Journal of Community & Communication Research
ISSN: 2635-3318
Volume 4, No. 2 December 2019
Pp. 206-216

Effectiveness of Mass Media Channels Use on Technology Transfer in Abia State, Nigeria

Accessible at: https://jccr.sccdr.org.ng/index.php/jccr/issue/view/1

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Review Process: Received: 07/10/19 Reviewed: 20/12/19 Accepted: 27/12/19

ABSTRACT
The study assessed the effectiveness of the use of mass media channels on technology transfer in Abia State, Nigeria. One hundred and twenty six (126) respondents were selected for the study through a multi stage sampling technique and structured questionnaire was used to elicit information from the respondents. Data collected were analyzed using descriptive statistics and probit multiple regression. Results showed majority of the respondents (83.33%) preferred radio to other mass media channels. Radio (= 2.8) and television (= 2.4) were used for technology transfer. Some of the constraints that affect the selected mass media channels are erratic power supply (= 2.6), high cost of radio and newspaper (= 2.6), inadequate mass media information (= 2.3), readability problem (= 2.0), timing of programme not suitable (= 2.6), Non availability of credit facilities (= 2.8) and network problem (= 2.6). Probit result revealed that there is a significant relationship on the effect of use of mass media on technology transfer. For radio at 5% level of probability, erratic power supply and high cost of radio were significant while low income level and network problem were significant at 1%. For television, erratic power supply, low income level, network problem and timing of programme were significant at 1% level of probability. Inadequate interest was significant at 1 % level of probability for newspaper. The study recommends that extension workers and media house should transfer more technology through radio and television since they are preferred and accessible channels to farmers.

Keywords: Effectiveness, Mass media Channels, Technology

INTRODUCTION

A new technology (or innovation) is "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003). In the present context, mass media can play very important roles in agricultural extension. They can reach more people in less time and less cost. The mass media can assist the federal government to bring rural development at the grassroots through proper and effective dissemination of information. The easiest way the government can penetrate the rural populace in terms of effective mobilization for national rural development and transformation is through the mass media, especially the electronic media such as radio and television (Ocheni and Nwankwo, 2012). Since majority of the farmers live in the rural areas, it is necessary therefore, to understand the situation and conditions surrounding their farming environment (Mgbakor *et al;* 2013).

The farmer gets the right information, in right time, through right form, through right channels, by right persons. Hence, mass media in agricultural extension is a game where all the players are winners. Thus, mass media play a very important role in extension, and greatly reduce the work load of the extension workers. However, in using it, coordination must be ensured among all the stakeholders to achieve maximum benefit.

Television, as an electronic audio-visual medium which provides pictures with synchronized sound, is cosmopolite in approach and can be used to create instant mass awareness. Television has unique advantages over other mass media. While it provides words with pictures and sound effects like the movies, it scores over the radio by its high intimacy and reaches the largest number of people at the shortest possible time. It was also identified by Adekunle *et al* (2004) that radio is a very good source of information to farmers in Abia State. Again, the availability of transistor's radio nowadays makes it easy for almost every family to own a radio (Onuekwusi and Atasie, 2011). Printed materials in the form of newspaper, magazine and pamphlet are highly valued for dissemination of agricultural information and their advantage of being re-used at convenience. All these mass media channels are used by extension workers to effectively transfer technologies to farmers.

Extension effectiveness may be determined by the level of awareness of extension services created among the farmers, number of visits paid by the village extension worker, percentage of scheduled meetings held between farmers and extension workers, number of field meetings held, regularity of meetings held by village extension worker, number of field days organized by village extension worker, monthly or quarterly number of demonstrations organized by the village extension worker within specified time frame (monthly, quarterly, annually), number of supervisory visits, number and regularity of research-extension linkage workshops and farmer training sessions\ (Agbarevo, 2013). However, Agricultural Development Projects (ADPs) in Nigeria with the mandate of extension services delivery has been bedevilled by a lot of challenges which has limited or hindered the effectiveness of their services to the farmers. This is evidently visible by the general shortage of extension staff as reflected by high level of extension agent/framer ratio. Currently, the executive director of (National Agricultural Extension and Research Liaison Service (NAERLS) Prof. Mohammed Khalid Othman stated that Village Extension Agents are grossly inadequate to deliver extension services to farmers, even as most states have not conducted agricultural resources survey in the last 20 years. He stated that the current situation is 1:5,000 extension agent/framer ratio against Food and Agricultural

Organization's (FAO) recommendation of 1:800 however, this is based on the number of extension agents to farmers in a particular State (Gbenga, 2018).

