

Utilization of Agricultural Information Sources and Adoption of Animal and Crop Technologies Among Farming Households in Imo State, Nigeria

<https://dx.doi.org/10.4314/jae.v22i1.13>

Uwandu, Chisom Norberth

Department of Agricultural Extension and Rural Development
University of Ibadan, Nigeria.

Email: fruitfulvine19@gmail.com

Phone: +2348036895687

Thomas, Kehinde Adesina

Department of Agricultural Extension and Rural Development
University of Ibadan, Nigeria.

Email: kehindeadesina@yahoo.com

Phone: +2348101281970

Okoro, Chinwe Mercy

Department of Agricultural Extension and Rural Development
University of Ibadan, Nigeria.

Email: mercyokoro95@gmail.com

Phone: +2348158591827.

Abstract

The study ascertained effect of utilization of agricultural information sources on adoption of animal and crop technologies among farming households in Imo State, Nigeria. Structured interview schedule was used to collect data from one hundred and fifty respondents using a multi-stage sampling technique. Data were analyzed using both descriptive and inferential statistics: PPMC and t test. Respondent's mean age was 48 years; 99.1% had contact with extension agents; 88.4% had access to between 1 and 5 hectares of land; 33.6% practiced crop science; 29.9% practiced animal science. Recommended crop spacing was adopted by 36.6% of the respondents; while 29.9% adopted improved breeds of livestock. Agricultural Development Project (ADP) was the most accessed ($\bar{x} = 2.97$) information source. There was a significant relationship between use of agricultural information sources and adoption of crop technologies ($r=0.262$; $p < 0.000$), while significant difference ($t=3.068$; $p < 0.05$) existed in the adoption of crop technologies between respondents with low and high access to agricultural information. Efforts by relevant agencies to improve frequency of use of information sources relating to appropriate

crop and animal technologies will ultimately increase their adoption of these technologies.

Keywords: Farming household, Information sources, Technologies and Imo state.

Introduction

Information is an indispensable factor in the practice of farming and it is the basis of extension delivery. Information plays a vital role in our present day society as a result of the advancement in information and communication technologies (ICTs). Information in its most restricted technical sense is an ordered sequence of symbols that record or transmit a message. It can be recorded as signs or conveyed as signal waves. It is defined by Adereti, Fapojuwo and Onasanya (2006) as data that have been put into a meaningful and useful context which is communicated to recipient who uses it to make decisions. According to Camble (1992), man requires information to be able to manipulate factors of production such as land, labour and capital resources into meaningful and productive use. Agricultural information, as suggested by Agbamu (2006) is defined as all published or unpublished knowledge in all aspects of agriculture. He classified agricultural information into four categories namely technical, commercial, socio-cultural and legal information. Agricultural information is needed for overall development of agriculture for the improvement of living standard of farmers. The objectives of agricultural information can hardly be realized if farmers have no access to information (Olawoye, 1996). Agricultural information creates awareness among farmers about agricultural technologies for adoption. Agbamu (2006) opined that information is the first and indispensable step of an adoption process. The characteristics of a good information source are relevance, timelessness, accuracy, cost effectiveness, reliability, usability, exhaustiveness and aggregation level. According to Oladele (1999), the efficiency of technologies generated and disseminated depends on effective communication which is the key process of information dissemination.

Technology is the application of knowledge for practical purpose which is generally used to improve the condition of human and natural environment as well as carry out some other socio-economic activities (Rogers, 2003). Agricultural technologies include both physical objects such as feeds or fertilizers as well as new farming techniques. The technology may not be new as such, but novel to the farmer. Thus, following Rogers (2003), a new technology (or innovation) is defined as 'an idea, practice, or object that is perceived as new by an individual or other unit of adoption'. Rogers (2003) identified two characteristics of innovations (from the perspective of the farmers) that best explain different adoption rates. They are the perceived relative advantage of using the technology vis-à-vis the technology it supersedes, and its perceived compatibility with existing values, needs and experiences. Rogers noted that innovations are more likely

to be adopted if they are less complex, lend themselves to trials and whose results are observable to others.

