

**RAPHIA PALM RESOURCE AND THREATS TO SUSTAINABLE CULTIVATION IN MBAISE AREA OF IMO STATE, NIGERIA**

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**ABSTRACT**

*This study was designed to assess raphia palm cultivation in Mbaise Area of Imo State. Data were collected with structured questionnaire from 90 randomly selected respondents, and analyzed using descriptive statistics such as means, percentage and frequencies; and inferential statistics such as Analysis of variance. The cultivation levels of raphia palm in Mbaise area is low. Raphia palm cultivation was found to be profitable. There were no significant differences in the cultivation levels of raphia palm in Mbaise area. Lack of raphia palm seedlings was the major threat to sustainable cultivation of raphia palm. Government should save this palm resource from going into extinction by encouraging the development and availability of raphia palm seedlings by research institutes and extension service.*

**Key words:** Raphia palm resource

**INTRODUCTION**

Raphia palm is a very important crop in Imo State. This is because it provides income to the tapers and a source of raw material to dry gin producers. The leaves (fronds) are used, as thatched roof for those living in the mud houses, while the bamboo serves as firewood and staking stem (Olomola 2001, NAD 2002).

In the early 1980s raphia palm used to be found on every farmland in Mbaise area of Imo state, but suddenly this resource started disappearing while the demand for its major product, palm wine continued to increase, because apart from the ones consumed in bars daily, palm wine is specially required in traditional ceremonies like payment of dowry, marriage, village meetings, resolution of conflicts, demarcation of land boundaries and pouring of libation. In spite of the recent policy attention given to issues of natural resource use, nothing has been done in the area of planting raphia palm as a renewable natural resource as is the case in the arid vegetational belts (Olomola 2000, Omoti 2003).

It appears there is no recognition of these important uses of raphia palm and the benefits it is expected to continue to yield that the inhabitants and government have not thought of embarking on any programme aimed at encouraging increased cultivation of the crop (Omoti 2001, Nwawe and Banmeke, 2005). If palm wine is to continue to be used in Mbaise area and beyond and people living in mud houses to continue to change their leaking roofs, there is need to increase cultivation of raphia palm and minimize the production constraints facing the raphia palm resources.

Based on the foregoing, the broad objective of this study is to assess raphia palm cultivation in Mbaise area of Imo State. The specific objectives are to;

- (i) ascertain the cultivation level of raphia palm crops
- (ii) ascertain the farm sizes of raphia palm growers,
- (iii) estimate the costs and returns of raphia palm produce, and
- (iv) identify various cultivation constraints of raphia palm in Mbaise area of Imo State.

It is hypothesized that, there are no significant differences in the cultivation levels of raphia palm in Mbaise area of Imo State.

**METHODOLOGY**

This study was carried out in the three Local Government Areas (LGAs) of Mbaise, in this study referred to as Mbaise Area namely; Ahiazu Mbaise, Aboh Mbaise and Ezinihitte Mbaise. The list of communities in each LGA was collected from their local government headquarters. From this sampling frame, three communities were randomly selected from each LGA making a total of nine communities. The list of households in each chosen community that have been having raphia palm between 2002 and 2005 was compiled with the assistance of village heads and other key informants, and from this list, 10 household heads were randomly selected from each community making a sample size of 90 household heads. Data were collected using structured questionnaire and personal observation between January and June 2006. Data were collected on variables such as cultivation level, farm size, cultivation constraints, costs and returns of raphia palm produce. Data were analyzed using descriptive statistics, such as means, frequency and percentages, while inferential statistics, such as Analysis of variance (ANOVA) was used in testing the hypothesis.