Information is an essential ingredient in agricultural development programmes, but Nigerian farmers' rarely feel the impact of agricultural innovations either because they have no access to such vital information or because it is poorly disseminated. It therefore means that inadequate provision of agricultural information, knowledge and improved technologies to the rural people has greatly undermined agricultural development and quality of life in Nigeria.

The high cost of air-time has affected the frequency and scope of the transmission of much agricultural information to the rural and urban people (National Agricultural Extension and Research Liaison Service (NAERLS) 2011) through mass media. This has led to the failure or little achievement attained by various development programmes implemented by government in Nigeria aimed at improving the living standard of the people. However, the value of a technology becomes less important unless it is transferred to end-users who derive benefit from the technology. Arising from this assertion, it becomes imperative that farmers should have access to improved and appropriate technologies that are suitable to their farming condition. Nevertheless, the available transfer channels to farmers have not been adequately used to transfer information needed to improve their livelihood. Since technologies are transferred through certain channels over time, it becomes necessary to assess the effectiveness of use of mass media channels to ensure that desirable results are achieved.

The specific objectives of the study were to:

(i) ascertain farmers' preference for the selected mass media of communication;
(ii) examine farmers' frequency of use of mass media channels for transfer of technology;
(iii) ascertain technology programmes transferred through the selected mass media channels;
(iv) identify constraints affecting the utilization of mass media for effective transfer of technology in the study area.

Hypothesis

HO_1: The constraints associated with the use of mass media do not significantly affect effectiveness of mass media in technology transfer in the study area.

METHODOLOGY

Study Area

The study was conducted in Abia State which covers a geographical area of 5243.7sq km, of the total land area of Nigeria. It is bounded on the north and north-east by Anambra, Enugu and Ebonyi States. On the west of Abia is Imo State. To the east and south-east are Cross River State and Akwa Ibom State, and to the south is River State. Rainfall is about 2400 mm/year, and intense between the months of April through October. Abia State lies between latitude 5° 25′ 0″ north and longitude 7° 30′ 0″ east (Abia, 2017). It is geographically located in the south-east region of Nigeria. It has a population of 3, 901,620 persons (NPC, 2018).

The population was made up of all farmers in Abia State. Multi-sampling technique was adopted in selecting 126 respondents for the study. Descriptive and inferential statistics were employed using frequency, percentages, mean and Probit regression.

Measurement of Variable

Objective 1 was to ascertain farmers' preference for the selected mass media of communication in the study area. The respondents were asked to indicate the preferred mass media (Radio, Television and Newspaper). The frequency was ranked using mean scores. Objective 2 was to ascertain the frequency of mass media utilization for transfer of technology. Information on the frequency of mass media utilization in the transfer of technology was collected using a 3-point Likert scale which was graded as follows: Always = 3, Sometimes = 2, Never = 1. Mass media with mean score of 2 and above were described as have been used by the respondents, while those with mean of less than 2 were described as not have been used by the respondents. Objective 3 determined constraints affecting the utilization of mass media for effective transfer of technology in the study area. The degrees of constraints were graded using a 3 point scale: 3: Severe constraint; 2: Mild constraint; 1: No constraint; Constraints with mean of 2.0 and above were considered to have affected technology transfer, while mean of less than 2.0 were considered not a constraint .The mean was determined by finding the mean scores on the 3 point Likert type scale.

This hypothesis was tested using the t-ratios produced by Probit multiple regression model fitted into the data. The Probit model is stated thus:

$$Yi^{*} = B^{1}X_{i} + E \quad (1)$$

$$Yi = 0 \text{ if } Yi^{*} \leq 0 \quad (2)$$

$$Yi = 1 \text{ if } Yi^{*} \geq 0 \quad (3)$$

Where,

Yi^{*} = an underlying latent variable that indexes use of mass media

Yi = observable dummy variable that indexes use of mass media

B^{1} = a vector of estimated parameter

X_{i}.....n= individual characteristics such as:

X_{1} = Erratic power supply (number of times)