Utilization of proven information sources by the farming households in Imo state has the potential to increase technologies' adoption level, which in turn increases households' income, national economic growth, and conservation of soil. Adoption of agricultural technologies cannot be effective without communication through effective communication channels. Mere provision of agricultural information to farmers does not guarantee its use. This is because a host of social, economic and psychological factors influence the rate of agricultural information use (Akande, 1999). Hence, information sources utilized by farming households in accessing agricultural technologies are subjects of issue in Nigeria especially, Imo state, where their primary source of income is agriculture. It is imperative therefore to evaluate the effect of utilization of agricultural information sources on adoption of animal and crop technologies among farming households in Imo State, Nigeria.

Objectives of the study

The general objective of the study was to evaluate the effect of utilization of agricultural information sources on adoption of animal and crop technologies among farming households in Imo State, Nigeria.

The specific objectives were to:

- identify the socio-economic and enterprise characteristics of the respondents;
- determine respondents' access to agricultural information sources;
- examine respondents' use of agricultural information sources; and
- ascertain farming households' adoption status of animal and crop technologies.

Hypotheses

- 1: There is no significant relationship between respondents' utilization of agricultural information sources and adoption of animal and crop technologies.
- 2: There is no significant difference in the adoption status of respondents with low and high access to agricultural information sources.

Methodology

The area of study was Imo state, Nigeria. which lies within Latitude $4^{\circ}45'N$ and $7^{\circ}15'N$, and longitude $6^{\circ}50'E$ and $7^{\circ}25'E$ with an area of about $5,530\text{km}^2$ (2140 sq. mi). Abia, Anambra, Ebonyi and River states bound the states in the east, west, north and south respectively. Imo state is made up of twenty-seven (27) local government areas and three agricultural zones - Owerri (9 LGAs), Okigwe (6 LGAs) and Orlu (12 LGAs). The study population consists of all farming households in Imo state, Nigeria.

Eight local government areas namely; Aboh Mbaise, Ahiazu Mbaise, Ezinihitte Mbaise, Ikeduru, Mbaitoli, Ngor Okpala, Owerri West and Owerri North were purposively selected because of accessibility as well as their predominant agricultural activities in animal and crop production. From the selected local government areas, two towns were randomly selected. Snow ball sampling was then used to generate a population of two thousand and five hundred (2500) farmers from the selected towns from which 10% of the population was randomly sampled to give a sample size of two hundred and fifty farmers which was used for the study. However, only responses from two hundred and forty-one respondents were found useful for data analysis

Method of Data Collection

Data were collected from primary source. Primary data were obtained from farming households, who responded to the structured questionnaire administered to elicit information used for the study.

Measurement of Variables

The independent variables of the study were: respondents' socioeconomic and enterprise characteristics, respondents' access to agricultural information sources, and respondents' use of agricultural information sources. The dependent variable is adoption status of animal and crop technologies.

Socioeconomic and enterprise characteristics: Age, farm size, farming experience were measured at ordinal level; while sex, marital status, religion, educational level, contact with extension agents and type of farming task, were measured at nominal level.

Access to agricultural information sources: Respondents were asked to indicate their access to agricultural information sources from the list provided on a 3-point scale of High Access scored 3, Access scored 2, and No Access scored 1. The maximum score was 33 and the minimum score was 11. The scores of each item were summed up to form a composite score for access to agricultural information sources for each of the respondents. The weighted mean was computed and used to rank respondents' access to agricultural information sources from high to low in order of accessibility.

Use of agricultural information sources: Eleven agricultural information sources were presented to the respondents. The sources were measured on a 4-point scale of Always Used = 4, Sometimes Used = 3, Rarely Used = 2 and Not Used at all = 1. Respondents were asked to respond to their use of these agricultural information sources in order to obtain score for each respondent. The maximum score was 44, while the minimum score was 11. The weighted mean was calculated and used to rank the agricultural information sources from high to low in order of frequency of use.

