Research Articles

DOI: 10.48165/jes.2025.41.1.1

Journal of Extension Systems
Year 2025, Volume-41, Issue-1 (Jan-Jun)

ISSN 0970-2989 **(Print)**
ISSN 2582-273X **(Online)**

Contact Farmers and Extension Personnel Perceptions of Constraints to Effectiveness of Agricultural Extension Services Delivery in Ondo State, Nigeria

Chete, O. B.

Department of Agricultural Extension and Rural Development
Adekunle Ajasin University, P.M.B.001 Akungba Akoko, Nigeria

ARTICLE INFO

Keywords: contact farmers; extension personnel; constraints

ABSTRACT

This research was conducted to investigate contact farmers' and extension personnel perceptions of constraint to effectiveness of agricultural extension service delivery in Ondo State, Nigeria. One hundred (100) contact farmers and twenty (20) extension agents were selected using simple random sampling technique. The data collected were subjected to descriptive and inferential analyses. The study found that majority (76%) of the farmers and all the extension agents (100%) indicated that agricultural extension services assisted in training farmers on improved farming techniques. The majority (97%) of the farmers and extension agents (95%) agreed that lack of motivation of extension personnel constrains the effectiveness of extension services. The major constraints to effectiveness of extension service by contact farmers include inadequate training of extension personnel ($\bar{x}$ = 1.86), lack of trust in extension agent ($\bar{x}$ = 1.65), low literacy rate ($\bar{x}$ =1.56) and limited access to information and technology ($\bar{x}$ =1.53) while the major constraints identified by the extension officers include high input cost, lack of trust in extension agents and inadequate training of extension personnel all with a $\bar{x}$ of 2.0 and within the mean response $\bar{x}$ (2.0). The results of the hypothesis tests shows that there is a significant relationship between contact farmers' and extension personnel's constraints to effectiveness of agricultural extension services as the variables are positively correlated (r= 0.678, $P<0.05$). Majority of the contact farmers suggested the following as solutions to constraints to effectiveness of agricultural extension services; Agricultural extension centers should be equipped with instructional materials for disseminating agricultural information or new innovations ($\bar{x}$ =1.26), Employment of more extension personnel to improve the effectiveness of extension service delivery ($\bar{x}$ =1.20), Farmers should be ready to work with the extension personnel and accept the services provided to them ($\bar{x}$ =1.18). The study recommends that more extension personnel should be employed and fortified with necessary equipment and facilities to enhance effective dissemination of information for the transformation of agriculture in the state. Proper planning of extension programmes should be made before being implemented to identify and tailor it to the needs of the farmers.

Corresponding author
Emails: cheteob4@gmail.com

1.0 Introduction

Agricultural extension is at the heart of the delivery of relevant information to farmers for increased productivity. According to Apantaku, Aromolaran, Shobowale and Sijuwola (2015), agricultural extension service delivery is concerned with communicating research findings, improved agricultural practices and innovation to transform agricultural production for food security and development of agrarian communities (Maake and Antwi, 2022).

Musa, Abdullahi and Sulaiman (2023) opined that the goal of extension services is to provide research-based information, educational programs, technology transfer and needs of the farmers, thereby enabling them to make informed decisions about their economic, social, and cultural wellbeing. According to Okello, Akite, Atube, Kalule and Ongeng (2023), when farmers lack access to knowledge and information that would help them achieve maximum crop yield, or relevant information on agricultural practices, they not only grope in the dark, but are driven by circumstances to migrate in search of formal employment, as an option for survival, which undermines agricultural production.

Contact farmers experiment or adopt new agricultural practices and transmit them to other farmers. They perform the role of opinion leaders, who receive new agricultural information from extension agents and communicate them to other farmers intentionally or at the request of those farmers who noticed the positive impact of the new practices, and keen to implement them on their farms.

Despite the role of agricultural extension services in enhancing agricultural productivity and improving the livelihoods of farmers in Nigeria, the sector faces several challenges from the perspectives of farmers and extension officers (Ezima *et al*., 2023).

This study explores the constraints faced by contact farmers and extension personnel in Ondo State, Nigeria in the delivery agricultural extension services.

