



Role of Farm-Radio Agricultural Programmes in Disseminating Agricultural Technology to Rural Farmers for Agricultural Development in Zaria, Kaduna State, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author AKA and AA designed the study, wrote the protocol, and wrote the first draft of the manuscript. Author AI and AA administer the questionnaire, while author ANA and MAM managed the literature searches, coding and analyze the data. All authors read and approved the final manuscript.

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ABSTRACT

The study was carried out to examine the role of radio agricultural programmes on awareness creation among farmers in the study area. The study districts were purposively selected for their known potentiality of agricultural production and a convenient sampling was employed to get a total of ninety farmers for the study, a structured questionnaire was used as an instrument for data collection. Descriptive and inferential statistics were used to analyze the data obtained. The finding of the research reveals that majorities (90%) of the farmers were males, within their active productive ages (31-42 years) and 50% of them had attained Islamic education. Most of the farmers obtained agricultural information through radio agricultural programmes (97.8%) out of which majority had access to information through the format of presentation or discussion by an expert and or the extension workers (77.8%). The finding also revealed that farmers adopted the information disseminated through radio, which was found to be highly relevant (32.2%) to

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the farmers' agricultural activities. Farmers gained the knowledge of agricultural management practices (26.7%), prevention of post harvest losses (17.8%) and appropriate application of fertilizer (16.7%), and which was found to be very important and effective to majority (97.8%) of the farmer's agricultural activities. The chi-square analysis depicts that there is significant relationship between the type of radio agricultural programmes aired and the knowledge gained by the farmers ($X^2=94.2$, $P < 0.03$). It is recommended that there is need for improvement on agricultural information programmes to farmers through radio and rural agricultural radio stations should be established in the villages to disseminate and to teach farmers improved agricultural practices.

Keywords: Role; farm-radio; agricultural programmes; awareness creation; rural development; 0020.

1. INTRODUCTION

The success of agricultural development programmes in developing countries largely depends on the nature and extent of use of mass media in mobilizing farmers for the need for development. Communication has been acknowledged for playing, a prominent role in the success of agricultural production and adoption of innovations. The planners in developing countries realized that the development of agriculture could be hastened with the effective use of mass media [1]. Mass media has been defined as any material, objects, instruments or system which serves to communicate information including letters, pamphlets, and other written and printed materials, all types of cinema films, radio, television and video system [2].

Mass media was found to be a veritable tool for creating awareness and mobilizing farmers on the importance of change towards new science-based agricultural findings. According to [3], the usefulness of research results is generally achieved through an efficient mechanism of information transfer to the appropriate target (farmers). The transfer of the information to the target audience at the required time could only be achieved by the use of mass media depending on the purpose and the number of farmers to be reached [4].

Several channels such as the extension agent, individuals, farmers-to-farmers contact, print media (news papers, magazines, news letter, pamphlet and posters) and electronics media (Radio, television, and film schedules and films trips) have been widely used to disseminate information to farmers [5], [6].

Among the mass media means of communication, radio is found to be the most important means of communicating agricultural information to the rural farmers. In the opinion of [7], radio is one of the broadcast medium which the rural populations are very familiar with and which almost all experts identified to be the most appropriate for rural emancipation programme. This is because radio beats distance and has immediate effect on farmers. Furthermore, radio is favored as a medium of communication in rural communities because of the advantages ascribed to it, inform of transcending the barrier of illiteracy and demanding less intellectual exertion than the print media massages [8].

Despite the fact that many researches were conducted on the importance of radio agricultural programmes on agricultural productivity, no such study was conducted and documented in the study area. This may limits the farmers' awareness of improved

agricultural technology and hence affects their level of production. This allowed a huge gap that tends to limit farmers awareness on the relevance and efficiency of radio as source of information for improving their agricultural activities. It also remains as a bottle neck to allowing the government concerned to enhance radio information dissemination.

Based on the above, it is therefore, imperative to examine the role of radio in creating awareness and acquisition of skill on agricultural science-based findings among farmers in the study area.

