Full-Length Research Paper

Logit Regression Analysis of Factors Influencing the Use of Mass Media by Rice farmers in Gassol Local Government Area of Taraba State, Nigeria

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ABSTRACT: The study analyses the drivers of mass media utilization among rice farmers in Gassol local Government Area of Taraba State, Nigeria. Purposive random sampling methods were used to generate data from 160 respondents. Data collected were analyzed using descriptive statistic and binary regression analysis. The results indicated that mean age of the respondents was 21 years and mean household size was 8 persons and mean farming experience 12 years while mean farm size was 4 hectares. Majority (81.2%) were married with over 84.8% of the respondents were literate and well experienced in farming. Further results show that mass media available to the respondents were radio, internet and television and ranked 1st and 2nd respectively. The major mass media available and utilized by respondents were radio (1st), television (2nd). The agricultural information medially accessed by the respondents from the mass media were credit facilities, marketing information, pests and diseases, fertilizer application, improved seeds and improved storage facilities. The result also disclosed that the intensity of mass media utilization in the study area was very high. The farmers identified high cost of mass media facilities and lack of electricity as the major constraints in the study area. The study recommends subsidizing the cost of media facilities, increase access to electricity supply, create awareness on the use of mass media, and increasing the usage of other mass media outlets were made to enable the respondents have full access/use of mass media to improve rice production.

Keywords: Mass media, drivers, utilization, rice, farmers, Gassol and Taraba State

INTRODUCTION

Mass media consist of both print and electronic media. The print media include circulars posters, leaflets, bulletin, newspapers and journals etc. while the electronic media consist of Television, Radio, Internet, Video and Telephone. According to Ani (2002) to get the best from the mass media, it is imperative to identify and examine each type medium of mass communication, identify the strength of each and weakness as a precondition to determining when a particular medium is most desirable. Televisions are prestigious, but not available in most rural areas programme dissemination could not be effective (Ogunbameru, 2001). The role of mass media in developing agriculture has received a worldwide attention. Studies have indicated that mass media are

intensively used in sourcing for agricultural information in developing countries such as Nigeria Anonguku *et al.* (2013).

Ani (2002) stated that, it is through communication that we are able to keep in touch with one another. Without the ability to communicate each of us will live to isolation (Ogunbameru, 2001). Radio is an effective tool for extension worker. It reaches large number of farmers at a time. Extension workers in many countries use radio listening groups to listen to a programme broadcast by certain station. Similarly, the mass media is increasingly, becoming a veritable instrument for transforming Nigerian agriculture (Abubakar et al., 2009). This is done through media reportage of agricultural operations in daily news, by agricultural journalists. It is useful sources of agricultural information to farmers and as such constitute methods of notifying farmers of new developments and emergencies. While the amount of detailed information transmitted by mass media is limited in some cases, it serves an important and valuable function of stimulating farmers" interest in new ideas. Once stimulated through mass media, farmers often seek additional information from neighbours, friends, extension workers or progressive farmers in their area.

Though rice production in Nigeria has increased over the years from an average of 300,000 tons in the 1990s to over four million tons in the year 2013 (Food and Agricultural Organization Statistics, 2015) the increase in rice being the leading staple food in the diet of Nigerians, its demand for consumption is rapidly growing, mainly driven by increase in population and urbanization (Ugalahi *et al.,* 2016). Household survey discovered that urban buyers on low salary spend more of their budget plan on rice than higher pay families, these development implies that rice is never again an extravagance nourishment however, it has turned in to the primary source of calories for low pay families. Between the period of 1985-2015, yearly rice consumption in Nigeria increased from roughly 1.3 million metric tons to 6 million metric tons. The per capita consumption of rice has grown from 3kg in to 1960s to an estimated 37.5kg in 2014 and is expected to increase due to increase in population and urbanization. In the last decade the growth rate of rice consumption has stood at 10.3% annually (Maji *et al*., 2015). Production has been by expansion in area harvested to rice which has increased from 14000ha in the 1960s to 2,863.815ha in the year 2013. However, yield per hectare declined from 1.6 tons for each hectare in 1987 to 1.1 tons in 2015. To meet the demand of the growing population, Jalpur (2011) is of the view that intensification of yield from each unit of land harvested to a crop must be increased. Hence, the need to extend this recommended technology to farmers. The inability of domestic production of rice to meet up consumption needs has resulted to high rate of importation. Imports rose from 569,000 tons in 1985to about 3.2 million tons in 2011. The imports are procured in the world market with Nigeria spending annually over three hundred and sixty-five billion Naira (N365,000,000,000) (Ugalahi *et al.,* 2016).