The ANOVA model is generally specified as follows (Ohajianya and Onyenweaku 2003).

$$F = \frac{MSSB}{MSSW} = \frac{SSB}{SSW} \left[ \frac{n-k}{k-1} \right] \dots\dots\dots (1)$$

$$SSB = \sum_{j=1}^k n_j (\bar{x}_j - \bar{x})^2 = \dots\dots\dots (2)$$

$$SSW = \sum_{j=1}^k \sum_{i=1}^{n_j} (X_{ij} - \bar{x}_j)^2 = \dots\dots\dots (3)$$

- Where
- F = value by which the statistical significance of the mean differences was be judged
  - SSB = sum of squared derivations between the sample means
  - SSW = sum of squared derivations within the samples
  - N = number of observations
  - K = the number of samples
  - n<sub>j</sub> = sample size from population j
  - X<sub>j</sub> = means of sample from population j
  - X̄ = grand mean
  - X<sub>ij</sub> = ith observation from population j

**RESULTS AND DISCUSSION**

**Cultivation level of raphia palm crops**

Table 1 shows that majority (56.7%) of the respondents did not cultivate raphia palm in their farms or backyards between 2002 and 2005, while only 2.2% of the respondents cultivated 7 to 9 stands, with a mean of 1.2 crops.

**Table 1: Distribution of respondents by cultivation level of raphia palm crops between 2002 and 2005.**

Cultivation level (No. of trees planted)	Frequency	Percentage
0 (None)	51	56.7
1-3	31	34.4
4-6	6	6.7
7 and above	2	2.2
<b>Total</b>	<b>90</b>	<b>100</b>

Mean cultivation level = 1.2 crops

Source: Survey data, 2006.

This result implies that only few people cultivate raphia palm in the area.

#### **Farm sizes of Raphia palm growers**

Table 2 shows that majority (74.4%) of the raphia palm growers own 1-3 crops while only 2.2% of them own 10 crops and above. The mean

**Table 2. Distribution of Raphia palm growers' by farm sizes.**

Farm size (No. of crops)	Frequency	Percentage
1-3	67	74.4
4-6	15	16.7
7-9	6	6.7
10 - 11	2	2.2
<b>Total</b>	<b>90</b>	<b>100</b>

Mean farm size = 3.1 crops

Sources: survey data, 2006

farm size of the raphia palm growers was 3.1 crops, implying that the cultivation of raphia palm is low in the Mbaise area of the Imo State. Most of these growers of raphia palm inherited the ones they own now and have not made any effort to plant theirs, which is a threat to sustainability.

#### **Costs and Returns of Raphia Palm Produce:**

Analysis of costs and returns of raphia palm produce (Table 3) shows that the mean gross revenue per raphia palm was ₦44286.44, while the mean total variable costs was ₦22359.02 per raphia palm. The difference between mean gross revenue and mean variable costs gave a mean net returns of ₦21086.15 per raphia palm. This result implies that the cultivation of raphia palm produce in Mbaise Area of Imo State is profitable, and worths encouraging. This finding is consistent with those of Bromley and Cernea (1989) and Olomola (1991).

**Table 3. Costs and Returns of Raphia Palm Produce**

Item	Mean Value/ Raphia Palm
<b>Gross Revenue</b>	
Sales of 667.08 litres of Palm wine	43354.39
Sales pf bamboo	360.53
Sales of raphia palm fronds	471.20
Sales of twine	100.32
<b>Total Revenue</b>	<b>44286.44</b>

**Operating Expenses**

Tapping labour (281.23 litres)	14061.50
Transport cost	7593.27
Other costs	704.25
<b>Total variable costs</b>	<b>22359.02</b>
<b>Fixed costs</b>	
Depreciation charges on items	814.27
<b>Total costs</b>	<b>23200.29</b>
<b>Net returns</b>	<b>21086.15</b>

Source: Survey data, 2006.

**Cultivation constraints of Raphia Palm**

Several factors constrain the cultivation of raphia palm in Mbaise area of Imo State. Table 4 shows that all (100.0%) the respondents indicated that the most disturbing factor in the Table 4. Identified Threats to Raphia palm cultivation.