Adoption status of animal and crop technologies: Respondents were asked to indicate their adoption status from the list of crop and animal technologies provided to them. Two options of 'Yes' or 'No' were used to elicit their responses.

Results and Discussion

Socio-Economic and Enterprise Characteristics of Respondents

Table 2 shows that the majority (61.8%) of the respondents were between 41 and 50 years, with a mean age of 48 years, indicating that the farming households in the study area were mainly middle age who were in their economically active age and as such, can undergo the stress relating to the operation of farming enterprise. This result corroborates the finding of Adesope et al (2012) that higher proportions (37.7%) of the farmers in Imo state were between the age of 41 and 50 years. The finding showed that the ageing population was less engaged in the operation of farming activities in the study area. Adesiji (2004) affirmed that age affect perception, attitude, and adoption of innovation, although other factors may play very important roles.

Table 2 also shows that the majority (55.2%) of the respondents were female. This could be expected as Egunjobi (1991) has asserted that women participate actively in all aspects of food product chain. Also, Mgbada (2002) and Rahman (2004) reported that women provide about 60-80% of agricultural labour and constitute about 80% of food production in Nigeria. The indication that females were more engaged in farming than male in Imo state does not actually indicate ownership of land by females, since ownership of land remains in the hands of men in Igbo culture (Palmer, 1991).

Furthermore, most (94.2%) of the respondents were married. This finding is similar to that of Adesope et al (2012) that the majority of the farmers in Imo state were married. This is an indication that farming households were responsible, which implies that they were likely to access information sources for proven agricultural innovations to be adopted for long term sustainability. Ojo and Jibowo (2008) in their study reported that married people, being responsible, their views are likely to be respected within the farming communities as they take decisions on the use of farm inputs.

The Table shows further that the majority (88.4%) of the respondents had access to between 1 and 5 hectares of land, with a mean farm size of 3.74. This is an indication that respondents could be closely described as peasant farmers. Brannel (1992) asserted in his study that a farmer with average farm size of 3 hectares is a peasant farmer. Moreover, the majority (63.9%) of the respondents had between 11 and 20 years farming experience with a mean of 18.23 years, which implies that respondents were quite experienced in the agricultural task they perform. Adequate farming experience help to build up farmer's confidence in making and implementing decision regarding proper use of agricultural technologies.

Most (99.2%) of the respondents had contact with extension agents. This is an indication of high technologies communication across farming households via information sources that could enhance long term sustainability of technology use. Asiabaka et al (2002) expressed the view that for farmers of different agricultural zones to adopt new technologies, they must be aware of the technologies, have a valid and up to date information on the technologies, the applicability of the technologies to their farming system and receive the technical assistance necessary for the technologies, which are among the key functions of the extension agents. Evenson (1998) stated that contact with extension agents represents a mechanism by which information on new technologies, better farming practices and better management skills can be transmitted to farmers.

Table 2 further shows that 33.6% of the respondents practiced crop farming; 29.9% practiced animal farming; while the remaining 36.5% practiced other agricultural enterprise.

Table 2: Socio-economic and enterprise characteristics of respondents

Characteristics	Categories	Percentage	Mean
Age	31-40	8.7	48
	41-50	61.8	
	51-60	29.5	
Sex	Female	55.2	
	Male	44.8	
Marital status	Separated	0.4	
	Widow(er)	4.6	
	Married	94.2	
	Single	0.8	
Religion	Traditional	0.4	
	Islamic	0.4	
	Christian	99.2	
Education	No formal education	0.4	
	Adult education	0.4	
	Primary education	6.6	
	Secondary education	41.1	
	OND	24.9	
	B.Sc	24.5	
Farm size	M.Sc	2.1	
	1-5	88.4	
	6-10	9.5	
	11-15	0.8	
Farming experience	16-20	1.2	3.74
	<10	4.6	
	11-20	63.9	
	21-30	31.1	
	31-40	0.4	
Contact with extension agents	Yes	99.2	
Type of Farming task	Crop farming	33.6	18.23
	Animal farming	29.9	
	Others	36.5	

