

EFFECTIVENESS OF PRINT MEDIA IN TECHNOLOGY TRANSFER AMONG RURAL FARM HOUSEHOLDS IN IMO STATE, NIGERIA

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ABSTRACT

Objectives: of the study analyzed the use and effectiveness of print media in technology transfer among rural farm households in Imo State, Nigeria. The specific objectives of the study are to; describe the socio-economic profile of the respondent; ascertain the access to print media by rural farm households; determine the frequency of print media in technology transfer in the study area; examine the perceived effectiveness of print media technology transferred; Identify the constraints affecting the use of print media in the transfer of agricultural technologies in Imo State, and determine the factors influencing the use of print media in technology transfer among rural households in Imo State.

Methodology: Multi-stage and simple random sampling techniques were used to select 126 farm households for the study. Data were collected with a structured questionnaire and analyzed using descriptive statistics and the ordinary least square multiple regression model.

Result and Discussion: Result revealed that 48.4% and 51.9% of the farmers were males and females respectively, with a mean age of 43 years, mean household size of 5 persons, mean farming experience of 29 years, mean education of 14 years, mean annual income of N31,573.8 and majority (81.7%) were married. A majority ($\bar{x} = 2.92\%$) had highest access to posters and flyers (87.3%). The highest frequently used print media was flyers ($\bar{x} = 2.9$). Result also showed that the use of print media in technology transfer among rural farmers was effective although all (100%) the respondents were not giving the opportunity to ask questions. the coefficient of age, cost, farming experience, farm size household size, frequency of extension contact and access to print media significantly influenced the use of print media in technology transfer. Time-consuming ($\bar{x} = 2.8$), high cost ($\bar{x} = 2.6$), limited space ($\bar{x} = 2.6$), inaccessible roads, ($\bar{x} = 2.3$) political censor (2.6) and no interaction ($\bar{x} = 2.5$) were serious constraints to the use of print media in technology transfer.

Conclusion: The study concluded that the socioeconomic characteristics of the farmers influenced the use of print media in technology transfer that could improve their farm activities.

Keywords: Access, Use, Print-media, Technology-transfer, Farm households.

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INTRODUCTION

Sustainable agriculture depends on the availability and adoption of appropriate agricultural technologies developed by research and promoted by extension agents to increase agricultural productivity especially in rural communities [1]. Improving appropriate methods of transferring farming technologies have become necessary to make farmers utilize technologies, take appropriate decisions and increase agricultural production [2,3]. The transfer of improved technologies to rural farmers is important for increasing agricultural production [4].

For the rural farmers to adopt the new technologies, the new ideas must reach their farms and homes through mass media channels [5,6]. Print media channels are used to disseminate messages to an audience in an attempt to influence them in a variety of ways. Many media are used to transfer technologies to farmers among them is the print media. Media methods are effective ways of reaching a very large number of people [7]. They are very effective in creating awareness of the existence of a new product, idea or practice and in sustaining the interest of the farmers [8]. Print media is effective where the people are literate and where the people are willing to reach them [9]. Even in predominantly illiterate communities, print media are still effective as a teaching tool because literate farmers can always read them and pass the information contained therein to the less fortunate ones [10,11].

The print media are valuable for their use in disseminating agricultural information to farmers [12]. Print media are important tools for the transfer of technologies to both literate and non-literate [13]. Print media can be useful to illiterate farmers who have children and neighbors who have educated relatives.

Nigeria has at least 213 newspapers of which 191 are privately owned and 22 are owned by governments. Some of these newspapers have regular agricultural columns on specific days of the week. Similarly, there are 90 magazines of which a majority (84) is owned by private enterprises and 6 are government-owned and several agricultural institutions-based pamphlets, periodicals and publications. Today technologies are daily being diffused by research institutes, yet to attain and sustain self-sufficiency in food production. Most of these technologies are stacked in the shelves of the originating institutes while agricultural production continues to suffer setbacks due to the problem of disseminating the recommended practices to end-users. [14,15].

Rural farm households have become an integral social feature and emerged economic phenomenon in rural communities of Nigeria. The farm households are endowed with varying amounts of social, human, financial and physical resources and capabilities that equip them to participate in activities in the rural communities [16].