Identified threats	Frequency	Percentage
Land tenure arrangements	73	81.1
High cost of tapping labour	46	51.1
Lack of improved variety	83	92.2
Inadequate compound farm lands	77	86.6
Lack of maintenance inputs	24	26.7
Lack of raphia palm seedlings	90	100.0
Difficulty in identifying variety of Interest	56	62.2
Lack of research and extension attention	37	41.1

Source: Survey data, 2006.

cultivation of raphia palm is lack of raphia palm seedlings. About 87% of the 4 respondents reported that inadequate compound farmlands was their major problem. They also added that Raphia palm thrives better in compound farms, and since it does not grow well on distant farmlands, those who do not have compound farmlands do not cultivate raphia palm. This was closely followed by lack of improved varieties as reported by 92.2% of the respondents. Inadequate compound farms was indicated by 85.6% of the respondents. Also, 81.10%, 62.2% and 51.1% of the respondents, reported that land tenure arrangements, difficulty in identifying variety of interest, and high cost of tapping labour respectively are other constraints to cultivation of raphia palm in Mbaise area of Imo State. Other constraints reported by the respondents are shown in table 4.

**Test of significant differences in the cultivation levels of raphia palm in Mbaise area of Imo State.**

Table 5 shows that the result of ANOVA test for significant differences in cultivation levels (number of raphia palm trees planted) of raphia palm in Mbaise area of Imo State produced an F-value of 0.412 which was less than the critical F-value of 3.09 at 5% level of significance, which implies that the calculated F-value was not significant at 5% level. This indicates that there are no significant differences in the cultivation levels of raphia palm in Mbaise area of Imo State. Thus, the hypothesis is hereby accepted.

Table 5: Analysis of Variance results for test of significant differences in the cultivation levels of raphia palm in Mbaise area of Imo State.

Source	SS	DF	MS	F-cal	Decision
Between Groups	5713	2	2856.50	0.412 <sup>ns</sup>	Accept
Within Groups	602914	87	6930.05		the null hypothesis
Total	608627	89			

F-critical at 5% and 2,87 df=3.09

ns= F-calculated not significant at 5% level.

Source: survey data, 2006.

### POLICY IMPLICATIONS AND CONCLUSION

Based on the findings of this study, it can be asserted that lack of improved variety and lack of raphia palm seedlings constitute major threats to sustainable cultivation of raphia palm in Mbaise area of Imo State. The government should endeavour to encourage the cultivation of raphia palm in Mbaise in particular and Imo State in general by encouraging the research institutes and extension service to develop and make available to people improved varieties and seedlings of the raphia palm for increased cultivation.

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**IMPACT OF MASS MEDIA ON ADOPTION OF AGRICULTURAL INNOVATIONS IN KADUNA STATE, NIGERIA**

**ADENIJI, O.B. AND L. A EGA**

**ABSTRACT**

*The study assessed the impact of mass media extension activities on awareness, adoption and gross farm income of the farmers in Kaduna State. It also examined how farmers' characteristics interact with the intervention of extension communication to determine small-scale farmers' adoption behaviours. A sample of 100 farmers were randomly selected and interviewed. The results showed that on the whole the impact of mass media was moderately positive. Awareness of agricultural innovations was high as more than 80 per cent of the respondents knew about the eight recommended farm practices presented to them. Adoption score was however low. The innovation with the highest adoption score was chemical fertilizer, while the least adopted innovations were millet and tractor hiring services. The Pearson's correlation analysis also indicated that a number of socio-economic factors (farm size, household size and non-farm income) were positively related (at p.0.05) to the impact of mass media on adoption. Unlike the radio, extension bulletin in Hausa and posters other mass media sources like newspapers, magazines and film shows did not make desired significant impact on the adoption of recommended farm practices. Based on the result of the study, it was recommended that policy makers should effectively integrate mass media programmes with other aspects of agricultural and rural development programmes and projects at all the planning stages.*

