JOURNAL OF AGRICULTURAL ECONOMICS, EXTENSION & SCIENCES
Official Journal of the College of Agricultural Economics and Extension
www.jaees.org
www.uam.edu.ng
Jaees Vol. 13 No.2 2026, Page 1-15
ISSN (Print) 2545-5179, ISSN (Online) 2714-5018

ADOPTION OF TECHNOLOGIES AIRED ON SOLID RADIO BY FARMERS IN SOUTHERN AGRICULTURAL ZONE OF NASARAWA STATE, NIGERIA

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Abstract
The study assessed crop farmers' adoption of agricultural technologies aired on Solid FM Radio in Southern Agricultural Zone of Nasarawa State, Nigeria. A multistage sampling procedure was used to draw 277 crop farmers who listened to agricultural programmes of Solid FM Radio. A structured questionnaire was used to collect data for the study. Data were analysed using descriptive and inferential statistics (Linear regression).The result on socio-economic characteristics of the respondents shows that majority (52.0%) were in the age range of 38 years and above, had one form of formal education or the other (81.2%) with a mean household size of 5 persons. The mean farming experience was 9 years, with majority (90.3%) having a farm size of 5 hectares. Also, majority (60.3%) had contact with extension agents, and had no access to credit facilities (64.3%) and all (100%) of the respondents owned or had access to a radio set. The study revealed that all (100%) of the respondents were aware of and had listened to the two popular agricultural programmes of Solid FM radio, *mu koma gona* and *noman shinkafa jari* .Results on adoption of agricultural technologies aired on the radio revealed that climate change mitigation practices (89.9%), best practices in rice production (87.9%), safe use /handling of agrochemicals (85.6%) were the technologies highly adopted by the respondents, The result further shows that age, household size, extension contact, amount of loan obtained, annual income and ownership of radio had a significant influence on adoption of agricultural technologies aired on the radio. Short duration of the programmes, (m=2.60), lack of feedback/inability to ask questions (m=2.56), wrong timing of the programmes were the major constraints to adoption of agricultural technologies aired on the radio. The study found that most of the technologies aired were adopted and therefore, recommended that the radio station should allot more time to agricultural programmes, time of airing programmes should be changed to night (8-9pm)
.

Keywords: Adoption, Agricultural, Farmers, Solid radio, Technologies

1.0 Introduction

Many Nigerian radio stations now broadcast agricultural programmes to meet

the agricultural information needs of the farmers (Agwu *et al.*, 2008). Most of these programmes are presented in different formats using predominantly the local languages understood by the people .Nasarawa Broadcasting Service (NBS), Lafia is also among these stations. The NBS (Solid FM 97.1) as it is popularly called was established in 1996 by the government of Nasarawa State in Nigeria. The Nasarawa Broadcasting Service (NBS) has consistently demonstrated a strong commitment to meeting public expectations in its core functions of information dissemination, entertainment and education.

To address the agricultural information needs of farmers in Nasarawa State and to support agricultural development, NBS has developed two key agricultural programmes: *"Mu Koma Gona"* (Let's go back to Farming),and *Noman Shinkafa Jari* (Rice Farming, a Profitable Venture), . While *Noman Shinkafa Jari* is sponsored by Radio Farm International (RFI), the other programme is produced and funded by NBS (Solid FM). These programmes are predominantly presented in Hausa language. The content spans various themes such as crop cultivation, livestock, fisheries, harvesting practices, post-harvest management, marketing strategies, environmental sustainability, price updates for agricultural inputs, as well as access to credit, loans, weather forecasts, and climate change awareness. This research will examine how farmers patronised and adopted the agricultural technologies aired on Solid FM radio.*Mukoma gona* is broadcast every Tuesday 2pm to 2,30 pm and *Noman shinkafa jari* is broadcast every Saturday 5 to 6 (pm). This study will therefore, focus on crop farmers' patronage of agricultural programmes of Solid FM radio and adoption of technologies aired.