Source: Field Survey 2013

Respondents Access to Agricultural Information Sources

Table 3 shows that ADP ($\bar{x} = 2.97$) ranked highest as the most accessed agricultural information source by the respondents. The highest accessibility of ADP by the respondents as a source of agricultural information could probably be due to the favorable extension approaches used by the ADP personnel to extend proven agricultural technologies/innovations to the farming households in the study area. This may include participatory methods in which ADP personnel work together with the farming households to analyze their current farming situations/problems in order to determine appropriate solutions for self-reliance and also regular individual farm and home visit in order to access the practicability of the innovation adopted by the respondents. Access to Radio ($\bar{x} = 2.93$) ranked second in the Table. This result agrees with that of Ajayi (2003) that the use of radio as a source of technology was one of the most popular among farmers in Nigeria. The popular use of radio by the respondents could probably be due to the fact that many farmers in Nigeria can afford to purchase a transistor radio as it is cheap and easy to maintain with the use of batteries. The least accessed agricultural information sources are Conferences ($\bar{x} = 1.33$) and Trade Fair ($\bar{x} = 1.21$) ranked tenth and eleventh respectively. The reason for the low accessibility to these sources could be due the fact that they were located in the urban centers where the cover prices were not within the reach of the farming households.

Table 3: Respondents access to agricultural information sources

Information sources	Access to agricultural information sources	
	Mean	SD
ADP	2.97*	0.21
Radio	2.93*	0.30
Extension agents	2.91*	0.36
Research institutes	2.35*	0.60
Local Government	2.07*	0.60
Family members	2.07*	0.35
Farmers' cooperatives	2.05*	0.24
Video	2.03*	0.31
State ministry of agriculture	2.02*	0.24
Conferences	1.33	0.48
Trade fair	1.21	0.43

Source: Field Survey 2013. *Accessible (mean \geq 2.0)

Respondents' use of agricultural information sources

Results in Table 4 show the respondents' use of agricultural information sources. ADP (mean=3.91) ranked first as the most utilized source of agricultural information for adopting animal and crop technologies in the study area. It could be inferred from this

finding that ADP is effective in carrying out their mandates in the study area which include technology transfer to farmers, distributing modern farm inputs, land development, etc, and as a result, farming households in the study area resort to them frequently to source for information on latest innovations. The second most utilized information source was radio (mean=3.80); while the least utilized information sources were conferences (mean=2.32) and trade fair (mean=2.23) ranked tenth and eleventh respectively. Insufficient fund and lack of awareness of these information sources could probably be the reason for their poor utilization.

Table 4: Respondents' use of agricultural information sources

Information sources	Utilization of agricultural information sources	
	Mean	SD
ADP	3.91*	0.36
Radio	3.80*	0.51
Extension agents	3.70*	0.55
Research institutes	3.25*	0.75
Local Government	3.17*	0.59
Family members	3.22*	0.54
Video	3.07*	0.44
Farmer's cooperatives	3.03*	0.30
State ministry of agriculture	2.99*	0.35
Conferences	2.32	0.59
Trade fair	2.23	0.56

Source: Field Survey 2013. *Used (mean≥2.5)

Adoption Status of Animal and Crop Technologies

Table 5 shows that higher proportion (33.6%) of the respondents involved in crop farming adopted crop technologies like recommended crop spacing, pesticides application, pest and disease control; whereas, 8.3% each adopted thresher and sickle respectively.

The Table also shows variation in the adoption status of animal technologies by the respondents involved in animal husbandry. Results show that 29.9% of the respondents adopted animal technologies like improved breeds of livestock, vaccination date, and de-worming. The least adopted animal technologies were dwarf wall/wire screening and east west orientation, where 2.1% and 4.1% of the respondents adopted dwarf wall/wire screening and east west orientation respectively.