Key words: mass media, extension activities, adoption

**INTRODUCTION**

The agricultural sector remains the major source of food and raw materials for the teeming population and domestic industries and it employs about 70 per cent of the rural population. Agriculture has sustained Nigeria's economy for decades, however the general trend of the sector since 1980s has been characterized by declining productivity and dependence on import (CBN 2000; Adubi, 2001). About 94 percent of farmers in Nigeria are small scale when judged by international standard, where all farms less than 10 hectares are classified as small scale. About 90 percent of the food crops are produced by the small scale farmers, though access to agricultural innovations are often limited by unfavorable economy, socio-cultural and institutional constrains (Olubiyo and Hill 2002). It is therefore clear against this background, that Nigerian farmers need new improved technologies to transform the traditional agriculture and increase production above the level of traditional technique therefore agriculture has to be given higher visibility in the media, in order to sensitize policy makers to its importance, and to convey valuable information to farmers in order to improve their productivity. Thus, increasing food production to keep pace with demand has been a challenge to agricultural research and government policy in Nigeria. The concern about adoption of improved farm practices by small-scale farmers in Kaduna State increased over the past decades. This was informed by the general understanding that the incorporation of appropriate practices within the farming systems would greatly reduce agricultural intensification problems and simultaneously ensure sustainable productivity.

Although various research institutes in the country have generated many technologies, the slow rate of adoption of these technologies has given concern to agricultural administrators and policy makers. Considering the extension efforts of these bodies, over

many years, it would be expected that an overwhelming majority of farmers in the target area would by now have adopted the recommendation given by the change agents. It is a common practice for research results in agriculture to be transmitted to the end users- farmers through extension workers.

However, most farmers are not getting the due benefit of what our research institutes have painfully laboured to produce because government extension services are crippled with lack of resources. The weak link is inefficiency in information management between the researchers and the extension outfit and to a large extent between the extension workers and the farmers. The use of mass media in agricultural extension is worth exploring in view of high extension staff/farmers ratio (about 1:5000) the seemingly high cost of the Training and Visit extension system (Atala *et al* 1992) and the issue of sustainability of ADPs after the expiration of World Bank loan, thus the use of mass media for dissemination of agricultural innovations becomes imperative. To redress this, government evolves active media participation in disseminating the technologies generated by research institutes. Therefore, a functional mass media which would disseminate agricultural information to improve the small-scale farmers' skill is imperative. The process of increasing efficiency of agricultural production through modernization depends mainly on the extent to which farmers can incorporate improved practices into their farming operations. In order to adopt these practices, farmers must become aware of their existence, develop interest, evaluate, try them, and become convinced of their relevance and usefulness before finally adopting the practices. Farmers rely on a variety of sources of information on improved farming practices to take decision about whether to adopt or not, one of which is the mass media. Agricultural extension is an activity mainly concerned with the improvement that can be brought into farmers' resource use and practice. It is essentially aimed at helping farmers to increase their production by persuading them to adopt improved technical skill, knowledge and making their attitude favourable to change. It also aimed at raising their efficiency and thus achieves higher level of production.

In both developing and advanced countries, the ingredients of success in agricultural transformation through extension are the same and include the fact that a) Extension must have something to extend, such as new technology or practices, (b) The innovation must be technically possible and reliable, economically attractive and socially acceptable, and (c) The innovation must be communicated to the farmers effectively (Rogers 2003). Change from the traditional to the more modern practices involves the communication and acceptance of new ideas. Communication therefore becomes a vital factor in implementing and secure change.

This study adopts Rogers and Shoemaker's (2003) definition of communication as a process by which innovation or messages are transferred from a source (point of origin) to a receiver (ultimate user) with a view to modifying the behaviour of the receiving unit in a manner thought desirable by the originator, or in order to elicit specific, intended response from the recipient.

Communication channels are means by which messages travel from a source to a receiver. Channels provide the vehicle for getting communication from one person or institution to another. Mass media channels that are used for transmitting messages include radio, television, newspapers, films, magazines etc, which enable the source of one or few individuals to reach audience of many (Rogers, 2003). For this study, the emphasis was on the messages and the effects of the channels (media) on change of knowledge, attitudes and overt behaviour of the receiver (farmers) especially in the area of adoption of agricultural innovations. Mass media channel are useful in reaching a wide audience at a very fast rate. They are useful as sources of initial information to farmers of new developments and emergencies (Ogunbameru, 2001). It is against this background that this study was

undertaken to assess the impact of mass media on adoption of agricultural innovations in Kaduna State. The media considered were radio, television, newspapers, mobile films/cinema, magazines, extension bulletin and posters.

