

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

DEPARTMENT OF AGRICULTURAL ECONOMICS, EDUCATION AND EXTENSION

**AN ASSESSMENT OF THE UTILISATION OF MOBILE PHONES IN THE
AGRICULTURAL SECTOR BY SMALLHOLDER FARMERS IN BIRCHENOUGH
BRIDGE WARD 33, BUHERA SOUTH DISTRICT IN MANICALAND PROVINCE
ZIMBABWE.**



BY

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS OF A BACHELOR OF AGRICULTURAL SCIENCE HONOURS
DEGREE IN AGRICULTURAL ECONOMICS AND MANAGEMENT**

JUNE 2024

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DEDICATION

This study is dedicated to my parents who encouraged and had prayers for me to succeed in my studies.

ACKNOWLEDGMENTS

Completing this dissertation would not have been possible without the inevitable support of different people. Furthermore, my greatest gratitude goes to my project supervisor. I always remember him for his guidance, counselling, assistance, motivation, and supportive role in directing me throughout the project. He mentored and equipped me with relevant academic knowledge. Also, I would like to thank the Ministry of Agriculture, AGRITEX department in Birchenough Bridge for permitting me to survey Birchenough Bridge Ward 33.

I would like to give a round of applause to (BUSE) lecturers especially those in the Department of Agricultural Economics & Extension Studies for their professional and academic assistance throughout the research study.

I would also like to express my sincere gratitude to my parents and husband Prosper Munjanja for financial and moral support. I thank him.

My grateful thanks to my child Tawananyasha who remained supportive and endured loneliness when I was carrying out this research study. Last but not least, many thanks to my family members and friends who encouraged and supported me in carrying out the research study. Above all, I thank the almighty for this blessed life.

ABSTRACT

This study assess the utilisation of mobile phones in the agriculture sector by smallholder farmers in Birchenough Bridge Ward 33, Buhera South, Zimbabwe. Descriptive statistics were used to establish mobile phone platforms used by smallholder farmers. Likert scale examines the frequency of mobile phone use in agriculture and binary logistic regression determines factors influencing mobile phone use in agriculture. Data was collected from 60 respondents using a structured questionnaire.

The survey data shows that 58.3 % of the respondents use mobile phones in agriculture and 41.7% never used mobile phones in agriculture. The study found that many smallholder farmers use WhatsApp and they use it more frequently than other mobile apps in agriculture however other apps were never used for example Esoko, Kurima Mari, and Seedney. # Kashagi is a mobile banking platform used by many respondents in the study and they use it more frequently than other platforms such as CBZ and Steward Bank, respondents showed that they had never used First Capital Bank to access mobile banking services. Econet is the mobile network used by many respondents in the study and they use it more frequently than other mobile networks like Telecel and Netone. Many respondents use Ecocash, Onemoney, and Telecash in agriculture. Ecocash is the most frequent use by respondents in agriculture.

The relationship between mobile phone use and factors influencing mobile phone use on age, education level, gender, marital status, and household head was examined. Results show that the independent variables fit well in the model with a Chi-square of 5.759 and sig of 0.674. Age, marital status, and educational level were statistically significant factors affecting mobile phone use in agriculture. The results showed a moderate use of mobile phones, however, there is a need for strategies to improve the use of mobile phones in agriculture. The study recommends increasing user support, by training farmers on how to use mobile phones in agriculture and using platforms that are more flexible for farmers for example WhatsApp. The government should partner with telecommunication network providers to ensure the network is available and reduce bundle prices to promote agriculture through mobile phone use in Zimbabwe.

Keywords: Smallholder farmers, agricultural sector, and mobile phones.

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LIST OF ACCRONYMS/ ABBREVIATIONS

GDP- Gross Domestic Product

CBZ- Commercial Bank of Zimbabwe

MFS- Mobile Financial Services

SPSS- Statistical Package of Social Statistics

MNO- Mobile Network Operator

LFSP- Livelihood and Food Security Program

SMS – Short message service

ATM- Automated Teller Machine

USD- United State Dollar

SeedCo- Seed Company

CHAPTER 1: INTRODUCTION

1.1 Background of the study

Farmers have historically relied on local channels for information sharing. For instance, they would talk among themselves and attempt to solve problems through trial and error, which led to losses. The introduction of mobile phones has shown to be revolutionary, offering many ways for knowledge and information sharing in agriculture (Rajender, 2023). Both rural and urban populations have embraced mobile phones in agriculture to stay informed about weather and markets (Mbiti, 2010). Farmers with access to essential resources such as information, appropriate technology, suitable markets, suitable credits, fair prices, and insurance are more likely to be more productive and raise their overall output (Bagazonzya, 2012). Smallholder farmers with limited access to the abovementioned elements will likely be underproductive (Musango, 2016). Most smallholder farmers are less productive and profitable than they could be viewed (Brugger, 2011). Hence farmers need to have access to agriculture information if improvement in the agricultural sector is to be realised.

Mobile phones are the best hope to enhance the agricultural sector viewed by (Nyamba, 2012). According to (Mbiti, 2010), mobile phones are transforming the agro-based environment by connecting farmers, agricultural workers, and rural communities, to access information, markets, and services. They provide new ways through which extension agents can reach farmers in rural areas that have in the past been very difficult to conduct in developing nations like Zimbabwe viewed by (Haruna, 2013). Mobile phone services gather and disseminate agricultural knowledge on topics like post-harvest handling, weeding, thinning, storage, and agriculture techniques (Rajender, 2023).

Many apps can be downloaded on mobile phones, such as Seedco's new app, eHurudza, Eco farmer, eMKambo, and many others in Zimbabwe designed to provide agricultural extension services to farmers. Instagram, YouTube, Google Facebook, and Whatsapp are not specifically designed for farmers, however, they can be very useful for farmers to connect and other stakeholders in the agricultural sector viewed by (Ramavhale, 2024). They can even use platforms like YouTube and Google where farmers can find solutions to their farming problems through tutorial videos. Farmers can also use a mobile phone for mobile banking and some mobile money services.

1.2 Statement of the problem

The use of mobile phones has the potential to improve crop and animal production and increase income for smallholder farmers in Zimbabwe. Limited use of mobile phones to access agriculture information dissemination has worsened the provision of timely and relevant information to small-scale farmers in remote areas (Munyua, 2000).

Due to the widespread usage of Facebook and Whatsapp, mobile phones have become increasingly prevalent in the agriculture sector. A study done in the Svosve –Wenimbi Marondera district in Zimbabwe (Masuka, 2016) showed that 95.32% of farmers own mobile phones. With the sudden increase in the use of mobile phones around the world, a growing body of literature has identified these mobile phones as a solution to the problem of information asymmetry, among smallholder (Mehar, 2012). Although the number of mobile phone subscribers in Zimbabwe is increasing daily, and most rural households currently own mobile phones, the extent to which they utilise mobile phones for agriculture remains unexplored.

(Birchenough bridge zone Population Census, 2022), states that in Ward 33 there are 105 smallholder farmers hence the population expected to have mobile phones is 100 farmers. However, there is limited evidence on the extent to which mobile phones are being used for agricultural purposes. In addition, there may be barriers to the adoption of mobile phones for agriculture purposes, such as age, sex, educational level, household head, marital status, and lack of access to mobile phones, literacy, data bundles being expensive, and language barriers. The study therefore sought to assess the utilisation of mobile phones in the agricultural sector by smallholder farmers in Birchenough Bridge ward 33.

