



## **FARMERS ASSESSMENT OF EXTENSION SERVICES DELIVERY IN BAUCHI STATE, NIGERIA**

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### **ABSTRACT**

The study examined farmers' assessment of extension services delivery in Bauchi State Nigeria. A multi-stage random sampling techniques was used in selecting 200 farmers from the three agricultural zones of the State. Data were collected through the administration of structured questionnaires and analyzed using both descriptive and inferential statistics. The findings revealed that majority (84.5 %) of the farmers were male with mean age of 42 years. Also majority (75%) were married with household size mean of 8 persons. Similarly, 38 % had farming experience of 6- 10 years with mean land size of 1.5 hectares. More than half (58%) of the farmers belongs to farmers cooperatives with 26% having monthly extension contact. Similarly, 78% of the farmers received technology under crop and farming sub sector while 88.5% sourced information on extension services delivery from radio. The logistics regression shows that annual income and access to extension were significant at ( $P < 0.01$ ), while extension contact was significant at ( $P < 0.05$ ) in influencing farmers assessment of extension services delivery. The major constraint to extension services delivery were inadequate transportation/mobility of extension workers, inadequate equipment/teaching material and poor extension agent farmer ratio. It was concluded that the key factors influencing farmer's assessment of extension services delivery in the study area were annual income, access to extension and number of extension contact. Based on the constraint highlighted the study recommended that extension agents should be provided with adequate mobility and incentives for easy access to the farmers, more extension workers need to be hired in order to significantly address the issue of poor ratio of extension agents to farming households.

**Keywords:** Assessment, Extension, Farmers, Services delivery, Data.

### **INTRODUCTION**

The history of extension dates back to 1850 when the universities of Oxford and Cambridge began to brainstorm on how they could serve the educational needs of the farmers living close to them. Thus "university extension" emerged when itinerant teachers went about giving lectures to the urban population in literary and social topics. From the 1980s agricultural topics were included for the rural farmers within the university community, (Jones, 2014). The role of agricultural extension in social and economic development of the nation cannot be over-emphasized. Never before in Nigerian history has the necessity for educating and raising the productive capacity of the farmers been of such importance as it is today.

For Nigerian agriculture to improve, our farmers have no alternative but to learn and adopt recommended scientific farming techniques in place of their traditional practices. Perhaps, the slow development of Nigerian agriculture can be attributed to the inability of the



Nigerian farmers to respond positively to new ideas or innovations. For farmers to respond positively to new ideas, they must be properly educated on how best to apply the new ideas or practices to their farming activities (Umeh *et al.*, 2015). This is because the new ideas are often complex, technical and can hardly be understood by most of our farmers. However, different authorities and experts have defined extension in different forms and ways, all ending on the improvement of the standard of living of the people. Fisher (2013) described extension as a system of education extending beyond the classroom to individuals on the farms and is available to every member of the family. Fisher, thus, analyzed extension in terms of family approach system whereby all members of the family are taken into consideration in planning extension programme.

In the agricultural-extension context, assessment is conceptualized as the fulfilment of farmers' prior expectations of the quality of extension services delivery (Elias, *et al.*, 2015). Farmers' assessment reflects the impact of extension services delivery and the extent of the formed mental image, which affects trust building between farmers and agricultural-extension providers in future activities (Kassem, *et al.*, 2020).

In Nigeria, agricultural extension services are free of charge by the government through government agencies both at Federal and States levels (Adejo, *et al.*, 2012). It was observed by Anderson and Feder in 2003 that despite the fact that public financing for extension is often justifiable, the general trends towards fiscal restraint and a reduced role for the public sector has led to financial crisis in public extension services. The challenge is that Nigeria is well reputed for putting in place policies without political will to sustainably implement them (Adejo, *et al.*, 2012). There are sometimes contradictions between national development policy and the interests of the vast majority of the rural poor who are engaged in agricultural production. Despite funding and expected logistics being provided the issue of effective delivery of planned extension services need to be answered, perhaps more realistic and reliable answers will emanate from the targeted receivers of these extension packages (Nasiru *et al.*, 2001). In essence farmers who are the end users of the generated research information and for whom huge lump sums have been collected for funding need to be asked if the information actually reach them. Therefore, the ability of farmers to contribute and participate effectively towards agricultural development depends on their ability to optimize the services of agricultural extension agents. Previous studies have shown that there are little or no empirical studies about farmer's assessment of extension service delivery in Bauchi State.

