Bishop Stuart University



Effectiveness of Radio Agricultural Programmes in Scaling Up Farming Activities of Smallholder Farmers in Bushenyi District

Musinguzi Duncan

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the Award of Master's Degree in Agriculture and

Rural Innovation of Bishop Stuart University

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Declaration

I, **Musinguzi Duncan** hereby declare that this research project titled "**Effectiveness of radio agricultural programmes in scaling up farming activities of smallholder farmers In Bushenyi District**" is my original work and to the best of my knowledge, it has not been submitted in any institution for any award.

Signature..... Date: 16/09/2024.....

Musinguzi Duncan

Approval

This is to certify that this dissertation titled "**Effectiveness of radio agricultural programmes in scaling up farming activities of smallholder farmers in Bushenyi District**" has been done under the supervision of the following supervisors and is ready for sub-mission to the graduate school of Bishop Stuart University.

Signature ..... Date 21/09/2024

PROF. EDWARD SSEMAKULA

Signature ..... Date 23/09/2024

REV. NUWEMUHWEZI GERSHOM

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Dedication

I dedicate this dissertation to God the almighty who makes all things possible, my ever loving brothers and sisters, entire family members, my classmates, all the authors cited in this project and my friends for their concern, love, inspiration and support to ensure that this project dissertation is completed.

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List of Abbreviations

ACODE	Advocates Coalition for Development and Environment
AERP	Agricultural Extension Radio Programmes
FRI	Farm Radio Initiative
ICTs	Information Communication Technologies
LTM	Long Term Memory
NAADS	National Agriculture Advisory Services
NAEP	National Agricultural Extension Programs
SSA	Sub-Saharan Africa
SSFs	Small Scale Farmers
STM	Short Term Memory
SWC	Soil and Water Conservation

Abstract

The study was about effectiveness of radio agricultural programmes in scaling up farming activities of smallholder farmers in Bushenyi district. The specific objectives were to; (i) assess the coverage and listenership of Agricultural Extension Radio Programmes; (ii) investigate the effectiveness of Agricultural Radio extension programmes on smallholder farming activities and (iii) determine the factors associated with radio listenership and application of the knowledge gained through agricultural radio messages. The study was a descriptive-cross sectional survey employing both quantitative and qualitative approaches to data collection. Data was gathered from a sample of 360 respondents across 18 listener groups of agricultural extension programs using questionnaire and interview guide. Data was analyzed using SPSS version 20.0 to generate both descriptive and inferential statistics. The study found out that the coverage and listenership to agricultural extension radio programmes is relatively high in rural settings compared to urban areas. The most listened to program was Obuhingi n'oburisa that aired on different radio stations. The study found out that agricultural extension radio programmes were effective on smallholder farming activities by enhancing of different production practices including crop husbandry and management, animal health and production management. The study further discovered that age bracket (39 – 48), radio ownership, place of residence, negative attitudes and perceptions, limited agricultural spaces, media exposure and investment capital were some of the factors associated with radio listenership and application of the knowledge gained through agricultural radio messages in the area. The study concluded that agricultural extension radio programmes have a wider coverage and have been so pertinent to smallholder farmer's activities, however listenership and application of the knowledge gained through agricultural radio messages is still hampered by certain impendiments that call for argent address. This study therefore recommends that the programme should be changed to evening when most farmers are available in their houses. Radio formats should be designed to reinforce massages in order to bring change among farmers to adopt new farming techniques for improved productivity. Radio producers and program hosts should do this through programme planning which informs the selection of topics, presentation of the topics on radio with interviews from selected experts and farmers.

Key Words: Agricultural Radio Programmes, effectiveness, smallholder farmers, Bushenyi district

Chapter One: Introduction

1.1 Introduction

This section consists of the background of the study, statement of the problem, research objectives and questions, justification and significance of the study, scope of the study, theoretical review and conceptual framework.

1.2 Background to the study

Globally, Radio is an essential communication tool for disseminating agricultural information globally, especially in rural areas where literacy rates are low, and access to other forms of media is limited (Maree et al. 2023). Its importance has grown as traditional agricultural extension services, which rely on direct interactions, face logistical challenges (Maree et al. 2023). Radio provides timely information on modern farming techniques, pest and disease management, and market access, improving productivity and food security among smallholder farmers (Maree et al. 2023).

Initiatives like Farm Radio International, established in Canada, have been pivotal in supporting radio-based agricultural programmes worldwide. These programmes focus on smallholder farmers and aim to bridge knowledge gaps and scale up farming activities in remote areas (Farm Radio International, 2023). Traditional mass media channels including radio, television and newspapers continue to be relevant particularly in developing where new technology has been slow in taking root.

In Africa, absence of functional agricultural information delivery systems had been a major constraint to agricultural development for a long time (Oduor, 2022). Thus, radio agricultural programs have become an important communication medium to promote new or improved agricultural technologies. This is because radios are an effective communication tool that rural

population is familiar with (Bagnini et al. 2023) and they are cheap to access as well as manage. The growth of rural radio stations and radio agricultural programs reflects both the improvements in information technologies and the shifting of the development paradigm towards a more participatory style of information and knowledge transfer (FAO, 2023). Radio agricultural programs are used to strengthen extension service delivery in a participatory manner.

In Sub-Saharan Africa, agriculture contributes immensely to household economy, and the sector has a growth rate of 6% per annum ((Asamoah et al. 2022). Despite the sector contribution towards household economy, farmers still suffer severe production constraints resulting from general lack of access to extension information. The number of frontline agricultural extension agents to ensure effective communication and delivery of agricultural messages is very inadequate causing insufficient and irregular contact with the farmers (Ochieng et al. 2023). Radio agricultural programs have thus been adopted to pass out information to the farmers at a cheaper cost (FAO, 2023). The preference of radio as a mass medium is attributed to its unique characteristics that allow the owners to expand the spectrum beyond urban areas, avoid economic barriers to farmers paused by high priced newspaper or TV subscriptions(Karanja et al. 2023). The oral nature of radio and its ability to employ native languages has enabled the medium to reach the critical rural farmers who make about 80% of the regions population (Ngowi et al. 2022). Radio is also preferred for its portability, dability, simplicity, and flexibility to the user.

In East Africa, Radio programs are considered useful in improving the sharing of agricultural information by remote rural farming communities (Kagwa et al. 2021). These programs support agriculture extension through the use of local languages to communicate directly with farmers and listener groups (Kagwa et al. 2021). Radio programmes on agriculture are run in most stations that serve agricultural communities and this is the norm rather than the exception in East Africa

especially in Uganda where the economy is heavily dependent on agriculture with small scale farmers being the major producers (Akello et al. 2023). The conviction by East African governments that knowledge and information are critical to increased productivity is evident in their application of the mass media in their agricultural education campaigns and in particular the use of radio which is accessible to the rural communities (Akello et al. 2023).

Uganda‘s economy is dependent on agriculture supported by small scale farmers. The sector provides a livelihood for about 80% of Uganda‘s population and employs more than 70% of the rural population (Olupot et al. 2022) Constraints such as poor roads, inadequate transport systems, and the limited number of extension agents have made it difficult for frontline extension services to deliver adequate services by having regular face-to-face interactions with farmers (Akello et al. 2023).

For many years in Uganda, farmers have been accessing agricultural information from extension workers through interpersonal communications. In the current situation, this seems to be inefficient given that the ratio of extension staff to farmers is increasing. For example, the current extension-farmer ratio stands 1: 4,550 (FRI, 2021) which puts much pressure on the extension system. Factors like remoteness, inadequate resources, lack of logistics and poor infrastructure have contributed to this inefficiency (ACODE, 2015). For example most of the roads in rural remote areas like Bushenyi are impassable during wet season and this prohibits communication between farmers and the extension staff (Tumwine et al. 2023). According to UFAAS, (2014) the extension system has also been criticized for employing ineffective message delivery approaches. Apart from failing to reach most farmers in their remote communities, extension system has also, in general, not achieved much success in communicating effectively with resource-poor farmers (Akello et al. 2023).

Government has instead turned to radio as simple but effective agricultural communication channels that directly connect with farmers (Akello et al. 2023). Localized communication systems have undoubtedly presented potential in information delivery and agricultural development at community level. Locally based radio stations have been essential in fostering agricultural development. They have expressed a strong capacity to increase agricultural production and rural development (Katusiime et al. 2023).

Bushenyi District, located in western Uganda, is primarily agricultural, with smallholder farmers growing crops such as bananas, beans, maize, and coffee. In this context, radio plays a crucial role in disseminating agricultural knowledge to farmers, many of whom live in remote areas with limited access to extension services. **Radio Bushenyi** and **Hunter FM** are the primary radio stations serving the district, and they both run regular agricultural programmes focused on improving farming activities (Katusiime et al. 2023). These programmes, typically broadcast in the Runyankore language, feature expert advice on issues such as pest management, soil health, and value addition (Katusiime et al. 2023). Farmers can also call in during live shows to ask questions and share their experiences.

Additionally, the Community Radio Networks in Bushenyi work with agricultural extension officers to disseminate critical information on best practices. These networks have helped smallholder farmers adopt improved crop varieties and better livestock rearing techniques, contributing to overall food security in the district (Kamugisha et al., 2023).

1.3 Statement of the problem

Sustainability and productivity of the agricultural sector worldwide largely depend on the quality and effectiveness of extension services (Ochieng et al. 2023). In Uganda, farmer's access

agricultural information from extension workers through interpersonal communication but apparently, the number of extension workers continues to grow smaller while that of farming families is increasing (FAO, 2023). This has limited the current agricultural extension system in terms of reaching out to farmers with timely and relevant agricultural information. Having access to relevant and timely information is essential for agriculture development, specific ICTs have presented as solution through which rapidly increasing number of farming families can get information accurate and timely information (FAO, 2023). Use of ICTs has the potential to enable farmers obtain up-to-date knowledge and information about agricultural technologies. Studies from different researchers have shown how agricultural radio programs have helped smallholder farmers to adopt new technologies including new varieties as well as access market (Katusiime et al. 2023). In Bushenyi district like any other district in Uganda, limited numbers of extension agents (one to 4,000 farmers) has made it impossible to reach all farmers by interpersonal means. For this reason, radio agricultural programs like "obyobuhiingi nebyokuriitsa" have been introduced on different area radio stations, and used to disseminate relevant agricultural information to larger numbers of farm families at minimal cost and in areas hitherto not accessible to extension agents on a regular basis. The districts' extension system has gradually changed to the use of radio programs in delivering appropriately packaged agricultural information to farmers so as to improve agricultural productivity. While prior studies have confirmed that agriculture radio programs have large audiences hence the potential in providing and disseminating agricultural information among farmers due to large coverage and affordability. There is still scanty literature on how effective radio agricultural programs are in terms of accessibility, coverage, meeting farmer satisfaction, program formats preferred, relevance and timeliness of the information provided. Understanding the effectiveness of radio agricultural programs would therefore help the district extension system

to properly utilize them to convey agricultural information as required by farmers. The need for a possible feedback from farmers is currently not catered for. The proposed study was intended to address the effectiveness of radio programmes and guide the extension workers on which program formats or combination of formats to use.

1.4 Objectives of the study

1.4.1 Main objective

The main objective of this study was to assess the effectiveness of radio agricultural programmes in scaling up farming activities of smallholder farmers in Bushenyi district

1.4.2 Specific objectives

1. To assess the coverage and listenership of Agricultural Extension Radio Programmes

2. To investigate the effectiveness of Agricultural Radio extension programmes on smallholder farming activities

3. To determine the factors associated with radio listenership and application of the knowledge gained through agricultural radio messages

1.5 Hypothesis

H_{01}:there is no significant relationship between the coverage and listenership of Agricultural Extension Radio Programmes .

$H0_2$: There is no significant relationship between agricultural radio extension programmes and agricultural activities

$H0_3$: There are no significant factors associated with radio listenership and application of the knowledge acquired through radio agricultural messages.