X_{2} = Low income level (measured in naira)

X_{3} = Non availability of credit (number of times credit was accessible)

X_{4} = High cost of mass media (measured in naira)

X_{5} = Lack of information (content of news)

X_{6}= Timing of programme (conduciveness of broadcasting time)

X_{7} = Inadequate interest (relevance to need)

X_{8} = Network problem (reception/ clarity of broadcast)

RESULTS AND DISCUSSION

Preference of Mass Media Channels for Technology Transfer

The results in Table 1 revealed that majority (83.3%) of the respondents preferred radio to the other mass media channels (television and newspaper). This is followed by television by 56.35% of the respondents. However, none of the respondents indicated for newspaper. This result agreed with the findings of Muhammad and Garforth (2001) reported that radio was the major source of agricultural information, followed by television.

Table 1 Distribution of respondents according to their preference to mass media channels for technology transfer

Mass media	Frequency	Percentage
Radio	105	83.33
Television	71	56.35
Newspaper	0	0

Frequency of Use of Mass media Channels for Technology Transfer

The result in Table 2 showed that the respondents used radio most frequent ($\bar{X}$=2.8) followed by television ($\bar{X}$ = 2.4) and newspaper ($\bar{X}$ = 1.7) on daily basis. This implies that radio was the most used mass media channels. Almost all homes have radio as a source of news and entertainment. The result may suggest that radio uses alternative source of power (battery) which is relatively cheaper when compared to electricity or fueling a generating set. Television was also popular due to its audio and pictorial qualities. This is also in tandem with Nwachukwu (2003) who stated that farmers love to hear and see for more understanding as its power of sight and sound appeal to emotions and is likely to motivate people. Considering their mean scores; radio ($\bar{X}$= 2.8) and Television ($\bar{X}$ = 2.4) were described to have been used for technology transfer, while newspaper ($\bar{X}$ = 1.7) was used.

Table 2Distribution of respondents according to their frequency of use of mass media channels for technology transfer

Mass media	Frequency of utilization				
	Always	Sometimes	Rarely	Mean	Decision
Radio	117*(83.57)	23*(16.42)	-	2.8	High
Television	68*(50.00)	51*(37.50)	17*(12.50)	2.4	Average
Newspaper	33*(19.87)	56*(33.73)	77*(46.38)	1.7	Low

Constraints encountered by respondents to the effective use of radio for technology transfer

The constraints that affected the effective use of radio for extension service delivery are: erratic power supply ($\bar{X}$= 2.6), low income level ($\bar{X}$= 2.1), high cost of radio ($\bar{X}$= 2.6), inadequate information ($\bar{X}$= 2.3) and information not relevant ($\bar{X}$= 2.8). The limited use of radio for transfer technology to farmers could be attributed to the existence of the problems associated with the utilization of the radio. This result, however, agrees with Onuekwusi and Atasie (2011) that high cost of mass media, lack of access to mass media information or inadequacy of mass media information and unstable power supply were some of the constraints encountered by respondents on the use of modern information sources.

Table 3: Distribution of respondents by perceived constraints to utilization of radio for technology transfer

Constraints to using Radio	No Constraint	Mild Constraint	Severe Constraint	Mean score	Decision
Erratic power supply	9*(5.73)	46*(29.30)	102*(64.97)	2.6	Accept
Low income level	10*(7.41)	98*(72.59)	27*(20.00)	2.1	Accept
Non availability of credit facilities	84*(66.67)	27*(21.43)	15*(11.90)	1.5	Reject
High cost of radio	8*(5.88)	37*(27.21)	91*(66.91)	2.6	Accept
Inadequate information	10*(8.00)	68*(54.40)	47*(37.60)	2.3	Accept
Timing of programmes not suitable	27*(25.47)	71*(66.98)	8*(7.55)	1.8	Reject
Inadequate Interest	92*(70.23)	29*(22.14)	10*(7.63)	1.4	Reject
Information not relevant to me	8*(5.88)	16*(11.76)	112*(82.35)	2.8	Accept
Network problem	54*(19.05)	69*(70.63)	118*(10.32)	1.7	Reject

