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Determinants of Constraints to Information Sources of Agricultural Innovation by Farmers in Southern Borno Senatorial, Nigeria

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Abstract: *The study was conducted in southern Borno senatorial zone of Nigeria to a determine constraints to information sources by farmers in the study area. Multi-stage sampling procedure was adopted for the study. 16 farmers were randomly selected from each of the 10 farming communities to give a sample size of one hundred and sixty (160) respondents. Primary data for the study were collected using structured questionnaire. Data collected was analyzed using frequency account, percentage and ranking order to satisfy objectives 1, 2, 4, and While multiple regression analysis was used to satisfy objective 3. From the findings of the research, out of the 160 respondents in respect to socio-economic characteristics: it was revealed that 68.8 % of the respondents were male, while 31.2 % were female with ages ranging from 30-39 years. While 67.5% of the respondents were married. A good number (83.1%) of the farmers were educated. About 46.3 % of them had household size of 6-10 persons per household with majority operating on small scale farm holdings between 1-2 hectares and majority had farming experience (12-17years). Source of information used by farmers are farmers meeting (55.6%), cooperative society (47.5%), Extension agent (41.9%), neighbor and friend (35.0%) and drum (2.5%). Effect of farmers socio-economic characteristics on utilization of information sources in the study area shows that age, level of education, farm size, family size, member of association and primary occupation are significant at 1% level, while gender, marital status and farming experience are significant at 5% level. The constraints to utilization of modern information sources in the study area shows that inadequate fund is the highest which ranked 1st while language barrier is the lowest which rank 10th.The study recommended that, the farmers should try to form a cooperative association, the farmers should try to be using available information sources in order to help them in farming system and irrelevant information should not disseminated and the information in question should always reach the rural farmers in good time. More so, the feedback mechanism should be strengthened and the extension workers should learn how to adjust to the situations while there on the field.*

Keywords:Determinants, Information, Sources, Constraints

INTRODUCTION

Background of the Study

Agriculture which is the leading sector of the economy in most developing countries is one of the areas that information is constantly sought and used. In Nigeria, the importance of Agriculture to the economy cannot be over emphasized despite the growth of industries, oil and commerce, it had continued to be the principal economic activity carried out by most Nigerians (Lughlugh, 2020) and it is crucial to meet the information needs of farmers for the development of the sector (Demet, Nilay, Marco and Tunç, 2016). To interact with the other factors of production, agricultural information is an essential factor. The farmers decision-making is facilitated towards improved agricultural production, processing, trading and marketing through an effective and efficient release system of essential information and technology services (Anju and Satbir, 2017; Ukachi, 2015). Success in enhancing agricultural production, providing income and job opportunities and ensuring that the agricultural sub-sector performs its manifest function in furtherance of rural and overall national development, depends largely on the communication system adopted to implement various agricultural programmes (Saleh, Burabe, Mustapha & Nuhu, 2018; Idiake-Ochei, Onemolease & Erie, 2016). In fact, there is a positive relationship between the increased flow of knowledge and information and agricultural development (Anjou and Satbir, 2017).

Information is an indispensable factor in the practice of farming and it is the basis of extension delivery. Information plays a vital role in our present day society as a result of the advancement in information and communication technologies (ICTs). Information in its most restricted technical sense is an ordered sequence of symbols that record or transmit a message. It can be recorded as signs or conveyed as signal waves. It is defined by Adereti, Fapojuwo and Onasanya (2006) as data that have been put into a meaningful and useful context which is communicated to recipient who uses it to make decisions.

Information is an important commodity used in the realization of any objective set by an individual or group. Information equips one with the knowledge needed to overcome challenges and take the appropriate step at the right time. A community cannot develop without knowledge, and a community can only become knowledgeable if they recognize and use information as their tool for development (Olaniyi and Ogunkunle, 2018).

A good information dissemination source must be relevant, timely, accurate, cost effective, reliable, usable and exhaustive and of an aggregate level. Information source is a base from which information originates, the one who transfers information to the receivers after carefully putting one's thoughts into words. Lucky and Achebe (2013) further noted that information sources used to disseminate agricultural research findings to farmers for on farm activities include researchers, extension officers, knowledgeable farmers, research institutions; mass media, commercial and government agencies.

One of the important factors leading to poverty as identified by Khapayi and Celliers (2016) is poor access to information among farmers. Lack of information adds to the vulnerability of farmers; therefore, rural farmers need to have access to information that is efficient for their livelihoods. Therefore, there is the need to investigate the constraints of information sources available to the farmers and its influence on their accessing agricultural innovation.

