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Effects of electronic and mass media method of agricultural innovations information dissemination to enhance food security in Nigeria

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Abstract

This study surveyed the impact of electronic and mass media on information dissemination to farmers by agricultural extension agents, with the goal of enhancing food security in the Nasarawa Central agricultural zone, Nigeria. The goals were to find the most popular news sources, figure out how they affect food security based on the socioeconomic status of farmers, and look into what stops farmers from using these sources to adopt better farming methods. The population comprised 6,000 extension agents and farmers, with a sample of 200 respondents selected through multi-stage sampling. The data were analysed using descriptive and inferential statistics. Findings indicated that the most frequently used media included handsets, radio, television, and the internet, along with flyers, handbills, and billboards. A significant positive correlation (p=0.006) was found between the use of media and farmers' education level, farm size, and extension agent contact. Major constraints identified were socio-economic, environmental, and policy-related. The study recommends improved education via extension services, enhanced communication infrastructure, and better policy delivery to promote effective media use in agricultural information dissemination to boost food security in Nigeria.

Keywords: *mass media, information, farmers, agricultural innovation, dissemination, and food security.*

INTRODUCTION

Background to the study

Food security depends on agricultural practices, and agriculture is the backbone of the economy and the livelihood of most populations in developing countries. In Nigeria, agriculture is the mainstay of the economy, accounting for over 40 percent of the gross domestic product (GDP) and the livelihood of 70 percent of the active labour force in the population (Bello, 2017). Development programs in agriculture, such as the National Fadama Development Project, the Root and Tuber Crops Expansion Programme (RTEP), the Special Programme for Food Security, and the Agricultural Transformation Agenda, etc., are part of the government's efforts to improve agriculture in Nigeria.

Not having enough suggested methods for higher production to boost economic growth and rural transformation is no longer the biggest problem in Nigeria's agricultural sector. The main problem is getting these methods to farmers, who are the main producers in rural and semi-urban areas (Obinne, 2016). Information on improved agricultural practices is a fundamental key to the diffusion and adoption of agricultural innovations. Adoption of innovation is necessary to improve on-farm

productivity to ensure food security, reduce the rate of unemployment, and reduce poverty. This, in the short and long run, would facilitate economic and agricultural development in Nigeria (Yahaya and Olajide, 2010). So, there are different ways for extension agents to get information to farmers about better ways to grow crops. These include one-on-one, small group, and mass media channels. Making use of appropriate channels and sources of information to reach, inform, and motivate farmers is necessary because their participation in food production is important for sustainable food security, improved income generation, and a reduction in poverty rates. Given the aforementioned considerations, electronic and print media channels serve as the most effective and rapid means of disseminating information to farmers. Messages conveyed through print media have a long life and can be referred to as and when require (Muhammad, 2015).

Electronic and print media could be reliable methods of disseminating agricultural innovation information. Generally, mass media channels of information dissemination are useful in reaching a wide audience (farmers) at a rapid rate. They are useful as sources of agricultural information to farmers and also constitute methods of notifying farmers of new developments, agricultural innovations, and other emergency innovations information that would better agricultural productions and the livelihood activities of farmers. Mass media and electronic methods of information dissemination could equally be important in creating awareness, stimulating farmers' interest, and motivating farmers to adopt improved agricultural technologies and practices to improve farm productivity (Ani et al., 2017).

Electronic media are media that make use of electromechanical energy to transmit information for the farmers or end users to access the content, while print media are printed on paper and circulated as physical copies to the audience. Some examples of printed media include newspapers, newsletters, magazines, banners, posters, billboards, books, fliers, etc., and some examples of electronic media include radio, television, the internet, electronic advertising, mobile phones, etc.

Statement of the Problem

Extension services rendered by agricultural extension agents serve as channels of communication through which information on improved agricultural technologies is passed to the farmers for adoption of improved technological practices to increase farm productivity. Using the right information sources to reach, educate, and inspire farmers is important for long-term food security, according to Ozowo (2015). This is because farmers' involvement in food production is important for the growth of agriculture, the economy, and the country as a whole. FAO (2011) reveals that extension services have played an effective role in bringing information to farmers to boost food production through the adoption of recommended/improved agricultural production practices. These improved/recommended practices include the use of mechanisation in farming, the use of improved seeds and seedlings, the use of fertilisers, improved animal breeds, improved methods of weed control, improved animal production management practices, and disease and pest control. The methods of harvesting, processing, and storage have also been enhanced. Furthermore, there have been advancements in transportation methods, marketing strategies, managerial skills, and technical advice. Therefore, different sources of information for improved agricultural production practices are available. They include individual, group, and mass media sources of information, which are used by agricultural extension agents (NADP, 2014). Using mass media sources of information to reach, inform, and motivate farmers is crucial due to their widespread presence in various locations. This approach not only enables farmers in rural areas to actively participate in food production, but also plays a crucial role in ensuring sustainable food security.

