

Research Article

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

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## Abstract

The study was about effectiveness of radio agricultural programmes in scaling up farming activities of smallholder farmers in Bushenyi district. The specific objective was to; 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 and analysis. 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 concluded that 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 impediments that call for urgent address. This study therefore recommends that the programme should be changed to evening when most farmers are available in their houses. 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.

## Keywords

Agricultural Radio Programmes, Effectiveness, Smallholder Farmers, Bushenyi District

## 1. Introduction

Globally, mass media are vital tools of communication; they are instrumental in informing the masses about developments taking place across the world [1]. 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 [12]. 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

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rural population would use to get information [2] 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 [11].

In Sub-Saharan Africa, agriculture contributes immensely to household economy, and the sector has a growth rate of 6% per annum [12]. 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. Radio agricultural programs have thus been adopted to pass out information to the farmers at a cheaper cost [10].

In East Africa, Radio programs are considered useful in improving the sharing of agricultural information by remote rural farming communities [7]. These programs support agriculture extension through the use of local languages to communicate directly with farmers and listener groups. 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 of the countries is heavily dependent on agriculture with small scale farmers being the major producers [2].

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 [6]. 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 [5].

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 [13] which puts much pressure on the extension system.

Bushenyi district is rich of Information and communication technologies infrastructures such as radio stations, the area is also reached with television broadcast. The rapid increase in ownership of fairly priced radio sets by farmers and the expanding FM radio stations, makes the radio an important means of communication [13]. With the presence of these Information and communication technologies infrastructures farmers and extension workers and other stakeholders in rural development would effectively benefit from these Information and communication technologies hence minimizing pressure on the agricultural extension system in the district. Information and communication technologies

[13].

## 2. Problem Statement

Sustainability and productivity of the agricultural sector worldwide largely depend on the quality and effectiveness of extension services [3]. 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 [13]. 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 [6]. 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 [13]. 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 had 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 was still scanty literature on how effective radio agricultural programs were 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.

## 3. Research Objectives

The general objective of the study was to; assess the effec-

tiveness of radio agricultural programmes in scaling up farming activities of smallholder farmers in Bushenyi district. The specific objective was to; determine the factors associated with radio listenership and application of the knowledge gained through agricultural radio messages.

#### 4. 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

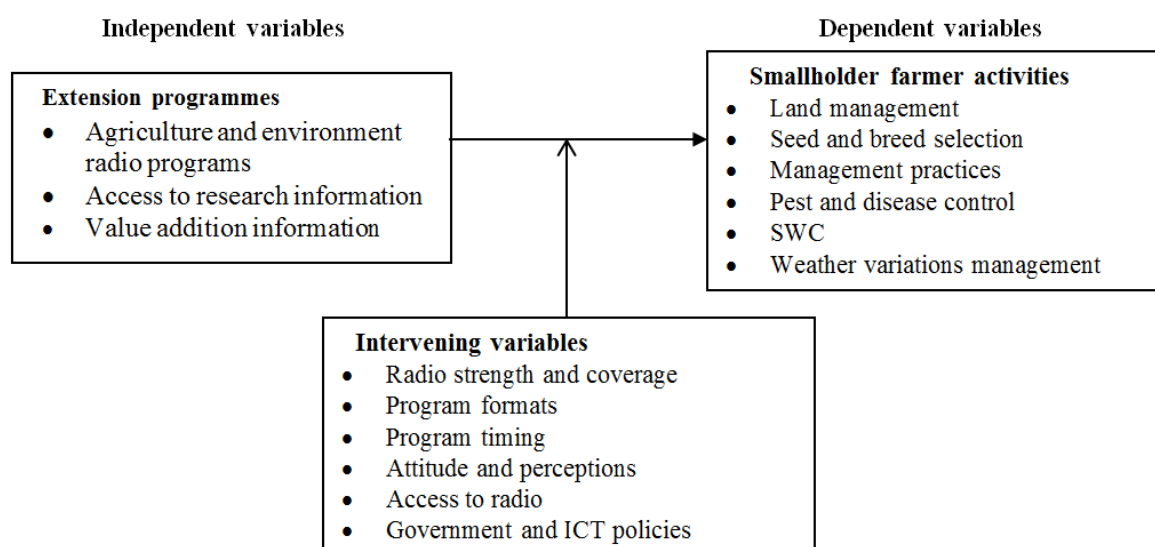
utilize their potential to complement other extension and knowledge services.

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.

#### 5. Conceptual Frame Work

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.



