

East African Journal of Agriculture and Biotechnology

eajab.eanso.org

Volume 8, Issue 2, 2025

p-ISSN: 2707-4293 | e-ISSN: 2707-4307

Title DOI: <https://doi.org/10.37284/2707-4307>



EAST AFRICAN
NATURE &
SCIENCE
ORGANIZATION

Original Article

Use of Radio by Smallholder Farmers in Accessing Agricultural Information in Ikolo Ward, Kyela District, Tanzania

Kenneth Nzilano^{1*}, Siweli Nyamba¹ & Innocent Busindeli¹

¹ Sokoine University of Agriculture, P. O. Box 3002, Morogoro, Tanzania.

* Author for Correspondence Email: nzilanokenneth@gmail.com

Article DOI: <https://doi.org/10.37284/eajab.8.2.3379>

Date Published: ABSTRACT

23 July 2025

Keywords:

Radio Use,
Agricultural
Information Needs,
Information
Accessibility,
Smallholder
Farmers.

Smallholder farmers rely on radio for agricultural information to improve their farming decisions, but its use is largely shaped by their personal characteristics and specific information needs. The study focused on radio as a tool. This study investigated the use of radio by smallholder farmers to get agricultural information. A cross-sectional research design was employed, and data were collected from 232 randomly selected farmers in Ikolo Ward. Data collection methods included semi-structured interviews, key informant interviews, and focus group discussions. Data were analysed using the Statistical Package for Social Sciences. Chi-square tests assessed the association between personal characteristics variables and radio use, with significance set at $p < 0.05$. Findings revealed that among the communication media, radio was most commonly used by smallholder farmers to access agricultural information, and they preferred night-time listening. In addition, personal characteristics such as sex, education, and marital status significantly influenced the use of radio for agricultural information, with males and individuals with higher education levels reporting greater use. The binary logistic regression analysis showed that the need for agricultural information on weather updates, fertiliser use, and market price updates had a positive and statistically significant influence on smallholder farmers' radio use. Radio helps farmers to plan their activities by offering timely and useful weather and market information. The study recommends developing agricultural gender sensitive radio programs focusing on smallholder farmers' needs, and farmer training on the use of radio to access agricultural information.

APA CITATION

Nzilano, K., Nyamba, S. & Busindeli, I. (2025). Agro-Pastoral Community of West Pokot County, Kenya: Challenges and Opportunities for Sustainable Climate Change Adaptation. *East African Journal of Agriculture and Biotechnology*, 8(2), 1-17. <https://doi.org/10.37284/eajab.8.2.3379>

CHICAGO CITATION

Nzilano, Kenneth, Siweli Nyamba and Innocent Busindeli. 2025. "Agro-Pastoral Community of West Pokot County, Kenya: Challenges and Opportunities for Sustainable Climate Change Adaptation." *East African Journal of Agriculture and Biotechnology* 8 (2), 1-17. <https://doi.org/10.37284/eajab.8.2.3379>.

HARVARD CITATION

Nzilano, K., Nyamba, S. & Busindeli, I. (2025), "Agro-Pastoral Community of West Pokot County, Kenya: Challenges and Opportunities for Sustainable Climate Change Adaptation", *East African Journal of Agriculture and Biotechnology*, 8(2), pp. 1-17. doi: 10.37284/eajab.8.2.3379.

IEEE CITATION

K., Nzilano, S., Nyamba & I., Busindeli "Agro-Pastoral Community of West Pokot County, Kenya: Challenges and Opportunities for Sustainable Climate Change Adaptation", *EAJAB*, vol. 8, no. 2, pp. 1-17, Jul. 2025.

MLA CITATION

Nzilano, Kenneth, Siweli Nyamba & Innocent Busindeli. "Agro-Pastoral Community of West Pokot County, Kenya: Challenges and Opportunities for Sustainable Climate Change Adaptation". *East African Journal of Agriculture and Biotechnology*, Vol. 8, no. 2, Jul. 2025, pp. 1-17, doi:10.37284/eajab.8.2.3379

INTRODUCTION

The agriculture sector has consistently contributed 4% to the global Gross Domestic Product (GDP) from 2000 to 2024. Between 2000 and 2020, the global value added by agriculture grew by 78% in real terms, with Africa experiencing a remarkable increase of 147%. In 2021, the sector employed approximately 866 million people, accounting for 27% of the global workforce, and played an essential role in ensuring food security by contributing 10% to the global food supply (FAO, 2022). Agriculture remains the second-largest source of employment globally, following public service sectors (Yeboah & Jayne, 2020).

Despite its global significance, the agricultural extension services face notable challenges, particularly in Tanzania. One of the most pressing issues is the inadequate number of agricultural extension agents, the lack of essential infrastructure, and facilities needed to effectively support farmers. As a result, government extension agents in Tanzania can reach only about 10% of farming households, leading to dissatisfaction among farmers and limiting the sector's potential impact at the grassroots level (Mosha & Daudi, 2024). The shortage of agricultural extension agents in Tanzania means many smallholder farmers are not reached with the support they need. As a result, they continue using traditional farming methods, which often lead to low crop yields, limited access to weather information, and low market prices for their produce.

Methods commonly used by farmers in accessing agricultural information include extension services, mobile phones, radio programs, television shows, printed materials, demonstrations, and field days. However, radio is a highly accessible and affordable medium for accessing agricultural information (CTA, 2020; FAO, 2023). According to Udeanya *et al.* (2019), radio is one of the communication tools used by farmers to get the information they need to address their pressing demands and issues. Radio remains a critical communication tool due to its extensive reach, cost-effectiveness, and ability to broadcast in local languages, which is essential in a country with diverse linguistic groups and varying literacy levels (Chapota *et al.*, 2014). Agricultural radio programs offer farmers timely, relevant information on topics like farming practices, pest control, weather, and markets. These programs are often interactive, encouraging farmer participation and feedback, which boosts learning and engagement (Sanga *et al.*, 2016).