Several studies (Nwachukwu, 2002; Agwu *et al.*, 2008; Njoku and Ugboaja, 2019) had been carried out on adoption of agricultural technologies on the radio in Nigeria at large, but little or no study has been carried out on adoption of agricultural technologies aired on Solid FM Radio by farmers in Southern Agricultural Zone of Nasarawa State, Nigeria. It is against this backdrop, that this study was designed to assess farmers' adoption of agricultural technologies aired on Solid FM Radio in Southern Agricultural Zone of Nasarawa State, Nigeria.

2.0 Objectives of the Study

The broad objective of this study was to assess adoption of agricultural technologies aired on Solid FM Radio by farmers in Southern Agricultural Zone of Nasarawa State, Nigeria. The specific objectives were to:

i. describe the socio-economic characteristics of the respondents in the study area
ii. ascertain the level of awareness of the agricultural programmes of Solid FM Radio Lafia by the respondents
iii. determine the level of adoption of the technologies disseminated on Solid FM Radio agricultural programmes
iv. identify determinants of adoption of technologies disseminated through the Solid FM Radio agricultural programmes and
v identify constraints to adoption of agricultural technologies aired on Solid FM Radio.

3.0 Methodology

The study was conducted in the Southern Agricultural Zone of Nasarawa State, Nigeria. The zone shares boundaries with Benue State to the South, Taraba State to the east, Plateau State to the North east, Nasarawa Eggon Local Government Area to the North

and Nasarawa Local Government Area to the West. The area is located between latitude 90,33^{0}N and Longitude 90.32^{0}E and covers a land area of 10,644 square kilometres (Nasarawa Sate government, 2020) with a population of 811,020 people (National Population Commission, 2006). The study area is characterised by a period of rainy Season from May- October. The average rainfall is approximately, 1750 mm and an annual temperature range from 22.7^{0}c to 39.0^{0}C (Nasarawa State Government, 2020). Agriculture is the dominant occupation of the inhabitants of the area. The zone has five Local Government Areas namely, Lafia, Obi, Awe, Keana and Doma.

The target population for this study comprised all the crop farmers in the Southern Agricultural zone who had listened to Solid FM Radio. A multi-stage sampling technique was employed to select a sample size of 277 respondents crop farmers. Stage 1, involved a random selection of three (3) Local Government Areas from the five Local Government Areas in the study area. Stage ii, was random selection of three villages from each of the three selected Local Governments to give a total of nine villages. Following the random selection of villages, a total of 277 crop farmers were purposively selected from a list of 906 farmers obtained from the Nasarawa Agricultural Development Programme. The list was subjected to Taro Yamane's (1967) formula.

4.0 Results and Discussion

4.1 Socio-economic Characteristics of Respondents

Table 1 shows that majority (52.0%) of the respondents were above 38 years. The mean age of the respondents was 40 years. This implies that majority of the respondents were still active and strong enough to participate actively in agricultural activities. . This finding agrees with Tafida and Sabiu (2021) who studied radio agricultural programmes utilisation among crop farmers in Kano and found that most of the crop farmers were

active and in good position to utilise radio agricultural programmes.

Table 1 further shows that majority (80.5%) of the respondents had formal education, while 19.5% had non formal education. This is an indication that most of the respondents could read and write, hence understanding and comprehending innovation on the radio will not be difficult. This result agrees with Yakubu *et al.* (2019) who studied effectiveness of radio agricultural programmes in Jibia Local Government Area of Katsina State and found that most of the farmers had one form of formal education or the other. Education was also found to influence farmers' access, comprehension and adoption of modern agricultural practices (Okwu *et al.*, 2007).

Table 1 further shows that 39.0% of the largest proportion of the respondents had a household size of between 1-5 persons. The mean household size of the respondents was 5 persons. This implies that the farmers in the area had a fairly large household size. Reasons behind large family size could be attributed to the polygamous practices among the people and their dependency on family as a source of farm labour. This agrees with the opinion of Tafida and Sabiu (2021) who reported that crop farmers in Kano State, Nigeria had high family responsibilities, which demanded them to utilise improved technologies aired on agricultural radio programmes.