Food and Agriculture Organization [17] affirmed that adoption of improved technologies by rural farm households remains low. This is because media for information dissemination in use are not effective. The rural farmers need adequate information exposure to the latest technologies, use the right methods to communicate relevant technologies to small-scale farmers. The agricultural extension service responsible for the transfer of these technologies is bedeviled with the challenges of technology transfer, quality advisory services, knowledge and timeliness. The ratio of extension staff to farmers is grossly poor making extension workers reach an insignificant number of farmers. [18].

More so, the increasing criticism of the public extension service for ineffectiveness, inefficiency poor coverage and low cost-effectiveness leaves doubt as to the appropriateness and sustainability of the approach. Rural farmers do not produce enough food, probably because of some obstacles that lead to a lack of access to timely and up-to-date information which would enable them to attain optimal yield from their farms [19].

Print media have tremendous power that could be harnessed by extension agencies and other relevant stakeholders for the benefit of rural farmers to increase food production [20].

The strength of print media is of great assistance to extension workers in providing cost-effective and efficient technology transfer to rural farmers and to reduce the workload using print media. However, print media involve one-way communication from innovation source to the receiver but they allow limited and delayed feedback but essential for effective communication [21].

Despite the valuable benefit of print media in information dissemination, there is still very low productivity in the area. This gap between low food production and improved agricultural technologies transferred to rural farmers in Imo State is too worrisome. It is against this background that this study was designed to investigate the access and use of print media in technology transfer among rural farm households in Imo State, Nigeria. The specific objectives of the study are to;

- Describe the socio-economic profile of the respondent
- Ascertain the access to print media by rural farm households
- Determine the frequency of print media in technology transfer in the study area
- Examine the perceived effectiveness of print media technology transferred
- Identify the constraints affecting the use of print media in the transfer of agricultural technologies in Imo State.
- Determine the factors influencing the use of print media in technology transfer among rural households in Imo State.

METHODS

This study was conducted in Imo State of Nigeria. The state lies between latitude 5° 45' North and longitude 6° 35' East of the Greenwich Meridian. The state is located within the rain forest belt Imo State has a population of 3,934,899 persons, with a total land area of 5530 km² [22]. The state has a population density of 710 persons per square kilometer. The choice of this state was informed by the fact that smallholder rural farmers dominated the rural areas of the state. It is bounded in the North West by Anambra State, South-South West by Rivers State and Abia State. The temperature ranges between 20°C and 30°C [23]. The major food crops grown include cassava, yam, cocoyam, maize and melon. Cash crops grown are oil, palm, rubber and forest trees such as Iroko, mahogany, and Obeche. Most farm households keep small ruminants, fishes and poultry. Imo State is made of 3 agricultural zones namely Owerri, Okigwe, and Orlu agricultural zones comprising of Owerri agricultural zone which consists of 11 extension blocks, Okigwe agricultural zone has 6 extension blocks, and Orlu agricultural zone has 10 extension blocks. The population of the study consists of all rural farm households

in the state. A multi-stage and simple, random sampling technique was used in selecting farm households used for the study.

Firstly, one extension block each was selected from the 3 agricultural zones in the state. In the second stage, 2 extension circles were randomly selected from each extension block selected. In the third stage, 3 sub circles were purposively selected from each cell based on the high concentration and intensification of farming activities in the areas. Finally, 7 farm households were selected from each of the sub circles selected which formed the sampling frame from which the respondents were chosen. In all 126 respondents were used for the study. Data were collected using a structured questionnaire using a descriptive survey and analyzed using both descriptive and inferential statistical tools. Objectives i, ii, iii, and iv were analyzed using frequency counts, percentages and means. A 3-point Likert type scale was used to determine the mean. While the inferential statistics used ordinary least square multiple regressions the implicit functional form is specified as follows:

$$Y=f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, +e_i) \dots \text{equation 1}$$

Where Y=Use of print media in technology transfer (measured in number of respondents)

X₁=Age (years)

X₂=Cost of print media (N)

X₃=Farming experience (years)

X₄=Farm size metric/m²

X₅=Household size (number of children)

X₆=Educational level (years in school)

X₇=Dummy for access to print media (yes=1 otherwise=0)

X₈=Frequency of extension contact (number of occurrences)

X₈=Other variables such as availability of print media; regular supply of print media (dummy)

e_i-Stochastic error term.

