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## Influence of Socio-economic Factors on the Use of Information Dissemination Channels among Groundnut Farmers in Northwest Nigeria

<https://dx.doi.org/10.4314/jae.v27i3.6>

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**Submitted:** 24<sup>th</sup> March 2023

**First Request for Revision:** 8<sup>th</sup> May 2023

**Revisions:** 3<sup>rd</sup>, 8<sup>th</sup>, 31 May, 3<sup>rd</sup>, 5<sup>th</sup> 8<sup>th</sup>, 9<sup>th</sup>, 10<sup>th</sup> July 2023.

**Accepted:** 19 July 2023

**Published:** 23 July 2023

**Cite as:** Abu, R.T., Haris, N. B. M., Hamzah, S. R., Hassan, S., Mustapha, S., Shah, J. A

(2023) Influence of socio-economic factors on the use of information dissemination channels among groundnut farmers in Northwest Nigeria. *Journal of Agricultural Extension* 27 (3) 53-60

**Keywords:** Information dissemination channels, adoption of groundnut farming practices,

**Conflict of interest:** The authors pronounce no impending conflict of interest.

**Acknowledgement:** Authors would like to express their profound appreciation to the Tertiary Institution Trust-Fund (TETFUND) of Nigeria, for funding the PhD research. The authors also wish to thank the Country Director of the Tropical Legume (TL I, II & III) Projects and the State's Agricultural Development Programme (ADPs) for assistance in the provision of relevant information and technical staff for the data collection.

**Authors' contributions:**

Tijjani, AR: (25%) Conceptualization; Data curation; Formal analysis; Software; Methodology; Writing - original draft; Writing - review & editing

Haris, NBM (25%): Conceptualization; Investigation; Methodology; Resources; Software; Supervision; Validation; Visualization.

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Hamzah, SR (10%): Conceptualization; Writing - review & editing

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## Abstract

*The study assessed the influence of socio-economic factors in the use of information dissemination channels among groundnut farmers in Northwest Nigeria. The research used primary data collected from 349 smallholder groundnut growers. Chi-squared was used in data analysis. The results indicated that farmers' place of residence ( $X^2 = 169.417$ ,  $df=15$ ) and sex ( $X^2 = 14.049$ ,  $df=5$ ) had a significant association with the farm visit extension pieces of advice. Also, significant associations were found between respondents' place of residence ( $X^2 =$*

169.417,  $df=15$ ), sex ( $X^2=14.049$ ,  $df=5$ ) and income ( $X^2=30.956$ ,  $df=15$ ) with the use of radio. Furthermore, significant associations were found between respondents' place of residence ( $X^2=103.417$ ,  $df=15$ ), sex ( $X^2=13.777$ ,  $df=5$ ) and income ( $X^2=22.973$ ,  $df=15$ ) with the use of mobile phones. The article concludes that farmers' place of residence, sex and income have a significant effect on their preference to the use of extension visits, radio and mobile phone technology transfer mechanisms in the study areas. It is recommended for constant training and retraining of extension workers to enhance their information delivery skills. Also, government and other stakeholders should give financial and logistic support to the extension workers to make use of diversified information communication channels.

## **Introduction**

Enhancing farmers' access to valuable agricultural information leads to higher productivity and sustainability (Sa'adu et al., 2022). Extension methods used in technology transfer could be individual, group and mass media (Ariyo, 2021). Whereas, Ullah and Khan (2019) affirmed that extension worker farm visits facilitate farmers' uptake of the technology. Referring to Benjamin et al. (2016) cited in Tafida and Sabiu (2021) assert that for sustainable development and sustainability in agriculture, radio remains the foremost avenue of creating awareness and supporting small-scale farmers' adoption of new farming practices. In a similar perspective, Sennuga et al. (2020) postulated that the advent of ICT in particular mobile phones, has enabled farmers to access more production information. Undoubtedly, the use of a single channel hardly meets farmers' varied information needs (Ragasa et al., 2021).

Studies that examined the use of more than one communication channel reported significant effects on farmers' uptake of technology (Mugumaarhahama et al., 2021; Silvestri et al., 2021). Groundnut (*Arachis hypogaea*) is essential to the economic and nutritional security of millions of farmers and consumers within the northern part of Nigeria. The global production indicates that China, India, Nigeria and the United State of America (USA) are the top-producing nations in the world (Onuwa et al., 2020). Furthermore, Nigeria occupies the first position in the West Africa region, providing 51%, contributing 10% in the world and 39% of the African share to global production demands (Thawur et al., 2021). The study assessed the efficacy of extension visits, radio and mobile phones utilized in the technology transfer of groundnut production practices, in the four states of North-west Nigeria.