Table 1 shows that most (47.3%) of the respondents had farming experience of between 1-10 years. The mean years of farming experience in the area was 9 years. This implies that most of the farmers had long years of experience in crop production. This confirmed the findings of Adikwu (2022) which asserted that yam farmers in Benue State, Nigeria had reasonable experience of yam farming.

Majority (52.3%) earned between ₦ 500,001- 1000,000. The mean annual income of the respondents was ₦568,077.62. This implies that crop farmers in the area earned good

farm income, which could be used to buy radio set and adopt technologies aired on the radio. This result disagrees with Tijani *et al.* (2019) who reported that farmers in Niono area of Segou,Mali earned low income from farming and were too poor to satisfy their household needs from farming activities. This could positively affect farmers' access to radio agricultural programmes and adoption of technologies aired on the radio.

Table 1 shows that majority (60.3%) of the respondents indicated they had no extension contact, while 39.7% indicated otherwise. This reason had made it necessary to find other means to reach farmers with the necessary agricultural information. Radio agricultural programme has been described as the most effective means of reaching farmers with reliable information. This result agrees with Njoku and Ugboaja (2019) who stated that, farmers in Imo State, Nigeria had very low extension contacts.

Majority (64.3%) of the respondents had no access to credit facilities, while 35.7% had access to credit. The result further showed that for respondents who had access to credit, majority (57.1. %) had accessed loan of above ₦400, 000. This implies that accessing loan in the study area was difficult. Credit facilities encourage adoption of technologies that are aired on the radio.

Table 1 also revealed that all (100%) of the respondents had radio set or access to one. This is an indication that farmers in the study area listened to radio and have access to agricultural information. Antwi *et al.* (2022) indicated that all owned their radio set or had access to a radio set.

Table 1: Socio-Economic Characteristics of Respondents(n=277)

Socio-economic variables	Frequency	Percentage (%)	Mean
Age (years)			
Less than 28	52	18.8	40.3 years
28-38	81	29.2	
Above 38	144	52.0	
Level of education			
Non-formal education	54	19.5	
Primary education	41	14.8	
Secondary education	94	33.9	
Tertiary education	88	31.8	
Household size (no. of persons)			
1-5	108	39.0	5 persons
6-10	104	37.5	
Above 10	65	23.5	
Farming experience (years)			
1-10	131	47.2	9,3
11-20	73	26.4	
Above 20	73	26. 4	
Total annual income (naira)			
1,000-500,000	70	25.3	N568,077.62
500,001-1,000,000	145	52.3	
Above 1,000,000	62	22.4	
Farm size (hectares)			
1-5	250	90.3	3.4 hectares
6-10	20	7.2	
Above 10	7	2.5	
Access to extension contact			
Yes	167	60.3	
No	110	39.7	
Number of extension contacts (no. of visits received)			2 visits
1-2	128	76.6	
3-4	14	8.40	
Above 4	25	15.0	
Access to credit			
Yes	178	64.3	
No	99	35.7	
Access to a radio set			
Yes	277	100.0	

Source: Field survey (2024)

4.2 Level of Awareness of Agricultural Programmes of Solid FM Radio

Table 2 shows the level of awareness of agricultural programmes of the 'Solid FM' Radio. All (100%) the respondents indicated having an awareness of agricultural programmes on the radio. Respondents' awareness of the various agricultural programmes aired on radio station reflects the popularity of the programmes among the

respondents. Knowledge of a particular programme and its contents will develop interest among listeners which could lead to its adoption. This corroborates the findings of Maurice *et al*. (2019) that farmers in Adamawa State were aware of various agricultural programmes aired on radio stations

Table 2: Awareness of Agricultural Programmes on Solid FM Radio by Respondents (n=277)

Variables	Frequency	Percentage (%)
Respondents' awareness of agricultural programmes on Solid FM Radio.		
Mukoma Gona		
Yes	277	100.0
No	0	0.0
Noman Shikafa Jari		
Yes	277	100.0
No	0	0.0

Source: Field survey (2024)

4.3 Adoption of Agricultural Practices aired on the Solid FM Radio station.

Table 3 shows that 15 improved agricultural practices were disseminated to the farmers via radio agricultural programmes. The radio agricultural programmes had enhanced adoption of all the practices by the farmers in varying degrees. Technologies such as climate change mitigation (89.0%) had the highest adoption, while information on weather forecast had lowest adoption (42.6%).