The explicit form is as follows; the linear function is expressed as in (4)

$$Y=b_0+b_1X_1+b_2X_2+b_3X_3+b_4X_4+b_5X_5+b_6X_6+b_7X_7+b_8X_8+u$$

Where Y=use of print media in transfer of technology transfers (measured in number of respondents)

X₁-X₈=Independent variable

b₁-b₈=Regression coefficients

b₀=Constant

e=Error term.

The four functional forms of the model; linear semi-log, double-log and exponential forms were tried and the best fit function form was chosen as the lead equation based on the statistical significance of the regression-coefficient, magnitude of the f-ratio as well as the conformity of the signs borne by the coefficients to a priori expectation.

RESULTS AND DISCUSSION

Table 1, reveal that (48.4%) of the respondents were males while 51.9% were females. This indicates that females constituted a higher proportion of the respondents engaged in farming activities in the study area. This is supposed to encourage their male counterparts to participate in farming activities. The result shows that 23.02% of the respondents belong to the age group of 26–35 years while 36.51% were between 36 and 45 age bracket. Results also showed that 30–2% belonged to the age bracket of 46–55 years and 10.32% belonged to 56–65 years. Results further indicate a mean age of 43 years old. The finding implies that the majority of the respondents was in the productive and active stage of their lives and was capable of engaging in farming activities.

This finding agrees with [24] who observed that younger people are an economically productive population and more actively involved in farming and willing in sourcing for information through the print media.

Majority (81.75%) of the respondents were married. This supports the finding that most of them were of age and ready to have their own family. This finding agreed with [7] who observed that majority of Nigerian population were engaged in agricultural production of various types regardless of their marital status. This could be because married people are expected to source for technologies and information through the print media to increase their productivity and enhance their income for the welfare of their families.

Majority 67.5% had 4–6 persons in their household as 18.3% of the respondents had 7–9 persons with household size mean of 5 persons. This finding indicates that relatively large-sized households engage in farming in the study area. Moderately (54.8%) of the respondents had primary education while 29.4% had secondary education.

This finding indicates that majority (91.2%) of respondents had one form of education or the other while 8.7% had no form of formal education. This implies that rural farm households in Imo State were educated and there is the likelihood of being receptive to new technologies. This is an advantage to the use of print media as a vital means of technology transfer to farmers in the study area.

This finding agrees with [9] who observed that farmers' education was found to enhance production among crops farmers in Anambra State of Nigeria. The result revealed that 37.3% had farming experience of 20–29 years as 25.40% had 30–39 years and 20.6% had 10–19 years with a mean farming experience of 29 years. This implies that the respondents had enough farming experience this could be because of their eagerness to remain viable and relevant in their economic activities.

Table 1: Distribution of respondents by socioeconomic profile

Variables	Frequency	Percentage	Mean \bar{x}
Gender			
Male	61	48.41	
Female	65	51.9	
Age (years)			43 years
26–35	29	23.02	
36–45	46	36.51	
46–55	38	30.21	
50–65	12	10.3	
Marital status			
Single	23	18.25	
Married	103	81.78	
Household size (number)			5 persons
1–3	18	14.3	
4–6	85	67.5	
7–9	23	18.3	
Educational level (number of years in school)			14 years
No formal	11	8.73	
Primary	69	54.8	
Secondary	37	29.4	
Tertiary	9	7.14	
Farming experience (years)			29 years
10–19	26	20.6	
20–29	47	37.3	
30–39	32		
40–49	14	11.11	
50–59	7	5.6	
Income (₦)			31,573.8
6000–30,000	76	60.32	
30012–54,000	33	26.19	
54012–90,000	17	13.49	

Source: Field survey, 2020

Result revealed that majority (60.3%) of the respondents earned N6000-30,000 per annum and 26.2% had above N30012-54,000. The mean income of the farmers was ₦31,573.8. This implies that farmers received low income when compared with the current economy and family size responsibilities. This finding was in consonance with that [25] who observed that socio-economic characteristics of the respondents affects information source of technologies used in agricultural development in Abia State of Nigeria.