1.3 Research questions

1. What mobile phone platforms are being used by smallholder farmers for agricultural purposes?
2. How frequently are smallholder farmers using mobile phones agricultural purposes?
3. What factors are affecting the utilization of mobile phones for agriculture among smallholder farmers?

1.4 Objectives of the study

1.4.1 Main objective

The main objective of the study is to assess the utilization of mobile phones in the agricultural sector by smallholder farmers in Birchenough Bridge Ward 33.

1.4.2 Specific objectives

To:

1. Establish mobile phone platforms that are used by smallholder farmers in the agricultural sector.
2. Examine the frequency of use of mobile phones for agriculture.
3. Determine factors that affect the utilisation of mobile phones for agriculture.

1.5 Hypothesis

H1: Gender is not correlated to the use of mobile phones in agriculture.

H2: Age is not significantly related to mobile phone use in agriculture.

H3: Marital status does not significantly relate to mobile phone use in agriculture.

H4: Level of education does not relate to mobile phone use in agriculture.

H5: Household heads is not correlated to mobile phone use in agriculture.

1.6 Justification

The assessment of mobile phone use by smallholder farmers in agriculture is a crucial study that benefits various stakeholders. Study examine mobile phone use among smallholder farmers, providing insights to improve agriculture productivity and rural development through informed policy and practice.

This study contributes to the intersection of technology and agriculture, informing future research in the study. It also serves as a resource for students pursuing research in agriculture technology, development studies, or related fields, providing practical example of how mobile phones can be used to improve agriculture productivity. Farmers are helped to identify their current use of mobile phones in agriculture and also shed light on some platforms that they never used and the benefits of the platforms.

The study findings will inform policy decisions related to agricultural development, technology adoption, and rural development, enabling the government to design targeted interventions that promote the effective use of mobile phones among smallholder farmers. This study contributes to the growing literature on mobile phone use in agriculture, highlighting its potential to improve agricultural productivity, market access, and information dissemination among farmers. The factors influencing mobile phone use by farmers will provide an insight to the government, companies providing mobile phone services and policy makers to find solutions to allow high usage of mobile phones, will also inform the design and implementation of projects aimed at improving agricultural productivity, market access, and technology adoption among smallholder farmers.

1.7 Organization of the report

This dissertation report is organized into five chapters:

Chapter 1 covers the background and the introduction to the study. The problem statement, objectives research questions addressed are found in this chapter.

Chapter 2 provides the different literature associated with the utilization of mobile phones in the agricultural sector.

Chapter 3 summarises the research methodology used in the study and a review of the study area. It also highlights the design process, data collection method, target population, analysis, and data presentation method.

Chapter 4 presents the findings of the research, discussing the results of the literature in chapter 2. The results are presented according to the objectives of the study.

Chapter 5 consists of a summary of the study in conclusion and recommendations according to the objectives of the study. Areas of further research are proposed in this chapter.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This chapter explores what other literature has discovered on the utilisation of mobile phones in the agricultural sector by smallholder farmers. Literature on mobile phones begins with the definition of mobile phone, mobile money, and mobile banking. Overview of mobile phone use by smallholder farmers in Zimbabwe, mobile phone platforms for farmers in Zimbabwe, the frequency of use of mobile phones, and factors influencing utilization of mobile phones by smallholder farmers.

2.1 Definition of terms

Important terms to the study that are worth consideration are going to be defined to establish a strong background of the study.

2.1.1 Mobile phones

(Paiano, 2013) , a mobile phone is a personal device that enables users to make and receive calls, sending and receive messages, access the internet, and perform various tasks wirelessly. It performs various tasks wirelessly. It's an internet connected device that allows users to share and discuss user-generated information, such as multimedia, visual and audio content. Mobile phones offer a range of features, including SMS, voice messages, short video training, audio messages, and dialling short codes for services like mobile banking and mobile money. They also come with internet access, a camera, and the ability to run mobile applications. Mobile phones come in three basic categories, features, and smartphones, which have revolutionized communication and engagement among farmers across the country highlighted by (Rajender, 2023).

2.1.2 Mobile money

Mobile money refers to the ability to conduct financial transactions and access financial services using a mobile device, such as a mobile phone, to store, transfer, and withdraw money as well as pay bills and make purchases, all through convenient and secure mobile platform viewed by (Chibango, 2014). Zimbabwe has three mobile money platforms such as Ecocash, One money, and Telecash which are operated by the three mobile network operators (MNOs), namely Econet, Netone, and Telecel respectively viewed by (Torera, 2022). Telecommunication companies use their extensive network coverage to offer mobile money services through mobile phones at a lower cost. According to (Salleh, 2020) mobile money makes it possible to deposit, withdraw and transfer

money and pay bills. Mobile money transactions have been increasing for Zimbabwean SMEs, with payment for goods and services at 30%, and receiving and sending money at 29% viewed by (Trust, 2022). For example, Ecocash uses short codes such as *151# to send and receive money through mobile phones. A study by (Parlasca, 2022) viewed that 15% of the surveyed respondents use mobile money for agriculture-related payments, and 1% use it for accessing mobile loans.

2.1.3 Mobile banking

Mobile banking is a convenient service offered by banks or other financial institutions that enables its customers to manage their accounts and conduct transactions remotely using a mobile device such as a mobile phone without the need to visit a bank or ATM viewed by (Tiwari, 2006). It uses software called an app provided by the financial institution for the purpose. “Econet mobile network subscribers will be able to open bank accounts through cell phones in a minute using a code *236# access urgent loan. Ecocash has reintroduced Kashagi loans in USD, reaffirming the country’s leading financial services platform’s commitment to providing accessible financial services to its customers. Kashagi, a quick access loan ranging from US\$5 to US\$50,” (NewsDay, 2024). Farmers can transfer funds from CBZ Bank, First Capital Bank, Steward Bank, and other bank platforms to other wallet accounts like Ecocash and Telecash from anywhere at any time, by simply dialling a code on their mobile phones. A study done by (Majoma, 2016) in Zimbabwe viewed that the most common use of mobile banking was receiving money (100%) and the least was paying bills 3% in agriculture.

2.2 Overview of mobile phone use by smallholder farmers in Zimbabwe.

(Kamara, 2019), viewed smallholder farmers as farmers who practice agricultural activities on a small piece of land of less than 2 hectares, this was supported by (FAO, 2012), smallholders are small-scale farmers who manage less than one hectare to 10 hectares. (Musingwini, 2018), viewed that smallholder farmers highly value mobile phones as quick and user friendly means of communication with various stakeholders in the agriculture value chain, enabling them to rapidly access information, seek advice, and receive timely solutions to the challenges they encounter, thereby enhancing their productivity and efficiency. (Surabhi, 2016), supported that mobile phones empower farmers with up to date market enables farmers to optimise their sales strategy, cutting down on unnecessary travel and time wastage. With real time pricing information, farmers can

make informed decisions about the best sale prices and locations for their products, leading to higher incomes and a more sustainable future, (Kamal, 2023).

A study conducted in the Midlands Province of Zimbabwe by (Musingwini, 2018), revealed that 50% of surveyed farmers use mobile phones to assist with farming. The farmers emphasized that mobile phone use has significantly improved their daily lives in agriculture. 100% of the surveyed households identified the lack of timely and relevant agricultural information, 90% has absence of market information as challenges they are facing. However, there is a slight decrease in mobile phone use in agriculture when compared with the study (Masuka, 2016) conducted in Zimbabwe, 51.1% made use of a range of mobile phone services, such as advisory services, weather data, mobile money transfers and access to market information on product and inputs. Farmers who use mobile phones can save time and money on transportation.