1.1 Objectives of the Study

The major objective of the research is to determine the role of farm radio agricultural programmes in awareness creation among farmers of the study area.

The specific objectives of the research are to:

1. Describe the socio-economic characteristics of the farmers in the study area.
2. Identify the relevance of radio as a source of agricultural information
3. Identify different agricultural knowledge gained through the agricultural programmes aired.
4. Determine the format of presenting agricultural information to the farmers
5. Find out the level of adoption of agricultural information aired
6. Examine the relevance and effectiveness of radio agricultural programmes on agricultural production in the study area.
7. Ascertain farmers' convenient time for listening to radio agricultural programmes.

1.2 Hypotheses

- i. There is no significant relationship between the farmers' socio-economic characteristics (age, education, marital status, and gender) and the effectiveness of radio agricultural programmes in disseminating agricultural information.
- ii. There is no significant relationship between the types of agricultural programme aired and knowledge gained.

2. METHODOLOGY

2.1 The Study Area

The study was carried out in Zaria Local Government Area of Kaduna State, North-western region of Nigeria. It is located between latitude 11° -' 4" North and longitude 7° - 42' 0" East. The study area lies in northern Guinea agro-ecological zone of Nigeria. The area experienced both the monsoon wind which blows from the Atlantic Ocean, brings rainfall to the area and the North-east trade wind that blows from the Sahara desert, resulting to Harmattan period (dry cold wind). The area experienced low temperatures of 21°C and below during harmattan period in the months of November, December, January and February. Harmattan is a period when an easterly trade wind which blows from the Sahara desert is experienced most especially in the northern regions (north-east, north-west, and the middle belt) of Nigeria. The harmattan wind carries along with it a dusty dry wind and a cold air of low temperatures. The study area also experience high temperatures of about 42°C and above during the dry season (March, April and May)[9]. The rainfall in the area is experienced between the months of May to September; with an average rainfall of about

1050 mm. Farming is the major occupation of the inhabitants. The economy of Zaria is based primarily on agricultural and industrial development. The chief agricultural products in Zaria are cereal crops (rice, millet, guinea corn, and maize corn), cotton, peanuts, hides and skins, ginger and bees wax.



Map of Kaduna State with an arrow pointing the study area

2.2 Sampling Procedure and Sample Size

Zaria Local Government Area comprises of seven districts, out of which three districts were purposively selected for the study because of their level of participation in both rainy and dry season agricultural activities. The districts selected were Tudun wada, Hanwa and Wuciciri. This is followed by a convenient sampling of 30 farmers from each of the already selected three districts, making a sample size of the study to constitute ninety (90) farmers.

2.3 Data Collection and Variables Measurement

The primary data for the study was sourced from a questionnaire administered to the farmers. While the secondary source was obtained from books, journals, conference proceedings, internet etc. The socio-economic characteristics of the respondents featured issues like gender (male, female); marital status (married, single, divorced and widowed); age (in years); educational attainment in the form of Islamic education, adult education, primary, secondary or tertiary education as well as the income of the respondents per season (in naira/season). The nature of radio programmes and format of presentation were captured by asking farmers on whether or not listening to radio and programme they listened

to. The format for radio programme presentation features drama, interview, discussion and others. The relevance of radio as a source of agricultural information features source of agricultural information and ownership of radio among respondents. Effectiveness and relevance of radio were rated through appropriate five point rating scale.

2.4 Data Analysis

Data collected for the study was analyzed with the use of descriptive statistics (tables, frequency counts and percentages) and inferential statistic (Chi-square).

3. RESULTS AND DISCUSSIONS

3.1 Socio-Economic Characteristics of the Farmers

3.1.1 Gender

The result in Table 1 indicates that majority (90%) of the farmers were males while only few (10%) of the farmers were females. Main farming activities were known to be practiced by the male farmers of northern Nigeria while females were in most cases left with processing and other value addition activities to the agricultural produce. This may be attributed to either the stress associated with farming, gender division of labor or access of women to lands due to their cultural background as well as prevailing norms and values of the people of the study area. This finding is in accordance with Crouch and [10] who posits that a communicator needs to know the cultural content in which he or she operates either based on the dominant belief, norms or values of the society.

