Comparative Analysis of the Determinants of Mass Media Usage by Urban and Rural Farmers in Kogi State, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author SOA designed the study, wrote the protocol and supervised the work. Author UMS performed the statistical analysis and managed the interpretation. Author MHE wrote the first draft of the manuscript and managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

The study compared the determinants of mass media usage by urban and rural farmers in Kogi State, Nigeria. A three staged random sampling technique was used to select 320 respondents. Data obtained through structured questionnaire were analysed using descriptive statistics and logit regression model. The study showed that 82.50% and 68.1% of the urban and rural farmers were males while 17.50% of urban and 31.9% of rural farmers were females. The result also revealed that urban farmers had a mean farm size of 2.5 hectares while the rural farmers had 5 hectares. Most (41.26%) of the rural farmers had no formal education. The result of the influence of socio-economic characteristics on media usage showed that age, education, extension contact, income and farming experience of urban and rural farmers were found to be positively related to the use of

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television, radio, GSM and internet at 5% level of probability. The study recommends improvement in educational status of farmers, especially those in rural areas through adult education programmes. Also, extension services in both urban and rural areas should be improved.

Keywords: Urban; rural; media; usage; logit.

1. INTRODUCTION

Effective agricultural information delivery requires recognition of the needs of the farmers and the determination of how best to provide them with the information they need. Extension services use mass media for its activities because of high speed and low cost with which information can be disseminated over a wide area [1]. Mass media has proved to have these characteristics which make it ideal and efficient in delivering agricultural information to the farmers. Mass media is a form of technological apparatus which is capable of reproducing the same message simultaneously for a large number of people over a given period of time [2]. This may be through large printing press, broadcasting transmitters, film-camera, bill board exhibitions and audiovisuals. Mass media are also channels of communication which can expose large numbers of people to the same information at the same time within a short space of time. They include media which pass on information through the use of sound, moving pictures or print. It exists in form of newspapers, magazines, billboards, posters, journals, mobile phones, radio, television, cinemas, films and storage devices, internet and on-line resources [3].

The use of mass media helps to reduce the work load of the extension personnel by bridging the distance between extension and farmer in addressing their problems and carrying their feedback to research centres [4]. It also helps to mobilize and accept the need for development. Some of the successes of agricultural and rural development are achieved through information dissemination. Indicatively, mass media bring about changes or modifications of one's behaviour in terms of knowledge, attitude or skills [5]. It also improves farmers' critical role in decision-making towards improved agricultural production, processing and marketing of products [6].

Knowledge of farmer's choice of sources of information on improved farm practices should be of great concern to development workers so that they can identify the set of preferred communication channels for reaching their clientele. Just as the communication environment

(the totality and attributes of available information sources) of a farmer influences his information acquisition and utilization of technologies, so also the farmer's communication behaviour may directly or indirectly influence his knowledge acquisition [7]. Farmers that are exposed to various media sources like radio, television, Global System for Mobile Communication (GSM), agricultural journals, newsletters and newspapers are expected to be more likely to quickly accept innovations than those not exposed to multi-media systems.

Agbamu [5] believes that adequate information is one of the major pre-requisites for widespread acceptance of agricultural innovations. The exposure of farmers to the different sources of information being used by the users is needed to bring out the relevance of these sources as well as the preference assigned to the different types of sources [8]. As a result of a wide range of sources of agricultural information available to farmers, choice of appropriate medium is critical in agricultural information delivery. This is because the desire to use or not to use a particular information channel is affected by the channel's disposition and information demand characteristics [9]. A source of information must be credible, reliable and above all, familiar to the user before he would use it.

The accessibility and usage of agricultural information can be done using mass media to promote the awareness and adoption of farm technologies. In spite of the benefits accruing from the use of media technologies, poor exposure of farmers to appropriate agricultural information has been identified as one of the major reasons for low yield recorded by many farmers [10]. Studies on media usage by farmers in Kogi State appear scanty especially with reference to agricultural activities. As a result of this non-accessibility of agro-information by farmers, many have continually practiced subsistence farming which does not give room for improved food production situation in the study area.

The problem therefore, is not only that of availability of agricultural technologies but that of accessibility and effective use of available media

sources for agricultural development in the study area. This means that the available media might not bring the expected change if they cannot be accessed by majority of the urban and rural farmers. The expected change might also be a mere dream if the available media do not address the desires and aspirations of the farmers. Consequently, this study was aimed to ascertain the determinants of mass media usage by small scale farmers in Kogi State, Nigeria.