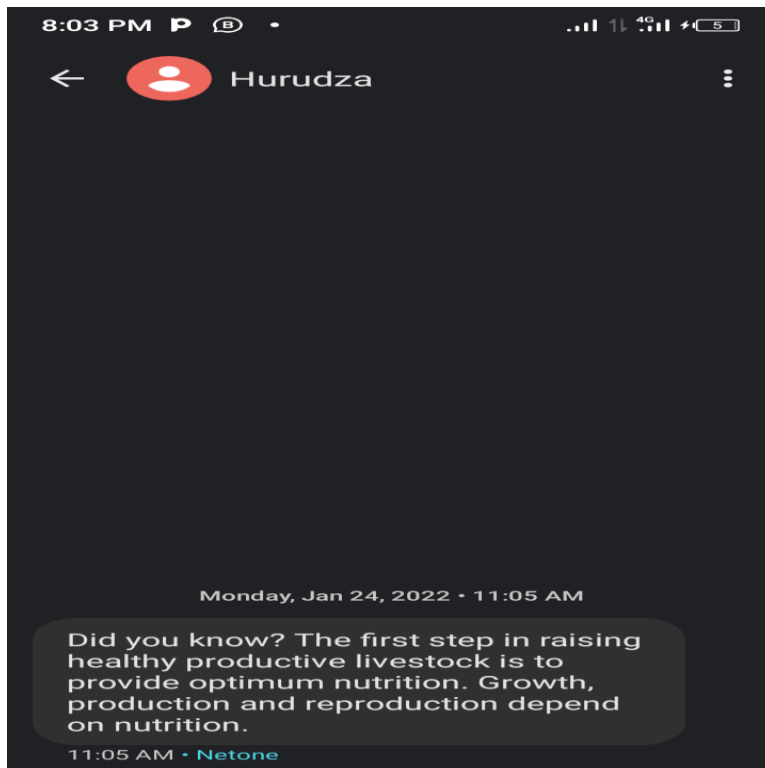
According to (Khou, 2018) , there is a growing trend of farmers' social media platforms, such as Facebook, Twitter, YouTube, and WhatsApp, to share agricultural information and best practices through mobile phone applications. In Zimbabwe, various mobile-based applications, including Esoko, Kurima Mari, EcoFarmer, eMKambo, and eHurudza viewed by (Musingwini, 2016), have been developed to support farmers. These applications enable farmers to access real-time market pricing information, saving time and travel, and empowering them to make informed decisions about where and at what price to sell their products, ultimately increasing their incomes and enhancing the sustainability of their livelihoods (Beuermann, 2012).

2.3 Mobile phone apps for farmers in Zimbabwe

(Mbiti, 2010), the utilisation of mobile apps in agriculture has the potential to bridge the information gap for smallholder farmers. In Zimbabwe a variety of mobile apps are available for farmers to access agricultural information, including Seedney, Kurima Mari, Esoko, eMKambo, Ecochat AI, eHurudza, Whatsapp, Youtube, Facebook, Instagram and EcoFarmer. These apps provide farmers with a convenient and accessible means of obtaining valuable agricultural information, enhancing their knowledge and productivity.

(Maponga, 2014), noted that eHurudza Africa introduced a mobile app designed for Zimbabwean farmers. This innovative app provides farmers with instant access to crucial information, including expert advice on fertilizer application and up-to-date market prices for their agricultural products. Notably, the app offers guidance in both Shona and English languages, making it a valuable

resource for farmers. As shown in the accompanying image, eHurudza sends informative messages to farmers, educating them on the best practices and supporting their success.



(Ehurudzaapp, 2022)

Figure 2.3 1 A picture of a message sent by eHurudza to a farmer

According to (Rabaya, 2023) , SeedCo launched the Seedney application in Zimbabwe to support farmers monitoring their crops and optimizing yields. The app offers a range of tools, including access to information on crop and animal production, testimonials from other farmers, and a calculator to determine optimal population density, row spacing, moisture content and expected yields. Additionally, Seedney provides guidance on pest and disease management for crops and animals, enabling farmers to take proactive measures to prevent harm. (Rabaya, 2023), Wendy Madzura said that “on the application, farmers can get information on the production of different crops and animals. They can get testimonials that summarize a wide range of activities that other farmers are doing in the country”.

EMKambo is a mobile application designed to support farmers by providing advisory services, including budgeting tools, news, market signals, and a platform for contributions and inquiries,

(eMKambo, 2016). The app offers real-time agricultural information and updates, empowering farmers with timely and relevant knowledge. However, it's important to note that this application is only accessible to farmers who actively participate in market sales, leaving those who don't engage in market sales without access to this crucial information.

Econet, Zimbabwe's leading mobile service provider, has launched EcoFarmer, a ground-breaking product designed to support smallholder farmers. EcoFarmer offers a comprehensive micro-insurance package that safeguards against crop failure, provides valuable farming tips, and delivers timely market information, empowering farmers to make informed decisions and mitigate risks, (Nyakanda, 2015). "Farmers are required to pay subscriptions of either \$2.50 or \$10 to be eligible for insurance cover" viewed by (Mthintwa, 2015), when fully registered farmers get daily weather reports, farming tips, market prices, and adverts and marketing links.

As noted by (Dauramanzi, 2023), Ecochat AI is an innovative artificial intelligence-powered chatbot that provides customers with instant and convenient access to a vast range of knowledge and information. This chatbot is capable of answering a wide range of questions, from general knowledge to specific queries. It is accessible to all Econet customers nationwide, regardless of their device type, basic or smartphone. Farmers can particularly benefit from this chatbot by seeking agricultural information and receiving timely responses to their questions, such as guidance on applying basal blend fertilizers to crops, thereby reducing the risk of incorrect application and crop damage.

Esoko is a mobile platform launched in Zimbabwe in 2012 that uses text messages SMS technology to provide access to market prices and weather updates. As of 2015, Esoko had reached a significant milestone, providing its services to over 170000 smallholder farmers, as reported (Mthintwa, 2015). This platform has played an important role in empowering farmers with timely and relevant information, enhancing their productivity and livelihoods. Esoko provides a simple but effective tool for businesses, projects, NGOs, and government to connect with farmers, sending information to farmers at a low cost via SMS, voice SMS, and a call centre (Mthintwa, 2015).

Kurima Mari is a Shona phrase translating to 'farming for money', was launched in Zimbabwe in 2015. This innovative platform, accessible on mobile phones is a collaborative effort between the Ministry of Agriculture Extension and the Zimbabwe Livelihoods and Food Security Program (LFSP). Kurima Mari specifically targets smallholder farmers, aiming to support and empower

them in their agricultural endeavours viewed by (Nyakudya, 2017). The app provides farmers with information on crops, livestock, nutrition, financial services, selling tips, and markets for buyers and sellers. The information provided can be read by many people in Zimbabwe as it will be available in different languages, English, Shona, and Ndebele. (Chaparadza, 2018)

According to (Rajender, 2023), farmers increasingly utilizing social media platforms such as WhatsApp, YouTube, Facebook, and Instagram to access vital agricultural information. These platforms are by farmers who recognize the potential of network technologies in enhancing their knowledge and understanding of modern agricultural practices. Through these platforms farmers can download tutorial videos, share short messages and videos and receive responses, thereby learning innovative methods to boost production and improve their agricultural skills. Social media has made farmers and their customers interact, besides receiving information and reaching out to extension officers, farmers can create videos about their farming activities on Youtube and Tiktok. Social media platforms overcome geographical boundaries making farmers share a common interest viewed by (Ramavhale, 2024).