1.1Research questions

1. What are the socioeconomic characteristics of contact farmers and extension personnel?
2. What are the perceptions of farmers and extension personnel on the effectiveness of agricultural extension services?
3. What are the major constraints hindering effective agricultural extension service delivery?
4. What are the strategies and interventions that can be implemented to address these constraints?

1.2 Objective of the study

The broad objective of the study was to examine contact farmers and extension personnel's perception of the constraints to effectiveness of agricultural extension services delivery in Ondo State, Nigeria

The specific objectives were to:

1. describe socioeconomic characteristics of contact farmers and extension personnel in the study area.
2. ascertain contact farmers' and extension personnel's perception of the effectiveness of agricultural extension servicesin the study area.
3. identify respondents'constraints to effectiveness of agricultural extension service in the study area and.
4. Analyse respondents' solutions to the constraints hindering the effectiveness of agricultural services.

1.3 Hypotheses

1. There is no difference between socioeconomic characteristics of contact farmers and constraints to the effectiveness of agricultural extension services.
2. There is no difference between socioeconomic characteristics of extension personnel and constraints to the effectiveness of agricultural extension services.
3. There is no significant relationship between contact farmers' and extension personnel's constraint to effectiveness of agricultural extension services.

2.0 Methodology

2.1 Study area

Ondo State is in the South-western part of Nigeria with the land area of about 15,195.2 km^{2}andlies at latitude 7° 10′ North and longitude 5° 05′ East. The State is predominantly tropical rainforest with forest savannah to its North and mangrove swamps to its South. The State is characterized by heavy rainfall which ranges from 1500 mm to 2000 mm with the climate mimicking the tropical pattern, while the temperature ranges from 21°C to 29°C coupled with high relative humidity. The state is the 25th-largest state by landmass and the 19th most populated state in the country. It is made up predominantly of the Yoruba ethnic stock and the state economy is dominated by the petroleum industry, cocoa production, and asphalt mining. The major occupation of the people is farming.

2.2 Study population

The population of the study comprised all contact farmers and extension personnel in Ondo state, Nigeria.