A study by the Food and Agriculture Organization (FAO) in 2015 indicated that over 75% of the world's population had access to a radio, making it an ideal tool for reaching a large number of people in rural areas. According to a continental survey of news viewers conducted by Afrobarometer, 68% of Africans get their news from the radio on a daily or weekly basis, while 53% get it from television and 37% obtain it from the internet (Malophane, 2022). Radio is a highly effective communication tool, especially in rural areas, as it reaches over three-quarters of the global population, including those with limited access to other media.

A number of strong reasons encourage Tanzanian farmers to use radio as a means of accessing agricultural techniques (Mtega, 2021). Radio is widely accessible and affordable, making it especially valuable for people in rural and remote areas with limited access to other communication forms. Its use of local languages ensures that even low-literate farmers can understand and benefit from the information (Chapota *et al.*, 2014). According to Sanga *et al.* (2016), radio programs can help farmers make decisions that will increase their output and standard of living by providing them with timely and appropriate agricultural information such as market prices, pest management strategies, and weather forecasts. Radio programs provide farmers with timely information on market prices, pest control, and weather, helping them make better decisions to increase their crop yields and improve their living standards.

However, Tanzanian farmers encounter many obstacles while attempting to obtain agricultural information through radio. Erratic radio signal quality can make it difficult to get accurate information, particularly in difficult-to-reach places (Sanga *et al.*, 2016). Another discouragement is the occasional lack of timely and relevant content tailored to the diverse agricultural needs and local conditions of different farming communities (Mtega & Msungu, 2013).

The rapid pace of information delivery over the radio can make it difficult for some farmers to fully understand and retain critical information without the ability to review it, unlike written or digital formats (Manda & Mwakaje, 2020). The competition for radio airtime with other entertainment and news programming can limit the frequency and duration of agricultural broadcasts, reducing their overall impact (Msangi, 2020).

Research by Mushi and Lambrecht (2018) shows that many organisations, including government bodies, private radio stations, religious groups, and international agencies, have used radio to share

agricultural information on topics like farming methods, markets, weather, and pest control. Support from public-private partnerships has also helped stations like Kilimo FM reach small-scale farmers with useful advice to improve farming and food security (FAO, 2017; Farm Radio International, 2020; Ministry of Agriculture, 2022).

Despite these efforts, challenges such as poor reception, mismatched airing schedules, limited coverage, and language barriers persist, affecting the effectiveness of these programs (Mtega, 2018). According to TCRA (2022), across the nation there are 42 community radio stations; two of them are located in Kyela, which are Kyela and Keifo FM, but also there is one national radio broadcasting station (TBC).

Studies have shown that both the public and private sectors in Tanzania have made efforts to share agricultural information with farmers. These efforts include hiring agricultural extension officers, using leaflets, radio, television, and mobile platforms like M-Kilimo, as well as support from research institutions and private organisations (Lwoga *et al.*, 2011; Mtega, 2021).

Radio remains one of the most accessible and affordable mass communication tools for smallholder farmers, especially in rural areas with limited access to the internet or television. Also, radio broadcasts can be delivered in local languages and at convenient times, making them an effective medium for disseminating agricultural information to a wide and diverse farming audience. Despite many agricultural programs being aired on the radio, only a small number of farmers have access to and benefit from this information (Hudson *et al.*, 2017).

A study conducted by Mtega (2021) concluded that radio remains the most accessible and trusted source of agricultural information among Tanzanian farmers, especially in rural areas like Morogoro and Kilombero. Although radio has been recognised as a key tool for disseminating agricultural

information to rural farmers, there is limited empirical evidence on how smallholder farmers effectively use radio to access agricultural information in the study area. Specifically, this study assessed the current use of radio in accessing agricultural information by smallholder farmers. The research question guided this paper to investigate how radio is used by smallholder farmers in accessing agricultural information.

Theoretical Framework

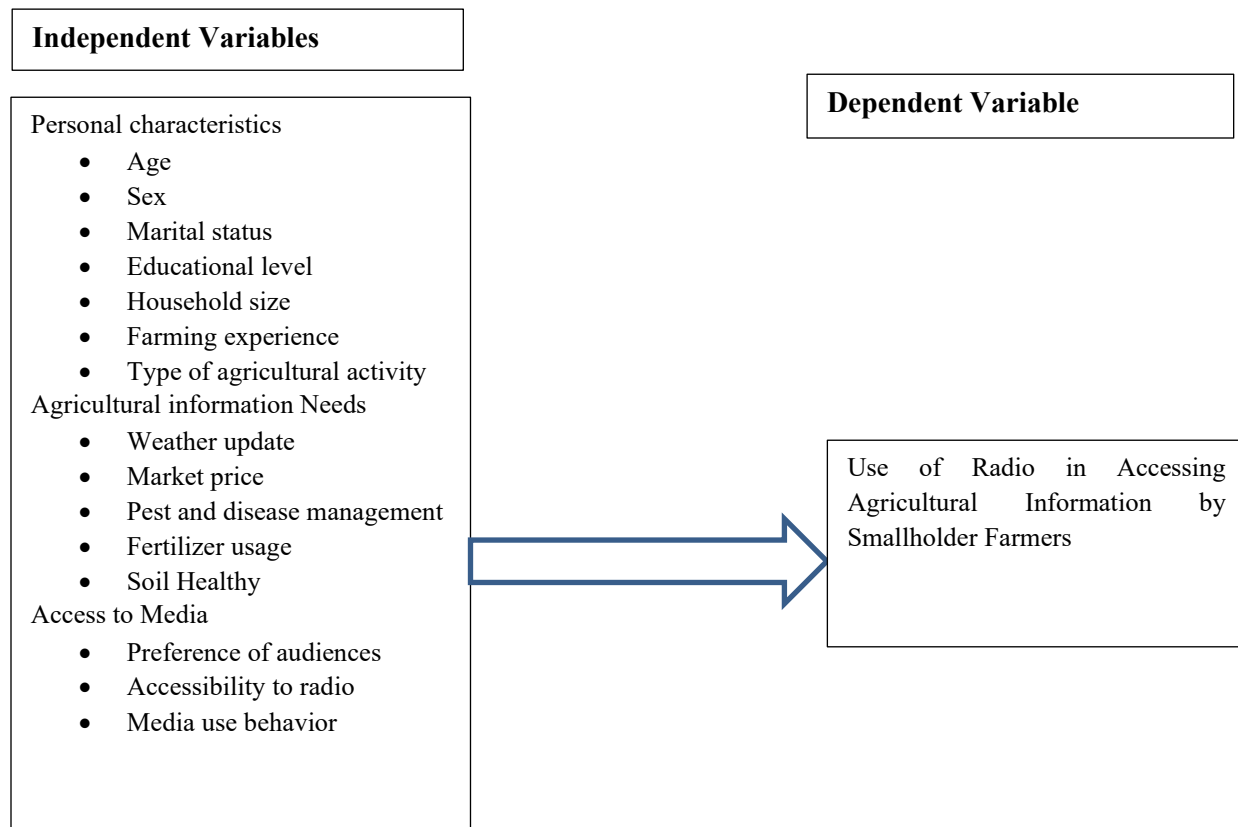
This study is guided by Uses and Gratifications Theory (UGT) founded by Ruggiero (2000). The Uses and Gratification Theory (UGT) is a communication theory that explains how and why individuals actively seek out specific media to satisfy particular needs. Unlike other media theories (such as the Hypodermic Needle Theory suggests that media messages are injected directly into the minds of a passive audience, leading to immediate