### **Objectives of the study**

The general objective of this study is to assess the impact of mass media channels on farmers' adoption behaviour in relations to their access/exposure to mass media. Consequently, the specific objectives of the study were to:

1. examine the mass media sources available to farmers for improved farm practices,
2. assess the impact of the mass media sources on awareness of agricultural innovations,
3. assess the impact of the mass media on adoption of agricultural innovations,
4. determine the feedback possibilities and channels for the farmers to communicate their needs to innovation sources, and
5. establish the relationship, between socio-economic characteristics of farmers and access to mass media.

### **METHODOLOGY**

The study focused on investigating the impact of mass media as means of disseminating extension information to farmers. The study was conducted in Kaduna State. The State was chosen because of these factors: there are research institutes disseminating proven technologies to farmers, two radio stations Federal Radio Corporation(FRCN) and Kaduna State Media Corporation (KSMC) three (3) television stations- NTA, KSTV, DITV and many newspapers and other periodicals with columns on agricultural related materials.

The study covered four villages: Bomo, Giwa, Shika and Basawa. They were located in Guinea savanna ecological region of Nigeria. Each village consists of a number of separated residential clusters under the jurisdiction of a village head. Majority of the people within the four villages are farmers, some of them engage in secondary occupations such as petty trading, tailoring, butchering. The villages were purposively selected because they are predominantly agricultural by vocation, secondly, the villages' are exposed to extension information carried out by Institute for Agricultural Research, Samaru (IAR) and National Agricultural Extension Research and Liaison Services(NAERLS) where proven technologies are being disseminated to farmers. Thirdly, the extension activities embarked upon by Kaduna State Agricultural Development Programme KADP via the media (FRCN and KSMC, Newspapers) in communicating agricultural innovations to farmers in the state is another factor for selection. The data collection was through structured interview schedule on 100 respondents from the selected villages. To obtain the sample size, the lists containing the names of compound heads for the villages were obtained from Kaduna Agricultural Development Programme KADP Zonal Office. From the list of 1000, registered farmers, a sample of 25 household heads was randomly selected from each village. This gave a total of 100 respondents. The data collected include socio-economic characteristics of respondents, exposure/access to media, awareness and adoption of agricultural innovations, benefits derived from exposure to media and so on. Data analysis was carried out using descriptive statistics, employing statistical tools such as means, percentage, frequency and regression analysis.

### **RESULTS AND DISCUSSION**

Certain socio-economic characteristics were considered in this study. These provide valuable information for better understanding of the impact of such variables on awareness and adoption of improved farm practices in the state. An investigation of personal and socio-

economic characteristics of the farmers would foster understanding of their predisposition, influence on acceptance and utilization of improved farm practices. The determination of these variables would facilitate better understanding of their relative influence on improved farming systems adoption.

The result of the study revealed that the age of respondents range from 25 to 70 years with a mean age of 46, suggesting that most of the respondents were middle aged. This implies that farming in the study area was dominated by young and middle aged who were active population in the society. They are agile and mentally alert and thus could learn new concepts. Only about 7 per cent of the respondents were old farmers. The mean household size of the respondents is 8, About 50 per cent never received formal education, only 14per cent have primary education, while 20 had secondary and tertiary education respectively. Although all the people interviewed were farmers, 58per cent had secondary occupation, such occupation includes trading, carpentry, blacksmith tailoring etc and the annual income ranged from ₦ 2000-70000.

**Table 1: Demographic distribution of the respondents' age.**

Age in years	Frequency	Percentage
15-30	13	13
31-40	22	22
41-50	36	36
51-60	22	22
61 Years & above	7	7
Total	100	100

Mean =46 years

**Available sources of information.**

Most of the respondents (96per cent) indicated that radio is a readily available source of information; 40per cent indicated Television, 24 per cent indicated Newspapers, 23 per cent indicated magazines, 68 per cent indicated posters, 72per cent indicated extension bulletin in Hausa while only 19per cent made use of film shows (Table 2.) Radio was mostly used because majority of the farmers had access to it.. Radio is one of the fastest methods of communicating with generality of the farmers. It has ability of reaching more people quickly than other channels, more so, it is cheap and less bulky. The results agree with the findings of Blench and Slaymaker, 2002, Oyegbami and Fabusoro, 2003 and Benamrane, 2005) that about 92 per cent of the respondents became aware of improved farm practices through radio