The main objective of this study was to examine farmers' assessment of agricultural extension service delivery in Bauchi State.

The specific objectives were to:

- i. describe the socio-economic characteristics of farmers;
- ii. identify the types of technologies delivered to farmers;
- iii. determine the factors influencing farmers assessment of extension services delivery;
- iv. identify the sources of extension services delivery available to farmers; and
- v. examine the constraints to extension service delivery in the study area.

The finding of this research is envisaged to provide empirical information about extension services delivery in Bauchi state. The result of the research will therefore help policy makers in fashioning out sustainable policies in the area of extension service delivery. It will also assist in providing more information about farmers and government effort toward agricultural development, more especially in the area of agricultural extension service. The population of the study focused on farmers in the three Agricultural zones of Bauchi State.



## **AMTERIALS AND METHODS**

### **The Study Area**

The study was carried out in Bauchi state. Bauchi State was created on 3rd February, 1976. The state has a population of 8,308,800 million people (NPC projection 2022). The State is located between latitude 9<sup>0</sup>30' and 10<sup>0</sup>48' north of the equator and longitude 8.45' and 15<sup>0</sup> east of the Greenwich meridian. It is bordered by seven States. To the north, it shares boundary with Kano and Jigawa States, Taraba and Plateau States to the south, Gombe and Yobe to the East and Kaduna to the west. The State occupies a total land area of 49,259 square kilometers representing about 5.3 percent land mass of Nigeria (Adaba, 2006). The State has two vegetation zones: Namely, the Sudan Savannah and the Sahel Savannah. Rainfall in the State ranges between 700mm and 1300mm per annum. In the savannah, rainy season Starts in May and ends in October. Rainfall variability increases northwards with relative humidity that ranges from about 12 percent in February to about 68 percent in August. The State has a land mass of 49.4 million hectares out of which 42.0 million hectares is cultivable. Predominant ethnic groups in the State are Hausa, Fulani, Kanuri, Gerawa, Sayawa, Jarawa, Bolawa, Kare – Kare and Warjawa. Suffice it to add that the State is pluralistic in nature as there are still other groups.

### **Sampling techniques and sample size**

Multistage sampling technique was employed for the study. In the first stage, from the three zones of the BSADP, all the Local Governments Area were selected; nine from northern zone, four from central zone and seven from western zone making a total of twenty LGAs. In the second stage, from the LGAs, one block extension was selected randomly making a total of twenty block extension. In the third stage, from the selected blocks, one extension cell was randomly selected. In the final stage, the systematic random sampling with interval of nine was used to select farmers from the sampling obtained from the BSADP.

### **Method of Data Collection**

Data for this study were collected through the administration of structured questionnaire to the respondent in the study area.

### **Method of Data Analysis**

Data for this study were analysed using both the descriptive and inferential statistics. Descriptive statistics such as mean, frequency distribution and percentage, rankings were used in analysing objective i, ii, iv, v and vi. The inferential statistics used in the study was ordered-logit model to analyse objective iii, it is empirically specified in Eq. (1):

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 \dots + \varepsilon \dots 1$$

where; Y = Response of farmers to extension services delivery and this will be measured by individual farmers response to extension services. (Yes delivery =1, No delivery =0)

X<sub>1</sub>=Age (years)

X<sub>2</sub>=sex (male=1 female=0)

X<sub>3</sub>=Marital status (Single; divorced, widowed or Married)

X<sub>4</sub>= Education (number of years spent in formal education)

X<sub>5</sub>=Household size (number of persons)

X<sub>6</sub>= Farming experience (Years)

X<sub>7</sub>=Membership to association (yes=1, No=0)

X<sub>8</sub>=Extension contact (Number of times)

X<sub>9</sub>= Land size (hectares)

X<sub>10</sub>= Access to credit (access=1, non-access=0)



$X_{11}$  = Annual income (₦)

$\varepsilon$  = Error term

$B_1, B_{11}$  = Regression coefficients

## RESULTS AND DISCUSSION

### Socio-economic Characteristics of the Respondents

The results in Table 1 reveals that 32.0% of the farmers were within the age bracket of 31-40 years while 23.0%, 20%, 13.5% and 11.5% fell within the age bracket of 20-30, 51 – 60 and more than 60 years of age respectively with an average of 42. This means that more than half of the respondents are youth and fell between the ages of 20 to 40 years. The results also reveal that majority (84.5%) of the farmers were male while the females constituted 15.5%. Thus, male headed households engage in farming more than female headed households. This could be due to the socio-cultural background of the area which gives males the access to production resources such as land more than females. The result further reveals that majority (75%) of the respondents were married, 18.5% were single while 4% were widows and 2.5% were divorced. This implies that most of the respondents are burdened with the responsibility of catering for the needs of their families. Similarly, the results indicate that less than half (45.0%) of the respondents attended tertiary education as their level of education, while 27%, 18% and 9.5% attended secondary, non-formal education, primary school respectively as their level of education. Thus, implies that majority of the respondents had basic education which can help them in their agricultural activities.