and uniform effects (Greenberg & Salwen, 2008). Agenda-Setting Theory suggests that media influences what people think about, though it assumes audiences are mostly passive (Rössler, 2016). In contrast, Uses and Gratifications Theory (UGT) sees audiences as active, choosing media based on their personal, social, and information needs. For farmers, this includes how often they listen, what kind of information they seek (like education, entertainment, or support for decisions), and their preferences for content and language.

Conceptual Framework

The conceptual framework of this study is grounded in the Uses and Gratifications Theory and comprises both independent and dependent variables (see Figure 1). This framework assumes a cause-and-effect relationship between agricultural information needs and the extent to which smallholder farmers use radio to access agricultural information.

Figure 1: Conceptual Framework on the Use of Radio in Accessing Agricultural Information



METHODOLOGY

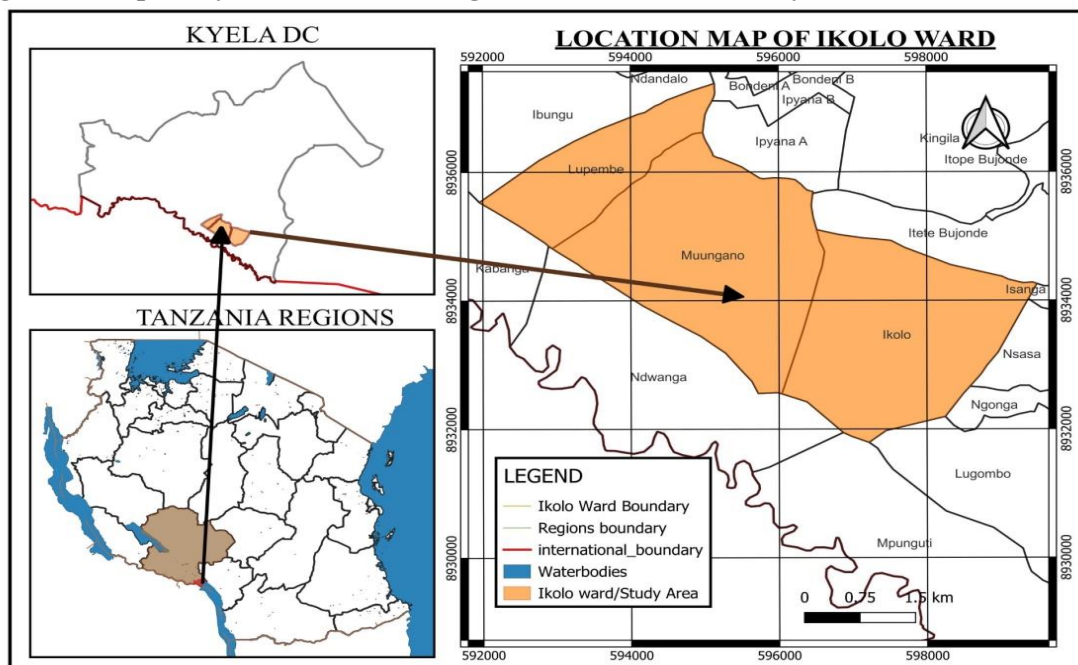
Description of the Study Area

The study was conducted in Kyela District Council, located in the Mbeya Region of Tanzania, specifically in the Ikolo ward, which comprises three villages: Ikolo, Muungano, and Lupembe. The district was purposively selected as the study area because it is a predominantly agricultural district where farming is the main livelihood, and farmers face challenges related to the use of radio in accessing timely, affordable, and relevant

agricultural information, making it an ideal setting to assess the use of radio by smallholder farmers in accessing agricultural information.

The district experiences a tropical climate, characterised by a warm and humid environment. The district receives substantial rainfall, ranging between 1,800 mm and 2,600 mm per year, making it among the districts with the highest rainfall in Tanzania. The weather is warm, with temperatures averaging 25°C to 30°C during the day. The rainy season duration is from November to May.

Figure 2: Map of Kyela District Showing the Location of the Study Area



Sampling Procedures and Sample Size.

The sampling procedure is the method used to choose a subset of individuals or units from a larger population to take part in a study. First, the ward was purposely chosen. Second, all three villages in the ward were included to make sure the study covered a wider area. Third, the total population in each village was taken from the village records. Finally, a random sampling method was used to pick the respondents.

According to Kothari (2004), when dealing with a larger population, a relatively small portion (e.g., 5%) may be adequate as a sample size, especially if random sampling techniques are used. A sample of 232 farmers out of 4,647 was determined. Proportional sampling was used to allocate respondents across the three villages in the ward to ensure fair representation based on village population sizes. Participants were selected through random sampling, which helped reduce bias and improve the reliability and accuracy of the study findings.

Table 1: Sample Size by Village

Ward	Village	Population			No. of Household	5% of the total Population
		Total population	Female	Male		
Ikolo ward	Muongano	1,581	772	809	809	79
	Ikolo	2,441	1,284	1,157	647	122
	Lupembe	625	324	301	183	31
	Total	4,647	2,380	2,267	1,271	232

Data collection procedures.