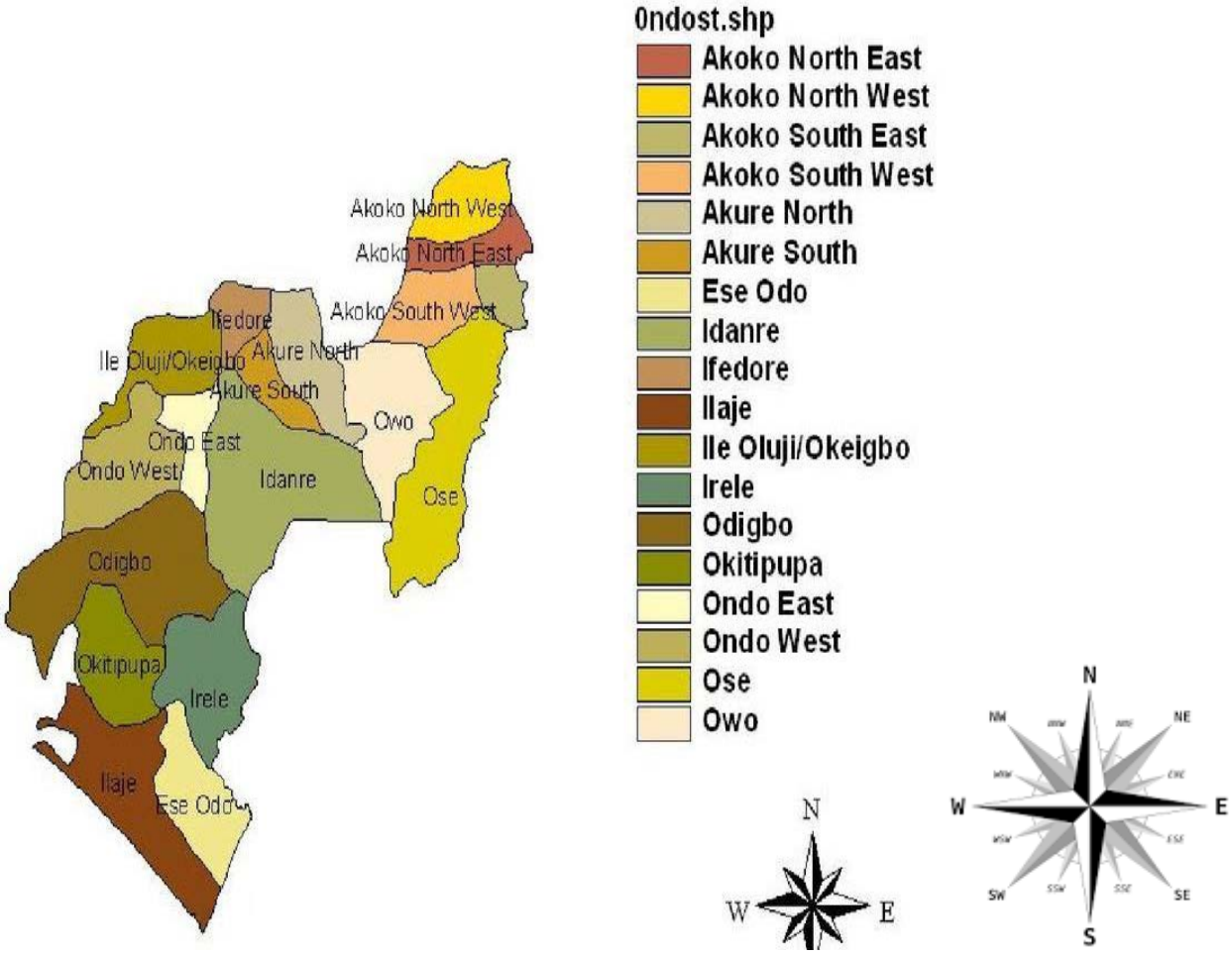

Figure1: Map of Ondo State, Nigeria.
Source: Mapcarta (2023)

2.3 Sampling procedure and size

A multistage sampling procedure was used to select the respondents for this study. Ondo state was purposively selected in the first stage due to the prevalence of extension service activities in the state. The second stage involved a purposive selection of five local government areas from the eighteen Local Government Areas in Ondo State. In the third stage, 20 respondents each were randomly selected from the five local government totalling 100 contact farmers. The state has two agricultural zones namely, Owo and Ondo zones with eight and ten blocks respectively. Both blocks have a total of 51 extension agents. However, 20 extension agents were randomly selected and used as the respondents for the study. Therefore, a total of one hundred and twenty (120) respondents were used for the study.

2.4 Method of data collection

Quantitative data was obtained through primary data collection using well-structured validated questionnaire.

2.5 Sources of data collection

Data was obtained from primary source. Primary data was collected using well-structured validated questionnaire to capture the objectives of the study. The secondary data were collected through review of related literature such as textbooks, journals, bulletins, seminar, and conference papers among others.

2.6 Validity and reliability of the instrument

A well-structured questionnaire validated by expert judgement was used to gather data from the respondents. The reliability of the instrument was determined through Test - retest method.

2.7 Measurement of variables

2.7.1 Dependent variable

Constraints to effectiveness of agricultural extension

services delivery Respondents were asked to indicate constraints to effectiveness of agricultural extension services. Using a 3-point Likert scale coded as not a constraint (3), mild constraint (2)and severe constraint(1). There were nine elements and they included: "Inadequate extension agents, Inadequate knowledge and skills of extension agents, Poor infrastructure, High input cost, Lack of trust in extension agent, Limited access to information and technology, Inadequate resources, Low literacy rate, Inadequate training of extension personnel."

Independent variables

Perception of agricultural extension services by respondents

Contact farmers and extension personnel were asked to indicate their perception from a list using a 4-point likert scale coded as 4 strongly agreed, 3 agreed, 2 disagreed & 1 strongly disagreed. There were eight elements for positive and reversed for negative statements and they included: "Agricultural extension services is good and helps to improve farming activities, Insufficient extension personnel does not hinder the effectiveness of extension service delivery, Agricultural extension services helps in training farmers on better ways of farming, Extension services can be effective without government support, Poor transportation network does not affect extension service delivery" among others.