According to Obinne (2016), the major setback in agricultural production in Nigeria is no longer the only challenge affecting agricultural and economic growth, but weak awareness of the recommended technologies to be practiced by farmers who are the end users of innovation for agricultural production in the field. However, mass media (electronic and print) are the most effective and quick means for reaching the farmers, and the messages conveyed through print media have a long life and can be referred to as and when required (Muhammad, 2015). Electronic and print methods of disseminating agricultural innovation information have been greatly given less priority by the government and thus have been left in the hands of businessmen whose services are exploitative, leading to high food costs and, thereby resulting in high food costs and leading to food shortages in Nigeria.

Empirically. Less has been done, and less attention is given to the effects of the use of electronic and print mass media for agricultural innovation information communication for enhancing food security in Nigeria. This is worrisome. Mass media (electronic and print media) methods of agricultural innovation information dissemination are one of the surest ways to solve the challenge of food insecurity, reduce the unemployment rate, and promote economic and agricultural development. It is against this background that this research was conducted to bridge the existing gap.

The following research questions are important to achieve the objective of this research:

i. What are the most frequently sources of accessing agricultural innovation information by the respondents?
ii. What are the effects of electronic and mass media sources of agricultural innovation

information on food security through socio economic characteristics in the study area? and,

iii. What are the constraints affecting access and utilization of electronic and print media sources of information dissemination to farmers by agricultural extension agents?

Objective of the Study

The broad objective of the study is to assess the effects and factors affecting use of electronic and print media for agricultural communication by extension agents and farmers in the central agricultural zone of Nasarawa state, Nigeria. The specific objectives are to;

i. ascertain the most frequently types of electronic and print media used for agricultural communication by the respondents,
ii. determine the effects of electronic and print media method of agricultural information dissemination through selected socio-economic characteristics of the respondents
iii. identify the constraints affecting use of electronic and print media method of agricultural information dissemination on adoption of improved agricultural production practices in the study area.

METHODOLOGY

The Study Area

This study was conducted in the Central agricultural zone of Nasarawa State.

Sampling Technique and Sample size

The target populations for this study consisted of 6,000 farmers including agricultural extension agents in the Nasarawa Central agricultural zone. Purposive selection of 10 respondents from each of the 20 farming communities using random sampling was done. A sample size of 200 respondents was selected using random sampling technique.

3.3 **Method of Data Collection**

Primary data were used for the study. Data collection was through the use of structured questionnaire.

3.4 **Data Analysis**

Data were analyzed using both descriptive and inferential statistics. Objective 1 was achieved using simple descriptive statistic such as frequency, percentage and objective 2 was achieved using a multiple regression model while objective 3 was analysed using factor analysis.

RESULTS AND DISCUSSION

Types of Electronic and Print Media most Frequently used for Agricultural Communication by Respondents

The results in Table 1 below show the distribution of respondents according to types of electronic and print media most frequently used for agricultural information. For electronic media, the results revealed that the majority (95%) access agricultural innovations information through radio, while 87.5% used GSM phones to access knowledge, and only 20% used the internet. This signifies that farmers prefer easier and more convenient sources of information dissemination. This agrees with the findings of Obinne (2016), who found that the client's preferred and welcomed means of communication enhance the effectiveness of the message. Results for print media on accessing agricultural innovation information indicated that flyers constituted the most frequently (80%) used print media by the respondents, followed by billboards (60%), while brochures had only 2.5%. However, bulletins had 40%, billboards had 30%, books had 35%, and newsletters had the least at 15%. The lack of internet, television, newspapers, and newsletters could be due to low economic status and poor infrastructure in the study area. Consequently, the low usage of print media such as bulletins, newsletters, magazines, and brochures can be attributed to the low literacy level of the respondents. These findings agreed with Yahaya (2012), who reported that extension publications such as bulletins and newsletters were not prioritised by farmers as important sources of agricultural information in Nigeria.