The study used a cross-sectional design and a mixed-method approach, combining the gathering of both quantitative and qualitative data. Data from 232 out of 4,647 respondents were collected through a semi-structured questionnaire using Kobo Toolbox, chosen for its user-friendly and offline functionality, which was suitable for remote areas with limited internet access. Semi-structured questionnaires were used to gather demographic information, radio access, and preferred listening time from the respondents. Three FGDs were conducted to discover respondents' views on their use of radio, one in each village with eight participants (men, women, youth, and elders) and key informant interviews with stakeholders such as extension workers, village executives, and radio broadcasters from Kyela FM radio, Keifo FM radio, and TBC.

The Key informant was selected based on their experiences in agricultural expertise, Radio broadcasters who were experienced in broadcasting agrarian programs. Data were gathered via in-depth in-person interviews that lasted between 30-40 Minutes each. Also, key informant interviews were conducted to gather in-depth information and expert opinions from radio presenters, Agricultural extension officers, and local leaders. To understand the farmers' agricultural information needs, they were asked to list the types of information they would like to receive from the radio to improve agricultural productivity and income.

Data Analysis

Data was cleaned, coded, and analysed with SPSS version 27.0 (Statistical Package for Social Sciences). The collected data focused on the types of agricultural information farmers required, the frequency of their needs, their preferred radio programs, and their radio listening habits. Data sources included direct opinions from farmers, key informants, and extension records, aligned with the study's objectives.

The data analysis employed a combination of descriptive and inferential statistical techniques to ensure an understanding of the findings. Descriptive statistics, including frequencies and percentages, were used to summarise the demographic characteristics of the respondents and the use of radio to access agricultural information. In addition, the chi-square test was used to determine the association between personal characteristics such as age, sex, education level, marital status, household size, farming experience, and the smallholder farmers' use of radio in accessing agricultural information.

This study employed qualitative methods, including interviews and focus group discussions, to collect in-depth data. The information gathered from focus group discussions and key informant interviews was analysed by using content analysis. This approach allowed for a deeper understanding of the patterns and insights emerging from the data and was integrated with quantitative findings to provide a more comprehensive understanding of the study's subject matter." During the Focus group discussion, the participants discussed and agreed that radio is a

useful tool for sharing agricultural information because it reaches a large number of rural people at less cost” (FGD at Muungano village, December, 2024).

Binary Logistic Regression Analysis

A binary logistic regression model was used to evaluate the effect of different agricultural information needs on smallholder farmers' use of radio, as given in the equation below.

$$\log\left(\frac{p}{1-p}\right) = \gamma + \theta_1 Y_{1i} + \theta_2 Y_{2i} + \dots + \theta_n Y_n$$

- p , is the probability of smallholder farmers' use of radio in accessing agricultural information.
- γ is The intercept.
- $\theta_1, \theta_2, \theta_n$ represent regression coefficients of independent variables.
- $Y_1, Y_2, Y_3, Y_4, Y_5, Y_6, Y_7, Y_8, Y_9$ represent the agricultural information needs such as weather updates, market prices, pest and disease management, fertiliser usage, and soil health.

The goodness of fit test evaluates how well the Binary Logistic Regression model explains the observed outcomes. Results in Table 5 indicate the percentage of variation used in calculating the overall estimate of how well the model fits the data using Nagelkerke R Square. In addition, the model was fitted at a 95% significance level. The Wald statistic and corresponding p-values for each independent variable were assessed, with

significant p-values (usually $p < 0.05$) indicating a meaningful impact on the likelihood of using radio.

RESULTS

Personal Characteristics of the Respondents

Results in Table 2 indicate that most of the respondents, 29.7% aged 50–65 years, 25.9% were over 65 years old, 24.1% were aged 34–49, and 20.3% aged 18–33. With regards to sex distribution, males accounted for about 62.5%, females were 37.5% almost half the population of males. Household size shows that most families (53.4%) are medium-sized (4-6 members), while 17.7% have smaller households (1-3 members) and 28.9% have larger households (7 or more members).

In case of marital status, data reveals that 69.4% of respondents are married, with 15.1% widowed, and fewer individuals reporting they are single (8.2%), separated (7.3%).

Regarding the educational background of respondents, most respondents (75.0%) have primary education as their highest level, while 18.5% attained secondary education, and only 1.7% completed tertiary education. Small proportions (4.7%) have no formal education. Agricultural activity is dominated by crop production (87.5%), with only 12.5% engaged in both crop and livestock farming. This suggests that crop farming is the primary livelihood for most respondents. Lastly, experience in farming varies, but a notable portion (45.7%) has 18 or more years of experience, indicating that many farmers have longstanding expertise in the field.

Table 2: Demographic Characteristics of Respondents.

Variables	Categories	Frequency	Percent
Age	18-33	47	20.3%
	34-49	56	24.1%
	50-65	69	29.7%
	More than 65	60	25.9%
Sex	Male	145	62.5%
	Female	87	37.5%
Education level	Non-formal education	11	4.7%

Variables	Categories	Frequency	Percent
Farming experiences	Primary education	174	75.0%
	Secondary education	43	18.5%
	Tertiary education	4	1.7%
	0-5	46	19.8%
	6-11	34	14.7%
	12-17	46	19.8%
	18 or More	106	45.7%
Household Size	1-3	41	17.7%
	4-6	124	53.4%
	7 or More	67	28.9%
Marital status	Married	161	69.4%
	Single	19	8.2%
	Separated	17	7.3%
	Widower	35	15.1%
Main Agricultural Activity	Crop production	203	87.5%
	Both crop and Livestock production	29	12.5%

Sources of Agricultural Information

Results in Table 3 indicate that (57.8%) of respondents use radio as a source of information. This suggests that radio is a popular channel for disseminating agricultural information to farmers. Extension services are also a widely used source of information, with 84.5% of respondents indicating that they use them.

Fellow farmers are another important source of information, with 59.9% of respondents indicating

that they rely on them for advice and guidance. The results show that farmers do not use the internet or mobile apps as sources of information, with 100% of respondents indicating that they do not use these channels. This suggests that farmers may not have access to these technologies or may not be familiar with how to use them. Printing media, such as newspapers and magazines, are also not widely used, with only 4.3% of respondents indicating that they use them.