Possible solutions to the constraints to effectiveness of agricultural extension services

Respondents were asked to indicate possible solution to the constraints to effectiveness of agricultural extension services. This was measured as Yes and No. 2 for No and 1 for Yes. There were six elements and they included: "Agricultural extension centers should be equipped with instructional materials for disseminating agricultural information or new innovations", "Farmers should be ready to work with the extension personnel and also accept the services provided to them", "Extension programs should be well planned before beingdisseminated to the farmer", "The scope of area to be covered by extension personnel should not be too wide for individual extension personnel to cover so as to promote effective agricultural extension service delivery", "Employment of more extension personnel to ease the effectiveness of extension service delivery". "Funds should be provided for extension personnel to facilitate their work".

2.8 Method of data analysis

The data collected was analyzed using both descriptive and inferential statistics. The descriptive statistics involved the use of frequency distribution, mean and percentages. Correlation analysis and t-test was used to test the hypotheses.

2.9. Results and Discussion

3.0. Socioeconomic characteristics of the respondents

Table 3.1 showed that majority (56%) of the farmers and 40% of the extension agents were in the productive age bracket of 36-45 years. These results agree with Apantaku *et al.* (2015) who also discovered that the farmers captured in their study were in the productive age 20 to 55 years, while the extension agents were aged between 40 and 60 years. The respondents were mostly males (64% farmers & 60% extension agents). This aligns with the findings of Ibitoye (2015) who reported that more men were engaged in farming in Kogi State than women. The preponderance of male farmers also reflects the heavily manual and tedious nature of farming in Nigeria which requires considerable energy to accomplish. Most (66%) of the farmers and 100% of extension agents were married, suggesting implicitlythat the farmers and extension workers considered their occupations as sufficient to maintain their families (Ibito, 2015).Fifty two percent of farmers and 55% of the extension agents were Christians which is not unusual in Southwestern Nigeria which is split down the middle between Christians and Muslims.

The analysis of the respondents' average monthly income reveals that about 51% of the farmers earned monthly income above #150, 000 while about half of the extension workers also earn above #150, 000. Meanwhile, 27% of farmers earned between #100, 001 and#150, 000 while 50% of extension workers also earned between #100, 001 and #150, 000. Only about 11% of the farmers earned less than#150,000.Approximately half (54%) of the farmers had between 5-10 years' experience in farming while majority 65% of extension workers had above 11 years' experienceon the job. This corroborates the finding of Antwi-Agyei and Stringer (2021) who also reported the same or close figures (9-11 years).About 42% (farmers) and 20% (extension agents) had secondary education while 11% of the farmers and 50% of the extension agent had tertiary education. However, 19% of farmers had no formal education.Thus, the educational status of the farmers in the study area was generally high (Apantaku *et al*., 2015).

Table 3.1: Socioeconomic characteristics of respondents.

	Contact Farmers		Extension agents	
Variables	Freq	%	Freq	%
Age				
25-35	11	11.0	-	-
36-45	56	56.0	8	40.0
45 and above	33	33.0	12	60.0
Sex				
Male	64	64.0	12	60.0
Female	36	36.0	8	40.0
Marital status				
Single	-	-	-	-
Married	66	66.0	20	100.0
Divorced	15	15.0	-	-
Widowed	19	19.0	-	-
Religion				
Christian	52	52.0	11	55.0
Muslim	48	48.0	9	45.0
Average monthly income				
Less than 50,000	11	11.0	-	-
50,000-100,000	11	11.0	-	-
100,001-150,000	27	27.0	10	50.0
Above 150, 000	51	51.0	10	50.0
Level of education				
No formal education	19	19.0	-	-
Adult education	12	12.0	6	30.0
Primary education	16	16.0	-	-
Secondary education	42	42.0	4	20.0
Tertiary education	11	11.0	10	50.0
Years of experience				
Less than 5	7	7.0	7	35.0
5-10	54	54.0	-	-
11 and above	39	39.0	13	65.0

Source: Field Survey, 2023

3.2 Perception of contact farmers and extension personnel of the effectiveness ofagriculturalextension services

Table 3.2 shows that majority of the contact farmers disagreed that "Extension services can be effective without government support (x′ =3.24; 3.0)," Poor transportation network does not affect extension service delivery support (x′ = 2.74; 2.55)," "Lack of capital does not affect the effectiveness of extension service delivery (x′ =3.11; 3.10)" fell within the favourable response of (x′ =2.5). The results show that the majority (76%) of the farmers and all the extension agents (100%) indicated that agricultural extension services help in training farmers on better ways of farming.