In spite of the relevant of information to farmers and the survival of nation, the researcher's pre-observation indicate that farmers have no access to relevant information that will help them in decision making and to accept new innovation in farming. The study therefore, was meant to provide answer to the following questions?

i. What are the socio-economic characteristics of the respondents?
ii. What are the sources of information used by the respondents?
iii. What are the effects of farmer's socio-economic characteristics on utilization of information sources?
iv. What are the constraints to utilization of modern information sources?

Objective of the Study

The main objective of the study is to determine the constraints of information sources used for accessing agricultural innovation by farmers in southern Borno senatorial zone of Borno state, Nigeria. The specific objectives were to:

i. describe the socio-economic characteristics of the respondents;
ii. examine respondents' use of agricultural information sources;
iii. analyze the effect the socio-economic characteristics on utilization information sources and
iv. identify constraints to utilization of modern information sources.

METHODOLOGY

Study Area

The study was conducted in southern senatorial zone of Borno State, Nigeria. The Local Government Areas (LGAs) are Askira/Uba, Gwoza, Damboa, Chibok, Shani, Biu, Hawul, Kwayakusar and Bayo. The study area is located between Latitudes 10^{o} and 12^{o}North of the Equator and Longitudes 11^{o} and 14^{o} east of the meridian (Borno State Agricultural Development Programme (BOSADP) 1998). The study area covers a total area of 7,472 Km^2, population of 431,894 (NPC, 2006) projected to 723,573 by (2020). Numerous ethnic groups and cultures characterize the area with approximately 80 percent of the population being small-scale farmers. Agriculture and trading constitute the major economic activities of the people in the area (BOSADP, 1998).

The study area is the most humid area in the State. With regard to crop and livestock production, it is the most productive part of state, having annual rainfall range of 900mm to 1,200 lasting for five months (June to October) (Amaza, 2016). These agro-climatic conditions make the zone conducive for the production of agriculture. In the study area, major crop grown are maize, sorghum, cowpea, groundnut, rice, and soybean. The livestock mainly comprises cattle's, sheep's and goats (Amaza, Olayemi, Adejobi, Bila and Iheanacho, 2007). The vegetation of the study area consisting of shrubs interspersed with trees and woodland. Most parts of the area are mountainous with rivers, which are, however, seasonal in nature (Amaza, 2016).

Sources of Data

Primary data and secondary source of information were used for the study; primary data was obtained from respondents with the use of structure questionnaires and interviews schedules. Secondary source of information were obtained from journal papers, textbooks, internet and publications.

Sampling Procedure and Sample Size

Multi-stage sampling procedure was used to select the respondents for the study. In the first stage, five LGAs (Askira/Uba, Gwoza, Damboa, Chibok Biu) were randomly selected out of the nine LGAs in southern senatorial zone of Borno State. Second stage, two farming communities were randomly selected from each of the five LGAs to give total of 10 farming communities for the study. In the third stage, 16 farmers were randomly selected from each village to give a total of one hundred and sixty (160) farmers.

Analytical Techniques

Descriptive and inferential were used to analyze the data. Descriptive statistics tools such as frequency count, percentage and ranking order were used to achieve objective i, ii, and iv. Multiple Regression analysis was used to achieve objective iii. The explicit model is express as follows:

$$Y= a + \beta_0 X_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + e$$

Where:

Y= level of information source used by farmers (%)

a= constant term

$\beta_1 - \beta_9$ = Regression Coefficients

$X_1 - X_9 =$ Socio-economic characteristics of the respondents

X_1= Sex of farmer (male = 1, female =0)

X_2 = Age of farmer (years)

X_4 = Marital Status (Married = 1, Single = 0)

X_4 = Educational status (number of years spent in formal school)

X_5 = Total farm size (in hectares)

X_6= Household size (number of persons in the household)

X_7 = Member of association (member = 1, nonmember =0)

X_3 = Farming experience (number of years spent in farming)

X_9 = primary occupation

e = the error term.

RESULT AND DISCUSSION

Socio-Economic Characteristics of Farmers

The results of the socio-economic characteristics of the respondents are presented in table1. The result revealed that 68.8% of the respondents were male while 31.2% are female. This

implies that, men take decision on farm management issues. The findings agreed with Pur and Gwary (2008) in their work access and application of information and communication technology (ICT) among farming household of north east revealed that majority (62.50%) were males. Indicates that male were participating more in agricultural activities and used these than female and also this is due to the fact that the study area is a parochial society where males are expected to head and take decision for the wellbeing of their families, while women and children are subordinated under men.