In an attempt to address the problem of rice imports and conserve foreign reserve, Nigerian government over the years has formulated and used various policy instruments and interventions in order to boost domestic rice production. Some of these measures include; imports restrictions, tariff and inauguration of presidential task force on rice in 1980, inputs subsidies and ban on imports between 1986-1995 (Daramola, 2005). These policies were put in place to stimulate local production and make local rice more competitive. In 2003, the Federal government set up a presidential initiative on rice production with the aim to become rice sufficient in 2007. The objective was to eliminate imports and generate exportable surplus and enhance food security through the production of 6 million metric tons of milled rice by the year 2005. A tariff of 100% was imposed on rice imports and levy of 10% was imposed (Daramola, 2005).

Taraba state is one of major rice producing state in Nigeria. The state is endowed with abundant human, land and water resources. In spite of all the huge effort, made by the federal government to ensure effective and efficient access and use of mass media through Growth Enhancement Support Scheme (GESS), which was designed as a component of Agricultural Transformation Agenda (ATA), available statistics has revealed that rice farmers in Taraba State are inadequately provided with such media facilities (National Bureau of Statistics, 2011). In Taraba State, Gassol Local Government Area provides the most suitable site for rice production in the state that is the reason why in an attempt to explore these resources, the state government engaged in private partnership with Dominion farms company to invest in rice production in the area. But most of the rice farmers in rural areas and in particular Gassol Local Government cannot be reached due to limited access to agricultural information.

METHODOLOGY

Study area

The study was conducted in Gassol Local Government Area of Taraba State. Gassol Local Government Area is located between latitude $7^0$32N to $8^0$40N and longitude $10^0$25'E to 11^0 15'E. The Local Government Area has a landmass of 5982km^2 and a population of 244,749 (125,293 males and 119,456 females) (NPC, 2006) but it has a projected population of 379,972 as at 2021 from the same National Population Commission.

The Local Government consists of two administrative districts, namely Gassol and Mutum-biyu. About three quarter of the population are crop farmers, while others are cattle rearers and fishermen. Besides that, most of the inhabitants do enjoy the presence of state owned media outlets such Taraba State Broadcasting Service (TSBS), Taraba Television (TTV) and other satellite stations perhaps, due to its proximity to the state capital. Important crops cultivated in the area include: rice (*Oriza sativa L*), groundnut *(Arachis hypogea)*, maize (*Zea mays*), yam (*Dioscorea spp*), cassava (*Manihot esculenta*), millet (*Panicum spp*), guinea corn (*Sorghum bicolar*), cowpea (*Vigna unguiculata*) and tomatoes (*Lycopersicom esculentum*) among others etc. Most of the farmers cultivate small plots of land. Farming activities usually starts around March with clearing of lands. The soil in the area consists of rich sandy loam soil. The annual rainfall is between 1000mm to 2200mm, the climate is tropical in nature with temperature of between 15^0C to 25^0C throughout the year. The major tribes in the local government area are: Fulani, Jukun, Tiv, Hausa, Wurkum, Jenjo, Kuteb, and Mumuye among others.

Methods of data collection

Primary data were used for the study and were collected with the use of questionnaire to be administered to the respondents. Data collected include; respondent's socio-economic characteristics, available mass media, agricultural information accessible from mass media, information needs, factors influencing the use of mass media and constraints in use of mass media among the respondents in the study area.

Sampling techniques

The population of the study comprises of 267 registered rice farmers in the local government area that were sourced from Taraba State Agricultural Development Programme (TADP) office in the state. Two districts make up the local government area; namely Gassol and Mutum biyu. Three wards from each of the districts were purposely selected due to their prominence in rice production. In Gassol district, Gassol, Sendirde and Wuriyo were selected. While in Mutum biyu district Mutum biyu A, Mutum biyu B and Tutare were also selected. In totality, six wards out of the twelve wards in the local government were used for the study. A sample size of 160 rice farmers were drawn from the population using Yamane Taro formula as presented below;

$$n = \frac{N}{1 + Ne^2}$$

Where;
n = sample size
N = population of the study (267)
e = Random sampling error

$$n = \frac{267}{1 + 267(0.05)^2}$$
$$= \frac{267}{1.6675}$$
$$= 160$$

Method of data analysis

The study used both descriptive and inferential statistics. The descriptive statistics such as mean, frequency, and percentage were used to analyze objectives. It is express as;

$$Y = \frac{FRX100}{N}$$

Where;
Y = The parameter (Variable) to be examined
FR = Frequency of response
N = sample size

The inferential statistics (Logistics Regression) was used to achieve objective (v), it is explicitly expressed as;

$$Y = a(b_1X_1, b_2X_2, b_3X_3, b_4X_4, b_5X_5 \dots \dots \dots \dots \dots, b_9X_9 + u_i(i)$$

Where:
Y = Use of mass media measured as dummy variable: 1 = Use of mass media, otherwise 0.
a = Intercept, b_1-b_9 is the coefficient (parameter to be estimated)
X_1 = Age (Years)
X_2 = Sex (Male=1; Female=0)
X_3 = Marital Status (Married=1; Single=0)
X_4 = Household Size (Number of People)
X_5 = Education (Years Spent in School)
X_6 = Farm Size (Hectares)
X_7 = Farming Experience (Years)
X_8 = Membership of Association (Yes=1; No=0)
X_9 = Extension Visit (Number of visit per farming season)
U_i = Error term

Logit models is appropriate for modeling dichotomous dependent variable outcomes because they are suited to situation when the probability of an outcome is restricted

Table 1: Distribution of respondents according to socio-economic characteristics.