Table 3: Source of Agricultural Information (n=232)

Variables	Yes	No
Radio use for agricultural information	134(57.80%)	98(42.20%)
Extension agent	196(84.50%)	36(15.50%)
Fellow farmers	139(59.90%)	93(40.10%)
Internet	0(0%)	232(100%)
Mobile apps	0(0%)	232(100%)
Printing media	222(95.70%)	10(4.30%)

Accessibility for radio use and the preferred listening time

Table 4 demonstrates a high level of accessibility to radio among the respondents, with 84.5% (reporting

that they have radio access, while only 15.5% do not. The results show that the majority of smallholder farmers (80.6%) reported using the radio daily to access agricultural information, while

a smaller proportion (37.9%) listened to the radio weekly. The high rate of daily use indicates that farmers see radio as an accessible, affordable, and trusted medium for staying updated on agricultural practices, weather forecasts, market prices, and other relevant topics. Regarding the preferred time for listening to the radio, the majority of respondents (94.8%) prefer to listen to the radio in the morning, suggesting that morning broadcasts may have a significant audience and could be ideal for delivering important messages or programs.

Afternoon radio programs are less preferred, with only 3.9% of respondents favouring this time. Evening listening appears moderately popular, with 28.9% of respondents indicating they listen during this time, while 71.1% do not. Night-time radio listening shows high popularity, with 88.8% of respondents favouring this time, compared to 11.2% who do not, indicating that late-night radio programs are highly appealing to a significant portion of the audience.

Table 4: Accessibility for Radio Use and the Preferred Listening Time (n=232)

Variables	Yes	No
Access to radio	196(84.50%)	36(15.50%)
Media use behaviour		
Daily	187(80.60%)	45(19.40%)
Weekly	88(37.90%)	144(62.10%)
Time preferred to listen radio.		
Morning	220(94.80%)	12(5.20%)
Afternoon	223(96.10%)	9(3.90%)
Evening	67(28.90%)	165(71.10%)
Night	206(88.80%)	26(11.2%)

Association between Personal Characteristics of Respondents and Use of Radio to Access Agricultural Information

The results from Table 5 indicate that sex, education level, and marital status have a significant association with the use of radio in accessing agricultural information. Males (91.7%) have significantly higher radio use in accessing agricultural information compared to females (72.4%) ($p = 0.001$). With regards to education level, those having secondary and tertiary education report 100% use of radio in accessing agricultural information, while individuals with no formal

education have the lowest radio use in accessing agricultural information (36.4%) ($p = 0.001$). Marital status is significantly associated with radio use in accessing agricultural information ($p = 0.001$), with single respondents (100%) having the highest radio use in accessing agricultural information, followed by married (88.8%), separated (76.5%), and widowed (60%). On the other hand, other demographic characteristics such as age, land cultivated, farming experience, and household size do not show significant associations with the use of radio in accessing agricultural information.

Table 5: Association between Socio-demographic Characteristics of Respondents and Use of Radio in Accessing Agricultural Information (n=232)

Variables	Categories	Access to the radio to get agricultural information		Chi-square (X ²)	df	P-Value
		No (%)	Yes (%)			
Age	18-33	6.4	93.6	5.154	3	0.161
	34-49	14.3	85.7			
	50-65	21.7	78.3			
	65 or more	16.4	83.3			
Sex	Male	8.3	91.7	15.467	1	0.001
	Female	27.6	72.4			
Education level	Non-formal education	63.6	36.4	28.237	3	0.001
	Primary	16.7	83.3			
	Secondary	0	100			
	Tertiary	0	100			
Marital Status	Married	11.2	88.8	22.636	3	0.001
	Single	0	100			
	Separated	23.5	76.5			
	Widow	40	60			
Land cultivated	1-3	17.6	82.4	2.931	2	0.231
	4-6	10.2	89.8			
	7 or more	0	100			
Farming experiences	0-5	6.5	93.5	6.343	3	0.96
	6-11	8.8	91.2			
	12-17	17.4	82.6			
	18 or more	20.8	79.2			
Household size	1-3	14.6	85.4	2.149	2	0.341
	4-6	12.9	87.1			
	7 or more	20.9	79.1			

Information needs influencing farmers' use of radio***Model Fit Test for Information Needs Influencing Farmers' Use of Radio***

The model summary in Table 6 indicates that the logistic regression model provides a strong fit to the data. Specifically, the Nagelkerke R Square value of

0.768 suggests that approximately 76.8% of the variation in the dependent variable is explained by the independent variables included in the model. The estimation process converged successfully after seven iterations, indicating that the model is stable and that the parameter estimates remained unchanged in the final steps of computation.

Table 6: Model Fit Test for Information Needs Influencing Farmers' Use of Radio for Agricultural Purposes.

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	73.478 ^a	0.474	0.768

The results in Table 7 indicated in the binary logistic regression analysis revealed varying levels of influence among different agricultural information needs on farmers' use of radio. The results showed that weather updates ($\beta = 3.564$, $p = 0.000$), fertiliser usage ($\beta = 3.300$, $p = 0.000$), and market prices ($\beta = 1.899$, $p = 0.013$) had the most significant and positive impact on smallholder farmers' likelihood of using radio. Specifically, for every unit increase in need for weather update information, results in a 3.564 increase in smallholder farmers' use of radio to access such information. In addition, for every unit increase in need for information on fertiliser use, results in a 3.3 increase in smallholder farmers' use of radio to access such information.

Furthermore, for every unit increase in need for information on market price, results in 1.899 increase in smallholder farmers' use of radio to

access such information. These findings suggest that farmers primarily turned to radio for timely and actionable information critical to their planning and input decisions. However, soil health and fertility information had a significant but negative relationship with radio use ($\beta = -2.120$, $p = 0.007$), indicating that smallholder farmers were less likely to rely on radio for this type of information. This may be because such topics often require more detailed, localised, or visual explanations, which radio is less suited to provide.

On the other hand, results indicate that pest control and crop disease management were not statistically significant predictors of radio use, with p -values of 0.649 and 0.441, respectively. This implies that although some farmers may have accessed pest and disease control advice via radio, it was not a strong influence and had no consistent influence.