Table 2 presents the level of access to print media by rural farmers seven types of 7 print media namely newspaper, magazine, poster, flyers, pamphlets leaflets and journals were investigated. The results show that posters had the highest mean level of access. (\bar{x} 2.92) This was followed by flyers, (\bar{x} =2.43) leaflet (\bar{x} =2.33) and pamphlets (\bar{x} =2.00). While the least mean level of access was the agricultural journals. (\bar{x} =1.86) Furthermore there was high access of posters, flyers and leaflets while low access of newspapers and magazine.

This finding agrees with [9] who noted that newspapers, magazine and posters were the most common type print media used in promoting agricultural innovation in the area. This finding supports the assertion by [24] who observed that illiteracy is not a barrier in disseminating agricultural information since many farmers can read and understand many print media or being read and passed to them by their friends and relatives who are literate. The implication of this finding could be as a result of high cost of newspapers and magazine while most of the rural farmers could have access to posters and leaflets because they can receive access it free from agricultural institutes.

Table 3 revealed that majority (92.85%) of the respondents confirmed that they always use flyers to get information about the improved technologies. This was followed by posters (91.3%), newspaper (83.3%), pamphlets (77.8%), and leaflets (55.6%). Result further shows that majority (75.4%) do not use prints media at all to receive information about new technologies. This findings indicate that flyers had the highest mean of (2.9), followed by posters (2.84) newspaper (\times 2.8) and pamphlet (\times 2.7) while agricultural journal the least mean of (\times 1.3) followed by magazine (1.8). The implications of this finding would be that the farm

Table 2: Distribution of rural farm households by level of access to print media

Print media	Not all	Low	High	Mean
Newspaper	16 (12.7)	110 (87.30)	0 (0.00)	1.97
Magazine	19 (15.08)	100 (79.4)	7 (5.6)	1.90
Posters	15 (11.90)	10 (7.9)	111 (83.1)	2.92
Flyers	26 (20.6)	20 (15.9)	80 (63.5)	2.43
Pamphlets	50 (39.7)	26 (20.6)	50 (39.7)	2.00
Leaflets	28 (22.1)	28 (22.22)	70 (55.6)	2.33
Agricultural journals	60 (47.6)	24 (19.04)	42 (33.3)	1.86

Source: Field survey, 2020

Table 3: Distribution of Rural Farm Households by frequency of print media use in Imo State Nigeria

Print media	Always	Rarely often (2)	Frequency of use	
			Not all	Mean
Newspaper	105 (83.3)	20 (15.9)	1 (0.8)	2.8
Magazine	115 (12.7)	65 (51.6)	45 (33.7)	1.8
Posters	115 (91.3)	117 (3.9)	4 (3.2)	2.84
Flyers	117 (92.85)	6 (4.8)	3 (2.4)	2.9
Pamphlets	98 (77.8)	22 (17.5)	6 (4.8)	2.7
Leaflets	70 (55.6)	52 (41.3)	4 (3.2)	2.5
Journals	6 (4.8)	25 (19.8)	95 (75.4)	1.3

Source: Field survey, 2020

households most frequently used print education was flyers information and knowledge about the improved technologies transferred to them. This finding agreed with [8] who observed that posters and flyers were the most commonly used print media although this finding disagreed with [9] who observed that newspapers and magazine were the most frequently used print media because of their credibility and clarity.

The effectiveness of use of print media in technology transfer to rural farm households was in this study measured as the qualities of print media. Distribution of farmers' to qualities of print media was presented in Table 4. The table shows that all of the rural farmers (100%) indicated that they do not have opportunities to ask questions. Similarly, 80.2%, 79.4%, 77.8%, 93.7%, 78.4%, 91.3%, 69.8%, 90.5%, 92.1%, 61.9%, and 59.5% of the farmers indicated that the messages were useful, effective, alright, clear, timely, motivating, source of good information, create awareness, suitable, and satisfied, respectively.