Socio-economic data	Frequency	Percentage	Mean
Gender			
Male	158	98.75	
Female	02	1.25	
Total	160	100	
Age (years)			
< 20	16	10	
21-30	22	13.75	
31-40	54	33.75	21
41-50	48	30	
51 and above	20	12.5	
Total	160	100	
Marital Status			
Married	130	81.25	
Single	25	15.62	
Divorced	5	3.12	
Total	160	100	
Household size			
Less than10	71	44.94	
10-20	53	33.54	
21-30	24	15.18	8
31 and above	12	7.5	
Total	160	100	
Farming experience			
Less than 5 years	16	10.06	
5-10 years	49	30.82	
11-20 years	44	27.67	12
21-30 years	36	22.64	
31 and above	15	9.37	
Total	160	100	
Educational level			
Qur'anic school	69	43.67	
Adult literacy	29	18.35	
Primary school	11	6.87	
Junior secondary school	10	6.32	
Senior Secondary school	10	6.32	
Tertiary education	31	19.62	
Total	160	100	
H. Farm size (ha)			
Less than 5	110	68.75	
5-10	28	17.5	4
11 – and above	22	13.75	
Total	160	100	

Source: Field survey, 2019.

to the zero to one interval and we must assume that the relationship between the outcome and explanatory variables is nonlinear (Gujarati, 2011). The logit and probit models are based on the idea that decisions are the result of utility maximization, represented by and unobservable utility index that is influence by relevant explanatory variables. The Logit regression model was used to achieve objective V of the study.

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents

This study examined the socio-economic characteristics of respondents. The result in (Table 1) shows that majority (98.7%) of the respondents were male and (86.7%) of the respondents with a mean age of 21 years.

Table 2. Distribution of the respondents based on mass media available in the study area

Mass media available	Available	Not available	Rank
Newspaper	52(37.7)	86(62.3)	6th
Magazine	19(13.8)	119(86.7)	9th
Internet	67(48.6)	71(51.40)	2nd
Tape recorder	40(29.0)	98(71)	8th
Radio	119(86.2)	19(13.8)	1st
Television	67(48.6)	71(51.4)	2nd
CD Rom	6(4.3)	132(95.7)	10th
Posters	64(46.4)	74(53.6)	4th
Leaflets	54(39.1)	84(60.9)	5th
Bulletins	43(31.2)	95(68.8)	7th

Source: Field Survey, 2019. Percentages in parenthesis

This implies that active people were involved in rice production in the study area. The findings also show that most (81.2%) of the respondents were married in the study area. This high percentage of married respondents translate that the respondents are responsible and capable of sustaining their family life. This is similar with the results obtained by Adedapo (2020) who reported that Maize production was dominated by married men and women in the study area. On the other hand, (Table 1) reveals that majority (77.9%) of the respondents had family members from 1-20 in the study area and a mean of 8. It could be said that most of the respondents have a large household size. The effect of a large household size is that a good proportion of the income of the household head will be diverted to meeting the basic needs of food, health care, education, shelter and clothing. On the other hand, the effect of large household size could influence family labour. Conversely, Adedapo (2020) found that majority of farmers in Ondo and Ekiti States, had family members above five. The result in (Table 1) further reveals that (56.4%) of the respondents had formal education. This implies that majority of rice farmers in the study area can read and write. Farmer's education is very important and indispensable for agricultural development because it enhances the awareness of the farmers, thus increase the level of technology adoption. The result also indicates that (81.13%) of the respondents had 5 and above years of farming experience and a mean of 12 years. The finding indicates that most of the rice farmers in the study area puts more than five years of farming experience. Farming experience is expected to influence level of productivity and subsequently enhance income of the farmers. Findings from this research reveals the mean of 4 hectares which accounted for (68.75%) of the respondents with less than 5ha of rice farm. This result indicates that majority of farmers in the study area had less hectares of land to produce rice. The findings do not agree with that of (Adedapo 2020) who observed that most farmers in Enugu, Ondo and Ekiti States cultivate farm land above 5 hectares.