**Table 2: Available media sources for Agric information to farmers**

Information Sources	Frequency	Percentage
Radio	96	96
Television	40	40
Newspapers	24	24
Magazines	23	23
Extension Bulletin	72	72
Poster	68	68
Film Shows	19	19

*\*Multiple responses*

**Impact of mass media sources on awareness and adoption of innovations**

The result in table 3 shows that most of the respondents (91 per cent) were convinced of adoption by radio, followed by extension bulletin in Hausa (60 per cent), posters (52 per cent). Others were TV (33 per cent), Newspapers (18 per cent), magazines (16 per cent) and film shows (12 per cent). This agrees with the findings of Fadji (2000) who asserted that farmers were convinced of usage of innovations through radio and extension agents. Printed media such as newspapers and magazines did not make much impact on respondents. This obviously could be because of the low literacy level identified.

**Table 3 : Information sources impact on awareness and adoption**

Information sources	Awareness%	Adoption %
Radio	97	91
Television	46	33
Newspapers	25	18
Magazines	16	16
Extension bulletin	68	60
Posters in hausa	62	52
Film Shows	15	12

*\*Multiple responses*

Table 4 shows that all the respondents were aware of improved variety of maize, 98 per cent were aware of intercropping, use of fertilizer 96 per cent, while 93 per cent were aware of improved cowpea seed, 86 per cent improved millet seed and 86 per cent equally for sorghum seed.

Table 4 also indicates the level of awareness and adoption of improved practices. Awareness level was higher for all the practices. The use of improved millet seed, sorghum cowpea and chemical fertilizer were adopted by 71 per cent of the farmers. However, the level of awareness of improved millet seed by farmers was 86 per cent while the adoption level was 49 per cent. The use of fertilizer and intercropping seems to be the most important practices adopted by 94 per cent and 92 per cent of the respondents respectively.

**Table 4 Awareness and adoption of innovations**

Agricultural innovations	Awareness (%)	Adoption (%)
Improved maize	100	83
Improved millet	86	49
Improved sorghum	86	58
Improved cowpea	93	60
Storage chemicals	97	94
Chemical fertilizer	96	94
Intercropping	98	92
Tractor hiring	98	38

*Multiple responses recorded*

**Best information sources on selected recommended practices**

Respondents evaluated information sources on a 6 point scale: Excellent, very good, good, fair, poor and very poor. The result in table 5 showed that 92 per cent of the respondents rated radio as excellent, very good to good. 56 per cent rated extension bulletin in hausa from excellent to good, 50 per cent rated posters equally on the same scale. However, magazines, newspapers and film shows were rated low by the respondents.

**Table 5 Rating of information sources**

Info.Sources	Mean score	Ranking	Remarks
Radio	4.75	1 <sup>st</sup>	Good
T.V.	2.96	4 <sup>th</sup>	Good
Magazines	1.81	7 <sup>th</sup>	Poor
Newspapers	2.16	5 <sup>th</sup>	Poor
Films	2.04	6 <sup>th</sup>	Poor
Ext.Bulletin	3.12	2 <sup>nd</sup>	Good
Posters	3.00	3 <sup>rd</sup>	Good

**NB: Excellent =5, Very good=4, good=3, fair=2, poor=1, very poor=0**

Table 6 shows farmers evaluation of radio and television programme being aired in the state. 96 per cent of the respondents found *mukoma gona* a radio programme very useful, while about 76 per cent evaluated the television farming programme very useful. However, a very negligible (18) per cent of the respondents considered agric panorama an English farming programme very useful, this is because majority of the farmers were not literate in English. It is logical to expect that the degree of interest in source is determined by how useful the source is evaluated to be. Similar findings by Chapman *et al* 2003 who concluded that whether a farmer continues to use information sources or relies on the information derived from the source depend on how useful and important he regards the information to be.