Table1: The age distribution of respondents revealed that majority (44.4%) fall between the age of (30 – 39 years), (21.3%) fall between 40 – 49 age bracket, (14.4%) fall between 20 -29 years, (12.5%) fall in the range of 50 years above. While the least (7.5%) fall below 20 years of age. This shows that most of the farmers are at the age of 30-39 years. This implies that, the respondents are middle aged and so still active and can participate adequately in farming activities. This findings agrees with Ommani and Chizani (2018) who stated that youths in their active years are energetic and innovative to participate more in agriculture.

It was equally observed in Table1 that 67.5% of the respondents were married and 32.5% were single. This shows that most of the respondents will have greater responsibility than the single, which may encourage respondents to be committed towards their participation in farming activities. As noted by Perez- Morales (1996), there is a trend for rural youth to start having responsibilities at an earlier age than urban youth. Hence, the tendency to marry early helps in building a virile farming population. This agree with Adamu (2016) who stated that about 90% of Nigerian population are engaged in agricultural production process of various types of regardless of their marital status.

Based on Table1: the level of education result shows that about (25.0%) attend primary education and (18.1%) had secondary education and (16.9%) had no formal education and (15.0%) attained Islamic education where (6.3%) of the respondents attend tertiary education in the study area. Such level of education is expected to have positive impact on the respondents' participation in the farming activities. Farmer's education generally has been found to enhance production among farmers apparently resulting from their efficiency in using new production technologies. This finding goes in line with (Ani, 2006) the belief is that education gives farmers the ability to perceive, interpret and respond to new information much faster than their counterparts without education.

Table1: indicate that (55.6%) of the respondents have the farm size 1-2ha, (26.9%) of the respondents have the farm size of 3-4 ha, (10.6%) of the respondents have the farm size of 5-6ha, while (7.5%) of the respondents have the farm size of 7ha and above. This shows the dominance of small farm size holdings in the study area. It is probable that most of the respondents had other source of income. The result shows that most farmers in the study area are still operating on a small scale farm which is due to shortage of resources for production such as land, finance and labour. This agree with Bereh (2012) who stated that most rural farmers had access to small portion of farmland which they use in farming activities.

Table1: Distribution of Socio-Economic Characteristics of Farmers (n= 160)

Socio-economic Characteristics	Frequency	Percentage
Gender		
Male	110	68.8
Female	50	31.2
Age		
Below 20years	12	7.5
20-29 years	23	14.4
30-39 years	71	44.4
40-49 years	34	21.3
50 and above	20	12.5
Marital Status		
Single	32	20.0
Married	108	67.5
Widow	12	7.5
Divorced	8	5.0
Level of education		
Non formal education	27	16.9
Adult education	30	18.8
Islamic education	24	15.0
Primary education	40	25.0
Secondary education	29	18.1
Tertiary education	10	6.3
Farm size		
1-2ha	89	55.6
3-4 ha	43	26.9
5-6 ha	17	10.6
7 ha and above	11	6.9
Family Size		
1—5persons	51	31.9
6—10 persons	74	46.3
11—15 persons	23	14.4
16 and above	12	7.5
Membership of association		
Yes	119	74.4
No	41	25.6
Farming experience		
1—5years	17	10.6
6—11 years	34	21.3
12—17 years	60	37.5
24 years and above	49	30.6
Primary occupation		
Farmer	102	63.8
Marketer	34	21.3
Civil servant	24	15.0

Source: Field Survey, 2021

Table1: indicate that (31.9%) of the respondents are having the family size of 1-5, (46.3%) of the respondents are having the family size of 6-10, while (14.4%) of the respondents are having the family size of 11-15. This implies that the large household size will ensure more net working for information and enhance more availability of information to farmers. In the tradition of African society, a household size is made up of a man, his wife/wives, children and number of dependents. This agrees with Olaniyi, (2013) who stated that farmers had opportunity to get agricultural information through electronic media consequently help in improving their family labour in relation to urban farming.

Table1 indicated that (74.4%) of the respondents are in a cooperative association, while (25.6%) of the respondents are not in a cooperative association. This shows that most of the respondents in the study area are members of cooperative. With this majority of respondents are membership cooperative association, it could be said that majority of the respondents have had long duration of experience as members of cooperative group which can facilitate understanding of agricultural information due to the interaction among members. This implies that farmer may had more access to resources and information that will improve their production practices and highlighting them the importance of some social capital involve in improving productivity.