Table 7: Information Needs Influencing Farmers' Use of Radio.

Variables	B	S.E.	Wald	Df	Sig.	Exp(β)	95% C.I. for EXP(β)	
							Lower	Upper
Pest control	0.404	0.888	0.207	1	0.649	1.498	0.263	8.533
Weather updates	3.564	0.729	23.884	1	0.000	35.309	8.455	147.457
Market prices	1.899	0.767	6.128	1	0.013	6.679	1.485	30.040
Fertilizer usage	3.300	0.779	17.964	1	0.000	27.123	5.895	124.789
Crop disease management	-0.508	0.659	0.594	1	0.441	0.602	0.165	2.191
Soil fertility	-2.120	0.788	7.246	1	0.007	0.120	0.026	0.562
Constant	-3.035	1.350	5.056	1	0.025	0.048		

DISCUSSION

Sources of Agricultural Information

Farmers in the study area relied on various sources to access agricultural information, reflecting a mix of traditional and modern approaches. Radio emerged as a vital source, as 57.8% of respondents utilised it. Its widespread use underscored its role as an accessible and cost-effective medium for disseminating agricultural knowledge. Radio's

effectiveness lies in its ability to deliver timely, localised content tailored to the specific needs of rural farmers. A study by Karanja *et al.* (2021) emphasised radio as a main source in enhancing agricultural productivity by providing real-time information on weather patterns, pest outbreaks, and market trends.

The extension agent was the most utilised source, with 84.5% of respondents depending on them. The personalised guidance, hands-on demonstrations,

and practical advice provided by extension agents significantly improved farmers' understanding and adoption of new agricultural practices. A study by Mwangi and Mutua (2021) highlighted the essential role of extension services in facilitating rural development, technology transfer, and capacity building among farmers.

Peer-to-peer knowledge sharing, through interactions with fellow farmers, was another significant source, with 59.9% of respondents acknowledging its importance. This form of informal communication fostered relationships, trust, and the exchange of practical experiences, which were important for innovation and problem-solving in agricultural practices. Similar findings by Adebayo *et al.* (2017) emphasised the importance of social networks and community-based learning in enhancing agricultural productivity and resilience. Only 4.3% of farmers used print materials for farming information, showing that printed resources are hard to access or not very useful in these areas.

A study by Muhammad *et al.* (2006) examines the role of mass media in disseminating agricultural information to farmers. While radio is an important source, it is not always the most preferred or effective medium, for example, in Pakistan, television was ranked first by 54.1% of respondents, with radio second at 25%.

Accessibility for Radio Use

The findings from Table 4 show a high level of accessibility to radio among respondents, with 84.5% reporting ownership or access, highlighting radio's sustained role as a tool for communication and agricultural information dissemination in rural areas. This aligns with a previous study by Karanja *et al.* (2021), which found that radio continues to be one of the most accessible and affordable mass media technologies among smallholder farmers in Sub-Saharan Africa. The persistent relevance of radio in rural development communication is attributed to its low cost, portability, and ability to

overcome infrastructural and literacy-related barriers (Mutsvairo & Ragnedda, 2020).

Key informants added that,

...."I always listen to the agricultural program early in the morning before I go to the farm because that's when I get useful advice for the day."(Village leader at Ikolo Village, December 2, 2024).

This means that listening to the program has become a daily routine, indicating trust in the content delivered via radio.

Preference of Audiences

In terms of listening habits, the majority of respondents (94.8%) prefer morning hours for listening to the radio. A study by Agbo *et al.* (2022) indicated that farmers are more attentive to the radio during the early hours, before engaging in their day's agricultural or economic activities.

Afternoon listenership is notably low (3.9%), a trend supported by Okello and Odiaka (2019), who found that the afternoon is often a time when farmers are most active in the field. Evening radio listenership shows moderate engagement (28.9%), reflecting a period when household responsibilities or fatigue may limit attentiveness. The higher preference for night-time listening (88.8%) suggests that farmers may be more relaxed and receptive to radio content at the end of the day. Research by Kyalimpa *et al.* (2021) indicates that late evening broadcasts often experience peak engagement due to the availability of time and reduced distractions in rural households.

Media Use Behaviour

The results show that the majority of smallholder farmers (80.6%) reported using the radio daily to access agricultural information, while a smaller proportion (37.9%) listened to the radio weekly. This finding highlights radio as a primary and trusted source of agricultural knowledge among smallholder farmers. A study in Uganda found that

smallholder farmers tune into the radio for 3–6 hours daily, with evening hours being the most preferred for agricultural programs (Hailu *et al.*, 2018).

Farmers prefer radio programmes that provide practical and useful information because they help improve their farming, solve problems, and support better decisions, which is important since their livelihoods depend on agriculture.

However, studies by Adeyeye and Salawu (2025) found that farmers do not consider radio as a reliable source of agricultural information, and instead prefer mobile phones or other channels, contradicting the findings that farmers are interested in staying informed about various aspects of agriculture through radio.

Key informants added that.

....” *There is a need for the government or NGOs to train radio broadcasters on how to report farming issues better. This will help us to share more useful and accurate information with farmers*”. (Keifo broadcaster, December 8, 2024).

Training broadcasters will improve their skills in reporting agricultural topics, ensuring farmers receive accurate and relevant information.

Association between Demographic Characteristics of Respondents and Use of Radio to Access Agricultural Information

Table 5 shows that age did not significantly affect the use of radio in accessing agricultural information; younger farmers (18-35 years) reported the highest radio use rate (93.6%). A study by Njuki *et al.* (2020) emphasised the adaptability and interest of younger individuals in adopting new communication technologies. These findings suggested that efforts to disseminate agricultural information via radio might have been particularly effective when targeting younger demographics, who were more motivated to engage with such media. In contrast, a significant gender disparity

was evident, with males having a significantly higher radio use rate (91.7%) than females (72.4%). This discrepancy, as noted by Karanja *et al.* (2021), is often reduced by sociocultural norms and unequal resource distribution in rural settings. These barriers highlight the need for gender-sensitive interventions to ensure women have equal access to agricultural information.