While 75.4%, 88.9%, 38.1%, and 30.2% of the farm households indicated that the message was not accessible, and not regular and not suitable. The finding on effectiveness of the use of print media in technology transfer to rural farm households agreed with that of [8] who asserted that most farmers confirmed that print media was effective

Table 4: Distribution of farm households by qualities of print media use in transfer of improved technologies

Qualities of print media	Frequency	Percentage
Accessibility of print media		
Yes	31	24.6
No	95	75.4
Usefulness of message		
Useful	101	80.2
Not useful	25	19.8
Communication effectiveness		
Effective	100	79.4
Not effective	26	20.6
Explanation of message		
Alright	98	77.2
Not alright	28	22.2
Regularity of message		
Regular	14	11.1
Not regular	112	88.9
Clarity of message		
Clear	118	93.7
Not clear	6	6.3
Timeliness of message		
Timely	99	78.6
Not timely	27	21.4
Motivating ability		
Yes	115	91.3
No	11	8.7
Appropriate to farming activities		
Appropriate	88	69.8
Not appropriate	38	30.2
Source of good information		
Yes	114	90.5
No	12	9.5
Opportunity to ask questions		
Yes		
No	126	100
Satisfaction with message		
Satisfied	75	59.5
Not satisfied	30	23.8
Very satisfied	21	16.7
Create-awareness-of-new technologies		
Yes	116	92.1
No	16	7.9
Suitability of time of message		
Suitable	78	61.9
Not suitable	48	38.1

Source: Field survey, 2020

in technology transfer. This finding also agreed with those of [26] who observed that effective instructional materials such as posters, flyers, and books enhances adult learners and vocational learning especially for agricultural for information source.

The estimated determinants of use of print media in technology transfer are presented in Table 5.

The semi-log⁺ functional form was chosen as the lead equation. This was based on the magnitude of the coefficient of multiple determinations (R²).

Number of significant variables and the conformity of the signs borne by the variables to apriority expectation. It has an R² value of 0.857 which implies that 85.7% of the variations in the use of print media in technology transfer was explained by the included variables. The F-ratio is significant at 1%, which implies that the data at least to the overall significance of the regression equation. Age was positively related to use of print media at 1% level of significance which implies that an increase in age would increase usage of print media. This conforms to apriority expectation. This finding implies that the older the age of the respondents, the more they make use of the print media. The reason could be that as their age increases, their responsibilities also increases and they are more eager to search for information to meet their farming challenges farm size was positive and related to use of print media at 10% level of significance, which implies that farmers with larger farm size make more use of print media than their counter parts with smaller farm size. Farming experience, educational level, frequency of extension contact, cost of print media, access to print media, and other variables were negative and significance at 10%. This finding implies that the more experience the less the use of print media. This could be related to the fact that farmers with higher experience are assumed to be able to handle their farming problems unaided. Educational status had positive and significant at 1% level to the use of print media. This indicated that with higher education, farmers are willing to use of print media. This could be due to the fact that there were no new programs transmitted to them. Frequency to extension contact was negative and related to use of print media and significant at 1% level of probability. The finding implies that farmers with higher number of contact with extension agents used less of print media to search for agricultural information. These findings agreed with [7] who observed that educated and professionals need less use of print media for their agricultural information. This is because most of them were, experimentally experienced and informed in modern farming technologies.

The distribution of rural farm households perceived constraints to the use of print media in technology transfer is presented in Table 6. The table shows that out of 10 possible constraints investigated in this study, eight were considered to be serious constraints to use of print media in technology transfer among farm households in Imo State. These serious constraints were time consuming ($\bar{x}=2.8$), high cost of print media ($\bar{x}=2.6$), limited space ($\bar{x}=2.6$), political censor ($\bar{x}=2.6$), no interaction ($\bar{x}=2.5$), inaccessible roads ($\bar{x}=2.3$), irregular supply message ($\bar{x} - 2.1$), and poor level of education ($\bar{x}=2.0$). This finding implies that time consuming frustrated the reading and learning interest of the farmer. The decrease in time consuming will lead to increased interest and consequently lead to improved utilization of improved technologies transferred through print media. The reason could be that the farmers would have learned and benefit from print media, which in turn affects their productivity. The findings of this study on high cost of print media agreed with those of [18] that inability to ask questions and get feedback from the print media editor constituted barrier to print media. The table further revealed a grand mean constraints of 2.2*. The table showed that the standard deviation was closely packed and small. This implies that the data had high degree of uniformity and reliability of the result. This is in line with the finding of [27] who explained that the smaller the standard deviation, the higher the degree of reliability of the estimates.