The result in Table1 revealed that majority of the respondents has farmed for a reasonable number of years, (37.5%) had farming experience of 12-17years in the study area, where (30.6%) had farming experience of 24years, (21.3%) had experience of farming of 6-11years and (10.6%) had farming experience of less than 5years. These years of experience in the farming activities were expected to translate into better utilization and understanding of the agricultural information which may invariably result into better income as well a standard of living. The shows that the more the farmers have experience on farming the more they have technology ideas on how to face farm production problems. This research finding is in line with Abdulsalam *et al.,* (2018) findings that the higher the farming experience, the more the farmers would have gained more knowledge and technological ideas on how to tackle farm production problems and to increase his output and income.

The data in Table1. Indicates, the primary occupation of the respondents in the study area the result shows that (63.8%) are farmers, (21.3%) of the respondents are marketers, while (15.0) are civil servants, this result shows that most of the respondents are farmers. This is because they are into farming activities in the study areas and this reason is a pointer to the most-likely profitability of occupation in the study area.

Farmers Sources of Information in the Study Area.

The result from Table 2 shows the distribution of the respondents according to source of information used by farmers. Majority 55.6% obtained their information from farmers meeting, 47.5% obtained their information from cooperative society. It was also noted that 41.9% obtained their information from extension agent, 35.0% obtained their information from neighbor and friend, 33.8% obtained their information from television, 31.9% obtained their information from Handset, 25.0% obtained their information from contact farmers, 21.3% obtained their information from local leader, 21.3% obtained their information from Radio, 5.6% obtained their information from Posters, 3.1% obtained their information from family meeting, 2.5% obtained their information from Drum, 2.5% obtained their information from Newspapers. This applies that, using these media would have been faster ways of reaching farmers with little effort and much success. Agricultural information transfer,

sourcing and usage thrive better in places where farmers are highly educated (FAO, 1993; Zijp, 1994). On the other hand, it should also be noted that internet and library are still an elitist communication media for most people.

Table 2: Distribution Based Sources of Information Used by the Farmers. (n= 160)

Source of information used by farmers	Frequency	*Percentage (%)
Town crier	8	5.0
Local leader	34	21.3
Television	54	33.8
Farmers meeting	89	55.6
Drum	4	2.5
Radio	34	21.3
Cooperative society	76	47.5
Handset	51	31.9
Extension agent	67	41.9
Neighbor and friend	56	35.0
Family meeting	5	3.1
Contact farmers	40	25.0
Newspapers	4	2.5
Posters	9	5.6

*Multiple responses

Source: Field Survey, 2021

The Effect of Farmers Socioeconomic Characteristics on Utilization of Information Sources

The effect of farmer's socioeconomic characteristics on utilization of information source the results was determine suing multiple regression analysis, the result are presented in table 3, the result revealed and estimated R^2 of 0.89 which accounted of about 89% of the variation of dependent variables were explain by the independent variables which shows the goodness of model.

Table 3: The Effect of Farmers Socioeconomic Characteristics on Utilization of Information Sources

Variables	Coefficient	Std. Err.	t-value
Gender	0.2563	0.1083	2.4**
Age	0.5389	0.0812	6.6***
Marital Status	0.0456	0.0231	2.0**
Level of education	0.0751	0.0229	3.3***
Farm size	0.2150	0.0748	2.9***
Family Size	0.2643	0.0524	5.0***
Membership of association	0.6650	0.0957	6.9***
Years of experience	0.1857	0.0905	2.1**
Primary occupation	0.7434	0.1298	5.7***
_cons	0.2397	0.1047	2.3**
$\bar{R}^2$	0.89		

Source: Field Survey, 2021

Note: **, *** are significant at 5% and 1% respectively

The coefficient of gender was found to be positive and significant at 5% level which implies that they is positive and significant relationship between gender and utilization of information source that is, a respondent being a male uses source of information utilization more than their female counterpart.

The age of the age of the respondent: The coefficient of age was found to be positive and significant at 1% level. This implies that a unit increase in age result to an increase in source of information utilization. This is true because a young and active farmer will look for more information source to increase their agricultural production compare to less experience farmers. This agree with the finding of Ommani and Chizari (2018) who reported that the older farmer utilized less of extension information. Invariably, it means that the younger farmers utilized more of the extension information at their disposal probably due to their youthful exuberance and tendency for adventure.

The Marital status of the respondents: The coefficient of marital status was found to be significant at 5% level. This implies that increase in the marital status result to an increase in source of information utilization. This is because the farmers need to be active and also look for more information source to increase their agricultural production in order to help them have enough produce to use at home and sell.

The education level of the respondent: The coefficient of education level was found to be significant at 1% level that shows they is a highly significant relationship between education of the respondents and their access to agricultural information. This implies that there is a positive relationship; which indicates that with the increase in the educational level of the respondents, there was an increase in their access to information. The results of the present study are in line with those of Katungi (2006) who found in his study "gender, social capital and information exchange in rural Uganda" that more educated farmers had more access to information.