The results also show that 30% of the farmers had 6 -10 members in their respective households, while 23.5%, 17.5% and 13% had a family size between 1 – 5, none and 11 – 15 members respectively with an average of 8 persons. In addition, the results further depict that 8% of the total respondent had household size of 16 -20 and more than 20 respectively. The results from Table 1 also depicts that less than half (31.5%) of the farmers were found to have more than 20 years of farming experience while 22.5%, 19%, 16% and 11% had between 1 - 5 year, 5 - 10 years, 11 – 15 years and 15 – 20 years of farming experience respectively with an average farming experience of 17 years. This implies that the farmers in the study area had reasonable experience in their production.



**Table 2:** Socio-economic Characteristics of Farmers (n = 200)

Variables	Frequency	Percentage	Mean
<b>Age (years)</b>			
20-30	46	23.0	42
31-40	64	32.0	
41-50	40	20.0	
51-60	27	13.5	
>60	23	11.5	
<b>Sex</b>			
Male	169	84.5	
Female	31	15.5	
<b>Marital status</b>			
Single	37	18.5	
Married	150	75.0	
Widow	8	4.0	
Divorced	5	2.5	
<b>Educational type (years)</b>			
Non formal education	37	18.5	
Primary education	19	9.5	
Secondary education	54	27.0	
Tertiary education	90	45.0	
<b>Household size</b>			8
None	35	17.5	
1-5	47	23.5	
6-10	60	30.0	
11-15	26	13.0	
16-20	16	8.0	
>20	16	8.0	
<b>Farming experience (Years)</b>			17
1-5	45	22.5	
6-10	38	19.0	
11-15	32	16.0	
15-20	22	11.0	
>20	63	31.5	
<b>Land size</b>			1.5
0.5-1	82	41.0	
1.5-2	57	28.5	
2.5-3	31	15.5	
3.5-4	30	15.0	

Source: Field Survey, 2021





**Table 2:** Socio-economic Characteristics of Farmers (n=200) **Cont'd.**

Variables	Frequency	Percentage	Mean
<b>Annual income (₦)</b>			<b>712375</b>
300000-450000	87	43.5	
460000-600000	38	19.0	
610000-750000	16	8.0	
760000-900000	13	6.5	
910000-1000000	16	8.0	
>1000000	30	15.0	
<b>Access to credit</b>			
No	106	53.0	
Yes	94	47.0	
<b>Membership of farmers' cooperative</b>			
No	83	41.5	
Yes	117	58.5	
<b>Extension contacts</b>			
None	37	18.5	
Weekly	13	6.5	
Fortnightly	17	8.5	
Monthly	52	26.0	
Quarterly	46	23.0	
Annually	35	17.5	

Source: Field Survey, 2021

The result further reveals that less than half (41.0%) of the farmers had land size of 0.5-1.0 hectares, 28.5% had farm size of between 1.5-2.0 hectares while 15.5% and 15% of the farmers had farm size of 2.5-3 and above 3.5 hectares respectively with an average farm size of 1.5 hectares. This implies that farmers in the study area are mainly smallholder farmers operating on little plots of farmland.

Similarly, the results from Table 1 also shows that 43.5% of the farmers generate between ₦ (300000 – 450000) while 19% and 15% earned between ₦ (460000-600000) and above ₦1000000 respectively. Also 8% and 6.5% had their annual income ranging from ₦ (610000 – 750000), ₦ (910000 – 1000000) and ₦ (760000 – 900000), respectively. This shows that most of the farmers earn not more than 450000 annually with a mean annual income of ₦712375. The results further reveal that majority (53.0%) of respondents had no access to credit. Majority (58.5%) of the respondents belongs to various cooperatives societies or the other. This implies that majority of the farmers are engaged in cooperative societies in the study area which indicates appreciable level of coordinated activities of the extension services towards agricultural development in the State. Less than half (26%) of the farmers had monthly contact, 23% and 17.5% were visited quarterly and annually respectively while 8.5% and 6.5% had fortnightly and weekly contact respectively. However, 18.5% reported no contact. The implication of regular extension visits is increase in exchange of information between the agents and farmers, it also enables timely response to challenges.