1.6 Justification of the study

The gap in information extension has for the past two decades limited farmer's capacity to apply of recommended farming practices, adopt improved varieties as well as properly market their output (Akello et al. 2023). Given the remote nature agriculture producing areas across the country, extending agricultural information at village level has been the most challenging part of the agricultural extension system in terms of resources (Akello et al. 2023). Agricultural extension radio programs have been initiated across the country as part of the mandate to disseminate agricultural information within resource limits (UFAAS, 2014). Although there are many agricultural extension programs on many radio stations across the country, there is little scholarly work on the role of radio in agricultural development in the study area and Uganda in general. In this regard, there is little information in the public discourse about the efficacy of radio in agricultural development so as to form the basis about the role of the majority of the local language radio stations in promoting agriculture in Uganda. This study is motivated by the lack of documented evidence on the effectiveness of agricultural radio extension programmes on smallholder farming activities. A few surveys or perhaps none have been done to document the phenomena and come up with scientific evidence. It is upon this background that this study builds a body of knowledge about the role of radio in agricultural development in Bushenyi district. This knowledge may be useful not only to the farmers of Bushenyi district but also to other Ugandans who engage in farming.

1.7 Significance of the study

The findings of the study may add to the body of knowledge in area of radio usage in agricultural information dissemination.

The findings may also assist agricultural extension agents and radio stations to design relevant agricultural programmes and air same at appropriate time to meet information needs of farmers.

The findings of this study may inform the Agricultural radio programme producers on the influence of their programmes on farmers and design better approaches to disseminating agriculture information. It is expected that this will assist them in the packaging of agriculture content for the radio.

The findings of this study will highlight the effectiveness of radio in disseminating agricultural information to smallholder farmers. This will enable farmers and extension staff to be in a position to understand the importance of these radio programs in extension services and hence be able to fully utilize their potential to complement other extension and knowledge services.

This study will also provide evidence based on methodological assessment of the effectiveness of agricultural radio programs in delivering agricultural information to smallholder farmers. It is therefore projected that the study will help the policy makers and the district extension system to design policies and programs that use the right mix of ICTs available for agricultural extension service delivery. This will lead to the improvement of agricultural extension service provision for better farm productivity.

Furthermore, the study will help the extension staff to properly utilize the present radio stations to provide critical access to knowledge, information and technology that farmers require in their farming activities.

The findings of this study will inform the radio producers of farming programmes on the impact of their programmes on farmers and better approaches to disseminating agriculture information. It is expected that this will assist them in packaging of agriculture content for radio. This will also provide the basis upon which to review programme production policies in terms of allocation of resources towards effective programmes that involve the other stake holders.

1.8 Scope of the study

The scope of the study was categorized into content, geographical and time as discussed below;

1.8.1 Content scope

This study; assessed the coverage, listenership, satisfaction and level of implementation of acquired knowledge through Agricultural Extension Radio Programmes; investigated the effectiveness of Agricultural Radio extension programmes on smallholder farming actives, time appropriateness and radio frequency formats preferred by smallholder farmers in acquiring knowledge; and determined the factors associated with radio listenership and application of the knowledge gained through agricultural radio messages.

1.8.2 Geographical scope

The study was conducted among listener groups of agricultural extension programs aired on different radio stations in the current Bushenyi district. The district is bordered by Kasese District to the north, Kamwenge District to the northeast, Ibanda District to the east, Buhweju District to the southeast, Bushenyi District to the south, Rukungiri District to the southwest and the Democratic Republic of the Congo to the west. The district lies under coordinates: 00 16S, 30 06E. Agriculture is the mainstay of the district's economy. The fertile soils and good climate has allowed adequate produce of food crops for home consumption and cash crops for sale. However, due to a mountainous terrain, bringing the produce to market remains a critical challenge to agricultural development. Famer's also generally lack adequate information on new effective farming methods and technologies.

1.8.3 Time scope

This study was conducted for a period of 9 months; March 2021 to December 2021 and it evaluated literature for a period of 8 years (2013 – 21). It was within this time frame that agricultural radio

programs had been widely promoted as part tools to disseminate agricultural extension information in remote areas across the country.

1.9 Conceptual framework

The framework demonstrates a set of relationships among background variables, independent variables and dependent variables. In this context, background and independent variables influence dependent variable. Agricultural radio extension programmes were the independent variables and smallholder farming activities the dependent variables.

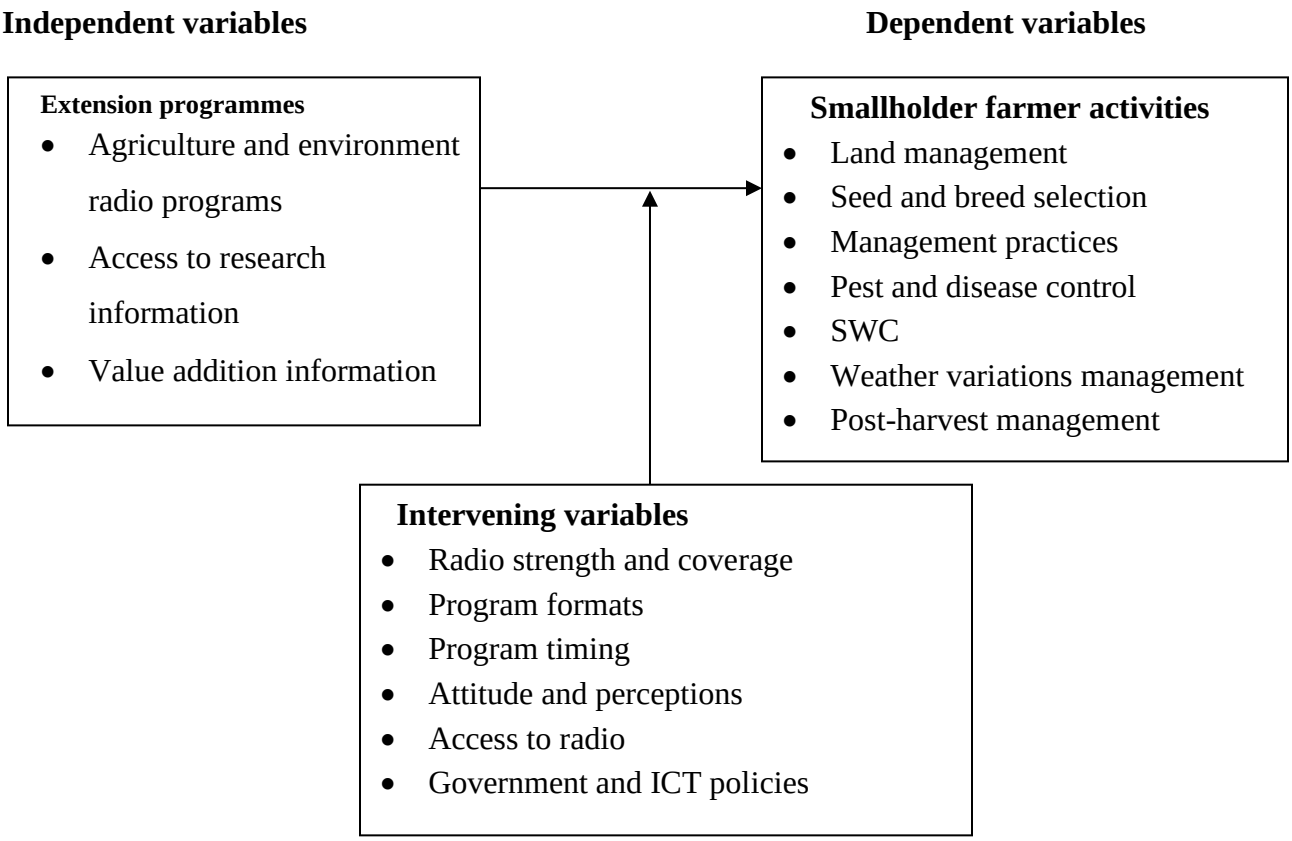


Figure 1: A conceptual frame work describing the relationship between radio extension programmes and Smallholder farming activities.

(Source: Researcher's own construct 2024)

From figure 1 above, local radio extension programmes have an impact on farming activities such as; land management, seed and breed selection, pest and disease control, SWC, weather variations adoption and post-harvest management. All these activities boost production through enhanced knowledge and skills. Access and listenership to agricultural extension radio programmes is influenced by household characteristics like age of the household head, level of education, gender, economic status, attitude and perceptions and ownership of hand radio.

Chapter Two: Review of Relevant Literature

2.0 Introduction

This chapter presented reviews of literature and relevant concepts that guided the study. Literature was reviewed as; Coverage and listenership of Agricultural Extension Radio Programmes**,** the effectiveness of Agricultural Radio extension programmes on smallholder farming activities and the factors associated with radio listenership and application of the knowledge gained through agricultural radio messages.

2.1 Theoretical framework

The Diffusion of Innovations Theory by Everett Rogers provides a useful framework for understanding how agricultural innovations are adopted by smallholder farmers. According to this theory, the spread of new ideas or practices follows a process of awareness, interest, evaluation, trial, and adoption, all of which are influenced by communication channels like radio (Rogers, 2023). In the context of Bushenyi District, radio agricultural programs serve as a key medium for disseminating information, offering affordable and easily accessible communication to farmers who may lack other forms of media (Kumar & Pandey, 2022).

Radio programs also play an important role in addressing knowledge gaps among smallholder farmers. These programs provide vital information on farming techniques, pest control, soil fertility, and market prices, which can significantly improve farm productivity (Moyo et al., 2021). Moreover, through frequent broadcasts of expert interviews, success stories, and practical advice, radio encourages the adoption of new agricultural techniques, aligning with the persuasion and decision stages of the diffusion process (Nyirenda & Mphande, 2023).

The ability of radio programs to reach a broad audience makes them particularly effective in scaling up agricultural activities in rural areas like Bushenyi. Studies have shown that radio can

influence the behavior of farmers, promoting the widespread adoption of improved farming practices (Ochilo & Obimbo, 2022). As early adopters within the social system begin to implement these innovations, others follow, creating a ripple effect throughout the community (Massawe, 2022). This aligns with Rogers' (2023) assertion that innovations are more likely to spread when they are communicated via effective channels like radio.

According to Rogers' (2023) the theory is relevant in the following ways;

I**nformation Dissemination**: Radio agricultural programs broadcast critical information on best farming practices, pest control, soil management, and market trends. This makes them a cost-effective way to reach smallholder farmers, especially in rural areas like Bushenyi, where access to other media may be limited.

Accessibility: Radios are affordable and widely available, making them an inclusive tool for delivering agricultural knowledge to farmers who may not have access to the internet or other forms of media.

Behavior Change: By frequently broadcasting success stories, interviews with agricultural experts, and practical advice, radio programs can persuade farmers to adopt new techniques or innovations, thereby improving their productivity.

Bridging Knowledge Gaps: Many smallholder farmers in Bushenyi may lack formal agricultural education. Radio programs can fill these knowledge gaps by offering easy-to-understand, real-time information tailored to their local context.

Scaling and Replication: As more farmers adopt the new practices discussed in these radio programs, the innovations can be scaled up across the district. The theory helps explain how early adopters can influence other farmers, creating a ripple effect that leads to widespread adoption.

2.2 Coverage and listenership of Agricultural Extension Radio Programmes

2.2.1 Coverage of agricultural radio broadcasts

The aspect of communication is critical to sharing of agriculture innovations among actors, in the more than fifty years of radio broadcasting in Africa, the farm forum is perhaps the best known type of rural broadcasting (Aker, 2021). In their compilation of a publication for UNESCO about rural radio, they provide a glimpse into the history of agriculture programming on radio in the world. The potential of radio in development was apparent from its inception in the 1920s in Africa when mass media were viewed as tools of power with which authoritarian governments would use to mobilize communities to rally communities around the development agenda. For farming communities living on the periphery of information technologies and societies, radio is the only window to global reality (Rugege and Murenzi, 2023).

Measuring radio's impact on audiences is complex as it is difficult to identify true control communities (Adegbidi et al. 2023). Some stations have national coverage, while in areas without a signal, listeners communicate with those who cannot listen to programmes. Radio's effectiveness can be assessed through estimates of listenership as well as changes in knowledge, attitudes and practice (Mudege et al. 2023). The Farm Radio Initiative focuses on creating high-quality, farmer-focused content that addresses the specific needs and challenges faced by smallholder farmers in Africa. Through partnerships with local radio stations, FRI provides radio scripts, training, and support to ensure that the programmes deliver relevant, timely, and practical agricultural information (Farm Radio International, 2021). For example, FRI helps tailor radio broadcasts to reflect seasonal farming activities, providing farmers with precise information on planting, pest control, and post-harvest management. This has led to improved knowledge dissemination, which is critical for successful agricultural extension (Farm Radio International, 2021).