Table 1: Multiple Response Distribution of Respondents according to Types of Electronic and Print Media Most Frequently Used for Agricultural Communication by Respondents

Channels	Frequency(N=200)	Percentage
Radio	190	95
Television	80	40
Internet	40	20
GSM Phone	175	87.5
Print Media		
Newspapers	**30**	**15**
Newsletters	20	10
Billboards	60	30
Bulletin	80	40
Fliers	160	80
Books	70	35
Brochures	5	2.5
Magazines	30	15

Source: Field survey 2024

Multiple Response

Effects of the Socio-Economic electronic and print media on food security through socio economic characteristics of the Respondents

Table 2 shows the results of the effects of the socio-economic electronic and print media on food security through the socio-economic characteristics of the respondents. The results revealed that there was a positive significant value (0.005) at the 1% level of significance on the farmer's level of education. This implies that farmers with higher educational qualifications have access to electronic and print media than farmers with a low level of education. The results further showed a significant value level (0.004). on the farm size at a 1% level of significance. This indicates that farmers with larger farm sizes use electronic and print media more frequently than those with smaller farm sizes. This affirmed the findings of Ani (2017), who discovered that farmers with large farm sizes seek to adopt agricultural innovations faster to boost their production compared to those with small farm sizes who are conservative with resources. Contact with extension workers also has positive significant value (0.006). This indicates that farmers who have access to agricultural extension workers often have access to electronic and print media. Ajayi (2018) reported that extension workers serve as motivators of information for adoption easily among rural farmers because of their skills of information dissemination. It also means that the more farmers have contact with extension agents, the more they are motivated to use electronic and print channels of information on agricultural innovation, probably due to the sensitisation and creation of awareness given to them by extension agents.

Table 2. Effects of electronic and mass media on food security through socio economic characteristic of the Respondents

Variables	Coefficients	Standard Error	T- value	Significant
(Constant)	2.310	1.152		1.320.000
Age	-0.012	0.012	-1.110	0.120NS
Sex	0.715	0.651	1.052	0.724NS
Education	0.146	0.152	0.955	0.005***
Marital status	0.013	0.215	0.082	0.112NS
Occupation	0.015	0.235	0.093	0.214NS
Household size	0.033	0.036	1.062	0.251NS
Cooperative	-0.175	0.312	-0.462	0.532NS
Farm experience	-0.011	0.128	-0.092	0.815NS
Farm size	0.185	0.082	1.712	0.004***
Annual income	-5.272E-6	0.000	-0.328	0.183NS
Extension contact	-0.173	0.235	-0.354	0.061**

NS = Not Significant $R^2 = 0.065$
*** = Significant at 1%
** = Significant at 5% Adjusted $R^2 = -0.013$
F-ratio = 0.751

Constraints affecting the effect and Use of Electronic and Print Media

Table 3 showed the result of the constraints affecting the use of electronic and print media in the dissemination of agricultural innovation. The results show that there are three main types of barriers that make it hard to use electronic and print media to spread information about agricultural innovations in the study area. These are socio-economic barriers (factor 1), environmental barriers (factor 2), and policy-related barriers (factor 3). Lack of capital (IC) (0.514) and a low level of education (LLOE) (0.506) were found to be two socioeconomic factors that affect how people in the study area use electronic and print media. This implies that socio-economic constraints (factor 1) could retard the extent to which agricultural information could be disseminated and reached. The constraints may discourage the weaker rural people who might not be able to cope if the problems persist. This also implies that respondents could do better when these constraints are addressed appropriately. These constraints limit growth in farm yield and annual income, which are the basis for mass production of farm produce to enhance food security in the study area and Nigeria in general.

The Banta (2018) found that problems affecting agricultural development in the Giwa Local Government Area of Kaduna State range from low yield, low level of capital for investment, and low level of education/awareness. This accounts for low output, and it slows the rate of agricultural development in the area. It means that the socioeconomic problems that have been found to slow down the growth of agricultural areas can make it harder for extension agents to get information to farmers, which slows down the fight for food security.

The factor analysis result in Table 3 also revealed the environmental constraints (factor 2) affecting the respondents' access to innovation information for agricultural production. The constraints include PPS (0.508), security challenges SC (0.512), and poor communication channels PCS (510). This implies that the above-mentioned environmental constraints slow the rate of progress in farm productivity. It also means that the environmental constraints (factor 2) affecting respondents can cause setbacks in the development of food production., thereby causing food shortages in the study area and Nigeria at large. The study area encompasses a variety of agricultural settings. According to Bulus (2012), one reason why people in the Lafia Local Government Area of Nasarawa State did not adopt new farming methods brought in by agricultural development programs and projects was because of problems with the environment. Similarly, Simongan and Omelhin (2012) found that poor environmental conditions discouraged 30% of the rural people in Kaduna State from adopting innovation on maize storage. This also means an unfavourable enabling environment is a problem that limits rapid agricultural development interventions.