3.1.2 Marital status

Getting married by especially male child is an important aspiration of the parents in northern Nigeria, as this help in bringing more men and or females in to the family that provides cheap/free needed agricultural labour to the family. The result in the Table 1 indicates that majority (87.8%) of the farmers were married, 6.7% of them were single, and 3.3% of them were widowed, while only (2.2%) of the farmers were divorced. The higher percentage of married farmers in the study area may be attributed to the socio-cultural and religious believe of the community members where marriage is encouraged and is termed as a sign of responsibility and its one of the religious obligations of the farmers of the study area [14]

3.1.3 Age

The result in Table 1 depicts that 34.44% of the farmers fall within the age group of 31- 42 years, 26.67% of them fall within the age group of 43- 54 years, 23.33% of the farmers fall within the age group of 18 to 30 years, and finally 15.56% of the farmers fall within the age range of 55 years and above.

The finding implies that most of the respondents were within the economically active age group of 31 to 54 years. Age factor was found to be significant in agricultural information accessibility and utilization and as such young people (farmers) are more responsive to new ideas and practice than older ones who were observed to be conservative and less responsive to adoption of new practices [12].

Table 1. Distribution of the farmers based on Socio-economic characteristics (n=90)

Gender	Frequency	Percentage
Male	81	90.0
Female	09	10.0
Marital Status		
Married	79	87.8
Single	06	06.7
Divorced	02	02.2
Widowed	03	03.3
Age group		
18-30 years	21	23.3
31-42 year	31	34.4
43-54 years	24	36.7
55 years and above	14	15.6
Education attainment		
Islamic education	45	50.0
Adult education	07	07.8
Primary education	03	03.3
Secondary education	17	18.9
Tertiary education	18	20.0
Income (N) /Season		
N12,000-22,000	21	22.3
N22,100-32,000	33	36.7
N33,100-60,000	29	32.2
N72,000-120,000	07	07.8

Source: field survey, 2012

3.1.4 Educational attainment

Attainment of education was found to have a positive relationship with the individual's attitudes towards change agents and as such favorable attitude to innovativeness. The findings in Table 1 showed that most (50%) of the farmers had Islamic education, 20.0% of them attained tertiary education, 18.9%, 7.8%, and 3.3% of the farmers had secondary school education, adult education and primary school education respectively. The finding implied that almost all the farmers had attained one type of education or the other. This finding is in accordance with [12] that an individual's level of education was found to affect his or her access, comprehension and adoption of modern agricultural practices. The effect of education on adoption had been argued by several researchers. For instance, in separate studies [13], [14] and [15] reported positive and significant relationship between formal education and adoption of agricultural innovation.

3.1.5 Income of the farmers

The finding in Table 1 revealed that 36.67% of the farmers earned N22, 100 to N32, 000 in a growing season, 32.22% had a seasonal earnings of between N33, 100 to N60, 000 and 22.33% of the farmers earned N12, 000 to N22, 000 per growing season while 7.78% of the respondents earned N72, 000 to N120, 000 per growing season. Those farmers with incomes between N22, 100 to N32, 000 constituted the highest population of the farmers. This indicates that the respondents generally were of low income which may affect their continuous production and adoption of capital intensive modern farm technologies [12].

3.2 Relevance of Radio as a Source of Agricultural Information

3.2.1 Source of agricultural information

As shown in the findings of Table 2, majorities (97.8%) of the farmers had access to source of information through radio agricultural programmes while only 2.2% of the farmers had access to agricultural information through other means apart from radio. This indicates that majority of the farmers of the study area relied on radio as their source of agricultural information compared extension contacts, farmer-to-farmer contact, print media (papers, magazines, seminars, extension bulletins, and pamphlets) This finding is in agreement with the research conducted by [16] which revealed that as far as agricultural extension work is concern, radio was the most important and effective means of disseminating agricultural information and innovation to the farmers in the developing countries.