2.2.2 Listenership to agricultural radio broadcasts

Radio in particular has consistently remained in the lead over all other forms of media as the most utilized medium, it has continued to provide real time news about events unfolding around the world, educating audiences about diverse subjects such as climate change, health issues, nutrition, and governance (Rugege and Murenzi, 2023). The influence of radio is best demonstrated by the stranglehold post authoritarian African governments maintained over the medium soon after gaining independence through state owned radio with the excuse they were protecting the citizens from its corrupting influence on the audience‖ (Guri & Addai, 2020)

Local Radio in Africa tops the list as the most attended medium among the mass media followed by local television, while newspapers come fifth after international radio and television (Guri & Addai, 2020). The attraction of radio has not waned and is still considered a vital tool in national development since pre-independence and more so after independence as a tool for rural development. This medium has continued to be used as a main tool for communication and access of information by stakeholders; the sender and the receiver (Chapota et al. 2020). The present dramatic developments in the information communication technology sector have not changed the place of radio, but have only served to enhance the medium with convergence; the incorporation of mobile phones has speeded up the flow of information from the sender to the receiver and increased interactivity (Guri & Addai, 2020).

Radio preference as a mass medium is attributed to its unique characteristics that allow the owners to expand the spectrum beyond urban areas, avoid economic barriers to consumers paused by high priced newspaper or TV subscriptions (Mubangizi et al. 2022). The oral nature of radio and its ability to employ native languages enables the medium to reach the critical rural population which

in Uganda is about 80%. Radio is also preferred for its portability, affordability, simplicity, and flexibility to the user (Guri & Addai, 2020) .

It is these traits about radio that have arguably placed the medium in the lead and consequently convinced governments and development partners that it can assist to reach their targets to advance their economic and social development agendas (Mubangizi et al. 2022).

Radio is considered useful in improving the sharing of agricultural information by remote rural farming communities it supports agriculture extension through the use of local language and rural radio to communicate directly with farmers and listener groups (Chapota et al., 2020) . Radio programmes on agriculture are run in most stations that serve agricultural communities and this is the norm rather than the exception in developing countries especially in Africa where the economy of the countries is heavily dependent on agriculture with small scale farmers being the major producers (Chapota et al., 2020). The conviction by governments that knowledge and information are critical to increased productivity is evident in their application of the mass media in their agricultural education campaigns and in particular the use of radio which is accessible to the rural communities.

In developed countries, the use of radio for agricultural information dissemination has declined with the rise of digital platforms. However, it still plays a role in remote rural areas where internet penetration is limited. For example, in the United States, the **National Public Radio (NPR)** offers agricultural segments that cater to the rural farming population, providing updates on agricultural policies, market trends, and technological innovations (Patterson & Johnson, 2021).

In the European Union, some countries still use agricultural radio broadcasts, particularly in rural and mountainous regions. In Scotland, **BBC Radio Scotland** has agricultural segments focusing

on rural farming issues, which remain popular among the older farming population (Scott, 2020). The radio here is not just for education but also for creating awareness about subsidies, rural development programs, and environmental sustainability (Thompson & Fletcher, 2020).

In Uganda, radio listenership has been instrumental in scaling up farming activities, with agricultural programs tailored to local languages and contexts. A study by MAAIF (2021) indicates that agricultural extension radio programs have improved farmers' knowledge and adoption of better farming techniques in regions such as northern Uganda. Similar results were noted in Ghana, where over 70% of rural farmers depend on agricultural radio broadcasts to obtain timely information on farm inputs and market opportunities (Khan et al., 2022).

In Kenya, the **Shamba Shape Up** program, broadcast on both radio and television, has been an innovative platform that combines entertainment and education, attracting millions of farmers. This program emphasizes farming techniques such as pest management and dairy farming, and its success has been linked to the large and consistent rural audience it engages (Odhiambo et al., 2021). This reflects the importance of effective communication strategies in enhancing agricultural productivity through radio.

2.3 Effectiveness of Agricultural Radio extension programmes on smallholder farming activities

Rural radio in many developing countries is an important tool for use in many aspects of development, including promoting the process of participatory democracy and rural and community development (Mubangizi et al., 2021). Agricultural communication and extension, however, take more air time of these rural radio stations. This is understandable and acceptable because radio stations in rural areas in Africa have a predominantly agricultural clientele, and the

radio stations are always aware that information on agriculture is most needed by the rural populations where the local radio stations operate (Mubangizi et al., 2021).

Agricultural radio programs have also significantly impacted productivity and income levels among smallholder farmers in Africa. In Uganda, the "Farm Radio" initiative has helped farmers improve their productivity through tailored programs that discuss specific crops and techniques relevant to the region (MAAIF, 2021). Smallholder farmers in Northern Uganda reported a 30% increase in crop yields after adopting techniques learned through radio extension programs (Mubangizi et al., 2021). These programs have also been linked to better resource management, such as water conservation and soil fertility management, which further improves productivity.

The strength of rural radio as an extension tool lies in its relative advantage of being able to reach illiterate rural farmers in even the remotest areas. It also provides them with information on all aspects of agriculture in the languages they understand (Taylor et al., 2022). Rural and community radio are effective in blending the people's cultures and traditional communication channels with development messages. One of the early approaches to the use of rural radio for agricultural extension in Ghana (Boateng et al. 2022).

Radio is one of the effective ways of communicating agricultural messages such as technologies and best practices that can help farmers improve production. This is achieved through different programs like radio forums tailored to local communities (Anderson & Hicks, 2020).

Access to information and free discussion is a tool of empowerment, especially for citizens who are geographically, economically or socially disadvantaged (Ndiaye & Manfre, 2022). Indeed, freedom of information and expression is a fundamental human right, and the internet, TV and newspapers are still out of reach for the majority of rural smallholder farmers (Manfre & Nordehn,

2021). Plus, face-to-face agricultural extension is often insufficient, leaving smallholder farmers, particularly women and those in very remote locations, without access to the information they need to improve their harvests (Manfre & Nordehn, 2021). Greater access to mobile phones and the internet provide many opportunities, but barriers remain regarding connectivity, cost, electricity, access, language and literacy.

Availability and use of radio in delivering agricultural information help farmers to improve production with quality in order to acquire more profit. Independent radio broadcasting services have been found to be positive about rural development outcomes such as programs focusing on improving rural lives through farming and functioning markets (Odhiambo et al.2021).

Agricultural communication in developing countries now seeks to emphasize both the message and the social dynamics of the message transmission (Taylor et al. 2022). Rural based mass media therefore seem most likely to be able to provide new focus in agricultural communication. As the most rapid and efficient means to inform audiences, electronic mass media, in particular, can reach millions of farm families in areas which are beyond the reach of extension personnel (Zossou et al. 2020). Local and rural radio stations particularly penetrate remote rural communities with their messages, and they scale the barrier of illiteracy. They are therefore useful vehicles for bringing to rural communities information, new ideas and relevant knowledge, especially in agriculture (Zossou et al. 2020).

Local radio agricultural programs expand and make available information networks for farmers so that they are able to benefit from the knowledge and skills of extension officers and also from other farmers in the communities (Chapota et al. 2020). Local radios strength as an extension tool, therefore, is seen in its ability to reach illiterate farmers and provide them with relevant

information, technology and skills on all aspects of agriculture in their own language (UFAAS, 2014).

Local radio programs are identified as a potentially useful and cost-effective way to enhance knowledge and technology transfer to farmers to raise agricultural production in developing countries (Farm Radio International, 2021). For the poor rural farmer, radio programs are a vehicle for participatory communication on agricultural information and innovations (Chapota et al. 2020). Realizing the importance of mass media in extension, the use of radio has been evolved in terms of the policies, laws, approaches and players involved (Farm Radio International, 2021). The rationale for using radio in extension and advisory services came from an understanding that radio is an excellent and cost-effective means of sharing knowledge, building awareness, facilitating informed decision-making and supporting the adoption of new practices by small-scale farmers. "Radio can help transform agriculture" (Mubangizi et al., 2021).

2.4 Factors associated radio listenership and application of the knowledge acquired through radio agricultural messages

2.4.1 Radio Ownership and Listenership

Radio ownership is a key determinant of access to information broadcast through radio channels. In many developing countries, radio ownership remains high due to its affordability and accessibility compared to other media forms such as television or internet-based platforms. According to a study by Zossou et al. (2020), radio ownership among rural households in sub-Saharan Africa is widespread, with over 80% of smallholder farmers owning at least one radio set. This widespread ownership enables greater exposure to agricultural programs, leading to improved farming practices.

However, radio listenership is not uniform, as it varies based on factors such as income level, age, and geographic location. Farmers with higher income levels are more likely to own multiple radios or advanced devices such as smartphones, which provide access to radio programs. Conversely, poor households may experience limited or interrupted radio access due to lack of funds to purchase radios or batteries (Chapota et al., 2020). Additionally, radio listenership can be influenced by language, time of broadcast, and the perceived relevance of the content to the listener's daily life.

In Uganda, for example, agricultural extension radio programs are particularly effective among older male farmers who tend to listen more consistently than younger farmers or women, who may have less control over media choices within the household (Mubangizi et al., 2021). The time of day when broadcasts occur also influences listenership, as farmers may not have the flexibility to tune in at certain times due to work or household responsibilities (Odhiambo et al., 2021).

2.4.2 Attitudes and perceptions of source credibility

Psychological processes and capacities influence our ability to function as members of a society, as they determine our ability to interpret, understand, and make judgements (Ndiaye & Manfre, 2022). Attitudes and perceptions have been studied copiously in relation to message learning and adoption. The importance of farmers' attitudes in message understanding and technology adoption among peasants and rural farmers in many parts of the world has been reported. Communication is a voluntary activity, and the propensity to get engaged in it will depend to a large extent on the perceived benefits to be derived from it (Khan et al., 2022). According to Odhiambo et al., (2021) attitudes provide a guide to our behaviour, and as such people's attitudes influence their perceptions and thinking. Our attitudes therefore are expressed by evaluating a particular entity; the product of this evaluation is a degree of favour or disfavor (Odhiambo et al., 2021). A positive

belief about an object therefore has a high likelihood of leading to a positive feeling or disposition towards the object. Positive attitudes towards radio therefore are expected to evoke high listenership to, and high participation in, the radio station's programmes (Chapota et al., 2020).

Perceptions, like attitudes, have influence on audience members' level of acceptance of the selection of the source of communication and recall of the messages from a communication source (Hovland & Weiss, 2023). Credibility, which is the degree of perceived trustworthiness and competence that audiences ascribe to a communication source, is an important element in the spread of innovations. Credibility could be measured through indices such as level of knowledge or technical competence of the source of the messages (Thompson & Fletcher, 2020). Based on the literature on the influence of psychological factors on message uptake, therefore, it seems logical to suggest that perceptions of credibility of radio would have a positive relationship with farmers' level of listenership to agricultural broadcasts (Hovland & Weiss, 2023).

2.4.3 Media exposure and socio-economic and demographic characteristics

The frequency and duration of media exposure significantly affect how listeners internalize and apply knowledge. Farmers who listen to agricultural programs more frequently and for longer periods are more likely to adopt the practices discussed (Zossou et al., 2020).

In general it is expected that people with high levels of education are expected to learn more from mass media than those with low levels of education (Mubangizi et al., 2021). This means they will be exposed to the mass media and learn news at a faster rate than the less educated . In relation to local radio, it is expected that farmers in local communities who rate high on education will listen to radio and learn more from the radio news than those who rate low on education(Mubangizi et al., 2021) .

Farmers with higher incomes and higher levels of education tend to have greater media exposure because they are more likely to own radios or smartphones, and they may have more time to listen to programs (Mubangizi et al., 2021). Higher education levels are also linked to better comprehension of the information provided, leading to more effective knowledge application (Mubangizi et al., 2021). In contrast, farmers with lower education levels may struggle to understand technical language or complex farming concepts, even if they listen regularly.