### **Types of Technology Delivered to farmers**

The results from Table 2 shows that majority (78.5% and 64%) of the respondents received technologies on crops and farming system, livestock farming and fisheries sub sector. The results also reveals that 65% of the farmers benefited from technologies related to crop



protection. More than half (53.5 and 51%) of the farmers received technologies on marketing and SG-2000(Sassakawa Global) respectively. The results further reveal that less than half (48.5%, 48% and 48%) of farmers received technologies on home economics, animal traction and soil conservation respectively. This implies that extension activities in the study area is crop based as most of the technologies are geared towards agronomic practices which dominates technologies on livestock and this could be due to the high concentration of crop farming in the study area.

**Table 2:** Distribution of Farmers according to Types of Technology delivered (n=200)

Technology	Frequency*	Percentage
Crops and farming system	157	78.5
Livestock farming	128	64.0
Fisheries	128	64.0
Crop protection	131	65.5
Animal traction	96	48.0
SG-2000	102	51.0
Marketing technologies	107	53.5
Soil conservation	96	48.0
Home economics	97	48.5

\*Multiple Response existed

Source: Field survey, 2021

### **Factors Influencing Farmers' Assessment of Extension Services Delivery**

The result from Table 3 shows factors influencing farmer's assessment of extension service delivery. The findings reveal that age, sex, marital status, household size, educational level, farming experience, farm size, access to credit, major occupation and membership of cooperatives were not significant which implies that these factors had no relationship with assessment of extension service delivery in the study area. The pseudo-R<sup>2</sup> was 0.4877, indicating that the explanatory variables explained around 48 % of the variation in farmer assessment of extension services delivery.

On the other hand, the result shows that access to extension and annual income of the respondent were found to be negative and significant ( $P < 0.01$ ) probability level. This implies that as income increases, assessment of extension services decreases, this may not be unconnected to the fact that most farmers with good income are innovators, they don't wait for technology to come to them through extension agents rather they search for it in order to boost their farming activities. The result further shows that access to extension was positive and significant ( $P < 0.01$ ) in influencing assessment of extension services delivery. This implies that as access to extension increases the better the assessment of extension services delivery in the study area. In addition, extension contact was negative and significant ( $P < 0.05$ ) in influencing the assessment of extension services delivery. This implies that assessment of extension services delivery decreases with increase in contact of farmers with extension agents. This is in line with opinion expectation because farmers can only assess delivery, they come into contact with extension agents and vice-versal.



**Table 3:** Factors Influencing Farmers' Assessment of Extension Services Delivery

Variables	Coef.	Std. Err.	z	P> z
Age	-.0107571	.0501089	-0.21	0.830
Sex	-.0347947	.936058	-0.04	0.970
Marital status	-.1257533	.5651263	-0.22	0.824
Household size	.0072883	.0717212	0.10	0.919
Highest education	-.0960473	.2507021	-0.38	0.702
Farming experience	.0142533	.044698	0.32	0.750
Farm size	.4180217	.3914725	1.07	0.286
Access credit	-.3620073	.6453002	-0.56	0.575
Main occupation	.3302592	.2364685	1.40	0.163
Annual income	-1.165006	4.305007	-2.69	0.007***
Farmer's cooperatives	-.1226843	.6508214	-0.19	0.850
Access to extension	7.842769	1.880157	4.17	0.000***
Extension contacts	-.8366916	.4012037	-2.09	0.037**
Constant	-.3209819	2.081202	-0.15	0.877
Pseudo R <sup>2</sup> = 0.4877				
Loglikelihood=-51.270798				

Note: \*\*\* P<0.01, \*\* P<0.05

Source: Field Survey 2021

### Sources of Extension Services Delivery Available to Farmers

Table 4 shows that majority (88.5%, 87% and 86.5) % of the respondents sourced information on extension services from Radio, fellow farmers and friends/neighbor respectively, 69 % of the farmers sourced information from farmers group/cooperatives, while 68.5% and 61% of the respondents also received information on extension services delivery from extension agent and community leaders, respectively.