3.2.2 Radio ownership

Radio as an important type of mass media played a vital role of enlightening farmers about government agricultural policies and dissemination of agricultural information to hundreds of thousands of farmers. Based on this importance, many rural farmers are fond of having transistor radio through which they are able to listen to both agricultural and non agricultural information. Table 2 of the findings showed that majority (97.8%) of the farmers had radio sets, while only (2.2%) of the farmers did not owned a radio sets. This implied that most of the farmers had access to radio, which is termed as step forward towards having access to information. This finding is in accordance with [12] that ownership of radio set by farmers is an important factor that indicates the physical availability of the medium and exposure of audience/famers to radio agricultural programmes.

Table 2. Distribution of the farmers according to source of agricultural information and radio ownership (n=90)

Source of agricultural information	Frequency	Percentage
Source of agric. information		
Radio agric. programs	88	97.8
Other sources	02	02.2
Ownership of radio		
Yes	88	97.8
No	02	02.2

Source: Field survey, 2012

3.3 Agricultural Programmes Listened through Radio

As shown in Table 3 of the findings majority (97.8%) of the farmers were found to have listened to agricultural programmes while only (2.2%) did not listen to agricultural programmes. This is an indication that a greater percentage of the farmers in the study area had access to agricultural information which according to them helps in providing furnishing information on agricultural activities, market price, weather conditions etc. This finding is in line with [17] who reported that agricultural radio programmes provide market price and weather information on regular basis.

The findings in Table 3 also reveals that out of the 2.2% of the farmers that did not listen to radio agricultural programmes was due to non visible demonstration of the programme (54.4%), 23.3% of the farmers could not be able to buy transistor batteries always, 13.3% were of the view that radio agricultural programmes are not educating while only (8.9%) of the farmers had no interest completely in listening to radio. The findings of study imply that visible demonstration of the agricultural programme to the farmers of the study area is the main determining factor limiting listening to radio agricultural programmes among the remaining farmers. This is because the farmers need to see with their naked eyes how a particular agricultural programme is being demonstrated step by step.

Table 3. Farmers distribution based on radio agricultural programmes (n=90)

Radio Programme	Frequency	Percentage
Listening to Radio Programme:		
Yes	88	97.8
No	02	02.2
Why Not		
Non visible demonstration of the agric.programme.	21	54.4
Cannot afford to buy batteries always.	49	23.3
Agricultural programmes aired are not educating.	08	08.9
Not interested in listening to radio	12	13.3
Agricultural Programme listened to:		
Agricultural commodity	20	13.9
<i>Daga Kasuwanninmu</i>	15	10.4
<i>Noma Tushen Arziki</i>	17	11.8
<i>Ina manoma?</i>	18	12.5
<i>Noman zamani</i>	10	06.9
<i>Attajirin rani</i>	10	06.9
Let's go farming	10	06.9
<i>Noma da kiwo</i>	12	08.3
<i>Don makiyaya a rugga</i>	11	07.6
All the programmes	19	13.2
	*144	

As shown in the findings of Table 3, 13.89% of the farmers listened to Agricultural commodity programmes, 13.19% of them listened to all the agricultural programmes, 10.41% of the farmers listened to *Daga Kasuwanninmu* (from our markets) agricultural programme, 7.64% of the them listened to *don makiyaya a rugga* (programme for nomads) agricultural programme, 6.94% of the farmers listened to *attajirin rani* (rich man of the dry season), *noman zamani* (modern farming) and lets go farming respectively. Lastly only (1.39%) of the farmers did not listen to any agricultural programme. This finding implies that almost all the farmers in the study area listened to one agricultural programme or the other. This finding is in agreement with [8] that radio segment of electronic media has by far the larger audience of all the media.

