 and above [ ]
2. Respondent's marital status (Tick√)
   i. Single [ ]
   ii. Married [ ]
   iii. Separated [ ]
   iv. Divorced [ ]
   v. Living with a significant other [ ]
3. Respondent's level of education (Tick√)
   i. Non formal education [ ]
   ii. Primary education [ ]
   iii. Secondary education [ ]
   iv. Collage/ tertiary education [ ]
   v. Other (Specify)……
4. Respondent's occupation (Tick√ all applicable)
   i. Farmer [ ]
   ii. Livestock keeper [ ]
   iii. Public servant [ ]
   iv. Petty business [ ]
   v. All of the above [ ]
   vi. Other (Specify)……..

5. Respondent's source of income? (Tick√)
   i. Salaried [ ]
   ii. Agriculture [ ]
   iii. Livestock [ ]
   iv. Business [ ]
   v. Casual labor [ ]
   vi. Other (specify)……
6. Number of improved chickens kept by the respondent? (Tick√)
   i. 50- 100 [ ]
   ii. 101- 151 [ ]
   iii. 152- 202 [ ]
   iv. 203- 253 [ ]
   v. Other (specify)…….
7. Respondent's source of knowledge for farming improved chicken? (Tick√)
   i. Home based [ ]
   ii. Neighbor [ ]
   iii. Reading written materials [ ]
   iv. Seminar attending [ ]
   v. Attending a course at Livestock/Agricultural institute [ ]
   vi. Extension officer [ ]
   vii. Other (Specify)……
8. For how long have you been involved in improved chicken farming business? (Tick√)
   i. Less than 2 years [ ]
   ii. 3 to 5 years [ ]
   iii. 6 to 10 years [ ]
   iv. Above 10 years [ ]

Other (Specify)…… .

9. What is the size of your family? (Tick√).
   a. 1-5 people [ ]
   b. 6-10 people [ ]
   c. 11-15 people [ ]
   d. Other (Specify)……..
10. How does your family limit your improved chicken farming business?
   a. Below 20% [ ]
   b. 40% [ ]
   c. 60% [ ]
   d. 80% [ ]
   e. 100% [ ]
11. What family responsibilities limit you to use mobile phones to communicate improved chicken farming business?

Tick in the appropriate box for your response.

ITEM	MAGNITUDE				
i. Rearing children	Major	Constraints	Somehow	Not at all	Don't know
ii. House cleaning	Major	Constraints	Somehow	Not at all	Don't know
iii. Agricultural activities	Major	Constraints	Somehow	Not at all	Don't know
iv. Food cooking	Major	Constraints	Somehow	Not at all	Don't know

v. Animal Keeping	Major	Constraints	Somehow	Not at all	Don't know

12. What amount of money do you use per day to buy airtime for your improved chicken farming business?
    a. 500/= Tsh
    b. 1000/=Tsh
    c. 2000/=Tsh
    d. 5000 and above.

13. What challenges do you face in your improved chicken farming business with regardsto mobile phone network?

……
……

SECTION B: The accessibility of mobile phone for use by women in communicating information on improved chicken farming business in the study area.

1. Do you have mobile phone? (Tick√)
   i. Yes [ ]
   ii. No [ ]
2. If yes from the question above what is the mobile network do you use? (Tick√)
   i. Tigo [ ]
   ii. Airtel [ ]
   iii. Vodacom [ ]
   iv. Halotel [ ]
   v. TTCL [ ]
   vi. Combination of the above [ ]
   vii. All of the above [ ]
   viii. Other (Specify)……
3. What types of mobile phone do you have?
   i. Non-Smart phone [ ]
   ii. Smart phone [ ]
4. Do you know how to use mobile phone in seeking information related to your business? (Tick√)
   i. Yes [ ]
   ii. No [ ]
5. If Yes (from the question above), what type of information do you seek related to your business? (Tick√)
   i. Improved chicken chicks [ ]
   ii. Extension services [ ]
   iii. Feeds [ ]
   iv. Market [ ]
   v. Transportation [ ]
   vi. Veterinary services [ ]
   vii. Financial institutions eg SACCOS, VICOBA etc [ ]
   viii. All of the above [ ]
6. If No from the question four give reason

   ……
   ……

7. For how long have you been using mobile phone to seek information related to improved chicken farming business? (Tick√).
   i. Less than 2 years [ ]
   ii. 2 to 5 years [ ]
   iii. 6 to 10 years [ ]
   iv. Above 10 years [ ]
   v. Other (Specify)……..
8. Importance of using mobile phone for seeking information about improved chicken farming business? (Tick all applicable)
   i. (1=most important)
   ii. (2=Very important)
   iii. (3 = important)
   iv. (4 =somehow important)
   v. (5 = least important)
9. To what extent are the constraints you have encountered in using mobile phones for seeking information related to improved chicken farming business?
   i. (1 =major constraints)
   ii. (2=constraint)
   iii. (3 =somewhat a constraints)
   iv. (4=Not constraint)
   v. (5=don't know)
10. Based on your answer on the above question how did you solve them?
   i. …….
   ii. …….
   iii. ……
   iv. …….
   v. …….