However all these mobile phone apps are available for farmers to use but in some studies for example the study done (Musingwini, 2018) in Zimbabwe midlands province viewed that none of their respondents who were surveyed knew eMKambo and EcoFarmer apps.

2.4 Factors influencing utilization of mobile phones by smallholder farmers.

Factors influencing utilization of mobile phones comprise of social, economic, technological and political. (Masuka, 2016), analysed the factors influencing mobile phone use by small holder farmers in agriculture using logit regression, the factors include gender, level of education, marital status.

Gender plays a role, with female farmers being less likely to adopt and use mobile phones for agriculture updates, (Zheng, 2023), related results were reported by (Krell, 2021)) also viewed that men tend to use mobile phone in agriculture. Research by (Yassen, 2021)revealed notable difference between the ways in which men and women used mobile phone to obtain information in agriculture.

Age is also a factor, as young farmers are more likely to utilize mobile phones for agriculture information compared to older farmers (Islam, 2021). According to, (Rode, 2021) establish that

young people tend to adopt new technology with ease and have more positive outlook on it compared to aged people. Utilisation of mobile phones in agriculture decreases with age, with young farmers being more likely to adopt mobile technology (Rode, 2021). A study by (Masuka, 2016) viewed that young farmers use mobile phones in farming than older farmers ($p < 0.05$), innovations are most appreciated by the generations in which they are introduced. This is supported by a study (Nyagango, 2023) of older farmers had a limited usage of mobile phones.

Additionally, marital status has an impact, with married farmers being more likely to adopt and use mobile phones for agricultural purposes due to their willingness to embrace new technologies (Anang, 2019). A study by (Spencer, 2022), (Sennuga, 2020), has found that married farmers are more likely to share mobile phone usage in agriculture, have similar intentions to use mobile phones, and are more willing to adopt and use mobile phones in agriculture.

(Nyagango, 2023) education level, ranging from primary, secondary, and tertiary plays a crucial role in an individual's ability to adapt to innovations, including the use of mobile phones for accessing agricultural information. The education level of stakeholders can either positively or negatively influence the acceptance of new technologies, with higher education levels fostering a more optimistic outlook and lower education levels leading to a more pessimistic view. Research has shown that higher education levels increase an individual's openness to innovation and change, leading to greater adoption rates. Furthermore, education level significantly impacts one's understanding, adoption, and access to new farming practices. As noted (Mwalupaso, 2019) there are positive correlation between education level and the use of mobile phones for accessing agricultural information, highlighting the importance of education in promoting digital agriculture and improving agricultural productivity.

These findings highlight the importance of considering socio-demographic factors in promoting digital agriculture and ensuring equal access to information for all farmers.

(Kaseke, 2017), viewed that majority of household heads (90%) of made use of mobile phones for agriculture purposes. A study done by (Rajkhowa, 2022), shows that there is a positive relationship between mobile phone use and female household head. Female-headed families are usually disadvantaged in different ways such as women are discouraged in their movements and have fewer outside ways to access information than men.

2.5 Frequency use of mobile phones in the agriculture sector

The frequency of use of mobile phones in the agricultural sector varies, with high-frequency use (daily or weekly) for accessing weather forecasts and market prices, receiving agricultural tips and advice, sharing knowledge and experiences with other farmers, and accessing extension services and support. Low-frequency use is observed for researching new technologies and innovations, accessing financial services and loans, and marketing and selling products. A study in North Harayna viewed farmers frequently use WhatsApp and YouTube to access the required information (Rajender, 2023)).

2.6 Empirical Evidence

(Krell, 2021), a survey of 577 farming households in central Kenya, 98 % of the respondents own mobile phones and approximately 25% use it to access information about agriculture. This study shows a decrease in mobile phone use by smallholder farmers compared to the 50% households who were found using mobile phone s in agriculture by (Musingwini, 2018)

Evidence on mobile financial services (MFS) for agricultural activities is limited. To address this gap we use nationally represented data from Kenya to examine the use of mobile payments, mobile savings and mobile credits among farmers. It is found that 80 % of farmers use mobile money but only 15% use it for agriculture-related payments. The use of mobile loans for agricultural investments is even lower at less than 1%. These findings show that there is still a gap in the use of MFS for agricultural activities in Kenya viewed by (Parlasca, 2022)

(Alex, 2023), used binary logistic regression model to explore demographic factors such as age, marital status and education that influence mobile phone use in agriculture and their relationship were statistically significant.

There is a scarcity of empirical evidence on the use of mobile phones by smallscale farmers in Zimbabwe for agriculture purposes. The researcher on which this study is based aimed to contribute to filling the knowledge gap by investigating the use of mobile phones among smallholder for agriculture purpose in Birchenough Bridge, Buhera District, in Manicaland Province.

CHAPTER 3: METHODOLOGY

3.0 Introduction

The aim of this chapter is to develop the methodology framework to be used for the study in relation to literature available in Chapter two. Firstly, the chapter describes the study site followed by research design, how data was collected and analytic tools per each objective.

3.1 Description of the Study Area

The study was conducted in Manicaland province in Buhera south district, Birchenough Bridge Ward 33. Natural region 4, which includes Buhera South District with summer temperatures between 30-40 degrees celcius and midwinter temperatures between 6-25 degrees celcius with a mean yearly temperature of 22 degrees celcius. Although the region frequently faces seasonal droughts and severe dry spells during the rainy season, most smallholder farmers in Ward 33 irrigate their crops using water from Ruti dam in Buhera, with some also receiving rainwater viewed by (Lloyd Pisa, 2021).