3.4 Format of Presenting Agricultural Programmes

In order to arouse the interest and create awareness among the listeners, radio stations normally presents their programme in different formats. As indicated in Table 4 of the result, majorities (77.8%) of the farmers were of the view that the format of the agricultural programmes listened to was presented through presentation or discussion by an expert and or an extension worker, 11.1% of the farmers expressed that the agricultural programmes listened to was presented through the dramatic presentation, 8.9% of the farmers listened to the agricultural programme through interviewing experts in the radio, while only (2.2%) of the farmers testified that they did not listen to any of the agricultural programs aired. This implies that majority of the farmers' listened to agricultural programmes that were presented through discussion or in dramatic format which is more enticing and fascinating to the listeners (farmers). This finding is in line with [18] reported that radio agricultural programmes are entertainment communications because its performances such as storytelling, interview and drama could facilitate development of agricultural extension programmes through the rapid diffusion of new technologies.

Table 4. Distribution of the farmers based on the format the agricultural programmes was presented (n=90)

Format	Frequency	Percentage
Drama	08	08.9
Interview	10	11.1
Discussion	70	77.8
No response	02	02.2

Source: Field survey, 2011

3.5 Convenient Time for Listening to Agricultural Programmes

Rural farmers were mostly found to have been engaged with either farm or domestic activities throughout the day. A convenient time to listen to any agricultural programme is very essential but time sacrificing. Therefore, any agricultural programme that needs the attention of the farmers has to be aired at the convenient time of the farmers. As indicated in the result of Table 5, majority (85%) of the farmers listened to agricultural programmes during the morning hours of the day, 6.7% of the farmers listened to the agricultural programmes in the night hours of the day, 5.6% of them listened to the agricultural programmes in the afternoon and lastly, 2.2% of the farmers were found listening to radio agricultural programmes both in the morning and night hours of the day. The majority of the farmers listened to agricultural programmes in the morning hours of the day; this might be due to the fact that almost all the farmers were engaged with either farm or domestic activities in the afternoon and evening hours of the day. This statement is in accordance with [19] that farmers own functional radio sets and prefer listening to agricultural programs at the morning and night hour's of the day.

Table 5. Distribution of the farmers based on the time of listening to agricultural programmes (n=90)

Time of listening to radio agricultural programme	Frequency	Percentage
Morning	77	85.6
Afternoon	05	05.6
No Response	08	08.8

Source: Field survey, 2011

3.6 Knowledge Gained from Agricultural Programmes Aired

The main essence of using radio to disseminate information to the farmers is to create awareness and convincingly demonstrate to the farmers on how such an improved technology could be practiced. The demonstrations could be made in different formant with the aim of attracting the interest of the farmers and ultimately create a conducive environment for them to change and adopt the technology disseminated. The findings in Table 6 showed that 26.7% of the farmers gained knowledge of agricultural practices through agricultural programmes aired by radio, 17.8% of the farmers gained knowledge on the prevention of post- harvest losses and 16.7% of them gained knowledge on both appropriate and correct application of fertilizer and treatment for various animal diseases. The finding also revealed that 11.1% of the farmers gained knowledge on the accessibility to agricultural credit and other loan facilities and 8.9% of the farmers gained knowledge on disease; insects and pests control measures while only (2.2%) of the farmers did not gained any type of knowledge on agricultural activities as a result of the agricultural programmes aired.

The finding of the research indicated that the farmers in the study area attained some knowledge out of the agricultural programmes aired and also the knowledge gained had made impact on the farmer's agricultural practices. This finding is in line with [12] that the listeners of radio agricultural programmes gained knowledge of various improved practices and the knowledge gained was found very useful to their agricultural endeavors.