2. METHODOLOGY

The study was carried out in Kogi state, Nigeria. Kogi State has a total population of 3,278,487 people based on the 2006 population census and is made up of 1,691,737 males and 1,586,750 females [11]. The State is located between Latitude 6°30'N, and 8°50'N and Longitude 5°51'E and 8°00'E. It shares common boundaries with Niger, Nassarawa and the Federal Capital Territory to the north, Benue State to the east, Anambra and Enugu States to the south, and Edo, Ekiti, Ondo, and Kwara States to the west. Important food and cash crops grown in the state are yam, millet, sorghum, rice, cocoyam, sweet potato, cassava, cowpea, bambara nuts, groundnuts, beniseed, banana/plantain and cotton. Fruits and vegetables such as okra, pepper, spinach and fluted pumpkin are cultivated. Tree crops such as cocoa, cashew, coffee, oil palm and citrus are equally grown. Cattle, goats, sheep and poultry are major animals reared. Fishing activities are carried out along Rivers Niger and Benue as well as their tributaries and other inland water bodies.

Two Local Government Areas (LGAs) were randomly selected from each of the four Agricultural Zones (A, B, C and D) as delineated by the Kogi Agricultural Development Programme, making a total of 8 LGAs. One urban and one rural community were randomly selected from each of the LGAs making a total of 16 communities (8 urban and 8 rural communities). Twenty (20) farmers each were randomly selected from both urban and rural communities making a total of 320 farmers for the study.

Data for the study was collected with the use of structured questionnaire and personal observations. Data obtained were analysed using descriptive statistics and Logit regression model. The Logit regression model used to identify the determinants on media usage by urban and rural farmers in the state was as specified below:

$$Prob(y = 1/x) = F(x, \beta)$$

$$Prob(y = 0/x) = 1 - F(x, \beta)$$

$$Ln\,(p/i - p) = \beta o + \beta 1X1 + \beta 2X1 + _____ \beta 8X8$$

Where;

Y	= media usage (1 = usage, 0 = otherwise)
P	= probability of use of media
Ln	= Natural logarithm function
B_0	= Constant
β_1 - β_8	= Logit regression coefficients
X_1	= Age of farmer (in years)
X_2	= Marital status (1=married, otherwise, 0)
X_3	= Educational Status (number of years spent schooling)
X_4	= Farm size (in hectares)
X_5	= Farming experience (in years)
X_6	= Farmers income (in naira)
X_7	= Extension contact (number of visits in a year)
X_8	= Sex (dummy, 1 = male and 0 = female)
e	= Stochastic error term

3. RESULTS AND DISCUSSION

3.1 Socioeconomic Characteristics of Urban and Rural Farmers in Kogi State

The socioeconomic characteristics of urban and rural farmers in the State is presented in Table 1. The socio-economic characteristics of urban and rural farmers involved in media usage presented in this section included sex, age, marital status, educational level, farm size, household size, farming experience and annual income.

The result shows that more males (82.5% in urban and 68.1% in rural areas) were highly involved in media access and usage. This is in agreement with [2] who reported that male farmers participated more in agriculture, therefore engage in media usage for sourcing agricultural information. The low percentage of women (17.5% and 31.88% in urban and rural areas respectively) in farming according to this finding support the view of Akukunda [12], that most of the women especially the low and middle income classes remain at home and engage in subsistence farming to ensure the availability of food in the household and to supplement household income while their husbands go to city

to work in formal or informal jobs. The mean age was 48 years and 43 years for urban and rural farmers respectively. This implies that rural farmers have more young people of economically active age that can use media in sourcing agricultural information than the older ones.