The factor analysis also showed that policy-related barriers (Factor 3) that slow down the growth of agricultural settings are weak extension, bad agricultural extension policy (PAEP) (0.502), few agricultural

extension workers (FEW) (0.531), and bad extension logistics (PEL) (0.511). It means that the policy issues that have been found to be blocking the use of electronic and print media to share information about agricultural innovations could slow down the progress that can be made in providing agricultural extension services and getting farmers to use new farming methods to increase food production and make Nigeria's food security better.

These results are similar to what Samuel (2012) found. He found that agricultural development projects in rural areas ran into a number of issues, such as socio-economic, environmental, cultural, political, and ethnic issues. Samuel did research on the factors that affected poultry production as a way to reduce poverty in Wamba Local Government Area of Nasarawa State.

The issues that slow down the growth of agricultural settings could also be things that stop the growth of agricultural settings. Knowing these problems is important for people who care about agricultural development to be able to come up with solutions.

Table 3. Factor Analysis of Constraints to use of electronic and print mass media in agricultural innovation dissemination to farmers by extension agents in Nasarawa State**.**

Items	Factor 1	Factor 2	Factor 3
Inadequate capital (IC)	0.514*	0.226	0.008
Low level of education (LLOE)	0.506*	0.190	0.018
Poor power supply (PPS)	0.189	0.508**	-0.100
Security challenges (SC)	0.206	0.512**	0.127
Poor Communication Structures(PCS)	0.231	0.510**	0.022
Land tenure problem(LTP)	0.127	0.110	0.189
Poor agric extension policy (PAEP)	0.206	0.208	0.502***
Few Extension Workers(FEW)	0.215	0.124	0.531***
Poor extension logistics (PEL)	0.346	0.032	0.511***
Fluctuation in planting date	0.103	0.137	0.162
Land degradation (LD)	0.122	0.559	0.156
Loss of biodiversity (LB)	0.140	0.540	0.164
Low output/ha(LO)	0.229	0.501	-0.027

Source: Field survey, 2024
Method: Varimax with Kaiser Normalization.
*Factor 1: Socio-economic constraints
**Factor 2: Environmental constraints
*** Factor 3: Policy related constraints

CONCLUSION

Electronic and print media play an important role in the dissemination of agricultural innovation information by agricultural extension agents to farmers. They contribute to creating awareness and motivate farmers' interest in the adoption of improved agricultural practices to enhance agricultural production by the farmers. Based on the results of the findings, radio, mobile phones, the internet, and television were the most frequently used electronic media by agricultural extension agents and farmers for disseminating agricultural information. Furthermore, handbills, fliers, billboards, newspapers, and posters were the most accessible and frequently used print media by agricultural extension agents and farmers for agricultural information. The constraints affecting the effects of access and use of electronic and print media include socio-economic, environmental, and policy-related constraints. Therefore, improving the access and use of electronic and mass media for agricultural information dissemination by providing steady power supply in rural communities, increasing funding of extension services, and motivating extension workers is needful. Farmers could also play the role of creating time and committing resources to access agricultural innovation information. Food insecurity in Nigeria needs to be prioritised because doing so could enhance stability and bring about agricultural and economic development in Nigeria.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations were offered for improving the use of electronic and print media to enhance the effects of agricultural innovations and information dissemination on food security in Nigeria:

i. Agricultural extension workers should improve their service delivery to farmers by improving the efficiency of mass media dissemination of agricultural innovation information to farmers for adoption.

ii. Stakeholders of agricultural extension should organise seminars and workshops regularly for training extension agents and farmers on the use of modern electronic and media facilities in extension services delivery.

iii. The government should provide infrastructural facilities in the rural areas, particularly electricity supply, to enable farmers and extension agents to have access to power at all times to enhance using electronic and mass media for accessing and disseminating agricultural innovations information.

iv. Information and media agencies should reduce the cost of service delivery, recharge cards, etc., on media such as radio, recharge card subscriptions, printing handbills, mobile phones, television channel subscription charges, newspapers, and flyers to affordable prices for farmers and users to patronise their services.

v. The government should address the constraint affecting access and use of agricultural innovation information by reducing the tax rate on electronic and mass media agencies. Furthermore, provide more incentives and motivation to agricultural extension workers to enable them to improve on information dissemination (service delivery) to farmers in rural communities in Nigeria.

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