A person's media exposure is measured by his level of reliance on mass media for information. People who rate high on media exposure often depend upon multiple sources of media for information. They seek information aggressively, and are also able to learn from the media than those who rate low on media exposure(Khan et al., 2022). People who rate high on media exposure tend to be the early adopters of information in a social system (Khan et al., 2022) and are normally the early adopters of innovations. People who rate high on media exposure also tend to learn more from the media. The proposition of the knowledge gap hypothesis is that the rich in knowledge benefits from a greater growth in knowledge than the less knowledgeable. Those who have knowledge tend to rely more on the mass media for even more knowledge than those who rate low in education and knowledge (Chapota et al., 2020).

Gender also plays a significant role in media exposure and knowledge application. In many African countries, men typically have more control over household resources, including radios, and more time to engage with media compared to women, who may have household chores or caregiving responsibilities (Chapota et al., 2020). Women's reduced access to radio programs limits their exposure to agricultural information, even though they often form a substantial portion of the agricultural workforce.

2.5 Time appropriateness and radio frequency formats preferred by smallholder farmers in acquiring knowledge

In Africa, studies have shown that smallholder farmers prefer agricultural radio programs that are broadcast during specific times that accommodate their work schedules. For example, in Kenya, Odhiambo et al. (2021) found that farmers prefer radio broadcasts early in the morning (6 a.m. to 8 a.m.) and in the evening (6 p.m. to 8 p.m.), when they are either preparing for the day or winding down after farm work. Similarly, in Uganda, a study by Mubangizi et al. (2021) revealed that farmers were more likely to listen to agricultural programs aired in the late evening, as they had completed their daily farming activities and could dedicate time to listening.

The timing of broadcasts is also influenced by gender. Women, who often bear the dual responsibility of farm work and household chores, may have different listening schedules compared to men. Women in rural areas of Malawi preferred listening to radio programs after completing household chores in the late afternoon, while men tended to listen either early in the morning or during evening hours (Chapota et al., 2020)

Radio agricultural programmes attracts large following from the audience if well produced, however this also depends on the content, format or style, and presentation. Chapota et al., (2020) also observed the challenges development content on radio faces; African radio is, of course, the need to produce programmes on a tight budget, which means that potentially high-impact educational dramas - which require retaining dedicated teams of writers, actors, technicians, editors, vehicles, fuel-supplies etc. - are too expensive to produce locally and are therefore produced by separate production houses and funded by donor aid. Wendland & Mustalahti, (2020), further argued that it is therefore no accident that the African airwaves are full of live studio-based programmes, that is news, music shows, call-in programmes, and live studio discussions. This gives African radio a very 'fresh' sound, but it has its dangers in terms of broadcasting unconsidered

opinion, myths and rumours, trivia and, at times, incitement to political or ethnic violence, when live discussions are badly managed (Wendland & Mustalahti, 2020).

According to Odhiambo et al.,(2021) radio formats should be designed to reinforce massages in order to bring change among farmers to adopt new farming techniques for improved productivity. Radio producers do this through programme planning which informs the selection of topics, presentation of the topics on radio with interviews from selected experts and farmers.

Farm Radio International, (2021) shows that impact programming formats are grounded in the agenda setting theory aimed at influencing farmers to adopt effective farming techniques. This position is confirmed by Farm Radio International that are working with key research and development partners, enabling them to effectively use radio in their knowledge-sharing efforts and thus contribute to improved livelihoods on a large scale (Farm Radio International, 2021).

Appropriateness of agricultural information is very crucial to farmers' success. Farmers need to be provided with the information at the right time so as to apply that information in their farming activities for better farm productivity (Anderson & Hicks, 2020). Timely availability of information is vital for effective performance of managerial functions such as planning, organizing, leading, and control (Anderson & Hicks, 2020).

Farmers need timely information to be able to plan for activities to be done according to the situation encountered. For example timely information about rainfall will help them plan for the time to start preparation of their farms (Wendland & Mustalahti, 2020). Also this information will make them aware of the kinds of crops to plant depending on the rate of rainfall in a particular season as most of these farmers depend on rain fed agriculture. On the other hand timely information on pest outbreak will allow the farmers to organize themselves on how to combat the problem so as to overcome losses (Wendland & Mustalahti, 2020).

In many African countries, FM radio is the dominant format for agricultural broadcasts. FM stations are preferred by smallholder farmers due to their clearer sound quality, which is crucial for understanding technical farming information (Zossou et al., 2020). For instance, in Ghana, FM stations broadcasting in local languages are popular among rural farmers, as they provide clear and understandable content tailored to specific regional contexts (Boateng et al., 2022). Additionally, FM radio's local reach allows for more community-centered programming, where information can be specific to the local climate, crops, and market conditions.

Chapter three: Research Methodology

3.1 Introduction

This chapter presents procedures and methods that aided in the management of the study. It covers the design, study population, sample size and determination, sampling techniques and procedure, data collection methods, data quality control**,** data analysis and ethical considerations.

3.2 Study Area

The study was conducted across 18 listener farmer groups of agricultural extension programs aired on different radio stations in Bushenyi district. The district is bordered by Kasese District to the north, Kamwenge District to the northeast, Ibanda District to the east, Buhweju District to the southeast, Bushenyi District to the south, Rukungiri District to the southwest and the Democratic Republic of the Congo to the west. The district lies under coordinates: 00 16S, 30 06E. Agriculture is the mainstay of the district's economy. Agriculture is the mainstay of the district's economy. The fertile soils and good climate have allowed adequate produce of food crops for home consumption and cash crops for sale. However, due to a mountainous terrain, bringing the produce to market remains a critical challenge to agricultural development. 76 % of the population depend on subsistence agriculture for livelihoods, the gap in information access has remained synonymous. The area was chosen because farmers still lacks adequate agricultural information and knowledge on new effective methods of farming and technologies due to weak extension coverage. Agricultural radio extension programs had thus been promoted to address the extension challenges across the district.

3.3 Study design

This study adopted a descriptive-cross sectional survey employing quantitative and qualitative approaches to capture data across different agriculture radio listener groups in the district. The

design helped the researcher in generating basic knowledge, clarifying issues and in-depth study of the effect farm radio programmes on smallholder farmering activities. The qualitative approach captured respondent's views, knowledge and opinions on the subject matter using interviews while the quantitative approach gathered quantifiable responses using questionnaire.

3.4 Study population

The study targeted radio listener groups and group leaders of agricultural extension radio programs aired on different radio stations across the current Bushenyi district. The choice for radio listener groups came from the fact that the individual program listeners would not have adequate knowledge about the phenomena being investigated. The researcher therefore believed listener groups would provide very accurate information.

3.5 Sample Size determination

The study sample was determined using a formula by (Kirkwood 1998:192). The level of confidence for the study was set at 95%, with 5% as the tolerable error. The sample size for the study was determined using the sample estimation formula below (Kirkwood 1998:192);

$$n = p \times q \times \frac{(Z_{\&/2})^2}{e} \text{ or}$$

$$n = Z^2_{\&/2} \times \frac{(p) \times (1-p)}{e^2}$$

Where:

n = sample size

p = Target population = 37.7% = 0.377

q = Non-target population = 62.3% = 0.623

e = standard error = 5% = 0.05

$Z_{\&/2}$= Z value of 95% confidence = 1.96 from the Z-table

Substituting the values into the formula: $n = 0.377 \times 0.623 \times \frac{(1.96)^2}{0.0025} = 360$ respondents

Therefore 360 radio listener group members and other key informants (group leaders) from the 16 groups were considered for the study as described in Table 1

Table 1: Showing target population and categories

Category	Target population	Sample size	Sampling strategy
Group leaders	30	16	Purposive Sampling
Group members	930	360	Snowball and Simple Random Sampling

3.6 Sampling strategy

The study adopted a snowball sampling technique in the selection of respondents. Snowball sampling is where research participants recruit other participants for study. It is used in situations where potential participants are hard to find. Since potential respondents were difficult to find given the sensitivity of the subject, the researcher identified radio stations with agricultural programs and their potential listener groups in the population. That is the researcher initially identified 3 categories of respondents form each of the 16 listener groups. These included 2 group members and 1 group leader. This was achieved by obtaining a list of group leaders and their members from the top agricuctural radio program hosts. These categories of respondents were asked to recruit other people (and then ask *those* people to recruit others). These steps were repeated until the needed target number of respondents (20 members) was got from each group. Key informants were purposively selected. These provided supplementary knowledgeable and information required for the study.

3.7 Data Sources

Listener group members from each of the 16 groups were the main source of primary data in the study. In addition, listener group leaders provided information as Key Informants. Secondary data was gathered from scholarly materials like published and unpublished books, articles, records, journals and reports.

3.8 Data collection methods/tools

The study applied questionnaire and interview methods for collecting primary data.

3.8.1 Questionnaire survey (Appendix 1)

A semi-structured questionnaire that had both closed ended and open-ended questions was designed and used to generate quantifiable information from the respondents. The questionnaire was originally sett in English and later translated into local languages to make the questions more simple, clear and understandable to the respondents. Questions captured information on respondents demographic characteristics, coverage and listenership of Agricultural Extension Radio Programmes; effectiveness of Agricultural Radio extension programmes on smallholder farming activities among smallholder farmers in acquiring knowledge; and the factors associated with radio listenership and application of the knowledge gained through agricultural radio messages.

3.8.2 Interview guide (Appendix 2)

Oral personal interviews that involved a face to face conversation using an interview guide was used to gather opinions and views from key informant categories. The researcher administered interviews to the key informants with a help of an interview guide reflecting the study objectives. With this instrument, the researcher engaged key respondents in oral questions. The interviews were used widely to supplement and extend the researchers' knowledge about individual (s)

thoughts, feelings and behaviors. While interviewing, probing was applied in cases where respondents would not give inadequate answers or where respondents got confused of the meanings. This helped the researcher to capture supplementary information on the subject under investigation.

3.9 Data Quality Control

3.9.1 Content Validity of Instruments

Majee & Hoyt, (2011) argues that validity of a measurement instrument is the extent to which the instrument measures what it's supposed to measure. It takes different forms each of which is important in different situations. Content validity was ensured by using expert opinion from the supervisors, and pre-testing instruments on 5 respondents outside the target sample to identify problems associated with answering the questions. This aided in making prior adjustments before actual data collection.

3.9.2 Reliability of instruments

Mugenda (1999) defines reliability as a measure of the degree to which a research instrument yields consistent results or data after repeated trials. Reliability of the instruments was tested by use of test-re-test method. Questionnaires were administered to 5 respondents from each group selected. The same questionnaires were administered after a week to the same group. The answered questionnaires were scored manually again and a comparison of the results was made. Pearson's correlation coefficient was computed to establish the extent of reliability. Gay (1992), notes that a correlation co efficient of 0.7 and above is acceptable. A correlation co-efficient of 0.753 was realized from the respondents.

3.11 Data analysis

Quantitative data from questionnaires was collaborated during data analysis. Data collected was coded, entered and cleaned using the excel computer program which was later exported to Statistical package for social scientists (SPSS), Version 20.0 for analysis. Both descriptive and inferential statistics were generated and used in interpreting results. Continuous variables (age in years, education in years, acreage, and quantity harvested) were analyzed using mean, variance and standard deviation while frequencies and percentages were applied on categorical variables (such as; gender, marital status, source of livelihood etc.). Multivariate analysis using correlations and logistic regression statistics was performed to determine the possible the factors associated radio listenership and application of the knowledge acquired through radio agricultural messages. Data outputs were presented in tables, pie-charts and graphs.

3.10 Ethical consideration

This research was approved by Bishop Stuart University Graduate School. Ethical approval was obtained from the Directorate of Graduate Studies Research an Innovations. Thereafter, a research permit was obtained from the graduate coordinator prior to the study. Administrative authorization to carry out the study was sought from the respective radios and listener group administrators. Informed consent was obtained from group members prior to their enrollment into the study. Participation in the study was voluntary. Confidentiality of the information from the study participants was maintained throughout the study. In addition, codes were used to maintain anonymity of all participants and keep their information confidential.