Furthermore, 89.38% and 85.63% of the urban and rural farmers respectively, were married. This is an indication that farming is seriously practiced by both urban and rural farmers to provide food and income for the families. The percentage of married persons recorded in this study underscores roles and responsibilities. Indicatively, most (51.89%) farmers in the urban areas had post primary education such as secondary and tertiary education, while majority (41.26%) of rural farmers had no formal education which could lead to lack of skills and literacy that may limit their use of media in sourcing for agricultural information. The average farm size was 2.5 hectares and 5 hectares for urban and rural farmers respectively. Farmers with larger farm size were willing to adopt new and improved practices such as mass media usage. This conforms to the views of Agbamu [13] that found a positive relationship between farm size and adoption of soil management practice. Table 1 also shows a mean household size of 7 members and 9 members by urban and rural farmers respectively. The large number of family size by both urban and rural farmers could be advantageous to farm labour need. This also implies that the large household size could help in sourcing agricultural messages/information, thereby increasing their access to different mass media channels, which will improve productivity, income and better standard of living. This finding agrees partly with Orebiyi et al. [14], despite the fact that large household size could be advantageous for farm families, economically it may be disadvantageous as more people means high demand for food, clothing, health, children' school fees among others. The average year of farming was 21 years and 30 years for urban and rural farmers respectively. In essence, both the urban and rural farmers had built-up ideas and belief over the years and have been exposed to extension agents, thereby predisposing to accepting agro-innovations. This agrees with the opinion of [5].

The mean annual income for both urban and rural farmers was ₦ 95,300 and ₦ 85,300 respectively. This is an indication that majority of the farmers are still operating at the subsistence level. This is in agreement with the finding of

Fasina [15] that over 90 percent of the country local food supply comes from the agricultural population who are small holder farmers. It should be noted that the higher the income level of a farmer, the less he or she will be disposed to fear of taking a risk in respect of adopting a given technology. Consequently, Umerah [3] posited that income is one of the major factors determining utilization of agricultural information and different technologies.

3.2 Determinants of Mass Media by Urban and Rural Farmers

Output of the Logit regression model on the determinants of mass media usage by urban and rural farmers in the state are presented in Table 2. The analysis was done based on the identified mass media used by the respondents.

3.2.1 Age (X_1)

The result shows that age was positively related to the use of television in both urban and rural areas. The relationship was significant with the use of television in the urban at 1% level of probability while it was found not to be significant in the case of rural area. It implies that the older a farmer gets, the more likely he uses television to source innovations. This could be attributed to the fact that older farmers are less busy and always at home with their television or radio. Their passivity also enables them to have time for Television and radio. The use of television by the older farmers requires less technical know-how and low literacy level to operate. The use of television combines both sound and vision which makes it easy for the older farmer to develop interest in sourcing agricultural information through it. This finding agrees with Adebayo and Adesope [16] who reported that the use of television ensures that interaction between two parties extends beyond exchange of words but include every expression both spoken and unspoken with the aim of reaching mutual understanding.

Age was also found to be positively related to the use of radio in the urban and rural areas. The relationship was significant at 5% level of probability in the urban and 1% level of probability in the rural area. This means that the older a farmer gets the more likely he uses radio for sourcing agricultural messages. It could be that radio is not costly, simple to operate and does not require high education and much experience. This finding agrees with that of Adejo

et al. [17] who said that radio is the most popular ICT facility used among rural farmers because it is considerably cheaper to buy and communicates useful agricultural messages to a large number of people at relatively low cost and faster rates.

Age was found to be negatively related to the use of GSM in both urban and rural areas at 1% level of probability in the rural area. The relationship was not significant in the urban area. This implies that the older a farmer is, the less likely he uses GSM to source agricultural information. It also shows that the younger farmers use more of GSM than the older farmers in both areas. It could be that the operation of GSM is easily understood by the young ones as cost and trekking long distances to source for network coverage by older farmers constitute major problems to their use of GSM. This is in agreement with the findings of Fagbola [18], who said that farmers especially those of rural areas had the desire for mobile phone but associated problems such as cost and lack of network coverage in their communities have left them with the option of making use of call centres. This means that the younger ones have more access to GSM than the older ones thereby boasting their incomes resulting in a more efficient local economics. Arokoyo [19] asserted that mobile phone significantly boost agricultural production and improve rural livelihoods in developing countries.

Age showed significant negative relationship with farmers' use of newspapers at 1% level of probability in the urban area but did not exhibit any level of significance in the case of rural area. It implies that the older a farmer is, the less likely he uses newspaper to source agricultural innovations. It also means that a unit decrease in age of the farmers will eventually increase farmers' use of newspapers. The study showed that the younger ones are more likely to read newspapers more than the older ones. The implication is that the younger farmers should be involved in agricultural activities since they can obtain information about agriculture through newspaper media houses. Furthermore, the coefficient of age was found to be negatively related to the use of internet in urban and rural areas at 1% level of probability in the urban and 5% level of probability in the rural area. This implies that as the farmer is advancing in age, the less he develops interest in using internet to

source agricultural information or messages especially when faced with problems such as lack of funds, electricity and poor network coverage. This finding agrees with the views of Fagbola [18] who reported that problems such as lack of electricity and cost of purchase particularly in rural areas prevent farmers from accessing modern media.