Constraints associated with use of television for technology transfer

The results shows some of the constraints militating against effective use of television in extension service delivery. These include erratic power supply ($\bar{X}$= 2.7), low income level ($\bar{X}$= 2.6), non-availability of credit facilities ($\bar{X}$= 2.8) and high cost of television ($\bar{X}$= 2.5). The respondents also perceived that inadequate television information ($\bar{X}$= 2.6) and timing of programmes not suitable ($\bar{X}$= 2.6) and network problem ($\bar{X}$=2.6) were some of the factor hindering the use of television. Erratic power supply could be a serious handicap to their effective utilization of television by farmer as the alternative source (use of generating set) is expensive. In addition, the respondents also indicated that the cost of television is high. This could be attributed to low income level and non-availability of credit facilities which farmers in rural areas face. It was also revealed that inadequate television information was a constraint. It is either that the programmes were not exhaustive since they were paid for or that it did not address their needs. This suggests that the television programmes may be-supply driven. Network problem is also a core challenge to television use as it affects reception.

Table 4 Distribution of respondent by perceived constraints to the use of television for technology transfer

Constraints to using television	No Constraint	Mild Constraint	Severe constraint	Mean score	Decision
Erratic power supply	6(4.35)	23(16.67)	109(78.98)	2.7	Accept
Low income level	12(9.45)	28(22.05)	87(68.50)	2.6	Accept
Non availability of credit facilities	7(6.48)	12(11.11)	89(82.41)	2.8	Accept
High cost of television	27(17.76)	29(19.08)	96(63.16)	2.5	Accept
Inadequate television information	19(15.08)	20(15.87)	89(70.63)	2.6	Accept
Timing of programmes not suitable	12(7.45)	41(25.47)	108(67.08)	2.6	Accept
Inadequate Interest	61(48.41)	52(41.27)	138(10.32)	1.6	Reject
Information not relevant to me	100(76.34)	31(26.66)	-	1.2	Reject
Network problem	16(12.80)	14(11.20)	95(76.00)	2.6	Accept

Constraints associated with effective use of newspaper for technology transfer

Constraints affecting effective use of newspaper for technology transfer include readability problem ($\bar{X}$= 2.0), low income level ($\bar{X}$= 2.6), High cost of newspapers ($\bar{X}$= 2.6) and inadequate information ($\bar{X}$= 2.1) were constraints accepted to have hindered the effective use of newspapers for extension service delivery. The group of respondents constrained by readability problem may be illiterate farmers who may not understand and benefit from most agricultural information or technology disseminated through the newspaper. The respondents were also constrained by income and cost of the newspapers as it is beyond their reach. Also information on newspaper is not adequate ($\bar{X}$= 2.1) as indicated in the result. Sometimes captivating titles are given to headlines with little or no content value.

Table 5 Distribution of respondent by perceived constraints to effective use of newspaper for technology transfer

Constraints to using Newspaper	No Constraint	Mild Constraint	Severe constraint	Mean score	Decision
Readability problem	28(21.37)	71(54.20)	32(24.43)	2.0	Accept
Low income level	17(13.49)	28(22.22)	81(64.29)	2.6	Accept
Non availability of credit facilities	39(27.27)	98(68.53)	6(4.20)	1.8	Reject
High cost of newspapers	19(12.84)	24(16.22)	105(70.96)	2.6	Accept
Inadequate information	19(11.90)	64(19.05)	89(69.05)	2.1	Accept
Inadequate Interest	45(35.71)	59(46.83)	22(17.46)	1.8	Reject
Information not relevant to me	56(44.44)	57(45.24)	13(10.32)	1.7	Reject

Hypothesis 1: *There is no significant relationship between constraints to the use of mass media and its effectiveness in transfer of technologies in the study area.*

Results on Tobit parameter estimates of constraints to the use of mass media and its effectiveness in transfer of technologies showed that most of the coefficients are consistent with hypothesized relationships, and their tests of significance help to indicate their importance in explaining the influence of effective use of mass media in the transfer of technologies. Some of the coefficients were significantly different from zero at 1%, 5% and 10% levels of significance. The estimates on this function is on the significance of the Chi-square, the R-square and statistical significance of the regression coefficient using the t-ratio. The mass media channels have R^2 values of 0.561 for radio, 0.713 for television and 0.515 for newspaper and significant at 1% level of significance as indicated by the Chi-square value of 103.742^{***}, 113.433^{***} and 94.752^{***} respectively for each of the mass media channel. The R^2 values implies that only 56.1% (radio), 71.3% television and 51.5% (newspaper) of the variability in the use and effectiveness of mass media in the transfer of technologies is explained by the independent factors.