Education emerged as a powerful determinant of radio use in accessing agricultural information, with those possessing secondary or postsecondary education reporting universal use of radio in accessing agricultural information (100%) compared to only 36.4% among respondents without formal education. Education has a strong influence on radio use for agricultural information; nearly all individuals with secondary or higher education use radio for this purpose, compared to those without formal education.

Marital status influenced radio use in accessing agricultural information, with single respondents exhibiting the highest radio use rates (100%), while widows had the lowest (60%). This could reflect the social and economic implications associated with marital status, as suggested by Njuki *et al.* (2020), where single individuals may have more autonomy or flexibility in accessing and utilising communication tools.

The household size did not significantly affect radio use in accessing agricultural information, although medium-sized households (4-6 members) reported the highest radio use rate (87.1%). A study by Karanja *et al.* (2021) indicates that household dynamics influenced resource allocation and decision-making regarding communication.

Information Needs Influencing Farmers’ Use of Radio.

The binary logistic regression analysis showed that weather updates, fertiliser usage, and market price information were the most important reasons farmers used the radio for agricultural information. Farmers who listened to the radio for weather

updates were about four times more likely to use it for farming advice ($\beta = 3.564$, $p < 0.001$). This indicates that as smallholder farmers' need for weather update information increases, it increases their chances four times to the radio. As smallholder farmers' desire for weather updates increases, they tune to the radio to satisfy their needs.

The changing climate may influence smallholder farmers to increasingly seek weather updates from the radio, which is readily accessible, to avoid potential losses. This supports findings by Mussa *et al.* (2023), who noted that timely weather forecasts help farmers plan activities and reduce risk. This means that, when farmers receive weather forecasts on time, they can organise their work more effectively and avoid potential losses.

Also, fertiliser usage information had a strong positive effect. Smallholder farmers looking for fertiliser advice were three times more likely to rely on the radio ($\beta = 3.300$, $p < 0.001$). This implies that as smallholder farmers' desire for the right information about how to use fertilisers increases, it increases their chances three times to tuning to the radio to satisfy their needs. As a result, when smallholder farmers acquire the right information about how to use fertilisers, it greatly improves their farming. A study by Maleko *et al.* (2021) indicated that radio helps farmers understand correct input usage. Market price updates also encouraged radio use ($\beta = 1.899$, $p = 0.013$). This indicates that as smallholder farmers' need for market price update information increases, it increases their chances by two times on the radio. This means that when farmers have the latest information about market prices, they can choose the best time and place to sell their produce. As suggested by FAO (2016) that access to date price information helps farmers make better selling decisions.

On the other hand, soil health and fertility information had a negative effect ($\beta = -2.120$, $p = 0.007$; $\text{Exp}(\beta) = 0.120$), meaning farmers were less likely to use radio for such topics. In Tanzania, soil testing used to be costly and only available at

research centres, making it hard for most farmers to access. Recently, the government, through the Ministry of Agriculture, has provided soil test kits to district councils to make testing easier and more affordable. The government wants to help farmers check their soil so they can choose the right fertiliser. Training is still being given to farmers and others, like radio broadcasters, but many farmers may not yet understand soil health well. This could be why they don't rely on the radio for soil information.

A study by Munyua *et al.* (2020) indicated that soil health advice is more technical and needs practical demonstrations. Variables like pest control and crop disease management were not significant ($p > 0.05$), meaning they did not strongly affect farmers' radio use in this study. This implies that pest control and crop disease management did not have a strong influence on farmers' use of radio for agricultural information in this study. The findings confirm that farmers mostly use radio for urgent and easy-to-understand information like weather, prices, and input use (Chikapa & Dlamini, 2020).

CONCLUSION

Radio is an essential way for farmers in Kyela District to get farming information. Most farmers said they need help with things like pest control, weather news, market prices, using fertiliser, soil health, and crop diseases. They mainly use radio because it is easy to access, especially in villages where other media are not available. Farmers mostly use radio when it gives helpful and timely updates about weather, fertiliser, and market prices. However, topics like soil health and crop diseases were less popular, likely because they are too complicated to explain clearly on the radio.

The study also found that gender, education, and marital status affect how farmers use radio. Men and more educated farmers used radio more than women and less educated farmers. This means women and those with little schooling might face challenges in getting farming information. Most farmers do not

use digital tools like the internet or apps, showing a need for better digital access and training. Improving this could help farmers use both radio and modern tools for better farming decisions.

Recommendation.

- Radio stations should focus on delivering timely, practical, and easy-to-understand agricultural information, especially on high-demand topics like weather updates, fertiliser use, and market prices.
- Government and Radio stakeholders should develop special programmes to target women and less educated farmers.
- Extension agents and local organisations should offer training to farmers on how to access, understand, and apply information from radio broadcasts.
- Government and development partners should invest in improving digital infrastructure in rural areas and provide basic ICT training.

REFERENCES

- Adebayo, K., Olagunju, F. I., Obisesan, A. A., & Akinola, A. A. (2017). Social network and community-based learning for enhanced agricultural productivity in Africa. *Journal of Agricultural Extension*, **21**(1), 134–147. <https://doi.org/10.4314/jae.v21i1.11>
- Adeyeye, B., & Salawu, A. (2025). From Airwaves to Farmlands: How Radio Programmes in Indigenous Languages Are Shaping Agricultural Development in North-Central Nigeria. *World*, **6**(1), 9.
- Agbo, B. C., Nwafor, K. A., & Edeani, D. (2022). Patterns of media use among rural dwellers: A focus on radio listenership. *Journal of Development Communication*, **33**(1), 45–58.
- Chapota, R., Fatch, P., & Mthinda, C. (2014). The Role of Radio in Agricultural Extension and Advisory Services—Experiences and Lessons from Farm Radio Programming in Malawi. *MEAS Case Study*, **8**, 1-10.
- Chikapa, T., & Dlamini, B. (2020). The influence of farm radio on the adoption of improved agricultural technologies. *Journal of Rural Studies*, **79**, 204–213.
- CTA (Technical Centre for Agricultural and Rural Cooperation). (2020). The digitalization of African agriculture report 2018–2019. CTA.
- FAO. (2016). How rural radio has improved farming for Tanzanian farmers. Food and Agriculture Organization.
- Farm Radio International. (2020). *Radio: A powerful tool for communication and empowerment in rural communities*. <https://farmradio.org/publications/>
- Food and Agriculture Organization (FAO). (2015). The state of food and agriculture: Social protection and agriculture: Breaking the cycle of rural poverty
- Food and Agriculture Organization of the United Nations. (2017). *The future of food and agriculture – Trends and challenges*. FAO.
- Food and Agriculture Organization of the United Nations. (2022). *The state of food security and nutrition in the world 2022: Repurposing food and agricultural policies to make healthy diets more affordabl*
- Food and Agriculture Organization of the United Nations. (2023). *The state of food security and nutrition in the world 2023: Urbanization, agrifood systems transformation and healthy diets across the rural–urban continuum*. FAO
- Greenberg, B. S., & Salwen, M. B. (2008). Concepts and Models. An Integrated Approach to Communication Theory and Research, 61..
- Hailu, G., Pittchar, J. O., Khan, Z. R., & Ochatum, N. (2018). Perceived preference of radio as an agricultural information source among