The farm size of the respondents: The coefficient of farm size was found to be significant at 1% level that shows they is a highly significant relationship between size of the land holding of the respondents and their access to agricultural information. They is a positive association between the variables; which indicates that with an increase in the size of land holding of the respondents, there was an increase in their access to agricultural information. The results of the present study are in line with those of Saadi *et al.* (2008) who found a highly significant relationship between land holdings of the respondents and their access to information.

The family size of the respondents: The coefficient of family size was found to be significant at 1% level, that shows they is a highly significant relationship between size of the family of the respondents and their access to agricultural information. They is a positive association between the two; which indicates that with an increase in the size of land holding of the respondents, there was an increase in their access to agricultural information.

The cooperative society of the respondent: The coefficient of cooperative society was found to be significant at 1% level that shows they is a highly significant relationship between cooperative society of the respondents and their access to agricultural information. A positive association was illustrated between the variables; which indicates that with an increase in the cooperative society of the respondents, there was an increase in their access to agricultural information. The results of the present study are in line with those of

Saadi *et al.* (2018) who found a highly significant relationship between cooperative society of the respondents and their access to information.

The farming experience of the respondent: The coefficient of farming experience was found to be 5% significant, that shows they is a highly significant relationship between farming experience of the respondents and their access to agricultural information. They is a positive association between the variables; which indicates that the higher the farming experience, the more the farmers would have gained more knowledge and technological ideas.

The primary occupation of the respondent: The coefficient of primary occupation was found to be significant at 1% level, that shows they is a highly significant relationship between primary occupation of the respondents and their access to agricultural information. They is a positive association between the variables; which indicates that with an increase in the primary occupation of the respondents, there will be an increase in their access to agricultural information.

Constraints faced by Utilization of Modern Information Sources

Various constraints were discovered which militate against information delivery to farmers such as, inadequate fund, improper awareness, incomplete/irrelevant information, information received, extension personality and timeliness of feedback, inadequate extension agent, inconsistency, inadequate facilities/professionals, complexity and language barrier.

From the survey, eleven (11) problems were identified. Results in Table 4 revealed that majority (89.4%) inadequate fund, also 76.3% of farmers indicated improper awareness which also affected the efficiency of agricultural practice and information use. While the least (7.5%) number of respondents indicated the Language barrier as constraints. Therefore, inadequate fund (89.4%), improper awareness (76.3%) and incomplete/irrelevant information (14.17%) were ranked as 1st, 2nd and 3rd constraints respectively to information sourcing. This implies that only fund is a major problem to information sourcing in the study area. It is also probable that the availability of fund may resolve most of the constraints identified. Moreover, the problem of fund probably explains why respondents indicated that they source for information mainly from the extension agents who they regard as credible source and who usually visited them to offer free services. The result in Table 4 also indicates that, language barriers with 7.5% which indicates that various sources of information to the farmers are in local language which is better understood by the farmers.

Table 4: Constraints to Utilization of Modern Information Sources.

Constraint	Frequency	Percentage	Ranking
Inadequate fund	143	89.4	1st
Improper awareness	122	76.3	2nd
Incomplete/irrelevant information	120	75.0	3rd
Information Received	100	62.5	4th
Extension Personality	95	59.4	5th
Timeliness of Feedback	90	56.3	6th
Inadequate extension agent	65	40.6	7th
Inconsistency	34	40.6	7th
Inadequate facilities/professionals	12	28.1	8th
Complexity	95	21.3	9th
Language barrier	45	7.5	10th

***Multiple Responses**
Source: Field Survey, 2021

CONCLUSION AND RECOMMENDATION

Conclusion

From the study, it could be concluded that, the sources to information to rural farmers were from; Farmers meeting, Cooperative society and extension workers. The finding also indicates that the effect of farmers socio-economic characteristics on utilization of information sources in the study area are shown as age, level of education, farm size, family size, member of association and primary occupation were found to be positively and significantly correlated to utilization of modern information sources and It was also discovered that constraints militating against the information utilization are; inadequate fund, improper awareness and incomplete/irrelevant information in the study area

Recommendation

The following recommendations are made based on finding from the study:

i. The farmers should try to form a cooperative association.
ii. The farmers should try to be using available information sources in order to help them in farming system.
iii. Irrelevant information should not disseminated and the information in question should always reach the rural farmers in good time. More so, the feedback mechanism should be strengthened and the extension workers should learn how to adjust to the situations while there on the field.

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