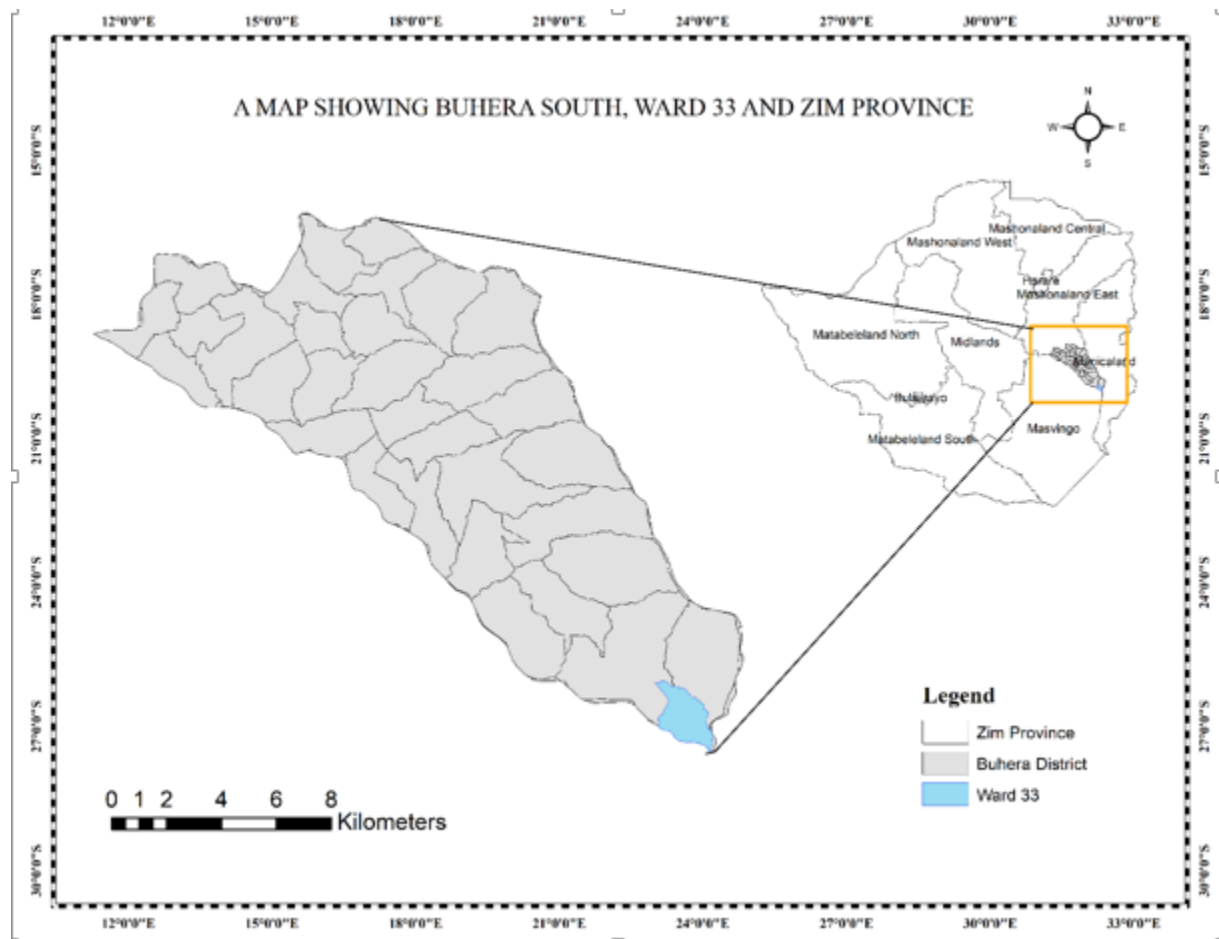


Figure 3.1 1 Map showing study area Buhera South District Ward 33

Source: Survey 2024

3.2 Research design

This study used a cross-sectional research design which involves the collection of data at a single point in time with the presence of one or more variables such as farmers have mobile phones. It was used in the descriptive study for the determination of the relationship of variables.

Data were collected on the extent to which smallholder farmers are using mobile phones in the agriculture sector, mobile phone platforms they have used for agriculture, frequency use of mobile phones in agriculture, and variables influencing utilization of mobile phones by smallholder farmers. The study utilised a mixed-method approach, combining qualitative and quantitative techniques for data collection and analysis. A survey was conducted using a questionnaire as the primary tool of gathering and collecting data. The questionnaire was designed to show both numerical and descriptive responses.

The research was based on primary data. Purposive and random sampling were employed in the study. The study selects farmers with mobile phones and small piece of land of below 2 hectares. Ward 33 comprised 105 smallholder farmers that made up the study sample.

The sample size required for the study was estimated using Slovin's formula as formulated by Barlett et.al (2000).

Where $n = N / (1 + Ne^2)$

n = is the desired sample size, N = population of the study

e = is the confidence interval of the study.

$$n = 105 / (1 + 105 (0, 05)^2)$$

$$n = 83$$

Therefore, the sample size of 83 respondents was selected from the total population of 105 smallholder farmers in ward 33 Birchenough Bridge, sampling was then employed for the selection of participants which are readily and easily available. As a result, 62 respondents were selected for data collection.

It is appropriate to have a sample size of between 30 to 500 people so that generalisations about the research region can be established (Roscoe, 1975). Convenience sampling was chosen by the researcher because it offers a high likelihood of selecting people who have highly relevant data for the study.

Prior to conducting the survey, ten farmers in Birchenough Bridge Ward 33 were used for pre-testing the questionnaire. Any unclear questions were then rephrased. The Ministry of Agriculture also gave the researcher authorization to distribute the questionnaire. Due to limited funding available for printing the questionnaires, 62 farmers were questioned. Sixty of the 62 questionnaires that were administered were returned, yielding a 98% questionnaire rate hence a higher percentage. During the survey, semi-structured questionnaires were utilised in order to utilise both qualitative and quantitative data. A formal, standardised set of questions intended to gather information from a subset of respondents is a questionnaire (Sear, 2015).

Farmers were informed of the objectives and the importance of the study. The composition of the survey questionnaire included both closed and open-ended questions. Open-ended questions gave the respondents more freedom to respond, on the other hand, the closed-ended questions were easy to answer.

3.3 Data analysis

Based on the results of the study, content analysis was used to analyse the qualitative data that was gathered, while Microsoft Excel and Statistical Package of Social Statistics (SPSS) Program Version 20 were used to analyse qualitative data based on the study objectives.

3.3.1 Analytical tool

Table 3.3 1Summary of objectives, research questions and analytic tools

Objectives	Research questions	Analytical tool
To establish mobile phone platforms that are used by smallholder farmers in the agricultural sector.	What mobile phone platforms are being used by smallholder farmers for agricultural purposes?	Descriptive statistics. Tables, graphs, pie charts

To examine the frequency, and use of mobile phones for agriculture.	How frequently are smallholder farmers using mobile phones for agricultural purposes?	Likert scale
To determine factors that affect utilisation of mobile phones for agriculture	What factors are affecting the utilization of mobile phones for agriculture among smallholder farmers?	Binary logistic regression

Table 3.3 2 Likert Scale interpretations and mean range

Mean range	Interpretation
1.00 to 1.79	Never used
1.80 to 2.59	rarely used
2.60 to 3.39	Occasionally used
3.40 to 4.19	frequently used
4.20 to above	Always

Published by (Syeda Shazmina Fayyaz, 2022)

3.3.3 Binary logistic regression model

To determine the factors influencing mobile phone use in agriculture by smallholder farmers in Birchenough Bridge, binary logit was adopted because the dependent variable is dichotomous. Respondents were asked whether they have used mobile phones in agriculture and their responses were coded as 1 (yes) and 0 (no). The binary logit is used to analyse the third objective of the study. (Banerjee, 2008) , viewed that the binary logit equation according to (Greene, 2003) is written as $\Pr(Y=1) = \frac{e^{\beta x}}{1 + e^{\beta x}}$

With the cumulative distribution function given by;

$$F(\beta_1 x) = 1 / (1 + e^{\beta x})$$

Where β represents the vector of the parameters associated with the factors X .

Where Y_j = probability of mobile phone use in agriculture.

X_{ij} = independent variables

β_1 = is the vector of coefficients influencing mobile phone use in agriculture.

$$Y_i = \beta_0 + \beta_1 X_1 - \beta_2 X_2 + \beta_3 X_3 - \beta_4 X_4 + \beta_5 X_5 + e_i$$

Y_i = mobile phone use in agriculture.

β_0 = intercept

X_1 = age

X_2 = educational level

X_3 = gender

X_4 = marital status

X_5 = household head

E = error term

Variable contents

Table 3.3 3 Variable Content

variable	Description
(Y) Mobile phone use Dependent variable	Y (1) if farmers utilise mobile phone and (0) otherwise
Household head	Dummy variable
Marital status	Dummy variable
Age	Dummy variable

Education level attained	Dummy variable
Not educated	
Primary	
Secondary tertiary	
Gender	Dummy variable
Female	
male	

Some factors may not be statically significant but in this area, they still influence mobile phone use in agriculture. For instance, the researcher expects a positive relationship between mobile phone use in agriculture and the identified independent variables.

CHAPTER 4: RESULT PRESENTATION AND DISCUSSION

4.0 Introduction

In this chapter, the researcher presents the results of the analysis of the empirical data collected from Birchenough Bridge Ward 33. The presentation begins with a general description of the data based on the respondent's demographic information and proceeds by logically presenting the findings in response to the research questions.

4.1 Demographic information

The demographic information gender, age, educational level, and marital status and how they relate to mobile phone use in agriculture was presented using cross-tabulation.