Table 5: Respondents' adoption status of technologies

Technologies	Percentage
Crop Technologies	
Pest and disease control	33.6
Chemical fertilizer application	33.2
Insecticide application	32.8
Farm yard manure	29.0
Hoe	32.0
Cutlass	27.8
Pesticide application	33.6
Thresher	8.3
Sickle	8.3
Animal Technologies	
Improved breeds of livestock	29.9
Vaccination date	29.9
De-worming	22.0
Litter management	27.4
Cross breeding	2.1
Dwarf wall/wire screening	4.1
East west orientation	

Source: Field Survey 2013

Relationship Between Agricultural Information Sources and Adoption of Technologies

The results in Table 6 show that respondents' use of agricultural information sources was significantly related to adoption of crop technologies ($r=0.262$, $p>0.000$) at 0.01 level. The positive correlation between respondents' use of agricultural information sources and adoption of crop showed that the more the respondents utilized information sources, the more they adopted crop technologies. It could probably be due to the fact that agricultural information relating to adoption of crop were available in the study area which could have served as motivational factor to the respondents to frequently source information on technologies through them. Also, the findings in Table 4 show that respondents' use of agricultural information sources was not significantly related to adoption of animal technologies ($r=0.034$, $p>0.604$) at 0.01 level. The non-significant positive correlation between respondents' use of information sources and adoption of animal technologies implied that respondents' use of information sources does not increase their adoption of animal technologies significantly. Low availability of information sources on animal technologies could be the limiting factor to the low adoption of animal technologies. Ozowa (1995) affirmed that Nigerian farmers do not

feel the impact of agricultural technologies mainly because they have low or no access to such vital information relating to the technologies which also limits their frequency of using the information sources.

Table 6: Relationship between respondents' use of agricultural information sources and adoption of crop as well as animal technologies by the farming households

Dependent variables	r
Adoption of crop technologies	0.262**
Adoption of animal technologies	0.034

* $P \leq 0.05$. Source: Field Survey 2013.

Difference in the Adoption Status of Respondents with Low and High Access to Agricultural Information Sources.

The mean value of adoption for crop technologies according to the finding in Table 7 shows that those with high access ($\bar{x} = 10$) adopted more crop technologies than those with low access ($\bar{x} = 5$) to agricultural information sources, and the t value ($t=3.068$; $p < 0.05$) showed that there is a significant difference in adoption level between respondents with high access and low access to agricultural information sources at 0.05 level. Accessibility of agricultural information through relevant sources is a pre-requisite for technology adoption

Also, the mean value of adoption for animal technologies according to the finding in Table 7 showed that those with high access ($\bar{x} = 4$) adopted more animal technologies than those with low access ($\bar{x} = 1$) to agricultural information sources, and the t value ($t=2.696$; $p < 0.05$) showed that there is a significant difference in adoption level between respondents with high access and low access to information sources at 0.05 level.

Table 7: Difference in the adoption status of respondents with low and high access to agricultural information source.

Technologies	Mean		Difference	df	t
	High access	Low access			
Adoption of crop technologies	10	5	5	239	3.068*
Adoption of animal technologies	4	1	3	239	2.696*

* $P \leq 0.05$.Source: Field Survey 2013.

Conclusion and Recommendations

Farming households accessed ADP, Radio and Extension agents mostly as sources of information for technologies adoption in the study area. Although, a lot of information sources on agricultural technologies were frequently utilized by the farming households, the influence of these sources on adoption still remain low especially on adoption of animal technologies. In addition, there was a striking difference in the adoption statuses of farming households with low and high access to agricultural information sources.

Frequency of use of information sources among farming households should be improved by making these sources accessible to them. Government and private agencies should invest on improving ADP as a source of information source since farming households in the study area resort to them for sourcing information.

Proper adoptions of agricultural technologies enhance productivity; it is therefore crucial that both governmental and non-governmental bodies make information on animal and crop innovations timely and accessible to the farming households by ensuring that the extension workers bring these technologies to them as at when due. Farming households should be encouraged by government and private operators to frequently utilize agricultural information sources to obtain latest information on farming technologies.