The coefficient of age was found to be negatively signed with respect to the use of computer in urban and rural areas. It showed no significant relationship urban area but was found to be significant at 5% level of probability in the rural area. The implication is that the younger farmers are always eager to know more about the latest activities in farming through the use of computer than the older farmers who feel contented with the experiences they had built-up over the years. This corroborates with the views of Agbamu [5] who said that older farmers who have built-up ideas over the years and have not been exposed to extension agents will be less willing to accept innovations. Age was also found to be negatively related to the use of journal and magazines in the urban and rural areas. The relationship was not significant in the urban area but was found to be significant at 5% level in the rural area. This implies that a unit increase in age of the farmer will decrease his use of journal/magazine. It then means the younger ones have ample of opportunity to move to newspaper stands and libraries to read agricultural journals with a view of sourcing agricultural information.

3.2.2 Educational status (X_3)

The coefficient of education with farmers' use of mass media was found to be positive and significant at various levels of probability. In the urban area, television, newspaper, Cinema, Internet were significant at 1% level of probability, while radio and GSM were significant at 5% level of probability. In the case of rural area, internet and journals were significant at 1% level of probability while television, GSM and newspapers were found to be significant at 5% level of probability. This implies that the higher the number of years a farmer spent schooling, the more likely he uses mass media channels to source agricultural innovations. This means that literate farmers desire to use mass media such as newspapers and farm magazine to seek agricultural messages than the uneducated ones.

Table 1. Socioeconomic statistics of urban and rural farmers in Kogi state

Socioeconomic variables	Urban			Rural		
	Freq.	Percentage	Mean	Freq.	Percentage	Mean
Sex						
Male	132	82.50		109	68.1	
Female	28	17.50		51	31.9	
Age						
20 – 30	9	5.63		14	8.75	
31 – 40	33	20.63		44	27.50	
41 – 50	43	26.88		49	30.62	
51 – 60	52	32.50		30	18.75	
61 – 70	17	10.63		15	9.38	
71 and above	06	3.75	48 years	08	5.00	43 years
Marital status						
Married	143	89.38		137	85.63	
Single	09	5.63		16	10.00	
Divorced	04	2.50		6	3.75	
Separated	04	2.50		01	0.63	
Educational level						
No formal education	48	30.00		53	33.13	
Adult education	11	6.88		13	8.13	
Primary education	18	11.25		19	11.88	
J S S III	03	1.88		01	0.63	
SSCE	24	15.00		26	16.25	
NCE	41	25.63		37	23.13	
B.Sc. and above	15	9.38		11	6.88	
Farm size						
0.1 – 2	78	48.75		56	35.00	
2.1 – 4	49	30.63		64	40.00	
4.1 – 6	33	20.63		38	23.75	
Above 6	0	0	5 hectares	02	1.26	2.5 hectares
Household size						
1 – 3	17	10.63		28	17.50	
4 – 6	64	40.00		77	48.13	

Socioeconomic variables	Urban			Rural		
	Freq.	Percentage	Mean	Freq.	Percentage	Mean
7 – 9	46	28.75		32	20.00	
10 and above	33	20.63	7 members	23	11.38	6 members
Farming experience						
1 – 9	32	20.0		46	28.75	
10 – 19	77	48.13		71	44.38	
20 – 29	50	31.25		34	21.25	
30 and above	01	0.63	21 years	09	5.63	21 years
Income per annum (Naira)						
70,000 and below	30	18.75		52	32.50	
71,000 – 90,000	45	28.12		45	28.13	
91,000 – 110,000	48	30.00		28	17.50	
111,000 – 130,000	15	9.38		13	8.12	
131,000 – 150,000	12	7.50		13	8.12	
Above 150,000	10	6.25	95, 343.75	09	5.63	

Source: Field study, 2013

Table 2a. Distribution of respondents based on the effects of socio-economic variables on media usage by urban farmers