Source: Researcher's own construct, 2024

**Figure 1.** Conceptual framework.

#### 6. Materials and Methods

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 north-

east, Ibanda District to the east, Buhweju District to the south-east, 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 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.

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 study in-depth the effect farm radio programmes on smallholder farming 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.

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 sample size for the study was determined using the sample estimation formula below [4].

$$n = p \times q \times \frac{Z_{\alpha/2}^2}{e}$$

$p$  = Target population = 37.7% = 0.377

$q$  = Non-target population = 62.3% = 0.623

$e$  = standard error = 5% = 0.05

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

$$n = 0.377 \times 0.623 \times \frac{(1.96)^2}{0.0025}$$

$n$  = 360 respondents

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 set 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, the factors associated with radio listenership and application of the knowledge gained through agricultural radio messages.

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 behavior.

Quantitative data, 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. Multivariate analysis using correlations and logistic regres-

sion statistics was performed to determine the possible the factors associated radio listenership and application of the knowledge acquired through radio agricultural messages.

This research was approved by Bishop Stuart University Graduate School. Ethical approval was obtained from the Directorate of Graduate Studies Research and 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.

The study was limited by inadequate funds to cater for transport, stationery requirements and secretarial services. Early preparations by the researcher however helped him get the required resources in time. Lack 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.

## 7. Study Results

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 study 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 $\pm$ Std. D)	33.23 $\pm$ 8.671
Education level in years (mean $\pm$ Std. D)	9.19 $\pm$ 2.346
Marital status (Freq. %)	
Never married	268 (74.4%)
Married	80 (22.2%)
Others	12 (3.3%)
Household size (mean $\pm$ Std. D)	4.02 $\pm$ 2.135
Total farm size in acres (mean $\pm$ Std. D)	3.25 $\pm$ 1.123
Source of livelihood (Freq. %)	
Farming	272 (75.6%)

Household Characteristics	Total (n=360)
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. Mean average age were 33 years with the youngest aged 17 and the oldest 65 years. Average number of years in school

were  $9.19 \pm 2.346$  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  $3.25 \pm 1.123$  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.

**Table 2.** Regression output for the factors associated with radio listenership and application of the knowledge gained through agricultural radio messages.

Factors 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	



Factors associated with radio listenership			
Variable	Value	AOR (95% CI)	p-value
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 were presented in [table 2](#).

Age bracket (39 – 48) increased the log odds of probability of listening to agricultural radio messages 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 messages by 3 and was statistically significant at ( $p = 0.000$ ). Households who owned radios were 3 times more likely to listen agricultural radio messages 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 messages by 3. Those who resided in townships were 3 times more likely to listen to agricultural radio messages 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 messages 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 messages by 1.6 and was significant at 5%. Those with more media exposure were 1.6 times more likely to listen to agricultural radio messages 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 farmers' 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 farmers' 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);  $p = 0.027$ ].

## 8. Discussion of Results

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 listenership of agricultural radio messages. Households or those who owned radios were 3 times more likely to listen agricultural radio messages 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 [3], who reported 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 listenership to agricultural radio messages. Those who resided in townships were 3 times more likely to listen to agricultural radio messages 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 [8] who also discovered a significant relationship between place of residence and radio listener ship.

Attitudes and perceptions reduced affected listening to agricultural radio messages by 0.4 chances. Those who negatively perceived agricultural radio programs were less likely to listen to the programs and vice versa. It was reported that most of the farmers especially smallholder still take agricultural radio messages to be for those with large farms and wealth. Therefore it was of no doubt that such negative per-

ceptions would prohibit listening to the radio. This finding is contradictory to findings by Odhiambo et al., [12] 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 message listenership. Those with more media exposure were 1.6 times more likely to listen to agricultural radio messages 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 is comparable to findings by [8] 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 [10] 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 Taylor et al., [9] who established a positive relationship between capital availability and technology uptake.

## 9. Conclusion

The study 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.

## 10. Study Recommendations

There is need for more capacity building and external sup-

port. This can be achieved through providing extra agricultural advisory services to supplement information and knowledge gained via radio programs.

Group listenership 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.

## Abbreviations

AOR	Adjusted Odds Ratio
CI	Confidence Interval
ICTs	Information and Communication Technologies
REV	Reverend
SPSS	Statistical Package for Social Sciences
UFAAS	Uganda Forum for Agricultural Advisory Services

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## Author Contributions

**Duncan Musinguzi:** Conceptualization, Formal Analysis, Writing – original draft, Writing – review & editing

**Edward Ssemakula:** Supervision

**Gershon Nuwemuhwezi:** Supervision

## Conflicts of Interest

The authors declare no conflicts of interest.

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