Table 6 shows that erratic power supply was significant and positively related to technology transfer for radio $(2.584)^{**}$ and television $(5.833)^{***}$ at 5% and 1% level of probability level respectively. This is against *a prior* expectation. The implication of the result is that when extension agents use radio or television for technology transfer may have distortion because the rural people do not have access to stable power supply or money to purchase power generating set and this will reduce the effectiveness of technology transfer. Ani *et al*., (2015) stated that the absence of stable power supply interfere with the functioning and use of mass media devices information dissemination.

Low level of income was positive for radio (3.393) ***, television (7.20) *** and newspaper (2.126)*. This is against *a prior* expectation which states there is no significant relationship between the problems associated with mass media and its effectiveness for technology transfer. Also, Mgbakor *et al.*, (2013) opined that inadequate resources impede utilization of mass media. The implication is that if an extension agent chose either radio, television or newspapers without considering farmers access to those media will have message distortion thereby creating problem in technology transfer process.

High cost of mass media was positive (2.974) ** at 5% level for radio, (2.311) for television at 10% level and newspaper (1.992)* also at 10% respectively. It implies that when mass media are not on ground it makes technology transfer very difficult. Timing of programme (6.264) *** was significant only for television. This indicates that if timing for broadcast is not suitable, the audience may be distracted by other concerns. The potential of television for transferring of technology should be harness for the benefits of the farmers (Nazari and Hazzan, 2011) since they tend to retain for a longer period they hear and see (Onuekwusi and Atasie, 2011).

Inadequate interest (3.221) *** was positive and had a significantly effect on the use of mass media for technology transfer. This shows that when a technology is not addressing the needs of the farmers, they will lose interest. This is in tandem with the findings of Ani *et al.*, (2015) who, suggested that agricultural information should be designed to suit the needs of the farmers by employing skilled extension personnel for need identification/assessment while designing agricultural information for farmers.

Network problem was positive and had a significant effect on mass media use for technology transfer. This is against *a prior* expectation that there is no significant effect of problems associated with mass media use and technology. This implies that when an extension agent is using radio or television as a channel of technology transfer and there is poor network coverage, it will lead to distortion in technology transfer.

Table 6: Probit estimates of the effect of constraints associated with use of mass media on technology transfer.

Variables	Mass media channels		
	Radio	**Television**	**Newspaper**
Erratic power supply	-0.481	-0.833	-0.240
	(2.584)**	(5.833)***	(0.681)
Low income level	0.503	0.921	0.411
	(3.393)***	(7.20)***	(2.126)*
Non availability of credit	0.240	0.126	0.141
	(0.682)	(0.213)	(0.511)
High cost of mass media	0.650	0.541	0.421
	(2.974)**	(2.311)	(1.992)*
Lack of information	0.115	0.022	0.009
	(0.253)	(0.151)	(0.087)
Timing of programme	0.111	0.888	0.211
	(0.201)	(6.2264)***	(0.531)
Inadequate interest	0.076	0.012	0.523
	(0.047)	(0.341)	(3.221)***
Network problem	0.876	0.633	0.042
	(4.136)***	(3.743)***	(0.015)
Chi-square	103.742***	113.433***	94.752***
Pseudo R^2	0.561	0.713	0.515
Log likelihood	349.902	328.882	289.327

Figures in parentheses are t values. ***, **,* represents levels of significance at 1%, 5% and 10% respectively

CONCLUSION AND RECOMMENDATION

The study has revealed that preference to radio and television were the means of transferring technologies in the study area. The major constraints that affected the effective use of these mass media for extension service delivery in terms of technology transfer were; erratic power supply, high cost of mass media, inadequate mass media information, readability problem, timing of programme and network problem.

The study therefore, recommends that

i. Extension workers and media house should transfer more technology through radio and television since they are preferred and accessible channels to farmers.
ii. Adequate financial support should be given to transfer of technologies through mass media by government to equip farmers.
iii. Provision should be made by government, extension and media house to curtail constraints hindering maximum technology transfer through mass media.
iv. There is also a dire need to create awareness on the use of newspapers to enable farmers benefit from it.

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