3.11 Limitations of the study

The following were the limitations during the process of the study;

- The researcher did not have adequate funds to cater for transport, stationery requirements and secretarial services. Early preparations by the researcher however helped him get the required resources in time.
- Luck of enough time for data collection. Early field data collection helped the researcher get the required information early and analyze it in time.
- Lack of cooperation among respondents. Prior communication about data collection was made with respondents a day before actual data collection.

Chapter four

Presentation, Analysis and Interpretation of Findings

4.1 The response rate

This chapter presents the analysis and interpretation of the results obtained from the field. The study was particularly interested in establishing the effectiveness of radio agricultural programmes in scaling up farming activities of smallholder farmers in Bushenyi District. Questionnaires were administered to three hundred and sixty (360) different agricultural radio listener group members, and the process was completed by 30th June, 2021. All the three hundred and sixty respondents ably answered and gave out their views which represented a response rate of 100%. Findings were presented in frequency tables, pie-charts and graphs.

4.2 Respondents socio-economic characteristics

This sub-section presents the demographic features of 360 sampled respondents from different listener groups. The key demographic characteristics captured for the study included; gender, age, education level, marital status, household size, total farm size in acres. These features were found to be of great help in terms of clearly depicting the diverse background of the farmers in the area.

Table 1: Socio-economic characteristics of farmers

Household Characteristics	**Total (*n*=360)**
Gender of respondents (Freq. %)	
Female	236 (65.6%)
Male	124 (34.4%)
Age in years (mean ± Std. D)	33.23 ± 8.671
Education level in years (mean ± Std. D)	9.19 ± 2.346
Marital status (Freq. %)	
Never married	268 (74.4%)
Married	80 (22.2%)
Others	12 (3.3%)
Household size (mean ± Std. D)	4.02 ± 2.135
Total farm size in acres (mean ± Std. D)	3.25 ± 1.123
Source of livelihood (Freq. %)	
Farming	272 (75.6%)

Business	52 (14.4%)
Formal Employment	36 (10%)

Source: Field data, 2024

The analysis in table 1 shows that majority (65.6%) of the respondents were female and 34.4% male, respectively. The participation of more females than males is reflection of the smallholder agricultural sector in the area that has attracted more females than men. Mean average age were 33 years with the youngest aged 17 and the oldest 65 years. Average number of years in school were 9.19 ± 2.346 with a minimum of zero and maximum of 16. 74.4% of the respondents were married, 22.2%% never married, whereas 3.3% were widowed and separated respectively. Average members at a household were 4 members with the largest family having 9 members and the smallest 3. Average land holdings were 3.25 ± 1.123 acres with a minimum of half an acre and largest holding 45 acres. Majority 75.6% sourced their livelihoods from farming, 14.4% small scale petty business like shops and hardware's while 10% depended on salary from formal employment.

4.2 Coverage and listenership of Agricultural Extension Radio Programmes

This section addressed research question one which sought to assess the coverage, listenership, satisfaction and level of implementation of acquired knowledge through Agricultural Extension Radio Programmes. Quantitative responses generated were capture and analyzed to generate frequencies and percentages as presented below;

Table 2: Place of residence and media use in accessing agricultural information

	Total (*n*=360)
Place of residence (Freq. %)	
Town	**25 (6.9)**
Peri-urban	**47 (13)**
Rural area	**288 (80)**
Do you use any form of media to access agricultural information (Freq. %)	
Yes	349 (96.9%)
No	11 (3.1%)
Form of media used (multiple responses generated) (Freq. %)	**n=656**
Phone	88 (13.4%)
Internet	59 (8.5%)
Television	189 (28.8%)
Radio	320 (48.8%)

Source: Field data, 2024

As shown in table 2, majority (80%) of the respondents resided in rural areas, 13% peri-urban and 6.9% in urban areas. 96.9% agreed to using different forms of media in access agricultural information to support their farming activities while 3.1% said no. 48.8% accessed information through radio stations, 28.8% television, 13.4% phone and 8.5% internet.

Table 3: Frequency of using form of media in accessing agricultural information

	Frequency of use *(n=360)*		
	Daily	Once a week	Rarely
Media type	*Freq. (%)*	*Freq. (%)*	*Freq. (%)*
Radio	223 (61.9)	100 (27.8)	37 (10.3)
Television	36 (10)	77 (21.4)	247 (68.6)
Phone	23 (6.4)	94 (26.1)	243 (67.5)

Source: Field data, 2024

As presented in table 3 above, more than a half 61.9% of the respondents used a radio to access agricultural information daily, 27.8% once a week and 10.3% once in two weeks. Only 10% of the respondents used television to access information daily, 21.4% once a week and the majority

68.6% rarely accessed information through television. 6.4% used a phone to access agricultural information daily, 26.1% once a week whereas majority (67.5%) rarely used a phone.

Table 4: Regression results on coverage and radio listenership of radio programs

Variable	Coefficient (B)	Standard Error	Significance (p-value)
Radio Signal Coverage (Yes)	1.20	0.50	0.01
Listening to Agricultural Programs (Yes)	2.50	0.70	0.001
Popular Program: Obuhingi noburiisa	0.75	0.40	0.06
Popular Program: Agriculture & Env. Mgmt.	0.20	0.30	0.40
Popular Program: Integrated Pest & Disease Mgmt	0.35	0.45	0.30
Radio Station: BFM	1.70	0.60	0.02
Radio Station: World FM	0.10	0.25	0.70
Radio Station: Hunters FM	0.25	0.35	0.50
Radio Station: Crane FM	0.50	0.40	0.10
Frequency of Listening: Very Often	2.80	0.90	0.001
Frequency of Listening: Seldom	0.40	0.30	0.20
Frequency of Listening: Not at all	-1.00	0.55	0.08

Results in table 4 are interpreted as below;

Radio Signal Coverage: The coefficient of 1.20 for "Yes" indicates that respondents covered by a radio signal are significantly more likely to be satisfied with the radio program, with a **p-value of 0.01** (significant at the 5% level).

Listening to Agricultural Programs: A high coefficient of 2.50 indicates a very strong positive relationship between listening to agricultural radio programs and satisfaction, with a **p-value of 0.001** (highly significant).

Popular Program: Obuhingi noburiisa: This program shows a positive relationship (coefficient = 0.75) with satisfaction, but its **p-value of 0.06** makes it marginally significant.

Radio Station: Bfm: This station has a strong positive relationship with satisfaction (coefficient = 1.70) and a **p-value of 0.02**, making it statistically significant.

Frequency of Listening: Listening "Very often" has a very strong positive relationship with satisfaction (coefficient = 2.80) and is highly significant (**p-value = 0.001**). In contrast, listening "Not at all" has a negative association

Non-Significant Variables: Programs like "Agriculture and Environmental Management" and "Integrated Pest and Disease Management," as well as radio stations like "World FM" and "Hunters FM," do not have significant impacts on satisfaction.

In an interview conducted with key informant on satisfaction, it was reported that "*Farmers generally express high levels of satisfaction with agricultural radio programmes, particularly when the content is relevant, easy to understand, and presented in local languages. Many farmers appreciate the practical and timely information provided, as well as the opportunity to engage directly with experts during call-in segments. However, satisfaction levels vary depending on the frequency of the programmes, the expertise of the presenters, and the extent to which the content addresses the specific challenges faced by smallholder farmers in different rural areas. Some farmers have expressed a desire for more in-depth content and more frequent broadcasts".*

Table 5: Level of implementation of acquired knowledge through Agricultural Extension Radio Programmes

Variable	Coefficient (B)	Standard Error	Significance (p-value)
Soil and Water Conservation	0.90	0.40	0.02
Enterprise Selection	0.45	0.30	0.10
Animal Health and Production Management	0.80	0.35	0.03
Post-Harvest Management	0.60	0.33	0.07
Crop Husbandry and Management Practices	1.20	0.45	0.001
Credit Management	0.30	0.28	0.25
Group Formation and Management	0.15	0.25	0.40

Results in table 5 are interpreted as follows;

Soil and Water Conservation: The coefficient of 0.90 suggests a positive relationship between implementing acquired knowledge on soil and water conservation and overall improvement, with a **p-value of 0.02** (significant).

Animal Health and Production Management: This area has a coefficient of 0.80, with a **p-value of 0.03**, indicating a significant effect.

Crop Husbandry and Management Practices: The highest coefficient (1.20) shows that this practice has a strong positive relationship with implementation, with a **p-value of 0.001** (highly significant).

Post-Harvest Management: A coefficient of 0.60 with a **p-value of 0.07** suggests that this variable is marginally significant and may still influence implementation, although not as strongly as the others.

Enterprise Selection, Credit Management, and Group Formation and Management show low coefficients and high p-values, indicating no significant relationship with implementation.

In an interview held with key informant on level of implementation of knowledge acquired from the programmes, it was reported that "*Farmers are more likely to implement practical, low-cost techniques that can immediately improve their yields, such as soil conservation practices, For example, after learning about soil and water conservation practices through radio, many farmers have adopted terracing or mulching to improve water retention. However, for more complex or resource-intensive practices, such as purchasing new agricultural technologies or transitioning to organic farming, implementation may be slower due to financial or resource constraint*s"

In an interview conducted with one of the key informants, it was reported that "*From my experience in using radio programs to communicate agricultural information, radio has proven to be a vital tool for farmer education and engagement. I have been involved in several radio programs that aim to enhance agricultural productivity by providing knowledge on sustainable farming practices, market trends, and crop protection techniques*".

4.3 Effectiveness of Agricultural Radio extension programmes on smallholder farming activities,

Quantitative responses generated were capture and analyzed to generate frequencies and percentages as presented below;

Table 6: Effectiveness of Agricultural Radio extension programmes, time appropriateness and radio frequency formats preferred by smallholder farmers

Variables	Coefficient (B)	Standard Error	Significance (p-value)
Improvement in uptake and utilization of SWC practices	0.75	0.35	0.03
Improved crop and animal enterprise choices	1.10	0.40	0.001
Increase in agricultural technology uptake and use	0.50	0.30	0.10
Improved animal health and production management practices	0.85	0.38	0.02
Improved post-harvest management practices	0.45	0.28	0.09
Enhanced crop husbandry and management practices	1.30	0.50	0.001
Proper credit utilization and management	0.25	0.25	0.30
Time; Morning hours	0.32	0.27	0.18
Afternoon hours	0.30	0.25	0.15
Evening hours	1.10	0.40	0.01
Late evening hours	0.45	0.30	0.08
Radio Formats; Interactive and participatory talk show	0.90	0.35	0.02
Grass root farmer centered	0.25	0.28	0.30
Local language talk show	0.75	0.33	0.04
Repeated programme/talk show	0.50	0.30	0.07
Formats that involve indigenous knowledge	0.65	0.32	0.05

The results in table 6 are interpreted below;

Improvement in uptake and utilization of SWC practices: This has a positive coefficient of 0.75 with a **p-value of 0.03**, indicating a significant effect of agricultural radio extension programs (AREPs) on soil and water conservation practices.

Improved crop and animal enterprise choices: With a coefficient of 1.10 and a **p-value of 0.001**, this is highly significant and suggests AREPs have a strong impact on enterprise decision-making. **Improved animal health and production management**: A coefficient of 0.85 and a **p-value of 0.02** highlight a significant effect on animal health and production practices.

Enhanced crop husbandry and management practices: The highest coefficient (1.30) indicates a strong and highly significant relationship between AREPs and improved crop husbandry, with a **p-value of 0.001**.

Improved post-harvest management practices: With a coefficient of 0.45 and a **p-value of 0.09**, this variable shows a marginal significance, implying it may still influence farming activities but less strongly than other variables.

Increase in agricultural technology uptake and use and **Proper credit utilization and management** are non-significant, with **p-values of 0.10 and 0.30**, respectively. This suggests that AREPs have little to no effect on these aspects.

Time Appropriateness:

Evening hours have a coefficient of 1.10 with a **p-value of 0.01**, indicating that this time is significantly preferred for acquiring knowledge through AREPs. **Late evening hours** show a positive relationship (coefficient = 0.45), but with a **p-value of 0.08**, indicating marginal

significance. **Morning and afternoon hours** do not significantly influence knowledge acquisition, as their p-values exceed 0.05.