## **Methodology**

The research was conducted in Nigeria (North-West). This is composed of six (6) states Kaduna, Jigawa, Katsina, Kano, Zamfara, Sokoto and Kebbi. The area is located between latitudes 9° 02'N and 13° 58' from the North and 3° 08 to 10° 15' east of the Greenwich Meridian. The study used multi-stage sampling procedures to select the sample of the study. In the first stage, purposive sampling was utilized to select four states (Katsina, Kano, Kebbi and Sokoto) that are free from banditry attacks, and the four states have a total population of (2762). The second stage, purposive sampling was used to choose male and female farmers that partake in groundnut improvement in the Tropical Legume (TL III) project. The third stage involves the use of random sampling to select six villages each from the four states. Finally, the 349 respondents' were proportionately selected, following Gedefaw and Sisay (2019) sample size determination formula. Table 1 depicts the procedures.

**Table 1: Population and sample**

Sample States	Population of villages	Percentage	Sample
Katsina	1474	$\frac{1474}{2762} \times 100 = 53.50\%$	$\frac{53.50}{100} \times 349 = 187$
Kano	655	$\frac{655}{2762} \times 100 = 23.73\%$	$\frac{23.73}{100} \times 349 = 83$
Sokoto	377	$\frac{377}{2762} \times 100 = 13.50\%$	$\frac{13.50}{100} \times 349 = 47$
Kebbi	256	$\frac{256}{2762} \times 100 = 9.27\%$	$\frac{9.27}{100} \times 349 = 32$
Total	2762	100	349

A structured questionnaire was used for data collection and data analysis was conducted using percentage and chi-square statistics. The use of information dissemination channels was the dependent variable and respondents' socioeconomic characteristics were the independent variables.

## Results and Discussions

### Influence of Farmers' Place of Residence, Sex, Age and Education on Extension Agent Farm Visit

The farmers' place of residence has a major impact on having extension agent farm visit advice. Thus, villages that are easily accessible to the extension service office/center, receive more extension workers patronage. The result in Table 2 indicates that there is a significant association ( $X^2 = 169.417$ ,  $df=15$ ) between the respondents' place of residence and the extension agent farm visit. This corroborates with the findings of Anag et al. (2020) that the proximity of farmers to extension stations offers them opportunities to have frequent contact visits that contribute progressively to the adoption of agricultural technologies. Also, the sex of respondents significant association ( $X^2 = 14.049$ ,  $df=5$ ) with the extension agent farm visit. Thus, considering the custom and tradition, in a typical north-western rural settlement, males being the household head have benefited more in agricultural interventions comparable to women, which are domicile for the household upkeep. This concurred with Gebre et al. (2021) that the perception of men as leaders of the households and women as helpers impedes women's ability to access agricultural information and production resources. Furthermore, the age of the farmers' had an insignificant ( $X^2 = 16.700$ ,  $df=25$ ) association with the extension agent visit. This contravenes the previous empirical research which pointed out that the number of years a farmer had in farming, offered him opportunities to have several contacts with the extension agents that persuaded his adoption decisions (Gao et al., 2020).

Additionally, the result of respondents' educational level reveals an insignificant association ( $X^2 = 35.674$ ,  $df=20$ ) with the extension agent visit. This is indeed worrisome and it has been in existence since the advent of agriculture to date that

more than two-thirds of the farming families had limited Western education, which makes them difficult to comprehend the technical aspects of production recommendations communicated. The result of the study deviates from Kassem et al. (2021) found a positive relationship between farmers' level of education and the use of extension pieces of advice in the adoption of agricultural technologies.

**Table 2: Influence of farmers' place of residence, sex, age and education on extension agent farm visit**

Variable	Chi-square
Place of residence	$X^2 = 169.417^*$ , df=15
Age	$X^2 = 16.700$ , df=25,
Sex	$X^2 = 14.049^*$ , df=5
Educational level	$X^2 = 35.674$ , df=20

\* $P \leq 0.05$ .

### **Influence of Farmers' Place of Residence, Sex, Age, Income and Education in the Rating of Radio Agricultural Information**

Table 3 shows a significant association ( $X^2 = 169.417$ , df=15) between farmers' place of residence and the use of radio agricultural programme, and this could be due to the adequacy and proficiency of the service delivery in the areas, which created enthusiasm and patronage of the farming families to the radio programme aired. In the same context, Silvestri et al. (2021) affirmed that radio has the potential in reaching wide geographical areas with educative messages that facilitate farmers' use of the practices. More so, the result of the respondents' age depicts an insignificant association ( $X^2 = 20.446$ , df=25) with the usage of radio agricultural extension information. The insignificance of age to the use of radio could likely be that farmers have other means of receiving information such as peer groups, friends, relatives and neighbours. The result is in line with the empirical evidence found in the work of (Chen et al., 2020) that older farmers' accorded much priority to agricultural market information received from their colleagues, at the expense of other production information. In addition, the sex of the respondents' portrayed a significant association ( $X^2 = 14.049$ , df=5) with the utilization of radio.