The reasons for their low adoption could be that the technologies were not properly explained, difficulties in understanding and use of the technologies, farmers' unwillingness to take risk on some of the new practices among others. This finding is in agreement with those of Njoku and Ugboaja (2019), who reported that 'Radio- Farmer' agricultural programme had enhanced adoption of all the fourteen agricultural practices disseminated on the radio by the farmers in Imo State, Nigeria.

Table 3: Adoption of Agricultural Technologies Aired by Solid FM Radio station (n=277)

Variables	Frequency	Percentage (%
Climate change mitigation practices	249	89.9
Best practices in rice production	241	87.0
Safe use/handling of agro -chemicals	237	85.6
Use of improved seed varieties	225	81.2
Urea second application	221	79.9
Control/prevention of crop diseases and pests	221	79.9
Proper storage methods for farm produce	216	77.9
Organic manuring	199	71.8
Maize production and its value chain	187	67.5
Timely planting of crops	175	63.2
Proper methods of preservation and utilisation of fruits and vegetables	154	55.6
Reputable sources of seeds	133	48.0
Market information	128	46.2
Home gardening/backyard farming	123	44.4
Information on the weather forecast	118	42.6

Source: Field survey (2024), multiple responses .

4.4 Determinant of Adoption of Agricultural Practices Aired on Solid FM Radio station.

Table 4 reveals that six (6) of the nine explanatory variables used in the analysis were significant at varying levels. These include coefficient of age (.027), household size (-.056), extension contact (.576), amount of loan obtained (3.998), total annual income (4.985) and ownership of radio (.438). The coefficient of multiple determinations (R^2) was 0.521 implying that 52.1% of the change in the adoption rate of agricultural technologies/practices aired on the radio was explained by the independent variables used in the model, thus, the variables had fitted well into the model.

The coefficient of age of farmers was positive and statistically significant at 0.05 level. This implies that as farmers get older, adoption of agricultural practices aired on the

radio increased. As farmers become older, they gained more experience in farming, and their quest to adopt technologies that will increases agricultural productivity also increases. Thus, they are likely to patronise agricultural programmes on radio that are relevant to their information needs. This result disagrees with the usual negative relationships between age and the usual adoption, where a farmer is defined to have adopted an innovation if he is younger (Smith *et al.,*2024). The result of this study agrees with that of Antwi *et al.* (2022) and Maurice *et al.* (2019) who found that age of farmers is strongly correlated with adoption of farm radio programmes.

The coefficient of household size was negative. Indicating a negative but a significant relationship with adoption. As household size grows, the tendencies to adopt agricultural practices aired on the radio decreases. This could be attributed to the fact that larger households may not be able to adopt agricultural practices over the radio due to the fact that such household may not have enough resources to buy radio and adopt technologies aired. Again, such household may channel more of their resources towards handling social responsibilities such as school fee, hospitals and feeding than on improved technologies aired on the radio. This result disagrees with that of Tafida and Sabiu (2021), who reported positive relationship between household size and adoption of improved agricultural technologies by farmers on the radio.

Extension contact had positive influence on adoption of agricultural practices aired on Solid FM Radio at 0.01 level of significance. This implies that farmers who had more extension contacts were more likely to adopt agricultural practices than farmers who had less or did not. Extension contact could reinforce and support the information provided through the radio agricultural programmes and can also provide targeted support to farmers, helping them overcome some specific challenges and increasing the

effectiveness of radio agricultural programmes. As the frequency of extension contact increases, the likelihood or extent of adopting agricultural practices on the radio also increases. This finding is in line with the findings of Tafida and Sabiu (2021) who reported significant positive relationship between extension contacts and adoption of agricultural practices on the radio by crop farmers in Kano State, Nigeria.