Radio Formats

Interactive and participatory talk shows (coefficient = 0.90, **p-value = 0.02**) and **local language talk shows** (coefficient = 0.75, **p-value = 0.04**) significantly influence knowledge acquisition.

Formats that involve indigenous knowledge also show a positive effect, with a coefficient of 0.65 and **p-value of 0.05**, making it significant.

Repeated programmes/talk shows are marginally significant with a **p-value of 0.07**. **Grass root farmer-centered formats** show no significant relationship with knowledge acquisition.

In an interview conducted with one of the key informants on advantages of radio in communicating agricultural information, it was reported that " *Radio is widely available and accessible, even in rural areas where other forms of communication may be limited. This makes it an effective medium for reaching large numbers of farmers, particularly those in remote regions with limited internet access*".

In another interview conducted with one of the key informants, it was said that *" Radio can quickly disseminate up-to-date agricultural information, such as weather forecasts, pest outbreaks, or market price updates, helping farmers make timely decisions to protect their crops and increase productivity".*

4.4 Factors associated with radio listenership and application of the knowledge gained through agricultural radio messages

Section 4.4 addresses research objective three that sought to determine the factors associated with radio listenership and application of the knowledge gained through agricultural radio messages. The quantitative responses gathered were analyzed using logistic regression to generate odds ratios as presented below;

Table 7: Parameter estimates for the factors associated with radio listenership and application of the knowledge gained through agricultural radio messagesFactors associated with radio listenership

Variable	Value	AOR (95% CI)	p-value
Age bracket	18 - 28	.683 (.330 - 1.415)	0.306
	29 - 38	.572 (.275 - 1.188)	0.134
	39 - 48	1.493 (.437 - 4.614)	0.002
	49 and above	1	
Access to radio	Yes	0.636 (0.568 - 1.158)	0.195
	No	1	
Radio ownership	Own	3.060 (0.721 - 7.154)	0.000
	Do not own	1	
Place of residence	Town	2.953 (0.507 - 5.762)	0.001
	Village	1	
Attitudes and perceptions	Negative	0.441 (0.656 - 8.164)	0.003
	Positive	1	
Employment status	Employed	0.462 (0.813 - 2.553)	0.183
	Not employed		
Media exposure	Exposed	1.603 (0.290 - 3.953)	0.023
	Not exposed		
Factors for non-application of the knowledge gained through agricultural radio messages			
Lack of skills	Yes	1.441 (0.656 - 3.164)	0.363
	No	1	
Limited agricultural spaces	Yes	0.511 (0.239 - 0.827)	0.032
	No	1	
Economic status	High	0.956 (0.568 - 1.608)	0.864
	Low	1	
Investment capital	Yes	0.588 (0.367 - 0.940)	0.027
	No	1	
Labour availability	Yes	1.419 (.462 - 4.362)	0.541.
	No	1	

Dependent variable: radio listenership and knowledge application

- AOR → Adjusted Odds Ratio
- CI → Confidence Interval

Results for the factors associated with radio listenership and application of the knowledge gained through agricultural radio messages are presented in table 7.

Age bracket (39 – 48) increased the log odds of probability of listening to agricultural radio massages by 1.5 chances. Those in the age group 39 – 48 years were 1.5 times more likely to listen to radio compared to those aged 49 and above [AOR = 1.493; (95% CI: .437 - 4.614); p = 0.002]. There was no significant difference in listenership between those aged 18 - 28 and 39 – 48 years.

Likewise, radio ownership increased the log odds of probability of listening to agricultural radio massages by 3 and was statistically significant at (p = 0.000). Households who owned radios were 3 times more likely to listen agricultural radio massages compared to those that did not have [AOR = 3.060; (95% CI: 0.721 - 7.154); p = 0.000].

Place of residence increased the log odds of probability of listening to agricultural radio massages by 3. Those who resided in townships were 3 times more likely to listen to agricultural radio massages compared to those in the village [AOR = 2.953; (95% CI: 0.507 - 5.762); p = 0.001].

Attitudes and perceptions reduced the log odds of probability of listening to agricultural radio massages by 0.4 and was significant at (p = 0.003). Compared to those with positive mind, those with negative attitude and perception were 0.4 times less likely to listen to agricultural radio programs [AOR = 0.441; (95% CI: 0.656 - 8.164); p = 0.003].

Exposure to media increased the log odds of probability of listening to agricultural radio massages by 1.6 and was significant at 5%. Those with more media exposure were 1.6 times more likely to

listen to agricultural radio massages compared to those with less exposure [AOR = 1.603; (95% CI: 0.290 - 3.953); p = 0.023].

Limited agricultural spaces reduced the log odds of famers' application of knowledge gained through agricultural radio messages by 0.511 and was significant at 5%. Farmers with limited spaces for agriculture were 0.5 times less likely to apply knowledge gained through agricultural radio messages compared to those with bigger spaces [AOR = 0.511; (95% CI: 0.239 - 0.827); p = 0.032].

Furthermore, investment capital reduced the log odds of famers' application of knowledge gained through agricultural radio messages by 0.588 significant at 5%. Farmers with limited capital for agricultural investment were 0.58 times less likely to apply knowledge gained through agricultural radio messages compared to those with capital [AOR = 0.588; (95% CI: 0.367 - 0.940); p = 0.027].

In an interview held with key informant on limitations of using radio to communicate agricultural information, it was said that " *One way communication limits communication where some programmes are interactive, many are not, limiting opportunities for farmers to ask follow-up questions or clarify doubts*".

In another interview conducted, it was reported that "*Farmers would miss important broadcasts due to their busy schedules or would not have the time to listen to long discussions, which limits the amount of knowledge they can acquire*".

In another interview conducted with key informant, it was revealed that "*Farmers would be occupied with fieldwork during the times when agricultural radio programmes are aired, preventing them from tuning in regularly*".

In an interview conducted with key informants on suggestions for improving radio programmes to effectively communicate agricultural information, it was reported that " *Scheduling programmes during times when farmers are more likely to be available, such as early mornings or late evenings, could increase listenership. Expanding the opportunities for farmers to ask questions and interact with experts can make the programmes more engaging and relevant to farmers' specific needs. Repeating important programmes at different times or offering summaries can help farmers catch up on missed content*".

Chapter five

Discussion, Conclusions and Recommendations

5.0 Introduction

This chapter presents discussions of the study findings in relation to problem statement and available literature review. The discussions were arranged according to the following subsections as below.

5.1 Discussion of Findings

5.1.1 Coverage and listenership of Agricultural Extension Radio Programmes

The study discovered a wide coverage of agricultural extension radio programmes especially in areas where there was radio signals. In areas without clear signal, listeners volunteered to communicate with those who could not listen to programmes. Listenership to agricultural extension radio programmes was at 98.3% due to educative nature and the fact that the biggest part of the population are farmers. The most liked radio program was “Obuhingi noburiisa” which airs on different radio stations including Bushenyi fm, world fm and crane fm respectively. This finding can be compared with that of Mubangizi et al. (2022) who reported that radio preference as a mass medium is attributed to its unique characteristics that allow the owners to expand the spectrum beyond urban areas, avoid economic barriers to consumers paused by high priced newspaper or TV subscriptions. Mubangizi et al. (2022) further revealed that the oral nature of radio and its ability to employ native languages enables the medium to reach the critical rural population which in Uganda is about 80%. Radio is also preferred for its portability, affordability, simplicity, and flexibility to the user.

The general analysis of the findings indicated that farmers were fairly satisfied with Agricultural Extension Radio Programmes based on their continuous participation through SMS, direct studio calls and group information sharing. The fair satisfaction was due to factors like; lack of signal, signal breaks up, limited public participation and over politicizing the programs. This study finding are comparable to Adegbidi et al. (2023) who revealed that in relation to radio broadcasting, it is expected that the level of perceived credibility of the radio station and its programme producers, the level of contact the farmers have with the radio staff, and the relevance of the radio messages, could all influence the level of perceived credibility of the radio station by its audience.

Findings indicate that agricultural extension radio programmes made a significant impact on the knowledge-gain of listener group members. Listeners therefore reported various improved practices gained knowledge as a result of the radio agricultural programmes. They implemented the knowledge acquired crop husbandry and management practices, soil and water conservation practices, animal health and production management, post-harvest management, crop and animal enterprise selection, credit access and management and group formation and management. These study findings are comparable to findings by Rugege and Murenzi, (2023) who revealed that the strength of rural radio as an extension tool lies in its relative advantage of being able to reach illiterate rural farmers in even the remotest areas. It also provides them with information on all aspects of agriculture in the languages they understand. Rural and community radio are effective in blending the people's cultures and traditional communication channels with development messages.

5.1.2 Effectiveness of Agricultural Radio extension programmes on smallholder farming activities

The study found out that agricultural Radio extension programmes were more effective on smallholder farming activities. The programmes indeed made a significant impact on the knowledge-gain level of the target audience which directly translated in improved practices. It was reported that programs were relevant to farmers agricultural informational needs a that is why they listened to the programs. Local radios act as an extension tool, and have the ability to reach illiterate farmers and provide them with relevant information, technology and skills on all aspects of agriculture in their own language. Therefore, listening to agricultural radio extension programmes had enhanced farmers adaption of crop husbandry and management practices, improved decision making on crop and animal enterprises, enhanced animal health and production management practices, increased the uptake of agricultural technologies as well as the uptake and utilization of SWC practices in the area. These study findings are in line with Chapota et al. (2020) who argued that radio is one of the effective ways of communicating agricultural messages such as technologies and best practices that can help farmers improve production. This is achieved through different programs like radio forums tailored to local communities. He reported about the relevance of the radio information with example of the 50% of Zambian farmers who confirmed that their crop yields increased by listening to the radio programs on agricultural extension education.

Respondents revealed that the most appropriate time for consuming agricultural radio programs is in the evening hours when they get back from their respective jobs. Unlike in the morning and afternoon hours where farmers are always busy with the daily work schedules, conveying agricultural radio massages in the evening hours give farmers an opportunity to tune in, listen an internalize the massage hence putting them in a position to apply the skills and knowledge gained

through a massage. Findings are comparable to findings by Taylor et al., (2022) who argued that local radio agricultural programs expand and make available information networks for farmers so that they are able to benefit from the knowledge and skills of extension officers and also from other farmers in the communities. Local radios strength as an extension tool, therefore, is seen in its ability to reach illiterate farmers and provide them with relevant information, technology and skills on all aspects of agriculture in their own language.

The study came out with different radio programme formats preferred by small scale farmers in acquiring knowledge such as; radio program formats that are interactive and participatory, formats that priotize local languages and needs of local people, programs repeats, formats that utilize and promote indigenous knowledge and radio formats that are grass root farmer centered. This study finding is in line with Manfre & Nordehn, (2021) who reported that radio formats should be designed to reinforce massages in order to bring change among farmers to adopt new farming techniques for improved productivity. Radio producers do this through programme planning which informs the selection of topics, presentation of the topics on radio with interviews from selected experts and farmers.

5.1.3 Factors associated with radio listenership and application of the knowledge gained through agricultural radio messages

Age had an influence on listenership of agricultural radio messages. Those in the age bracket of 39 – 48 years were 1.5 times more likely to listen to radio compared to those aged 49 and above and other groups. This is because this group is actively involved in agriculture to earn a living hence justifying their need for agriculture information than other groups.

Radio ownership presented a significant influence on listen ship of agricultural radio massages. Households or those who owned radios were 3 times more likely to listen agricultural radio

massages compared to those that did not have. The ratio of household to radio ownership was very low in rural remote places compared to townships. It was reported that lack of money to change batteries and power shortages are some of the reasons why only a few households owned radios in rural areas. This finding is in line with that of Chapota et al., (2020), who revealed that after a study on the diffusion of innovations from a local radio station, Radio Benue, reported that 69% of the farmers owned radio sets. They found that farmers listened to the radio agricultural broadcasts from Radio Benue.