4.1.1 Gender and highest education attained cross-tabulation

The results show that among male households the majority (41) have attained primary education (16) followed by not educated (15), tertiary, and secondary (5). In contrast, females are more evenly distributed across education levels, with a slight majority having attained primary and secondary (5), and 6 are not educated. Notably, more males have attained primary school, and more females are not educated.

Table 4.1 1 Gender and highest education attained cross tabulation

Gender	Not educated	Primary level	secondary	Tertiary	Total
male	15	16	5	5	41
female	6	5	5	3	19
total	21	21	10	8	60

SOURCE: Survey data

4.1.2 Gender of household and household age Cross tabulation

The data below shows the distribution of gender and age of households. Among male the majority fall within the range 35-44 with (16) and 25-34 with 9. Females are also concentrated in the 25-34 with (8) and 4 in 35-44 years. The 55-64 age group has a relatively equal representation among both female and male, while 65+ age group is predominantly male (5) compared to female (1). These findings show that the majority of household gender are between 35-44 years and 25-34.

Table 4.1 2 Gender of Household and Household age Cross tabulation

Gender	25-34 years	35-44 years	45-54 years	55-64years	65+	Total
male	9	16	5	6	5	41
female	8	4	1	5	1	19
total	17	20	6	11	6	60

SOURCE: Survey data

4.1.3 Marital status and highest education attained cross-tabulation

The tables below show marital status and highest education attained. The study shows that many respondents are married (43) and have the highest number of people who are not educated.

Table 4.1 3 Marital status and educational level cross tabulation

Marital status	Not educated	Primary level	Secondary level	Tertiary level	Total
single	1	1	1	1	4
married	15	14	7	7	43
Divorced	1	3	1	0	5
Widow/widowed	4	3	1	0	8
total	21	21	10	8	60

SOURCE: Survey data

4.1.4 Marital status and household age Cross tabulation

Results shown on the table below shows marital status and age of the respondents. Many respondents are married (16) and are at age of 35-44. Very few respondents are single (4). This shows that the highest number of people who are active in the agricultural sector in Birchenough Bridge are married and are at the active age of 35-44.

Table 4.1 4 Marital status and age cross tabulation

Marital status	25-34 years	34-44 years	45-54 years	55-64 years	65+	Total
single	4	0	0	0	0	4
married	12	16	6	6	3	43
divorced	1	3	0	1	0	5

Widow/widowed	0	1	0	4	3	8
total	17	20	6	11	6	60

Source: Survey data

4.1.5 Mobile phone use and highest education attained

The results show that many respondents who are not using mobile phones are not educated (21) and respondents who are educated to primary level (20) are using mobile phones in agriculture. Respondents who are educated to tertiary education all use mobile phones in agriculture, this supports the view by (Mwalupaso, 2019), that level of education plays a crucial role in use of mobile phones in agriculture, the ability of those who are educated to operate mobile phones and web-enabled gadgets to access agriculture information is high.

Table 4.1 5 Mobile phone use and Highest education attained

	Highest education attained				Total
Mobile phone use	Not educated	primary	secondary	tertiary	
No	21	1	3	0	25
Yes	0	20	7	8	35
Total	21	21	10	8	60

4.1.6 Mobile phone use and household age cross tabulation

The results indicate that there is a relationship between farmers age and use of mobile phones in agriculture. Many young farmers use mobile phones than the elderly. The age group 35-44 years has the highest number of respondents using mobile phones in agriculture followed by 25-34 years age group. This implies that if the young farmers are encouraged and assisted to use mobile phones in agriculture the mobile phone use in agriculture will increase. Very few respondents at age of 45-65+ (2) use mobile phone in agriculture. Many respondents at 55-64 (10) never used mobile phones in agriculture followed by age group 65+ (6).

Table 4.1 6 Mobile phone use and age

Mobile phone use	25-34 years	35-44 years	45-54	55-64	65+	Total
------------------	-------------	-------------	-------	-------	-----	-------

no	1	3	5	10	6	25
yes	16	17	1	1	0	35
Total	17	1	6	11	6	60

SOURCE: Survey data 2024

4.2 Mobile phone platforms

The mean of 2.5 and standard deviation of 1.359 for both mobile network and mobile money transfer indicate that most respondents use Econet and Ecocash, respectively. This suggests a higher level of preference for these services among the respondents.

The mean of 3.52 and standard deviation of 1.827 indicate that respondents have a moderate level of agreement on their preferred mobile banking service provider, with a bias towards the middle options CBZ and Steward Bank. Respondents prefer # Kashagi more than other banking platforms.

Mobile phone apps have a mean of 7.2, 8.5, and 9.5 and standard deviation of 4.867, 3.86, and 1.513 for the four mobile apps used EcoFarmer, eMKambo, eHurudza, and Whatsapp, indicating a high level of variability in the data. Other mobile phone apps were never used by respondents.

Table 4.2 1 Mobile phone platform

Mobile phone platforms	N	Mean	Std. Deviation
Mobile networks	60	2.5	1.359
Mobile money transfers	60	2.5	1.359
Mobile banking service (# Kashagi, Steward Bank, CBZ, First Capital)	60	3.52	1.827
Mobile phone apps (ecofarmer)	60	7.2	4.867
Mobile phone app (eMkambo, eHurudza)	60	8.5	3.86
Mobile phone apps (Whatsapp	60	9.5	1.513
(N)	60		

SOURCE: Survey data

4.2.2 Mobile phone apps

There are four mobile phone apps used by smallholder farmers in Birchenough Bridge Ward 33. Results of the study show that a large number of respondents used Whatsapp (50%) followed by EcoFarmer (38.3%), eMKambo (20%), and eHurudza (10%). 25 farmers never used any of the mobile platforms. Whatsapp has the highest number of farmers using it in agriculture. This supported the view by (Rajender, 2023) who viewed farmers who value effectiveness of modern agricultural technology in enhancing their knowledge and understanding tend to frequently use certain apps.

Table 4.2 2 Mobile phone apps

EcoFarmer	eMKambo	eHurudza	Whatsapp
38.3%	20%	10%	50%

SOURCE: Survey data

4.2.3 Mobile networks

Telecel, Netone and Econet are mainly used by farmers in Birchenough Bridge in agriculture while Econet has the highest number 64 %, Netone 22% and Telecel is used by 14% of the population in the study.

Table 4.2 3 Mobile networks

Econet	Netone	Telecel
64%	22%	14%

SOURCE: Survey Data

There are three mobile money platforms used by smallholder farmers in Birchenough Bridge Ward 33. Results of the study show that a large number of respondents used the Ecocash platform supported by Econet wireless followed by Telecash supported by Telecel. Ecocash has 38.3 % (23) while Telecash has 8.3% (5), Onemoney 13.3% (8) of respondents who used them in agriculture sector. (Cremer, 2000) , shows that in an area with network effects, where there are three firms with asymmetric market share, the larger the firm will not prefer compatibility with rivals. This is shown in Birchenough Bridge Ward 33 where Econet Wireless which supports Ecocash has a lot of infrastructure that supports its platform therefore out-competing its competitors.

4.2.4 Mobile money platforms

Table 4.2 4 Mobile money platforms

	frequency	percentages
Ecocash	23	38.3%
Telecash	5	8.3 %
One money	8	13.3 %
none	24	40 %

SOURCE: Survey data

4.2.5 Mobile banking platforms

The study shows that mobile banking mostly used are #Kashagi, CBZ, and Steward bank. #Kashagi has the highest number of respondents with 67 % usage, it seems to be a widely adopted and trusted platform among the smallholder farmers in Birchenough Bridge Ward 33. CBZ has 15% and Steward Bank's 18% seems to be a notable but slightly lower usage rate compared to other platforms. This can be due to factors like poor service quality poor network coverage and farmers do not have bank accounts so they need to be educated about the benefits of having a bank account and how to access different bank services on their mobile phones which support agriculture. The figure below shows the banking platforms used by smallholder farmers and the number of farmers using the platforms.