Amount of loan obtained had a positive coefficient, which was significant at 0.01 level of significance. This indicated that it had a positive influence on adoption of agricultural practices aired on 'Solid FM Radio. A positive coefficient shows that the larger the loan obtained, the more chances of adopting agricultural technologies. Implying that farmers who obtained larger loans are more likely to adopt agricultural practices aired on 'Solid FM' radio. The result disagrees with Maurice *et al.* (2019) who reported that access to credit has no significant relationship with adoption of agricultural technologies aired on the radio.

Total annual income had a positive coefficient; this indicates it had a positive influence on adoption of agricultural practices aired on 'Solid FM' Radio. It shows that as income increases, the tendencies to adopt agricultural practices will also increase. Farmers with more annual income were more likely to have more opportunities to learn about innovations, have more incentives to adopt it and are able to bear risks associated with early adoption than those with smaller farm incomes.

The coefficient of ownership of radio was positive and also statistically significant at 0.05 level. This implies that owning a radio set will increase the likelihood of farmers to adopt improved agricultural technologies disseminated via radio. When the programme timing favours the farmer, the tendency is for the farmer to always tune in to the programme.The finding of this study agrees with Njoku (2016) and Maurice *et al.*

(2019) and Tafida and Sabiu (2021) who all reported that radio ownership is a significant factor that influences adoption of technologies aired on the radio.

Table 4: Determinants of Adoption of Technologies disseminated through the Solid FM Radio Agricultural Programmes (n=277)

Variables	β- value	Standard error	t-value
(Constant)	10.152	.488	20.803
Age	.027	.012	2.250**
Level of education	-.040	.050	-.800
Household size	-.056	.020	-2.800***
Years of experience in crop farming	.017	.014	1.214
Extension contact	.576	.066	8.727***
Amount of loan obtained	3.998	1.118	3.576***
Total annual income	4.985	1.195	4.172***
Farm size	-.079	.055	-1.436
Ownership of radio	.438	.180	2.433**
R^2 = .521 (52.1%)			

Source: Field survey (2024).
Note: *** = Significant at 1% level, ** = significant at 5% level
Dependent variable (Y) = Number of Agricultural technologies adopted by the respondents.

4.5 Constraints to Adoption of Agricultural Practices Aired on the Solid FM Radio Station

The result of the study on the constraints to adoption of agricultural practices disseminated on Solid FM Radio is presented in table 5. The result showed that out of the possible constraints investigated in this study, five (5) were considered to be serious constraints to adoption of technologies transferred through the radio agricultural programmes of 'Solid FM Radio'.

These serious constraints include, short duration of the programmes by crop farmers in Kano State, Nigeria.

Table 5: Constraints to Adoption of Agricultural Practices Aired on Solid FM Radio (n=277)

Constraint,	Mean	Rank
Short duration of the programmes	2.60*	1st
Lack of feedback/inability to ask questions	2.56*	2nd
Timing of airing the programmes	2.45*	3rd
High cost of batteries	2.42*	4th
Irregular electricity power supply	2.31*	5th
Lack of radio set or having access to one	1.81	6th
The technologies aired are too difficult to understand/use	1.74	7th
Programme content not relevant to my needs	1.70	8th
Poor presentation of the programmes	1.68	9th
Language barrier	1.07	10th
Lack of awareness of the radio agricultural programmes	1.02	11th
Poor radio signal in my area	1.00	12th

Source: Field survey (2024).
Note:*= Serious Constraint
Decision rule: A weighted mean ≥ 2.0 mean severe constraint, while any weighted mean of < 2.0 mean not serious constraint.