Variables	TV	Radio	GSM	N/Paper	Cinema	Internet	Computer	J/Mag
Age	0.032	0.35	-0.023	-0.02	-0.095	0.609	-0.048	-0.027
	(0.012)***	(0.16)**	(0.024)	(0.008)***	(0.070)	(0.063)**	(0.038)	(0.019)
Marital status	-0.30	-0.096	0.232	-0.98	-0.32	0.241	-0.034	-1.83
	(0.63)	(0.59)	(0.60)	(0.778)	(0.52)	(0.198)	(0.21)	(1.14)
Education	0.18	0.007	0.021	0.101	0.03	0.208	0.087	0.087
	(0.03)***	(0.02)**	(0.009)**	(0.038)***	(0.009)***	(0.081)**	(0.048)*	(0.039)*
Ext. contact	0.87	0.034	0.1958	-0.018	0.034	-0.016	0.072	0.024
	(0.09)*	(0.12)***	(0.1004)*	(0.058)	(0.057)	(0.121)	(0.027)**	(0.13)**
Income	0.053	0.017	0.086	0.014	0.005	0.002	0.092	0.0021
	(0.028)*	(0.008)**	(0.041)**	(0.007)**	(0.002)**	(0.0008)**	(0.043)**	(0.001)**
Household size	-0.54	-0.14	-0.128	0.023	0.71	0.337	-0.026	-0.483
	(0.16)	(0.006)**	(0.112)	(0.008)***	(0.62)	(0.101)***	(0.175)	(-0.13)***
Farm size	-0.05	-0.062	-0.306	-0.558	0.38	-0.766	-0.78	-0.82
	(0.023)	(0.185)	(0.185)	(0.255)	(0.54)	(-0.421)**	(0.388)**	(0.29)***

Variables	TV	Radio	GSM	N/Paper	Cinema	Internet	Computer	J/Mag
Farming experience	-0.04	-0.013	-0.04	0.028	-0.067	-0.079	-0.031	-0.14
	(0.29)	(0.028)	(0.014)***	(0.0378)	(0.021)***	(0.038)	(0.047)	(0.123)**
Constant	-0.84	0.84	0.63	-0.101	4.92	-5.900	-2.19	2.38
	(1.37)	(1.29)	(1.29)	(1.589)	(4.21)	(3.20)	(2.55)	(1.93)

Table 2b. Distribution of respondents based on the effects of socio-economic variables on media usage by rural farmers

Variables	TV	Radio	GSM	N/Paper	Cinema	Internet	Compt.	J/Mag
Age	0.023	0.04	-0.9	-0.0096	-0.005	-0.0021	-0.143	-0.052
	(0.20)	(0.015)***	(0.035)	(0.029)	(-0.031)	(0.162)**	(0.061)**	(0.025)**
Marital status	0.040	-0.61	0.77	-0.459	-0.41	-0.002	-1.502	-1.85
	(0.57)	(0.39)	(0.411)*	(0.651)	(0.56)	(0.014)	(0.182)	(1.17)
Education	0.073	0.07	0.43	0.098	0.057	0.134	0.142	0.176
	(0.04)*	(0.069)	(0.19)**	(0.040)**	(0.063)	(0.016)***	(0.062)**	(0.06)
Ext. contact	0.024	0.068	0.089	0.024	0.094	-0.02	0.071	0.031
	(0.13)**	(0.016)**	(0.031)**	(0.008)***	(0.032)**	(0.009)*	(0.025)**	(0.008)***
Income	0.52	0.02	0.0000025	-0.004	-0.07	-0.005	0.0034	-0.005
	(0.17)	(0.006)***	(0.0000012)**	(0.0034)	(-0.21)	(0.0012)***	(0.0012)***	(0.002)**
Household size	-0.12	-0.04	-0.144	-0.095	0.053	-0.096	-0.145	-0.08
	(0.04)***	(0.012)***	(0.079)*	(0.471)	(0.012)***	(0.025)***	(0.041)***	(0.031)***
Farm size	-0.03	0.16	-0.091	0.086	-0.27	-0.014	-0.0314	-0.9
	(0.12)**	(0.106)	(0.04)	(0.082)	(0.016)	(0.002)***	(0.013)	(0.041)**
Farming experience	-0.009	-0.012	0.015	-0.016	-0.018	-0.085	-0.085	-0.15
	(0.06)	(0.18)	(0.026)	(0.031)	(0.021)**	(0.0074)	(0.054)	(0.07)**
Constant	0.556	3.22	1.35	-1.400	-1.33	-0.602	-1.55	-3.73
	(1.34)	(1.31)	(1.24)	(1.42)	(1.43)	(1.031)	(2.44)	(2.19)