SECTION C: The extent of mobile phone usage by women in communicating information on improved chicken farming business in the study area.

1.How many times per day do you use mobile phones to access information on improved chicken farming business? (Tick√).
   i. Less than 1 times per day [ ]
   ii. 2 to 3 times per day [ ]
   iii. 4 to 7 times per day [ ]
   iv. More than 7 times per day [ ]
2. How many times per day do you use mobile phones to receive information about improved chicken farming business? (Tick√).
   i. Less than 1 times per day [ ]
   ii. 2 to 3 times per day [ ]
   iii. 4 to 7 times per day [ ]
   iv. More than 7 times per day [ ]
3.Who do you frequently call in a day for your business? (Tick√)
   i. Extension officers.
   ii. Feed companies.
   iii. Transporters.
   iv. Financial institutions.
   v. Veterinary services.

4.From who do you frequently receive calls in a day for your business?

i. Extension officers.
ii. Feed companies.
iii. Transporters.
iv. Financial institutions.
v. Veterinary services.

SECTION D: Type of information improved chicken farmers seek through mobile phones along the value chain.

What type of information do you seek related to improved chicken farming business on the following?

1. Improved chicken chicks (Tick√).
   a. Cost for purchase 1 day old chicks [ ]
   b. Types of vaccine required for chicks [ ]
   c. Amount of feed (in grams) required for chicks per day [ ]
   d. Others (Specify)……
2. Feeds (Tick√).
   a. Types of feed required for all stages of rearing improved chicken [ ]
   b. Composition of feed required for improved chicken [ ]
   c. Amount of feed (in kg) required for feeding in all stages [ ]
   d. Price of feeds [ ]
   e. All above [ ]
3. Market (Tick√).
   a) Price of eggs [ ]
   b) Price of live chicken selling [ ]
   c) Price of chicken meat [ ]
   d) Transportation cost [ ]
   e) Where to get the market [ ]
4. Transportation (Tick√).
   a) Transportation of chicks [ ]
   b) Transportation of animal medication [ ]
   c) Transportation of feeds [ ]
   d) Transportation of chicken meat [ ]
   e) Transportation of chicken eggs [ ]
   f) All of the above [ ]
5. Extension services (Tick√).
   a) Building of proper housing [ ]
   b) Space requirement for keeping improved chicken. [ ]
   c) Farm management [ ]
   d) Farm records keeping [ ]
   e) Market identification [ ]
   f) All of the above [ ]
   g) Others please specify……
6. Veterinary services (Tick√).
   a) Types of vaccination required for improved chicken [ ]
   b) Time regime for each vaccine required for improved chicken [ ]
   c) Treatment of sick chicken [ ]
   d) All of the above [ ]
   e) Others please (Specify)……..

7. Financial institutions eg SACCOS, VICOBA etc (Tick√).
   a) Loans credit and repayment [ ]
   b) Conditions for getting loans [ ]
   c) Membership for financial institution [ ]
   d) All of the above [ ]
   e) Others (Specify)…….

THANK YOU FOR YOUR TIME.

Appendix 4: A Checklist for Key Informant Interview

Iddi, Hadija. (MSc-Agricultural Extension)
Research title: The role of mobile phones in the development of improved chicken farming business by women in Misungwi District, Mwanza Region.

SECTION A: Socio-economic factors influencing women in using mobile phones to communicate improved chicken farming business information.

1. How long have you been working with women engaged in improved chicken keeping in this area?
2. What is your position and roles with regard to improved chicken farming business in your area?
3. Based on your communication with improved chicken women farmers, what are the socio-economic factors which limit them to use mobile phones tin communicating about their business information?
4. What measures have you taken to help them improve their improved chicken farming business in your area?

SECTION B: The accessibility of mobile phone for use by women in communicating information on improved chicken farming business in the study area.