Place of residence increased the greatly influenced listen ship to agricultural radio massages. Those who resided in townships were 3 times more likely to listen to agricultural radio massages compared to those in the village. This is because most rural places in the district are not yet connected with power and yet affordability of radio batteries is still a big challenge given the economic situation of most households in the area. This finding is in agreement with findings by Thompson & Fletcher, (2020) who also discovered a significant relationship between place of residence and radio listener ship.

Attitudes and perceptions affected listening to agricultural radio massages by 0.4 chances. Those who negatively perceived agricultural radio programs were less likely to listen to the programs. It was reported that most of the smallholder farmers still take agricultural radio massages to be for those with large farms and wealth. Therefore it was of no doubt that such negative perceptions would prohibit listen ship to the radio. This finding is contradictory to findings by Chapota et al., (2020) who asserted that a positive belief about an object therefore has a high likelihood of leading to a positive feeling or disposition towards the object. Positive attitudes towards radio therefore are expected to evoke high listenership to, and high participation in, the radio station's programmes. Perceptions, like attitudes, have influence on audience members' level of acceptance

of the selection of the source of communication and recall of the messages from a communication source.

Media exposure presented a significant influence on agricultural radio massage listener ship. Those with more media exposure were 1.6 times more likely to listen to agricultural radio massages compared to those with less exposure. As it is expected, farmers in local communities who rated high on education listened to radio and learned more from the radio news than those who rated low on education. This study finding can be compared with that of Zossou et al., (2020) who also revealed that people with high levels of education are expected to learn more from mass media than those with low levels of education. This means they will be exposed to the mass media and learn news at a faster rate than the less educated.

Limited agricultural spaces decreased the chances of applying of knowledge gained through agricultural radio messages. Farmers with limited spaces for agriculture were 0.5 times less likely to apply knowledge gained through agricultural radio messages compared to those with bigger spaces. This study finding is in line with Khan et al., (2022) who asserted that most countries in Africa smaller average land holdings as a result of serious land fragmentation. The average land holding size is less than 1 ha which limits the application of different technologies.

Investment capital reduced the log odds of farmers' application of knowledge gained through agricultural radio messages. Farmers with limited capital for agricultural investment were 0.58 times less likely to apply knowledge gained through agricultural radio messages compared to those with capital. Capital is needed to buy inputs, hire machinery and acquire new technology. This finding is comparable to findings by Guri & Addai, (2020) who established a positive relationship between capital availability and technology uptake.

5.3 Conclusions

In conclusion, the study confirmed that the coverage and listenership to agricultural extension radio programmes is relatively high in rural settings compared urban settings. Despite a wide listen ship and continuous participation through SMS, direct studio calls and information sharing, most farmers satisfied with the way agricultural radio program massages are conveyed. Farmers had implemented the acquired knowledge through agricultural radio program massages in aspects like crop husbandry and management practices, soil and water conservation, animal health and production management, post-harvest management and enterprise selection.

The study also concludes that Agricultural Extension Radio Programmes were effective on smallholder farming activities by enhancing of different production practices including crop husbandry and management, animal health and production management. They further enhanced farmers decisions on crop and animal enterprise choices, uptake and utilization of SWC practices and technology. The most preferred time for conveying agricultural radio extension programmes is the evening hours when farmers get home from work. Farmers preferred radio program formats that are interactive and participatory, formats that priotized local languages, involved indigenous knowledge as well as formats that are grass root farmer centered.

The study further concluded that age bracket (39 – 48), radio ownership, place of residence, negative attitudes and perceptions, limited agricultural spaces, media exposure and investment capital were some of the factors associated with radio listenership and application of the knowledge gained through agricultural radio messages in the area.

5.4 Recommendations

Based on the findings, the study came out with the following recommendations;

This study established that some farmers were not comfortable with the time the programme were aired. This study therefore recommends that the programme should be changed to evening when most farmers are available in their houses.

Radio formats should be designed to reinforce massages in order to bring change among farmers to adopt new farming techniques for improved productivity. Radio producers and program hosts should do this through programme planning which informs the selection of topics, presentation of the topics on radio with interviews from selected experts and farmers.

Appropriateness of agricultural information is very crucial to farmers' success. Farmers need to be provided with the information at the right time so as to apply that information in their farming activities for better farm productivity.

The strength of rural radio as an extension tool is widely regarded to lie in its ability to reach illiterate farmers and provide them with information relating to all aspects of agricultural production in a language they understand. Therefore programs/talk shows should be presented in local language.

Radio extension programmes, need to be prepared and broadcast in a way that makes them accessible to the target audience. This requires program organizers/moderators to consult with the community so as to identify not only the different subject priorities farmers but also the timing of the broadcasts including any meetings of listeners' groups or follow-up training, to fit in with work and household schedules.

There is need for more capacity building and external support. This can be achieved through providing extra agricultural advisory services to supplement information and knowledge gained via radio programs.

Group listener-ship should be encouraged through establishment of community listening centres in the rural areas. This may help those who don't own personal radio sets. It may also enhance interaction and discussion of the messages among the listeners, thereby encouraging active participation and better comprehension.

Since radio stations set up in rural areas have a predominantly agricultural clientele. Agricultural program moderators are recommended to use participatory approaches or top-down technical scientific information approach that embraces diversity of both local agricultural problems and farmers' existing knowledge and skills.

5.4 Areas for further research

Since majority of the farmers indicated that they preferred listening to radio in the evenings to any other time. Therefore further study should be conducted on the effect of agricultural radio program timing on the listenership and internalization of agriculture extension information.

This study was limited to agricultural extension radio programmes in Bushenyi district. The study therefore recommends further studies on the role of radio in agricultural development Uganda as general.

Further studies should be conducted on the factors affecting the participation of farmers in agricultural development programmes on radio stations.

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Appendices

Appendix I: Questionnaire for the Main Respondents

Dear respondent

I am **Musinguzi Duncan,** a student of Bishop Stuart University carrying out a study titled "**Effectiveness of radio agricultural programmes in scaling up farming activities of smallholder farmers in Bushenyi District**". This study is part of the requirements for my course and is for academic purposes only, the answers that you provide will be treated with utmost confidentiality, please co-operate by providing the correct information only.

Demographic data

Name…….…….….

Telephone number…… Sub-county…….

Parish…….……..Village……..……..

Position in the household……..…….

1. Gender: a. Male ( ) b. Female ( )

2. Age in years…….…….

3. Educational level in years……..…….

4. Marital status

a. Never married ( ) b. Married ( )

5. Source of livelihood

a. Farming ( ) b. Business ( ) c. Employment ( ) d. Others…….

6. Household size……..

7. Size of land owned (in acres) ……

8. What proportion of your farm is used for?

a. Crop production…….. b. Livestock production……

c. Homestead…… d. others (specify)……

9. Do you use any form of media?

a. Yes ( ) b. No ( )

10. If yes, which form of media do you use?

……

……

11. How often do you access;

a. Radio

i) Daily ii) twice a week iii) rarely

b. Television

i) Daily ii) twice a week iii) rarely

c. Newspapers

i) Daily ii) twice a week iii) rarely

d. Phone

i) Daily ii) twice a week iii) rarely

12. What is the reason for your access of the preferred medium in 3 above?

……

……

13. Do you listen to any agriculture radio programme?

a. Yes ( ) b. No ( )

14. If yes, which programme(s) do you listen to?

……

……

15. On which radio station do you access the program form?

……

……

16. How often do you listen to the programme?

a. Often ( ) b. Seldom ( ) c. Not at all ( )

17. When did you last listen to the programme?

a. Days ……

b. Weeks……...

c. Months…….

18. Where do you listen to the radio program from?

a. In the house ( ) b. In the farm ( ) c. At the office ( ) d. Public paces/ market ( )

e. Others. Specify……

19. Do you listen in as a group or alone?

a. Group ( ) b. Alone ( )

20. Give the reason for your answer above?

……

……

21. Do you directly participate in the programme?

a. Yes ( ) b. No ( )

22. If yes, how do you participate in the programme?

a. SMS ( ) b. Call-ins/phones ( ) c. Emails ( ) d. Facebook ( )

e. Other (state)…….

23. If No, explain why?

……

……

24. How are you (if at all) satisfied with the programme content?

a. very satisfied ( ) b. fairly satisfied ( ) c. Not satisfied ( )

24. a) What are your reasons for finding the programme satisfactory?

……

……

25. If no, why?

……

……

26. Are the topics addressed in the programme relevant to your agriculture activities?

a. Yes ( ) b. No ( )

27. If yes, how?

……

……

28. If no, why?

……

……

29. What are some of the farming techniques talked about by the program?

……

……

30. What are some of the benefits of these techniques to you as a farmer?

……

……

31. In which specific agricultural activities is the programme most relevant?

a. Fertilizer use b. crop husbandry c. SWC

d. Animal health and management e. Crop management practices

f. Post-harvest management g. credit mamanement

h. Group formation and management i. Others (specify)……

32. Are you satisfied with the programme content?

a. Yes ( ) b. No ( )

33. If yes, how are you satisfied with the programme content on a scale of 100%?

a. 67 – 10% (Very satisfied) ( )

b. 34 – 66% (fairly satisfied) ( )

c. below 33% (Not satisfied) ( )

34. What is your reason (s) for the level of satisfaction in 33 above?

……

……

35. If no, 34 above why?

……

……

36. Do you apply the knowledge you gain from local radio?

a. Yes always ( ) b. sometimes ( ) c. I do not apply ( )

37. How helpful (if at all) do you find what you listen to in the programme to your farming activities?

……

……

38. If you do not apply the messages often, please state your reasons?

……

……

39. In what specific aspects have you found the programme (s) usefull

……

……

40 To what extend have you implemented knowledge acquired at a scale of 1 – 100%?

a. 1 – 20% ( ) b. 21 – 40% ( ) c. 41 – 60% ( )

d. Above 61% ( )

41. Could there be factors associated radio listenership and application of the knowledge acquired through radio agricultural messages

a. Yes ( ) b. No ( )

42. What are the factors hindering radio listenership to agricultural messages?

……

……

……

……

43. What are the factors hindering the application of the knowledge acquired through radio agricultural messages?

……

……

……

……

44. Is the duration for the agricultural broadcasts adequate?

a. Yes ( ) b. No ( )

45. If no, pleases indicate your preferred duration for the broadcasts?

……

46. Do you think the amount of time the program airs is sufficient?

a. Yes ( ) b. No ( )

47. If No, briefly explain why?

……

……

48. Do you think the program's timing of the broadcast is appropriate?

a. Yes ( ) b. No ( )

47. If No, why?

……

……

48. Which radio programme format do you prefer most for agricultural broadcast??

a. discussion ( ) b. drama ( ) c. straight talk ( ) d. Magazine ( )

e. Other (please specify……

49. Give reasons to your answer to above question (Question 48)

……

……

……

50. Are there any aspects in them radio programme you wish to be improved?

a. Yes ( ) b. No ( )

51. If yes, what aspects of the programme would you want to be improved?

……

……

52. What other programmes do you listen to on radio stations?

……

……

Thank you for you participation

Appendix II: Interview Schedule for the Key informants

1. What are the names?
2. Sub county of work?
3. Occupation?
4. What is the main source of livelihood for people in this area?
5. What is the average landholdings in this area?
6. What is the number of farmers you serve?
7. Have you ever used radio to communicate agriculture information? Yes No
8. Which agriculture information do you usually communicate?
9. What are the advantages of radio in communicating agriculture information?
10. What is your experience of using radio programmes to communicate agriculture information? (please discuss the radio programmes you have been involve in)
11. Are the topics addressed in the programme relevant to the information needs of small scale farmers?
12. What is the impact (if at all) of radio programmes on agriculture in improving farming practices of small scale farmers?
13. Do farmers actively participate in the programmes? If yes how?
14. How satisfied are farmers with the programme(s)?
15. What is level of farmer implementation of the knowledge acquired from programmes?
16. What are the limitations of using radio in communicating agriculture information?
17. What are some of the barriers that farmers face in listening to radio programmes?
18. How can radio programmes be improved to effectively communicate agriculture information?

19. What are the key radio programme formats preferred by small scale farmers in acquiring knowledge?
20. Apart from radio, which other sources do you think farmers can obtain agricultural information from?
21. Of the sources above, which one do you think is more popular than radio?
22. If none, why do you think radio is most popular in disseminating agricultural information?
23. What are your general remarks about the role of radio in agricultural development?