Table 6. Distribution of the respondents based on the knowledge gained through radio agricultural programmes (n=90)

Knowledge gain	Frequency	Percentage
Appropriate and correct application of fertilizer	15	16.7
Agricultural practices	24	26.7
Prevention of post- harvest losses	16	17.8
Appropriate treatment for various animals diseases	15	16.7
Access to agricultural credits and loans	10	11.1
No response	02	02.2

Source: Field survey, 2011

3.7 Adoption of Information Aired through Radio Programmes

The main essence of creating awareness through radio programming is to make the farmers aware and convincing through appropriate captivating format which subsequently convince the farmer to adopt the innovation. As indicated in Table 7 of the findings, majority (97.8%) of the farmers adopted the new practice disseminated through radio agricultural programmes while only (2.2%) of the farmers did not adopt the information obtained from the radio

agricultural programmes. Farmers in the study area adopted the new technology disseminated through radio due to the availability of this media sources as well as its portability and the format in which the programme was aired. Drama as a traditional means of information dissemination allows different possible endings by encouraging audience participation which is aimed at changing the behavior of participants of such means of communication [20,21].

Table 7. Distribution of the farmers according to adoption of Agricultural information aired through radio programs (n=90)

Adoption of information	Frequency	Percentage
Yes	88	97.8
No	02	02.2

Source: Field survey, 2011

3.8 Relevance of Radio Agricultural Programmes

Table 8 of the result indicated that 32.2% of the farmers expressed that radio agricultural programmes were highly relevant to their agricultural activities, 24.4% of the farmers were of the view that the radio agricultural programmes were very relevant to them, 22.2% of the farmers agreed that the radio agricultural programmes were partially relevant to their agricultural activities, 17.8% of the farmers were of the view that the radio agricultural programmes were relevant while only (3.3%) of the farmers were of the opinion that the radio agricultural programmes were not relevant to their agricultural activities.

The finding of the study implied that radio agricultural programmes are relevant as a result of the knowledge gained that helps in improving their agricultural activities. [16] Observed that radio programmes are usually timely and capable of extending messages to the audience no matter where they may be as long as they have a receiver with adequate supply of power.

Table 8. Distribution of respondents based on the relevance of radio agricultural programmes (n=90)

Relevance of radio programs	Frequency	Percentage
Highly relevant	29	32.2
Very relevant	20	22.2
Partially relevant	22	24.4
Relevant	16	17.8
Not relevant	03	03.3

Source: Field survey, 2011

3.9 Effectiveness and Importance of Radio Agricultural Programmes in Awareness Creation

3.9.1 Effectiveness of radio agricultural programmes

The findings in Table 9 showed that 72.2% of the farmers agreed that radio agricultural programmes were effective tool in awareness creation among farmers, 24.4% of the farmers strongly agreed with the effectiveness of farm radio programmes in awareness creation while only (1.1%) of the respondents remained undecided, disagreed and strongly disagreed

respectively. This implies that radio agricultural programmes are an effective tool in creating awareness on improved agricultural programmes among farmers. This finding corroborated with [22] that farm radio broadcasting when skillfully used has proved to be the most effective medium of communication, which is essential for developing societies.

3.9.2 Importance of radio agricultural programmes

The reason behind airing any agricultural programme by any mass media means is to sensitize and educate farmers about improved agricultural practice needed to be adopted. As shown in Table 9 of the result, the majorities (97.8%) of the farmers were of the view that the radio agricultural programmes were very important to them in their agricultural practices while only (2.2%) of the respondents testified that the agricultural programs were not important to their agricultural practices. This implies that majority of the farmers in the study area enjoyed the agricultural programmes aired and it helps them in improving their level of productivity and income. This finding is in corroboration with [12] that radio is the most highly used media in accessing development and agricultural information. The listeners of agricultural programmes indicated various improved practices they gained knowledge of and they found the program aired as very useful to their agricultural practices.