5.0 Conclusion and Recommendations.

5.1 Conclusion

Based on the findings of this study, it can be concluded that majority of the farmers were aware of agricultural programmes of Solid FM Radio. The technologies disseminated on the agricultural programmes were relevant to farmers information needs/agricultural practices and most of the technologies were adopted by the farmers. Factors such as age of the farmers, household size, number of extension contact, amount of loan obtained, annual farm income and ownership of radio were found to have significant influence on the adoption of agricultural technologies aired on the radio. Short duration of the programmes, lack of feedback/inability to ask questions, wronged timing of the programmes high cost of batteries and erratic electricity power supply were the major challanges to adoption of technologies aired on the radio agricultural programmes

identified by the study.

5.2 Recommendations

It was recommended as follows:

i. More time should be allotted to the agricultural programmes by the radio station.

ii. Time of airing the programmes should be changed preferably in the night between 8-9PM.

iii. Programmes Managers should design the programmes in such a way that it can allow audience participations. In this way farmers could ask question and expect feedback from the experts.

iv. The government should improve electricity supply to the study areas. Alternative power sources such as the solar power should be considered too. This will reduce the cost of buying batteries always by the respondents.

References

Adikwu.,D.A.S.,(2022). Effectiveness of Farm Radio Broadcast in the Promotion of Yam minesett Technology Among Farmers in Benue State, Nigeria. *Journal of Community and Communication Research*. 7(1):2022.

Agwu ,A.E., Anyanwu,, C.I. and Nwabuwa, C.C., (2016). Adoption of Improved Practices through radio broadcasting. Evidence from small scale Farmers in Nigeria. *Journal of Agricultural Extension,* 20(1): 123-135.

Antwi, E., Enoch, K.J.A., Daniel, C.A., David, B. and Ernest, L.O. (2022). Patronage of farm Radio as an Agricultural knowledge source for farmers, Experience from Ghana, *Journal of media and communication studies.* 4 (1):8-16.

Maurice, D.C, AC., Ali, S.S. and Ali Y. (2019) the Role of agricultural Radio Programmes in the Adoption of Agricultural Technologies among farmers in Girei L.G.A of Adamawa state, Nigeria.

Nasarawa State Government, (2020). Statistical Year Book. 2020 Edition.

National Population Commission (2006) .National population census report of the Federal Republic of Nigeria. Pp. 20-30.

Njoku, J.I. and Ugboaja, C.I.,(2019). Adoption of agricultural technologies transferred Via Radio- Farmer programmme among farmers in Imo State, Nigeria. *Journal of Sustainable Agriculture and Environment,* 17:17(1): 168-180).

Okwu, O.J. Kuku, A.A and J.I. Aba. (2007). An Assessment of use of Radio in Agric information dissemination; A case study of Radio Benue in Nigeria. *Africa Journal of Agricultural Research*, 2(1); 14-18.

Smith,W.M, Jacob, I.A., Agape, K.D. and Ebenezer, T.A.(2024). Influence of Communication on Smallholder Farmers' Adoption of Agricultural Innovations in Damongo of the Savannaa Regionof Ghana. *African Journal of Empirical Research*. 5(4): 1278-1295.

Tafida, I. and Sabiu, S.A.,(2021). Analysis of Agricultural Radio Programmes Utilizaton Among Crop Farmers in Kano State, Nigeria. *Journal of Agricultural Economics, Environment, and Social Science.*7 (11):167-188.

Tijani, S.A, Traore, A.B. and Badiru, 1.O, (2019). Farmer's preference for Agricultural Radio programme in Niono area of Segou, Mali, *Nigeria Journal of Radio Extension and Development.*13 pp 14-21

Yakubu, D.H., Musa, N., Muhammad, M.B., Shuaibu, H., Mamman, M. and Oduche, T.C (2019). Assessment of Farmers' perceived Effectiveness of Radio Agricultural Programmes in Jibia Local Government Area of Katsina State, Nigeria. *Journal of Agriculture and Environment.* 15 (2): 51-59

Yamane, T.,(1967). Statistics: An Introductory Analysis.2nd Edition, Harper and Row, New York.