**Table 4:** Distribution of Farmers according to Sources of Information on Extension Services Delivery. (n=200)

Source	Frequency*	Percentage	Rank
Radio	177	88.5	1 <sup>st</sup>
Fellow farmers	174	87.0	2 <sup>nd</sup>
Friends/neighbor	173	86.5	3 <sup>rd</sup>
Farmers groups/Cooperatives	138	69.0	4 <sup>th</sup>
Extension agents	137	68.5	5 <sup>th</sup>
Community leaders	122	61.0	6 <sup>th</sup>
Television	118	59.0	7 <sup>th</sup>
Internet	102	51.0	8 <sup>th</sup>
NGOs	90	45.0	9 <sup>th</sup>
Educational institutions	78	39.0	10 <sup>th</sup>
Research institutes	68	34.0	11 <sup>th</sup>
Print media	45	22.5	12 <sup>th</sup>

\*Multiple Response

Source: Field survey, 2021

The result (Table 4) also reveals that more than half (59% and 51%) of the farmers received information on extension services delivery from television and internet respectively, while 45% sourced information from NGOs. Less than half (39%, 34% and 22.5%) of the respondents sourced information on extension services through educational institution, research institute and print media respectively. As indicated above large percentage of farmers





sourced information from radio and this is in line with Sennuga *et al.* (2020) that farmers preferred traditional ICT, mainly radio as their main source of accessing agricultural information.

### **Constraints faced by Farmers on Extension Services Delivery**

The results from Table 5 shows that all the constraint mentioned were perceived by the farmers to be limitations to extension services delivery in the study area. However most (92%) of the farmers reported that inadequate transportation/ mobility was a major constraint limiting extension services delivery in the study area which was ranked 1<sup>st</sup>. Abasi (2009), in agreement reported that the numbers of extension workers were very few compared to the number of farmers. That the few available extension workers had no-mobility to visit the farmers as many of them were not prepared to live in rural areas where farmers reside. The result also reveals that majority (84% and 75%) of the respondents perceived inadequate equipment/ teaching materials and poor extension agent farmer ratio respectively were among the major constraint to extension services delivery which were ranked 2<sup>nd</sup> and 3<sup>rd</sup> respectively. However, 65%, 62% and 60% of the respondents also reported inadequate sources of information, inconvenient training schedule and lack of clarity of extension messages respectively to be limitations to extension services delivery. The result further reveals that more than half (58%) of the farmers perceived inadequate skills as constraint to extension services delivery while 52% and 51% reported high frequency of transfer and poor attitudes as limitations to effective extension services delivery.

**Table 5:** Distribution of Farmers according to Constraints to Extension Services Delivery

Constraint	Frequency*	Percentage	Rank
Inadequate transportation/ mobility	184	92	1 <sup>st</sup>
Inadequate equipment and teaching materials.	169	84	2 <sup>nd</sup>
Poor extension agent farmer ratio	150	75	3 <sup>rd</sup>
Inadequate sources of information	130	65	4 <sup>th</sup>
Inconvenient training schedule	124	62	5 <sup>th</sup>
Lack of clarity of extension message	120	60	6 <sup>th</sup>
Inadequate skills	113	58	7 <sup>th</sup>
High frequency of transfer	105	52	8 <sup>th</sup>
Poor attitudes	103	51	9 <sup>th</sup>

\*Multiple Response

Source: Field survey, 2021

### **CONCLUSION AND RECOMMENDATIONS**

Based on the findings of this study, it can be concluded that the key factors influencing farmer's assessment of extension services delivery in the study area were annual income, access to extension and number of extension contact. The extension services delivery in the study area could be improved by addressing major constraint such as inadequate transportation/mobility, inadequate equipment /teaching materials and poor extension agent farmer ratio to mention few. The need to address this constraints cannot be overemphasize because it has potentials for improving extension services delivery and vis - a - vis improving the productivity of farmers in the study area. Based on the findings of the study, the following recommendations were made:

1. The extension agents should be provided with adequate mobility and incentives for easy access to the farmers.



2. Effort should be made to provide additional funding support to Agricultural Development Programme to provide extension agents with adequate equipment and teaching materials for effective extension services delivery.
3. More extension workers need to be hired in order to significantly address the issue of poor ratio of extension agents to farming households.
4. Government should employ more agricultural graduates youths and train them.
5. Efficient extension services should be rendered by competent extension agents who are under continuous training and retraining programmes and continuously supported by a dynamic system of monitoring and evaluation and good government policy.

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