Source: Field survey 2013   Note: Figures in asteriskes are the coefficients
* sig @ 10% 0.1   Figures in parenthesis are the standard errors
** sig @ 5% 0.05
*** = sig @ 1% 0.01

3.2.3 Extension contact (X$_4$)

Extension contact was found to be positively related to the use of television in the case of urban and rural areas. The relationship of extension contact with the use of television was significant at 1% and 5% level of probability in the urban and rural areas respectively. This implies that the higher the number of extension visits, the more the likelihood to use television. Extension contact was also found to be positively related with the use of radio in both urban and rural areas and at 1% level of probability. This means that the more farmers get in contact with the extension service, the more likely they use radio for sourcing agricultural information. This finding agrees with the views of Obinne and Anyanwu [20] who found that if the use of extension agents by farmers' as source of agricultural information is increased, they will adopt more improved crop technologies. In contrast to the finding, Agbamu [13] said that extension contact alone does not contribute to the adoption of new improved maize variety, improved practices of groundnut and new varieties of cassava and maize respectively. Similarly, Agbamu [5] pointed out that though contact with extension workers made significant contribution to the adoption of soil management practices, it had a negative regression coefficient, indicating that farmers having access to extension service adopt less of the innovations. The reason could be that village extension agent had contact with the farmers but did not properly disseminate information on new perspectives in soil fertility to the farmers. It is through proper education and the effective use of media that agricultural extension agents are able to bring about change in farmers knowledge, attitude and skills which put the farmers in a frame of mind that are conductive for adopting proven agricultural innovation.

The coefficient of extension contact with the use of GSM was found to be positively signed in both areas, but the relationship in the urban area was at 5% level of probability while the relationship in the rural area was at 1% level of probability. It shows that the use of GSM is higher among the rural farmers than the urban farmers. It could be that the use of GSM among the rural farmers makes communication easier, faster and permits negotiation before travelling to places within the rural areas. This also implies that the more rural farmers have contact with extension workers, the more likely they use mobile phones for agricultural business. Arokoyo [19] asserted that mobile phone significantly boost agricultural production and improve rural livelihoods in developing countries. Through mobile phone detail information about distribution of inputs, sales of commodities, agricultural messages from research institutes are disseminated to farmers [18].

Extension contact was found to be negatively related to the use of newspapers in the urban area while in the rural area it was found to be positively related at 1%. This implies that the more a farmer gets in contact with extension service, the more likely he reads newspapers for sourcing agricultural messages. Extension contact was found to be positively related to the use of computer in urban and rural areas and the relationship was found to be significant at 1% level of probability. Urban and rural farmers must possess the required education and technical know-how through the extension workers to transform certain innovations into practical reality. Extension contact was also found to be positively related to the use of journal and magazine in the urban and rural areas. It (extension contact) showed a significant positive relationship with farmers' use of magazines at 5% and 1% level of probability in the urban and rural areas respectively. This implies that farmers with larger farm business in terms of acreage will work closely with extension workers for advice and useful information. The use of farm journals and magazines by farmers is relatively cheap and permanent medium in that the messages are imprinted permanently with high storage value which makes them suitable for reference and research.

3.2.4 Income (X$_5$)

Income was found to be positively related to the use of radio in both urban and rural areas but was also found not to be significant at any level of probability. It means an increase in the income of the farmers does not really affect their level of usage of radio in seeking agricultural messages. This implies that farmers ability to own a transistor set do not really depend on high level of income and education of the farmers. This finding corroborates with the views of Adejo [17] who said that radio is the most popular ICT facility because it is considerably cheap to buy and communicates useful agricultural messages to large number of people at relatively low cost and faster rates.

The coefficient of income was also found to be positively related to the use of GSM and it

showed a significant positive relationship at 5% level of probability. This implies that the more a farmer's income increases, the more likely he uses mobile phones for getting agricultural messages. The implication is that the farmers with high income level will have mobile phone for making calls with farmers within and outside their communities by creating the needed awareness of up-to-date agricultural information on the current farming system which could bring about increased production. With mobile phones, the farmers can communicate with relatives, fellow farmers and customers to acquire accurate information on prices of agricultural commodities and inputs. Income was found to be positively related to the use of newspaper in the urban area while this (income) was negatively related to the use of newspapers in the rural area. Income further showed a significant and positive relationship with farmers' use of newspaper at 5% level of probability in the urban area but was found not to be significant with farmers' use of newspapers in the case of rural areas. It implies that an increase in the farmers' income level does not make them to read more newspapers. An illiterate farmer with high income level may not deserve to read newspapers since he does not know how to read. On the contrary, literate farmers with little income may decide to move to newspaper stand to read without necessarily buying them before getting the agricultural messages he desires.