Mass media available to farmers in the study area

The mass media available to the respondents in the study area were analyzed and presented in (Table 2). The results indicated that radio (86.2%) ranked the first major media available to the respondents in the study area. This is followed by television and internets (48.6%) each, posters (46.4%), leaflets (39.1%), newspaper (37.7%) and bulletins (31.2%). However, tape recorder (29%), magazine (13.8%), and CD Rom (4.3%) were the least available mass media in the area. This shows that radio, television and internet were the major media available to the farmers in the study area. This could be attributed to the fact that electronic media are spreading agricultural information to the farmers at a faster rate than the other print media, that is aside being portable, affordable as well as useful during emergencies and hence, the reason for their popularity/availability in the study area. The finding is in line with that of Adeniyi and Yekini (2018) who reported that the affordability, and capacity of some devices to convey information visually and audibly make them more useful to people.

Tobit regression analysis of factors influencing use of mass media in the study area

Age of the farmers (X_1)

Age has a negative influence on used of mass media among rice farmers and significant at 10%. This could be expected because as farmers' advances in age, their likelihood of using mass media to access information on rice production is likely to decreases. The value of marginal effects indicates that if farmer's age increase by

Table 3. Logit regression results on factors influencing the use of mass media by the respondents

Variables	Marginal effect	Standard error	Z	p>[z]
Age (X_1)	-0.142	0.008	-1.72*	0.0085
Sex (X_2)	-0.469	0.103	-4.55***	0.000
Marital status (X_3)	0.342	0.156	2.19**	0.028
Household size (X_4)	0.0068	0.011	0.62	0.534
Education (X_5)	0.295	0.008	3.58***	0.000
Farm size (X_6)	0.023	0.016	1.46	0.144
Farming experience (X_7)	-0.008	0.009	-0.09	0.930
Membership of association (X_8)	0.034	0.154	0.22	0.824
Number of extension visit (X_9)	-0.007	0.134	-0.05	0.958
Pseudo R^2	0.3655			
LR Chi^2	62.58			
Probability	0.0000			

*=significant at 10%
**=significant at 5%
***=Significant at 1%

1%, the probability of them using mass media to access information on rice production will decrease by 0.142% all other things being equal.

Sex of the respondents (X_2)

Sex has negative influence on mass media usage among rice farmers and significant at 1%. This might be obvious since males are more involve is different economic activities than their female counterparts. The value of marginal effects indicates that if the numbers of female farmers increase by 1%, the probability of using mass media to access information on rice production will decrease by 0.469% holding all other variables constant.

Marital status

The marital status of the farmers has a positive influence on mass media utilization among rice farmers and significant at 5%. The value of marginal effects revealed 0.342% increase in mass media utilization for every 1% increase in the number of married rice farmers in the study area. This could mean that as more farmers were married, there is the likelihood to expand their information sources through the mass media in order to provide more food and income for the depending members of their family. Naruzzaman (2003) also found that marital status and household size are positively and highly correlated to the use of agricultural information in Nigeria

Education of the farmers (X_5)

The years of formal educational of the respondents (X_5) has also a positive influence on mass media utilization

among rice farmers and significant at 1% probability level. The value of the marginal effects shows that if years of formal education of the farmers increase by 1%, the probability of using mass media to access information on rice production will increase by 0.295% all thing being equal. Education is thus an important determinant of use of media among farmers because as more and more the farmers are literate; it will increase their writing, reading and reasoning capacity and thus, pave way to information that will increase their overall farm livelihood activities. Boz and Ozcatalbas (2010) also found that farmers educational level has significant effects on their usage of modern information sources and thus, influences pattern of information use (Table 3).

Conclusion

The study therefore concluded that, mass media can be cheap and readily available to reach out to farmers with new innovations in the study area if high cost of mass media facilities can be subsidized by the authorities as well as make provision for steady power supply at low cost. Notwithstanding, mass media such as radio, television, internets, posters, leaflets, and newspaper were the most important media facilities access and used by the farmers in search of vital information relating to their farming activities. The willingness with which the farmers can access agricultural information from mass media is influence by the age of the farmers, marital status, as well as the years of education of the farmers.

Recommendations

The study therefore recommends that;

(i)   There is the need to subsidized the cost of mass

media facilities in the study area to enable the farmers which are mostly poor have access to agricultural information. This can be made possible through the subsidizing the cost of media access such as newspaper, and charges on tariff charge by network providers, as well as, data for accessing information from the internets.

(ii)   Mass media facilities such as television, radio, internets among others depend heavily on electricity for their functioning. To make them readily available to the farmers at all times, there is the need to increase the supply of constant electricity to the farmers in the study area.

(iii)   There is also the need to create more awareness to the farmers on the use of mass media so that the willingness for farmers to access information from mass media can be improved since the study revealed a positive correlation between education and mass media use.

(iv)   The study revealed that radio, television, internets, posters, leaflets, and newspapers were the major mass media accessed and used by the farmers thus, there is the needs to increase the usage of other mass media outlets so that large numbers of farmers can be reached.

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