- smallholder farmers in Uganda. *International Journal of Agricultural Extension*, 5(3), 119-130.
- Hudson, H. E., Leclair, M., Pelletier, B., & Sullivan, B. (2017). Using radio and interactive ICTs to improve food security among smallholder farmers in Sub-Saharan Africa. *Telecommunications Policy*, 41(7-8), 670-684. *Journal of Agricultural Sciences*, 22(2) adoption.
- Karanja, A. W., Chepkilot, R., & Wafula, C. (2021). Role of radio in enhancing agricultural productivity among smallholder farmers in Kenya. *African Journal of Rural Development*, 6(2), 15-24.
- Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Age International Publishers.
- Kyalimpa, F., Namukwaya, V.A. & Kagawa, E. B. (2021). An assessment of radio listening patterns among rural farmers in Uganda. *East African Journal of Communication*, 3(1), 33-42
- Lwoga, E. T., Stilwell, C., & Ngulube, P. (2011). Access and use of agricultural information and knowledge in Tanzania. *Library review*, 60(5), 383-395.
- Maleko, D., Msuya, E., & Dulle, F. (2021). Access to agricultural information among smallholder farmers in Tanzania: The role of radio and mobile phones. *Journal of Agricultural Extension*, 25(2), 10-23.
- Malophane, Libuseng. 2022. "Digital Divide: Who in Africa Is Connected and Who Is Not." *Afrobarometer*, Dispatch No. 582, 14 December. Accessed 23 November 2023.
- Manda, J., & Mwakaje, A. G. (2020). Adoption of ICT-based information services among rural farmers in Tanzania: A case study of Iringa District. *Information Development*, 36(4), 565-578
- Ministry of Agriculture. (2022). *Annual agricultural performance report 2021/2022*. Government of Tanzania
- Mosha, S. S., & Daudi, J. M. (2024). Performance of Agriculture Extension Services under Local Government Authorities in Tanzania 7(3), 30-36.
- Msangi, N. H. (2020). The Contribution of Radio in Promoting Agricultural Activities in Rural Tanzania: A Case of Radio Nyemo FM in Dodoma Rural District. The Open University of Tanzania.
- Mtega, W. P. (2018). The usage of radio and television as agricultural knowledge sources: The case of farmers in Morogoro Region of Tanzania. *International Journal of Education and Development Using Information and Communication Technology* 14(3): 252-266.
- Mtega, W. P. (2021). Communication channels for exchanging agricultural information among Tanzanian farmers: A meta-analysis. *IFLA Journal*, 47(3), 355-364
- Mtega, W. P., & Msungu, A. C. (2013). Using Information and Communication Technologies for Enhancing the Accessibility of Agricultural Information for Improved Agricultural Production in Tanzania. *The Electronic Journal of Information Systems in Developing Countries*, 56(1), 1-14.
- Muhammad, S., Garforth, C., & Butt, T. M. (2006). Role of television in the dissemination of agricultural information among farmers. *International Journal of Agriculture & Biology*, 8(3), 349-352
- Munyua, H., Adera, E., & Jensen, M. (2020). Innovative knowledge-sharing platforms for agriculture and rural development. *Information Development*, 36(3), 395-406.
- Mushi, D., & Lambrecht, J. (2018). Enhancing agricultural information dissemination through

- radio programs in Tanzania. *Journal of Agricultural Education and Extension*, 24(4), 319-335.
- Mussa, M., Ng'ang'a, S., & Shaka, R. (2023). Implications of climate data for extension services delivery to smallholder farmers in Tanzania. *International Journal of Climate Services*, 12(1), 45–59.
- Mutsvairo, B., & Ragnedda, M. (2020). Mapping the digital divide in Africa: A media and communication perspective. Amsterdam University Press.
- Mwangi, W. M., & Mutua, K. T. (2021). ICT-based weather advisories for smallholder farmers. *African Journal of ICT*, 14(6), 317-332
- Njuki, J., Kaaria, S., Chamunorwa, A., & Chiuri, W. (2020). *Women and youth empowerment in agriculture: Policy brief*. International Development Research Centre (IDRC). <https://idl-bnc-idrc.dspacedirect.org/handle/10625/59461>
- Okello, D. R., & Odiaka, T. I. (2019). Understanding audience behavior for effective rural radio programming in Sub-Saharan Africa. *African Communication Research*, 12(2), 201–220
- Rössler, P. (2016). The Agenda-Setting Function of Mass Media: von Maxwell E.
- Ruggiero, T. E. (2000). Uses and gratifications theory in the 21st century. *Mass communication & society*, 3(1), 3-37.
- Tanzania Communications Regulatory Authority. (2022). *Annual report 2021/2022*
- Udeanya, N. H., Chiamaka, E. C., Innocent, E., Ngozi, O. M., Chigozie, U. J., & Osita, U. C. (2019). Mass media utilization by poultry farmers in Anambra State, Nigeria. *Journal of Agricultural Extension*, 23(2).
- Yeboah, F. K., & Jayne, T. S. (2020). Africa's evolving employment trends. In *The Transformation of Rural Africa* (pp. 27-56).