Table 5: Factors influencing the use of print media in technology transfer to rural farm households in Imo State

Variable	Linear	Semi-log+	Double log	Exponential
Constraint	-1.163 (-2.951)***	-15.871 (-4.918)***	-5.886 (-5.131)***	-0.495 (-2.857)***
Age (year)	0.102 (5.194)***	4.167 (4.051)***	1.326 (3.625)	0.035 (4.110)***
Cost of print media (₦)	0.020 (-1.167)	00.701 (-0.189)	-0.146 (-0.461)***	0.002 (0.264)
Framing expresses	-0.212 (-0.946)*	-0.534 (-2.039)**	-0.203 (-2.181)**	-0.093 (-0.984)***
Farm size	0.171 (1.841)*	0.732 (1.085)	0.197 (0.821)	0.045 (1.166)
Education level	-0.509 (-0.772)***	-0.458 (-0.648)	-0.234 (-2.363)**	-0.919 (-4.135)
Access to print media	0.096 (-0.775)	-0.305 (-0.693)	-0.113 (-0.723)	0.047 (0.906)
Frequency extension contact	-0.463 (-2.929)***	0.230 (0.802)	0.013 (0.105)	-0.134 (-1.987)**
Household size	8.739E.5 (1.290)	0.539 (1.165)	0.269 (1.634)	2.442E-5 (-1.865)
Other variables (X _g)	-0.499 (-1.550)	0.047 (0.757)	0.237 (1.138)	0.003 (2.538)***
R ²	0.850	0.857	0.827	0.818
R ² (adjusted)	0.837	0.840	0.808	0.801
F-ratio	63.172	50.858	45.627	49.331

Source: Fields survey, 2020. *, ** and ***Represent significant at 1%, 5% and 10%

Table 6: Distribution of rural farm households according to perceived constraint to use of print media in technology transfer

Constraints to use	Not serious (1)	Serious (2)	Very serious (3)	Mean	Std. Dev.
Poor level of education sole	28 (29.32)	71 (54.2)	32 (24.43)	2.0	0.4103
Limited space	17 (13.5)	98 (22.2)	81 (64.3)	2.6	0.6198
Lack of incentive	39.(27.3)	89 (68.5)	6 (4.2)	1.8	0.4293
High cost of print materials	19 (12.84)	24 (16.22)	105 (70.9)	2.6	0.6957
Irregular supply by vendors	19 (11.9)	64 (50.8)	89 (69.1)	2.1	0.5321
Timeliness of message	45 (35.7)	59 (46.8)	22 (17.5)	1.8	0.4993
Inaccessible roads	13 (40.3)	57 (45.2)	56 (10.40)	2.3	0.5321
Political censorship	12 (9.5)	23 (22.2)	87 (68.5)	2.6	0.4427
No interaction	27 (21.4)	19 (15.1)	80 (63.5)	2.5	0.6253
Time consuming	7 (6.5)	12 (11.1)	89 (82.4)	2.8	0.5619

Source: Field Survey, 2020

CONCLUSION AND RECOMMENDATIONS

The need to improve agricultural productivity through disseminating agricultural technologies using the print media is very paramount in sustaining agricultural production in Imo State. The resource poor farmers may not have the where withal to buy print media and therefore need to be encouraged and supported. Consequently, the findings of this research and the recommendation arising from it will serve as an invaluable guide to government agencies and policy makers in Imo State in ensuring sustainable food production in the state. The study recommends that;

- Appropriate measures, which will involve the use of demonstration farms, print media and other extension packages, which will ensure that farmers work in collaboration with extension agents to practice improved technologies disseminated using print media
- An urgent technology dissemination policy should be put together for Imo State government such a policy should be got from a comprehensive benchmark survey of the prevalent technology development and dissemination. And this will help extension agents in educating farmers.

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