**Table 6: Farmers ' rating of farming programme**

Farming programme	% Very useful	% useful	% Fair	%useless	%very useless
Mukomangona ( R )	84	12	2	-	2
Filima Noma (R )L	80	18	2	-	-
Noma Kankara (R) L	84	14	2	-	-
Noma Yanke Tallauci (TV) L	76	21	2	-	1
Agric Panorama E (R)	18	20	26	11	25
Kiwoche kiwoche (L) (R)	68	24	6	2	

**L= local language**

**R= radio programme**

**TV= television programme**

**E= English**

### **Feedback Possibilities and channels for farmers' observations**

An important variable in communication is the feed back mechanism available for beneficiaries of information. Table7 shows the medium/channel available to farmers to channel their observations to information sources. The result shows that village extension agents accounted for 65per cent, sending of memo 22 per cent, while 11 per cent of the respondents paid personal visits to the source of information, while 2 per cent channeled their observation through media forum for agriculture. It shows there was relative feedback from the farmers on improved practices. This would further enhance the delivery system being adopted by the information source. It would equally help researchers to determine research priorities and best channels to use for its dissemination

**Table 7: Respondents' feedback sources**

Feedback to source	Radio		Cumul. %	Television		Cumul. %
	No.	%		No.	%	
Send a memo	22	22	22	22	22	22
Personal visit	11	11	33	11	11	33
Through village extension agent	65	65	98	65	65	98
Media forum for agriculture	2	2	100	2	2	100
Total	100	100	-	100	100	-

**Factors related to mass media impact on adoption**

Pearson correlation analysis was used to determine the relationship between awareness, adoption and gross farm income and the selected socio-economic variables. Table 8 shows that 3 variables were found to be positively and significantly related to adoption of agricultural innovations at  $p=0.05$ . These were radio, extension bulletin in hausa, posters and film shows. Newspapers and magazines were negatively and insignificantly related to adoption of innovations. Pearson correlation analysis of the socio-economic characteristics and mass media shows four of the seven socio-economic variables have significant impact on farmers use of mass media, vis- a- vis adoption of farm practices. These were age, farm size, non-farm income and house hold size. The data supported the hypothesis relating to socio economic characteristics of farmers and impact of mass media on their adoption of improved practices.

**Table 8: Pearson correlation analysis of the relationship between mass media exposure and adoption of agricultural innovations**

Variables cross classified	Correlation coefficient	Test result at 0.05 level
Radio	0.376	Supported
Television	0.180	Not supported
Film Show	0.165	Not supported
Newspapers	0.105	Not supported
Ext. bulletin in hausa	0.254	Supported
Magazines	0.078	Not supported
Posters in hausa	0.210	Supported

The result of the stepwise regression (table 9) showed that all the variables explained about 47 percent of the variability in adoption of improved farm practices. Four variables were important in explaining much of the variability. These were radio, 19% extension bulletin in Hausa, 15%; posters, 10%; television 2%. The data therefore showed that radio was the best predictor among media selected contributing to adoption of innovations.

**Table 9: Stepwise regression analysis of farmers adoption and mass media**

Variables cross classified	Correlation	R <sup>2</sup> Change
	Coefficient	
Radio	0.19125	0.19125
Ext. bulletin in Hausa	0.34143	0.15018
Posters	0.44257	0.10114
Television	0.46313	0.02056
Magazines	0.46767	0.00212
Newspapers	0.46525	0.00242
Film show	0.46912	0.00145

### CONCLUSION AND RECOMMENDATIONS

The study shows high level of awareness of extension messages through the mass media. About 85per cent of the farmers were aware of all the innovations investigated., while adoption rate of all the listed innovations was low. The impact of mass media was considerable with respect to the following innovations: fertilizer, storage chemicals, cowpea, intercropping and improved maize seed.

Most farmers adduced increase in farm output as a result of adequate information from mass media on recommended practices thereby showing its importance.

It is recommended that effort should be made to make use of other media that are less significant also there is the need to encourage the information sources to present more programmes on innovations with less adoption rate

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