Table 4.2 5 Mobile banking platforms

#Kashagi	CBZ bank	Steward bank
67%	15%	18%

SOURCE: Survey data

4.3 Five-point Likert Scale

4.3.1 Frequency use of mobile phone apps

Table 4.3 1 Frequency use of mobile phone apps

	rarely	occasionally	monthly	weekly	daily	Mean	Standard deviation	decision

EcoFarmer	5(8.3%)	20(33.3%)	1(1.7%)	0(0%)	0(0%)	5.2	8.69	Always used
eHurudza	4(6.7%)	0	0	0	0	0.8	1.81	Rarely used
eMKambo	15(25%)	0(0%)	0(0%)	0(0%)	0(0%)	3	6.71	Always used
Whatsapp	0(0%)	7(11.7%)	3(5%)	20(33.3%)	0(0%)	6	8.34	Always used

SOURCE: Survey data

Rarely=1, occasionally=2, monthly= 3, weekly =4, daily =5,

Weighted average = 3.75

Four mobile phone platforms EcoFarmer, eHurudza, eMKambo, and Whatsapp were used and the data above shows their frequency of use by the respondents. The table also shows the mean and standard deviation. Six other platforms Ecochat, Esoko, Kurima Mari, Seedney, Facebook, and Instagram were never used by the respondents. Whatsapp is the highest platform with many respondents who used it weekly at 33.3%, mean of 6 and standard deviation of 8.34 thus it is always used. EcoFarmer has a mean of 5.2 and a standard deviation of 8.69 which shows that the platforms is always used, eMKambo has a mean of 3 and standard deviation of 6.71 thus it is always used. EHurudza has mean of 0.8 and standard deviation of 1.8, this shows that this app was less used hence it is regarded as never used in the study. These platforms have a weighted average of 3.75 this shows all the platforms were used frequently. This supports the study done by (Rajender, 2023) that Whatsapp is frequently used to access agriculture information.

4.3.2 Frequency use of Mobile banking platforms

Table 4.3 2 Frequency use of mobile banking platforms

	rarely	occasionally	monthly	weekly	daily	mean	Standard deviation	Decision
#Kashagi	11(18.3%)	7 (11.7%)	0(0%)	0(0%)	0(0%)	3.6	5.15	Frequently used
CBZ	2(3.3%)	0	0	0	0	0.4	0.89	never

								used
Steward	5(8.3%)	0	0	0	0	1	2.24	rarely used

SOURCE: Survey data

Weighted average =2.4

As shown on the table above #Kashagi has a mean of 3.6 and a standard deviation of 5.15 which shows that the platform is frequently used, CBZ has of a mean 0.4 and a standard deviation of 0.89 this shows the platform is never used, Steward bank has mean 1 and standard deviation 2.24 this shows the platform is never used. The weighted average of 2.4 shows that the platforms are rarely used.

4.3.3 Frequency use of mobile money platform

Table 4.3 3 Frequency use of mobile money platforms

	rarely	occasionally	monthly	weekly	daily	mean	Standard deviation	decision
Ecocash	0	0	2(3.3%)	22(36.7%)	0	4.8	9.67	Always used
Onemoney	0	8 (13.3%)	0	0	0	1.6	3.58	Never used
Telecash	2(3.3)	3(5%)	0	0	0	1	1.41	Never used

SOURCE: Survey data

Weighted average = 3.46

The table above shows the frequency use of mobile money platforms, Ecocash has the highest number of people using it with a mean of 4.8 which shows this platform is always used, Onemoney has mean of 1.6 which shows the platform is never used and Telecash has mean of 1 this shows it is never used. The weighted average was 3.46 meaning that these platforms were frequently used.

4.4 Binary logistic Regression

Binary logistic regression was used to assess the factors influencing mobile phone use in agriculture. Factors analysed include age, gender, marital status, education level and household head.

After running a binary logistic regression, the surveyed results show a chi-square value of 5.759 assuming the predicted probabilities are in line with the observed outcomes, the model is a good fit. A value greater than 0.05 indicates a good fit hence the sig of 0.674 fits the data well.

Table 4.4 1 Model summary

Step	Chi- square	df	sig
1	5.759	8	0.674

Variable in the equation

Table 4.4 2 Variable test of significance

	B	Sig	Exp(B)	95% C.I for EXP(B)	
				Lower	Upper
Gender of household	-0.684	0.808	0.505	0.002	125.105
Household age	-3.506	0.007**	0.30	0.002	0.387
Marital status	2.674	0.087***	14.500	0.677	310.728
Highest education attained	2.418	0.015**	11.226	1.608	78.359
Household head	-1.222	0.582	0.295	0.004	22.707
Constant	1.045	0.676	2.842		

Source: Survey data

** shows the significance of a variable at a 5% level and *** shows the significance of a variable at a 10% level.

$$Y_i = \beta_0 - 0.684 \text{ gender} - 3.506 \text{ age} + 2.674 \text{ marital status} + 2.418 \text{ highest education} - 1.222$$

Household head

The right-hand side of the equation represents the dependent variable in the equation and the left-hand side of the equation represents the independent variables that influence mobile phone use in agriculture in Birchenough Bridge Ward 33. The values on the right-hand side of each variable are coefficients of the variables, whilst the signs before the coefficients represent the relationship between the independent variable and dependent variable.

The variables with positive relation to mobile phone use in agriculture are marital status and highest education level. This means that these variables are relevant for increasing mobile phone use in agriculture, as they increase mobile phone use in agriculture tends to increase.

Age, gender, and household head negative relationship with mobile phone use in agriculture. This means that as these variables increase mobile phone use in agriculture tends to fall. The coefficient of age was negative, this supports the view that younger people highly use mobile phones in agriculture than older people (Folitse, 2018).

The results indicate that age has a significant and negative impact on the use of mobile phones in agriculture ($p=0.007$). For every 0.03 year increase in age, the odds of using mobile phones in agriculture decrease by a factor of 0.030, $\text{Exp}(B)$, equivalent to an odds ratio of -3.586, this shows that aged farmers are less significantly likely to adopt mobile phone technology in their agricultural practices compared to younger farmers. The results validate the denial of the null hypothesis that there is no significant association between age, and using mobile phones to obtain agriculture. The results show that smallholder farmers become less knowledgeable and skilled in employing modern technologies as they get older. According to (Hoang, 2021) young farmers were likely to use mobile phones to obtain information in agriculture.

The highest education attained has sig 0.015 these p- p-values are lower than 0.05 hence statistically significant at 5% level, $\text{Exp}(B) = 11.226$, the results indicate that when education level increases by 11.226 with an odd ratio of 2.418 this adds the ability to use mobile phones in

agriculture. The results concluded that the premise that the degree of education has no bearing on the use of mobile phones in agriculture is not accepted. Younger, educated farmers use mobile phones more than illiterate farmers. This supports research by (Hoang, 2021) found farmers with higher education level had a greater ability of using mobile phones in agriculture, hence mobile phone agriculture platform providers should take into account educational level.