Nevertheless, scholars have found mixed results, some were of the opinion that males were at the forefront in the patronage of radio agricultural information, whereas, others considered women to have an edge over their counterparts in the utilization of radio agricultural extension programmes. In line with this, Salik et al. (2021) observed that imaginative women between the ages of 18 and 50 listened to and were more conscious of and influenced by the radio program than males. Further findings in Table 3 unveiled a significant association ( $X^2 = 30.956$ , df= 15) between respondents' income and radio, inferring that income generated from groundnut outputs motivates farmers' to seek more information, from within and outside, in order to enhance their production and productivity. Likewise, an insignificant association ( $X^2 = 35.674$ , df= 20) between farmers' educational level and the use of radio was documented. The result is contrary to the findings of Das et al. (2020) reported a significant association between farmers' educational level and the use of radio agricultural information.

**Table 3: Influence of farmers' place of residence, sex, age, income and education in the rating of radio agricultural information.**

<b>Variable</b>	<b>Chi-square</b>
Place of residence	$X^2 = 169.417^*$ , df=15
Sex	$X^2 = 14.049^*$ , df=5
Age	$X^2 = 20.446$ , df=25
Income	$X^2 = 30.956^*$ , df= 15
Educational level	$X^2 = 35.674$ , df= 20

\*P < 0.05.

### **Influence of Farmers' Place of Residence, Sex, Age, Income and Education In the Rating of Mobile Phone Agricultural Information**

The findings in Table 4 portray a statistically significant association ( $X^2 = 103.417$ , df=15) between the respondents' place of residence and the use of mobile phones. Undoubtedly, the majority of farming families reside in rural enclaves, and thus, the availability and accessibility of services to dominant food-producing areas will by no means enhanced food security. The significant association of mobile phones with the place of residence is consistent with Krell et al. (2021) noted that adequate provision of mobile phone services within the rural enclave has overwhelmingly enhanced effective agricultural extension communications that improved the production capacity of the rural dwellers. More so, the outcome of the analysis revealed a significant relationship ( $X^2 = 13.777$ , df=5) between respondents' sex and mobile phone usage, adducing that male being the head of the household has domination and control of the communication device, and even though, in some instances, the wife is in ownership position of the gadget, but other restrictions due to marriage rules in the study areas negate them from free communications with extension agent and other agricultural promotion agencies. This corroborates the findings of Gumucio et al. (2020) inadequate access of women to communication and decision-making processes in agriculture, has substantially limited their adoption of improved production practices communicated via mobile phones.

Likewise, an insignificant association ( $X^2 = 25.717$ , df=25) between the age of respondents and mobile phone use was documented, and apparently, young age is more enthusiastic to meet up with globalization, and such ego, drives them to learn the use of mobile phone applications. The finding of an insignificant correlation contradicts the findings of Nyaplue-Daywhea et al. (2021) that the age of the farmers had a positive association with the use of mobile phones. Also, the chi-square result between the farmers' income and mobile phone use revealed a significant association ( $X^2 = 22.973$ , df= 15) indicating that the more farmers reap the benefits of groundnut production the higher utilization of the communication device. Consistent with this, Hoang (2020) confirmed that farmers with high incomes have a greater tendency to adopt ICT tools (mobile phones) information for better fruit management practices and marketing. Consequently, the findings of farmers' educational level and the use of mobile phones reveal an insignificant association ( $X^2 = 29.897$ , df= 20) it apparently demonstrating that respondents had limited educational background to cope with the use of mobile phone applications. The research finding contravene the findings of Karim et al. (2020) that a significant association between farmers' level of education and utilization of mobile phones.

**Table 4: Influence of farmers' place of residence sex, age, income and education in the rating of mobile phone agricultural information**

Variable	Chi-square
Place of residence	$X^2 = 103.417^*$ , df=15
Sex	$X^2 = 13.777^*$ , df=5
Age	$X^2 = 25.717$ , df=25
Income	$X^2 = 22.973^*$ , df= 15
Educational level	$X^2 = 29.897$ , df= 20

\*P < 0.05

## Conclusion and Recommendation

Respondents' socioeconomic factors influenced their information requirements and preferences. Farmers' place of residence, sex and income have a significant association with the use of multiple information channels (farm visit, radio and mobile phone) in the implementation of improved groundnut practices. However, age and education portrayed insignificant associations with all three extension communication mediums utilized in the diffusion of groundnut practices.

Selection of the media channels to be used by the extension agents should be guided by the existing institutional structure, complexity of the technology, farmers' socioeconomic factors and the resources available. The government needs to minimize sex inequality embedded in societal norms so that women could have access to production and information sources. Government and other stakeholders need to join hands for greater improvements in farmers' education through adult literacy classes.

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