Income was also found to be positively related to the use of internet in the case of both urban and rural areas at 1% level of probability. It implies that the higher the income level of a farmer, the more likely he uses internet as a source of innovation. Empirical studies have shown that there is significant positive relationship between level of income and adoption of agricultural innovations. A farmer with higher income will not be disposed to fear of taking any risk in respect of adopting a given technology. This finding agrees with that of Agbamu [5] who pointed out that farm income made significant contribution to the adoption of farm innovations.

3.2.5 Household size (X_6)

Household showed a significant positive relationship at 5% level of probability with radio in urban area. Also, household size with the use of television and radio was found to be negative and significant at 1% level of probability in the rural area. This implies that the higher the number of household members, the less likely

they possess television and radio for sourcing agricultural messages. The implication is that the available funds will be used to cater for the increasing family responsibilities. Similarly, a farmer with large family size brings about pressure on the land which has to be fragmented into small holdings. The effect of this on the family is that any extension package that requires large-scale farming might not be readily adopted by such farmers who are constrained by adequate land area.

Household size was also found to be negatively related to the use of internet and computer in the urban and rural areas. It showed significant positive relationship with the use of internet at 1% level of probability in the urban area and was not significant with computer in the urban area. However, household size exhibited significant positive relationship with the use of internet and computer at 1% level of probability in the rural area. This implies that as a farmer's household size increases, the less he uses internet and computer in seeking agricultural messages. The use of internet and computer as sources of innovations seems to be costly and requires high literacy level of the farmers. The wide variation in the use of internet and computers with that of older technologies such as radio, television among others in the urban and rural areas showed clearly that inspite of the existence of these new technologies farmers do not access them because of its cost and complexity. Cuba [21] noted that older technologies such as television and radio, although now given attention have a longer and richer history as instructional tools. The author further stressed that radio and television for instance have for over forty years been used for dissemination of extension messages, although print remains the cheapest most accessible and therefore most dominant delivery mechanism in both developed and developing countries. The use of internet and computers is still in its infancy stage in developing countries due to limited infrastructures, illiteracy and high costs of access [22].

3.2.6 Farm size(X_7)

The coefficient of farm size was found to be negatively related to the use of internet, computer, and journals/magazines, with 5% level of significance, while it was inversely related to the use of television, internet, and journals/ magazines in rural areas. This implies that an increase in farm size will lead to a decrease in

their desire to use these media channels. The implication of this is that a farmer with fragmented or small farm size will not see the need to source additional information since he is operating within the subsistence level of production.

3.2.7 Farming experience (X_8)

Farming experience negatively influenced the use of GSM, cinema, internet, and journals/ magazines in urban areas at 5% level of significance, while it showed same relationship with the use of cinema and journals/magazines among farmers in rural areas. This implies that, the more experienced a farmer is, the less likely he desires the use of these medium for sourcing agricultural information. This agrees with the finding of Okwu and Shimayohol [23] and Boz and Ozcatalbas [24] that many clients, especially older people who had spent many years in farming rely more on traditional channels for agricultural information while newer technologies as a complement.

4. CONCLUSION AND RECOMMENDATIONS

The study revealed that age, education, extension contact income and farming experience of the urban and rural farmers were found to be positively related to the use of television, radio, GSM and internet 5% level of significance. For increased usage of mass media and its multiplier effect on agricultural productivity, the following recommendations are made based on the findings:

1. There is also the need for government to set up communication centres especially in the rural areas where extension agents who have the technical skills to operate these machines, are available to help teach the farmers on how to operate them effectively.
2. Radio and television programmers should give more time slots and at convenient time for the farmers on agricultural issues so that they could develop positive attitude towards media usage.
3. Government should assist farmers by organizing adult literacy classes so that farmers can be updated educationally to enable them make use of the various sources of agricultural information effectively.

4. Farmers should be adequately trained by extension officers on how to use the various media sources through the establishment of well equipped training centers at strategic locations in the state.
5. Extension education programmes should focus on farmers, especially those extensively using traditional information sources and have weak linkages with media sources.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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