Marital status has a sig of 0.087, and the p-value is below 0.1 hence it is statistically significant at a 10% level. Exp (B) 14.500, the results show that married farmers are more likely to use mobile phones with odd ratio of 2.674. The null hypothesis that marital status is not correlated to the mobile phone use in agriculture by farmers. Married farmers tend to be under pressure to desire high production resulting in seeking mobile phones in agriculture. The results align with the research conducted by (Abbas, 2020) which demonstrated that the use of mobile phones in agriculture was statistically significantly influenced by marital status. Smallholder farmer's marital status should be considered in agriculture.

The results show that household head has a negative relationship with mobile phone use and is not significant to mobile phone use hence the hypothesis that household levels is not correlated to mobile phone use is accepted.

Source: Survey data 2024

CHAPTER 5: Conclusions and Recommendations

5.0 Introduction

This chapter outlines the conclusion and recommendations of the study based on the results from previous chapter.

5.1 Conclusions

The study aims to explore the use of mobile phones in agriculture in Birchenough Bridge Ward 33 with the objectives of establishing mobile phone platforms that are used by smallholder farmers in the agricultural sector, to examine the frequency use of mobile phones for agriculture and to determine factors that affect utilization of mobile phone for agriculture.

Many smallholder farmers are using mobile phones in the agriculture sector with 58.3% of the respondents using mobile phones and 41.7 % of respondents never used mobile phone in agriculture.

The study found that many smallholder farmers are using Whatsapp followed by EcoFarmer, eMKambo, and eHurudza apps. However, the results of the study show that other platforms such as Esoko, Seedney, Facebook, Instagram, Kurima Mari, and Ecochat, farmers have never used the platforms.

#Kashagi was mostly used followed by CBZ and Steward Bank. The first capital bank was never used by the respondents. The mobile money platform used most is Ecocash followed by Netone and Telecash. Telone and Netone which is why they are less frequently used. Whatsapp and EcoFarmer are always used.

A binary logistic regression model was run and showed a relationship between the use of mobile phones in agriculture and age, educational level and marital status and household head. Marital status and highest education attained correspondence positively to mobile phone use in agriculture. Gender, age, and household age correspond negatively. Age had a sig 0.007 and highest education attained had a sig 0.015 at 5% statistically significant and marital status had sig at 0.087 at 10% statically significant. The use of mobile phones by smallholder farmers is influenced by the above-mentioned factors but other factors can influence mobile phone use that has not been included in the study.

The research comes to a conclusion that many respondents are using Whatsapp most frequently and that socio-demographic variables have a big impact on how people utilise their mobile phones in agriculture.

5.2 Recommendations

The research results shows that many farmers are illiterate contributing to farmers not using mobile phone in agriculture, researcher is recommending that the Ministry of Information and Communication Technologies, in partnership with other private players use the ICTcentres that are already in existence as centres for training farmers both the importance and how to use mobile phones in agriculture. Creating user-friendly platforms for example use of SMS messages which are cheaper than other apps that require data bundle. It is important to give adults farmers in particular the proper training in order to raise awareness. Mobile phone farmer app developers should conduct user research to understand farmers' needs and preferences.

To promote use of mobile phones as a source of agriculture information the government should partner with telecommunication companies to ensure that networks are made available in rural areas in the country. Free access to websites that offer agriculture information, this can be done by the government or other players that support development in agriculture.

Extension agents should adapt the use of mobile phones as way of extension delivery for them to reach many farmers and encourage farmers to use mobile phones in agriculture.

Most of smallholder farmers finds it expensive to buy bundles to access agricultural information on different websites for example whatsapp hence the researcher recommend that agricultural information providers use SMSs to send information such as outbreak of crop and livestock diseases to farmers.

5.3 Areas of further study

This study identified the use of mobile phone in the agriculture sector in Birchenough bridge ward 33, Buhera South, there is need for further research on the use of mobile phone in the agriculture sector in other districts in Zimbabwe, considering the contribution of mobile phones in increasing profits in agriculture and its ability to cause price volatility on agriculture products in Zimbabwe.

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APPENDIX: Questionnaire

An assessment on the utilization of mobile phone in the agricultural sector by smallholder farmers in Birchenough Bridge Ward 33.

My name is Saliwe Ndadadzwa a student from Bindura University of science Education studying for an Honours Degree in Agricultural Economics and Management. As part of my degree programme I am currently carrying out the above mentioned research study. Note that all information provided by the interviewee is strictly confidential for academic purposes. I will be grateful if you could assist me with filling out this questionnaire in an honest manner.

Instructions

Please fill in the blank spaces below and tick where appropriate.

Section A

1. Personal information

Household sex.

Male ☐

female ☐

Household age. 25 to 34 ☐ 35 to 44 ☐

45to 54. ☐ 55 to 64. ☐ 65 + ☐

Marital status

Single. ☐ Married ☐ Divorced. ☐ Widow/ widower ☐

Never married ☐

Highest education attained

None. ☐ Primary. ☐

Secondary ☐ Tertiary. ☐

Household head

Female male child headed

2) How many hectares do you use for farming? 0.5-2 3 and above

3) Main income source 1= agricultural 2=not agricultural

4) Average household income per year _____

5) How many people at your home can read and write _____

6) Which crops do you grow?

Onion tomatoes sugar beans wheat maize

Groundnuts butternuts chilli cotton

None _____

7) Which animals do you keep? Cattle goats chickens pigs

None _____

8) How many livestock do you have? 1-20 30-50

Section B

8) Have you used your mobile phone to access any agricultural information?

1=Yes 2= no

9) What information have you accessed or received?

Weather reports market prices weeding harvesting

Transport production

Others _____

10) Which of the following mobile phone functions do you use in agriculture?

Receiving SMS ☐ receiving calls ☐ making calls ☐ sending SMS ☐
Whatsapp ☐ taking photos ☐ mobile transfer ☐ none ☐

11) Which mobile network do you use?

Econet ☐ NetOne ☐ Telecel ☐ none ☐

12) Which mobile money transfer do you use in agriculture?

Ecocash ☐ Onemoney ☐ Telecash ☐

14) Which mobile banking service provider have you used to access loans for agriculture on your mobile phone?

#Kashagi ☐ CBZ ☐ first capital ☐ steward bank ☐

15) Which mobile phone app have you used to access agricultural information?

EcoFarmer ☐ eHurudza ☐ e MKambo ☐ Ecochat AI ☐ Esoko ☐
Kurima Mari ☐ Seedney ☐ Whatsapp ☐ Facebook ☐ Instagram ☐

Section C

16) How frequently do you use your mobile phone for agricultural purposes?

1=Rarely 2= occasionally 3=monthly 4= weekly 5=daily

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

17) How frequently do you use each of these mobile phone platforms for agricultural purposes?

	rarely	occasionally	monthly	weekly	daily	Never used
EcoFarmer						
eHurudza						
eMKambo						
Ecochat al						
Kurima Mari						
Seedney						
Whatsapp						
Facebook						
Instagram						

18) How often do you access loans on your mobile phone through these different mobile banking platforms?

	rarely	occasionally	monthly	weekly	daily	Never used
#Kashagi						
CBZ						
First mutual						
Steward						

19) How frequently do you use this mobile money transfer for agricultural purposes?

	rarely	occasionally	monthly	weekly	daily	Never used
Ecocash						
Onemoney						
Telecash						

Section D

20) What challenges are affecting your utilization of a mobile phone for agricultural purposes?

1=yes, 2= no

Poor network ☐ high bundle prices ☐ language barriers ☐

Power outage ☐

21) How much are you willing to pay monthly to access agricultural information?

22) What other sources of agriculture information do you use?

Newspapers ☐ radio ☐ television ☐ other farmers ☐

None ☐