1. From your experience what do you think is affecting the usage of mobile phones by women engaged in improved chicken farming business in your area?
2.

SECTION C: The extent of mobile phone usage by women in communicating information on improved chicken farming business in the study area.

1. What is the extent of mobile phone usage by women who keep improved chicken?
2. How many times in a week do you communicate with women improved chicken keepers?

SECTION D: Type of information improved chicken farmers seek through mobile phones along the value chain.

1. According to your experience, what are the major information do women require in improved chicken keeping?
2. What do you consider to be the challenges that women engaged in improved chicken farming business face in acquisition of information needed?
3. What is your suggestions on types of information that women need in improved chicken keeping in improving their improved chicken farming business?

THANK YOU FOR YOUR TIME

Appendix 5: **Focus group discussion checklist**

Research title: The role of mobile phones in the development of improved chicken farming business by women in Misungwi District, Mwanza Region.

Checklist for Focus group discussion with women improved chicken farmers.

SECTION A: Socio-economic factors influencing women in using mobile phones to communicate improved chicken farming business information

1. How do you consider your business as a whole?
2. What is the contribution of your family to your business?
3. What kind of help do you get from your family member in keeping improved chicken?
4. How does the financial institutions (eg. VICOBA and SACCOS) contribute to the development of improved chicken farming business?
5. What are the factors influencing the use mobile phones in improved chicken farming business?

SECTION B: The accessibility of mobile phone for use by women in communicating information on improved chicken farming business in the study area.

1. What kind of extension service do you access by using mobile phones?

SECTION C: The extent of mobile phone usage by women in communicating information on improved chicken farming business in the study area.

1. What do you think is the extent of mobile phones usage in your business?
2. Which mobile phones companies do you most work with in your business?
3. What are the advantages of using mobile phones to communicate with various stakeholders in your improved chicken farming business?

SECTION D: Type of information improved chicken farmers seek through mobile phones along the value chain.

1. To what extent are the types of information on improved chicken sought through mobile phones added value to your business?
2. How often do you get information through mobile phones on your improved chicken farming business?

THANK YOU FOR COOPERATION

Appendix 6: Permit for conducting research in Tanzania

CLEARANCE PERMIT FOR CONDUCTING RESEARCH IN TANZANIA

UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY.

SOKOINE UNIVERSITY OF AGRICULTURE
OFFICE OF THE VICE-CHANCELLOR

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Please refer to:
Our Ref: SUA/ADM/R.1/8/867 **Date:** 27th April, 2022

Permanent Secretary,
President's Office,
Regional Administration and Local Government,
P.O. Box 1923, Mji wa Serikali,
41185 DODOMA.
Email: ps@tamisemi.go.tz

RE: UNIVERSITY STAFF, STUDENTS AND RESEARCHERS CLEARANCE

The Sokoine University of Agriculture was established by University Act No. 7 of 2005 and SUA Charter, 2007 which became operational on 1st January 2007 repealing Act No. 6 of 1984. One of the mission objectives of the University is to generate and apply knowledge through research. For this reason the staff and researchers undertake research activities from time to time.

2. To facilitate the research function, the Vice Chancellor of the Sokoine University of Agriculture (SUA) is empowered to issue research clearance to staff, students, research associate and researchers of SUA on behalf of the Tanzania Commission for Science and Technology.

3. The purpose of this letter is to introduce to you **Ms. Hadija Iddi** a bonafide **MSc. (Agricultural Extension)** student with Registration number **MEE/D/2020/0004** of SUA. By this letter **Ms. Hadija Iddi** has been granted clearance to conduct research in the country. The title of the research in question is "**THE ROLE OF MOBILE PHONES IN THE DEVELOPMENT OF IMPROVED CHICKEN FARMING BUSINESS BY WOMEN IN MISUNGWI DISTRICT, TANZANIA".**

CLEARANCE PERMIT FOR CONDUCTING RESEARCH IN TANZANIA

4. The period for which this permission has been granted is from **May, 2022** to **July, 2022**. The research will be conducted in **Mwanza Region**.

5. Should some of these areas/institutions/offices be restricted, you are requested to kindly advice the researcher(s) on alternative areas/institutions/ offices which could be visited. In case you may require further information on the researcher please contact me.

6. We thank you in advance for your cooperation and facilitation of this research activity.

Yours sincerely,

Prof. J.S. Kabote
FOR: VICE-CHANCELLOR

c.c. Director, DPRTC, SUA. - To note in file.
c.c. Student – **Ms. Hadija Iddi**

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