Table 9. Distribution of farmers based on the effectiveness and importance of radio agricultural programmes in awareness creation (n=90)

Effectiveness of radio agricultural programmes	Frequency	Percentage
Strongly agreed	22	24.4
Agreed	65	72.2
Undecided	01	01.1
Disagreed	01	01.1
Importance of radio agricultural programmes		
Yes	88	97.8
No	02	02.2

Source: Field survey, 2011

3.10 Test of Hypotheses

3.10.1 Relationship between the farmers' socio-economic characteristics and the effectiveness of radio agricultural programmes in awareness creation

The nonparametric Chi-square analysis in Table 10 indicated that the Chi-square value indicated that the chi-square value (0.99) on the age of the farmers is greater than the significant level (0.05) therefore; the null hypothesis is accepted, indicating that there is no significant relationship between the age of the farmer and the effectiveness of radio agricultural programmes. The analysis further revealed that the P- value (0.00) on the gender of the farmers is less than the significant level (0.05) therefore the null hypothesis is rejected. This expressed that there is significant relationship between the gender of the respondents and the effectiveness of the radio agricultural programmes. This implies that the effectiveness of the agricultural programmes aired is related to the gender of the participating farmer.

The analysis of the relationship between marital status of the farmers and the effectiveness of radio agricultural programmes indicates that the P- value (0.00) is less than the significant level (0.05) therefore the null hypothesis is rejected. This expressed that there is significant

relationship between the marital status of the respondents and effectiveness of radio agricultural programmes on their agricultural activities. This implies that the effectiveness of radio agricultural programmes aired is related to the marital status of the respondents. The result of the relationship between educational level of the farmers and the effectiveness of radio agricultural programmes reveals that the P- value (0.00) is less than the significant level (0.05) therefore the null hypothesis is rejected. This implies that there is significant relationship between the educational level of the farmers and the effectiveness of radio agricultural programmes in their agricultural activities.

Table 10. Relationship between effectiveness of radio agricultural programmes and socio-economic Characteristics of the farmers

Variables	X ² values	Df	p-values
Age	18.422	40	0.99ns
Gender	57.600	1	0.00*
Marital status	189.556	3	0.00*
Education	59.778	4	0.00*

*Significant 5%, ns= Not significant, X² = Chi-square, Df=Degree of freedom

3.10.2 Relationship between radio agricultural programmes aired and knowledge gained (skill) by the farmers

The Chi-square analysis in Table 11 depicts that radio agricultural programmes aired is significantly ($p < 0.01$) related to the knowledge gained by the farmers. It indicates that the more the agricultural programmes aired the more the knowledge gained.

Table 11. Relationship between the radio agricultural programmes and knowledge gained by the farmers

Variables	X ² values	Df	P-value
Radio programmes aired and knowledge gained	94.216	60	0.03*

*Significant at 10%, X² = Chi-square, Df = Degree of freedom

4. CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

Based on the findings of the study, it could be concluded that radio is an effective means of communicating agricultural information to the farmers and as such an effective tool in creating awareness about improved agricultural information most especially among farmers in the rural areas. The findings revealed that majority of the farmers that listened to agricultural programme were males, married and were within the active productive ages of 31-42 years. All the farmers were found having one type of education or the other more especially Islamic education.

It was also observed that almost all the farmers received information on agriculture from farm radio programmes and most of the information disseminated through the farm radio was aired through discussions (talking) by an extension worker or an expert on the field. Based on the findings of the study, knowledge of certain agricultural practices such as appropriate and correct application of fertilizer, agricultural practices, prevention of post-

harvest losses, appropriate treatment for various animals' diseases and access to agricultural credits and loans were obtained. The study reveals that knowledge obtained through radio agricultural programmes were very important, highly relevant and effective in solving farmer's agricultural problems.

4.2 Recommendations

Based on the findings of the study, it is deemed necessary to draw the following recommendations:

1. Agricultural farm radio stations should be established within the reach of the farmers.
2. There is need for more effort in providing more agricultural information programmes to farmers through radio especially in the morning hours and during some of the leisure times of the farmers.
3. The public and Non-Government Organization (NGO's) should endeavor to sponsor some agricultural programmes especially those that have strong bearing with the needs and interest of the farmers.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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