Thank you for you participation

Appendix I: Questionnaire for the Respondents (Translated)

Ssebo/Nyabo,

Amaziina niabanyeta **Musinguzi Duncan,** omwegi wa Bishop Stuart University ni ndondoreza aha a kumanya "**orurengo oru purogramu za rediyo zirikuhikaho omukutnguura omutindo gwebyobuhingi hamwe noburiitsa omubahingi hamwe nabatungi ababureijo omuri District ya Bushenyi**". Oku okukyondooza nikimwe ahabirikwetaaga kihikirizibwa omwegyi kuheza omushomo. kandi nikikorebwa ahabwenshonga yokumaririza omushomo gwonka, okugarukamu kwawe kwebibuzo nikuza kutwarwa nka ekihama, mbwenu noshabwa ku kwatanitsa okagamba amazima gonka

Section A: Ebirikukukwataho

Amaziina…….…….….

Enamba yesimu…… Egomborora…….

Omuruka…….……..Ekyaro……..……

..

Nokora nkaki/Ori oha omuka egyi……..…….

1.a. Omushaija ( ) b. Omukazi( )

2. Oyine emyaka engahe ……..…….

3. Okakoma omukyakangahe (obwingi bwa emyaka eyiwashomire)…….

4. Osweire/ningashi osweire

a. Tinkashwera/rwa ga ( ) b. Nshweire(we) ( )

5. Nokora Murimoki

a. Obuhingi/Oburitsa ( ) b. Okushubura ( ) c. okukozesibwa ( ) d. Ekindi…….

6. Eka egi erimu abantu bangahe?……

7. Mweine eitaka ririkwinganaki (nka ebishahe bingahe) ……

8. Nimukozezaho eitaka ririkwinganaki okukora ebi?

a. Ebyokuhinga …….. b. Ebyobureitsa……

c. Ahokutuura…… d.ebindi (hamwe nekyokureberaho)……

Section B: Ahi rediyo erikukoma, Obuhurikiriza, okuhereza ebyabantu barikwenda hamwe nokuteeka omunkora ebibarikweega ahamishomo ya aha rediyo yebyobuhingi hamwe nebyobureitsa.

9. oyine empurizana yona eyorikukozesa (any media form)?

a. Yego( ) b. Ngaha ( )

10. Kwerabe eriho, Nokozesa eha yona?

……

……

11. Nogikozesa kumara emirindi nka engahe;

a. Radio

i) Buri eizoba ii) Emirundi ebiri burisabiti iii) Rimwe na rimwe

b. Television (TV)

i) Buri eizoba ii) Emirundi ebiri omu sabiiti iii) Rimwe na rimwe

c. Empapura zamahurire

i) Buri eizoba ii) Emirundi ebiri omu sabiiti iii) Rimwe na rimwe

d. Esimu

i) Buri eizoba ii) Emirundi ebiri buri sabiiti iii) Rimwe na rimwe

12. Empurizana nokira kukozesa eha, kand ahabwenk (omuri 3 ezagambwaho ahaiguru)?

……

……

13. Hariho puroguramu yebyobutungi nobureitsa eyorikukira kuhurikiriza?

a. Yego ( ) b. Ngaha ( )

14. Kwerabe eriho, Nokiraga kuhurikiza eha yona?

……

……

15. Puroguramu egi nokihuririza aha rediyo ki?

……

……

16. Nogihurikiza emirundi engahe?

a. Bureijo ( ) b. Obumwe na bumwe ( ) c. ingaha ( )

17. Okashemba ryari kigihurikiza?

a. Ebiro ……

b. Esande……...

c. Emyezi…….

18. Puroguramu nogihurikizaga waba orinkahe?

a. Omunju ( ) b. omu faamu ( ) c. omu office ( ) d. Aheru omubantu/ omukatare ( )

e. Ogundi mwnya gwona. guha?……

19. Nimuhurikizaga hamwe ninga wenka?

a. Tuteireine hamwe ( ) b. Nyenka ( )

20. Ninshongaki erikuretera wahurikiza mwetereine ninga wenka(kuruga omu 19 ahaiguru?

……

……

21. Puroguramu egi nogizaho otensa ninga ogarukamu ebibuuzo?

a. Yego ( ) b. Ngaaha ( )

22. Kworabe nogyegeitamu, nogyegeitamu ota?

a. Okusindika mwsegi ( ) b. Okuteera esimu ( ) c. okusindika e-mail ( )

d. Ekibanja ekirikugaita abantu /Facebook ( )

e.Endeijo yona (gigambe)…….

23. Waba oteine, Gamba ahabweki?

……

……

24. Okumarwa kwawe ahbirikuba nibishomesebwa omu purogramu za radio?

a. Mazirwe munonga ( ) b. Habaasa ( ) c. Nibuburaburamu ( )

24. a) Purogramu bakagigirabata kureeba ngu wamarwa kurungi kandi wayega?

……

……

25. Kuyakubakitarikityo, ahabwenki?

……

……

26. Ebirikutensebwaho omu purogramu, byeine akakwaate nebyokuhinga hamwe nokureitsa kwawe?

a. Yego ( ) b. Ngaha ( )

27. Kukirabe nikwe kiri, tushobororeho?

……

……

28. Kukirabe tikwe kiri, ahabwenki?

……

……

29. Nibukoryoki bwokuhinga obwoyegiire omu purogramu?

……

……

30. Kandi obu obukoryo bwoyegiire omu program bukuyambireki?

……

……

31. Puroguramu esingire kukuwhera omuriki?

a. Okukozesa orwezo b. Omuhuhinga c. Ebyameizi na nokureberera eitaka

d. Ebyobutuungi e. Okuhiinga kurungi

f. Okukwatagye ebyasharurwa g. Okukozesagye ssente za loan

h. Entwaza yebigombe byokweheita i. Ekindi kyona (kishoborore)……

32. Oyine okumarwa nentebekanisa ya purogramu ?

a. Yego ( ) b. Ngaha ( )

33. Kukiraabe nikwe kiri, ookumarwakwawe ni zingahe ahari 100%?

a. 67 – 10% (Mazirwe munonga) ( )

b. 34 – 66% (Habaasa) ( )

c. below 33% (Timazirwe) ( )

34. Kworabe omazirwe, nahabwanshongaki ? kuruga omuri 33 eyagambwaho?

……

……

35. Kandi kuwakuba otamazirwe otugambire enshonga, 34 ahaiguru?

……

……

Section C: Okukora kwa purogramu za rediyo ezebyobuhingi noburiitsa ahabuhingi bwabureijo, obweire obuhikire hamwe na za rediyo ezi abahingwyi barikukunda okwegeraho.

36. Ebyorikwega aha rediyo obiteeka omunkora?

a. Yego, bureijo bwona( ) b. obumwe na bumwe ( ) c. tindikukira kubiteeka munkora ( )

37kukurabe nekwe kiri, nokikora ota?

……

……

38. Kukirabe tikwe kiri ahambeki otarikubiteeka munkora, tugambire ensonga?

……

……

39. Notungamu obuhweziki (kuburabe buriho) omukwegyera aha rediyo?

……

……

38. obutumwa bwaha rediyo nobuteeka omunkora?

……

……

40. Puroguramu ezi, zikuyambire mumuringoki?

……

……

41. Eborikwega obiteeka omunkora kuhika harurengoki 1 – 100%?

a. 1 – 20% ( ) b. 21 – 40% ( ) c. 41 – 60% ( )

d. Ahaiguru ya 61% ( )

Section D: Ebirikuretera abuhurikiza bwa rediyo , hamwe nokutenka omunkora ebyayegyesibwa omu puroguramu zaha rediyo.

42. obuhurikiza bwa rediyo, hamwenokuteeka omunkora ebyayegyesibwa, bweine ekiburikungenderaho, ?

a. Yego ( ) b. Ngaha ( )

43. Abahingi nibagyendera ahariki kuguma barikuhurikiriza puroguramu za ebyobuhingi noburiitsa aha rediyo?

……

……

……

……

44. Ebirikuretera abamwe batateeka munkora ebibayega aha puroguramu niki?

……

……

……

……

45. Obweire bu purogramu ezi zirikutwara aha rediyo nibumara?

a. Yego ( ) b. Ingaha ( )

46. Kukirabe kitarikwe, nishaha zingahe ezakukozire kurungi?

……

47. Puroguramu ezi, nizitwara obweire burikumara?

a. Yego ( ) b. Ingaha ( )

48. Kikirabe tikwe kiri, Shoborora ahabwenki?

……

……

49. Puroguramu ezi, nibazitekaho omubweire burungi?

a. Yes ( ) b. No ( )

47. Kukirabe tikwekiri, nahabwenki?

……

……

50. Ni puroguramuki, ahabyobyobuhingi nebyoburiitsa eyorikukunda aha rediyo?

a. okuhanuura ( ) b. emizaano ( ) c. okugamba ahanshonga ( ) d. obutabo bwamahurire oburimu ebusuani( )

e. Ningashi ekindi kyona (kishoborore……

51. Hereza ensonga ya numbern48

……

……

……

52. Purogramu bakagyongyeramu omutiindo?

a. Yego ( ) b. Ngaha ( )

53. Kukirabe nikwekiri, bagwongere munshongaki(shoborora)?

……

……

54. Ekindi ekiwakuba noyenda kwongyeraho?

……

……

Webare kukwatanisa neitwe.

Appendix II: Interview Schedule for the Key informants

1. Maziina?
2. Egomborora yibarikukoreramu of work?
3. omurimo?
4. Nimirimoki erikubeesaho abantu omu mwanya ogu?
5. Abantu abeingi beine eitaka ririkwinganaki obuhango?
6. Nimuhereza abantu barikwinganaki?
7. Mwarakozeiseho rediyo kugamba hamwenabantu ebirikukwata ahabuhiingi hamwe nomuriitsa? Yego/Ngaaha.
8. Nibutumwaki obumurikuhereza abantu oburikukwata ahabugiingi noburiitsa?
9. Nibirungi ki ebiri omukokozesa rediyo okuhitsya obutumwa omubahiingi?
10. Tushobororeho ebyoshangire omukukozesa purogram za redio orikuhitsaya obutumwa bwa wbyobuhingi noburiitsa ahababahingi nabariitsa? (tushobororereho orikwejunisa purogramu eziwarebeire oimu aha rediyo)
11. Hariho ebimwaraganeireho ebirikukwata ahabyetaago byabahingi nabariitsa ababureijo?
12. Puroguramu ezi zihindwirehoki (kukiraabe kiriho) ahakutunguura mutiindo gwe ebyoburiitsa nobuhingi ahamuhiingi wabureijo?
13. Puroguramu ezi,abahiingi nibazetabamu? Kandi bata?
14. Abahingi puroguramu nibazegeitamu?
15. Abahiingi nabareitsa ebibarikwega omu purogramu za rediyo babiteire omunkora kuhika aha mubaroki?
16. Nikusomozebwaki okuri omukukozesa puroguram za rediyo ezi?
17. Nibintuku ebirikuremesa abahingi nabariitsa okuhurikiza proguramu za rediyo ezi?

18. Nenki ekitwakubaasa kwongyera omu puroguramu za rediyo ezi, kwongyera omuku whera abahingi nabariitsa?
19. Abahingi nibakira kukunda proguramu za redio ziiha zona, ningashi ezitebekanisiibwe zita omukwega ebyobuhiingi noburiitsa?
20. Oyihireho puroguram za rediyo, nogira ngu ninkahe ahandi ahu abahingi barikutunga kwegyesibwa ningashi okumanyisibwa ahabyobuhingi noburiitsa.?
21. Omubiwagamaba aheiguru, nogira ngu ninkahe ahu abahiingi baakwenzire ngu batungye okumanysibwa ninga shi okweega oyihireho radio?
22. Habahatariho, ahabwenki nogira ngu radio niyo erikusingirayo abahiingi hamwe nabariitsa?
23. Nibintuku ebindi ebiwakubaasa kutugambira ahakukozesa rediyo omukwongyera omutindo ahabyobuhingi noburiitsa?

Mwebare kuhanuura.