References

- Adereti, F. O., Fapojuwa, O. E., Onasanya, A. S. (2006). Information Utilization on Cocoa Production Techniques by Farmers in Oluyole Government Area of Oyo State, Nigeria. *European Journal Social Science* 3(1), pp. 1-7.
- Adesiji, G. B. (2004). Training Needs of Extension Agents in Agricultural Development Programme of Selected State of South West Nigeria. Ph.D Thesis, Department of Agricultural Extension and Rural Development, University of Ibadan, Nigeria. pp. 95.
- Adesope, O. M., Mathew-Njoku, E. C., Oguzor, N. S. and Ugwuja, V. C. (2012). Effects of Socio-economic Characterization of Farmers on their Adoption of Organic Farming Practices. *Crop Production Technologies*, Dr. Peeyush Sharma (Ed), ISBN: 978-953-307-787-1, Intech, Available from: <http://www.intechopen.com/books/crop-production-technologie/effect-of-organic-farming-practices>.
- Agbamu, J. U. (2006). *Essentials of Agricultural Communication in Nigeria*. Lagos: Malthouse Press Limited.
- Ajayi, M. I. (2003). Analysis of Mass Media Use for Agricultural Information by Farmers in Nigeria. *Journal of Extension System*. Vol. 19, No. 2, pp. 45 - 55
- Akande, S. O. (1999). *A Study of Agricultural Research System of Nigeria*. Nigeria Institute of Social and Economic Research (NISER), Monograph Series No. 6. Ibadan.
- Asiabaka, C. C. and Owens, M. (2002). 'Determinants of Adoption Behaviours of Rural Farmers in Nigeria'. Proceedings of the 18th Annual Conferences of AIAEE, 2002, Durban, South Africa. pp. 13-20.
- Brannel, J. B. (1992). *Economics of Cassava Production and Marketing in Asaba*. Delta ADP.
- Camble, E. (1992). *Access to and Utilization of Quality Information in Rural Development Programmes in Bama Zone of Borno State*. Ph.D Thesis, Department of Library, Archival, and Information Studies, University of Ibadan.
- Egunjobi, A. O. (1991). *Harvesting the Women Factor in the Nigeria Food Security Drive. The Role of the University*. In Proceedings of the Development Strategies in 21st Country Nigeria.
- Evenson, R. (1998). *Economics Impact of Agricultural Research and Extension Mimeo*, Yale University.
- Federal Government of Nigeria (FGN). (2004). *National Policy on Population for Sustainable Development*, FGN.

- Mgbada, J. U. (2002). Production of Staple Crops by Rural Women in Enugu and Ebonyi States: Lessons for Enhancing Poverty Alleviation Programmes. In: Olowu T. A. (Edition) Agricultural Extension and Poverty Alleviation in Nigeria. Proceeding of the Agricultural Extension Society of Nigeria, 10-12.
- Oladele, O. J. (1999). Analysis of the Institutional Research – Extension Farmers Linkages System in South Western Nigeria. A Ph.D Thesis in the Development of Agricultural Extension and Rural Development, University of Ibadan, Nigeria.
- Olawoye, J. E. (1996). Agricultural Production in Nigeria in Utilizing Research to Increase Food Production: The Role of Mass Media. Proceedings of the One Day Seminar Organized by Oyo State Chapter of the Media Forum for Agriculture.
- Ozowa, V. N. (1995). Information Needs of Small Scale Farmers in Africa: The Nigerian Example. Quarterly Bulletin
- Palmer, I. (1991). Gender and Population in the Adjustment of African Economics. *Planning Change*. International Labour Organization, Geneva.
- Rahman, S. A. (2004). Gender Differential in Labour Contribution and Productivity in Farm Production. Empirical Evidence from Kaduna State of Nigeria. Paper Presented at the National Conference on Family Held at New Theatre Complex. Benue State University, Makurdi, Nigeria. 1st - 5th March, 2004.
- Rogers, E. M. (2003). Diffusion of Innovations, 5th Edition. New York: Free Press.