Majority (97%) of the farmers and extension agents (95%) agreed that lack of motivation by extension personnel makes the extension service ineffective. This is substantiated by Apantaku *et al*. (2015) who arrived at the same conclusion. Similarly, about 81% of the farmers and 95% of extension agents believed agricultural extension services are good and help to improve farming activities. The results also reveal that about 78% of farmers and 100% of extension agents disagreed that poor transportation network does not affect extension service delivery. Majority (76%) of the farmers and 100% of extension agents disagreed that extension services can be effective without government support. About 55% of farmers and 15% of extension agents disagreed with the statement that insufficient extension personnel do not hinder

the effectiveness of extension service delivery. Lastly, about 97% of farmers and 100% of extension agents disagreed that insufficient fund is not a barrier for the effectiveness of agricultural extension service. This suggest that funding constrains the effectiveness of agricultural extension services. This finding is validated by Apantaku *et al*. (2015) that Nigeria's extension service is bedeviledby several problems which include inadequacy and instability of funding and poor logistic support for staffs.

Table 3.2: Contact farmers and extension workers perceptions of effectiveness of agricultural extension services.

	Contact farmers									Extension workers								
	SA		A		D		SD		x′	SA		A		D		SD		x′
Variables	F	%	F	%	F	%	F	%		F	%	F	%	F	%	F	%	
Agricultural extension services is good and helps to improve farming activities	33	33.0	48	48.0	14	14.0	5	5.0	1.91	12	60.0	7	35.0	1	5.0	-	-	1.45
Insufficient extension personnel do not hinder the effectiveness of extension service delivery	45	45.0	43	43.0	12	12.0	-	-	1.67	7	35.0	10	50.0	3	15.0	-	-	1.80
Agricultural extension services help in training farmers on better ways of farming	76	76.0	16	16.0	8	8.0	-	-	1.32	20	100.0	-	-	-	-	-	-	1.00
Extension services can be effective without government support	-	-	-	-	-	76.0	24	24.0	3.24	-	-	-	-	20	100.0	-	-	3.00
Poor transportation network does not affect extension service delivery	7	7.0	14	14.0	78	78.0	-	-	2.74	3	15.0	3	15.0	14	70.0	-	-	2.55
Lack of motivation towards extension personnel makes the extension service ineffective	45	45.0	52	52.0	3	3.0	-	-	1.58	13	65.0	6	30.0	1	5.0	-	-	1.40
Lack of capital does not affect the effectiveness of extension service delivery	-	-	7	7.0	75	75.0	18	18.0	3.11	-	-	-	-	18	90.0	2	10.0	3.10

Variables	Contact farmers									Extension workers								
	SA		A		D		SD		x′	SA		A		D		SD		x′
	F	%	F	%	F	%	F	%		F	%	F	%	F	%	F	%	
Insufficient aids needed to disseminate information reduce the rate of effectiveness of extension service	69	69.0	28	28.0	3	3.0	-	-	1.80	4	20.0	16	80.0	-	-	-	-	1.80

Source: Field Survey, 2023
x′ ≥ 2.5 = favourable response
x′ < 2.5 = unfavourable response

3.3 Contact farmers and Extension workers' constraints to effectiveness ofagricultural extension services

For the contact farmers, the major constraints to effectiveness of extension service as presented in Table 3.3.include inadequate training of extension personnel(x′ = 1.86), lack of trust in extension agent(x′ = 1.65), low literacy rate (x′ =1.56) and limited access to information and technology (x′ =1.53). This partly agrees with the findings of Apantaku *et al.* (2015) who reported inadequate extension equipment, insufficient extension personneland improper planning of extension programme as the major constraints to effectiveness of agricultural extension services. The major constraints identified by the extension officers as displayed in Table 3.3.include high input cost (x′ =2.0), lack of trust in extension agents (x′ =2.0) and inadequate training of extension personnel (x′ =2.0).

Table 3.3. Contact farmers perceived constraints to effectiveness of agricultural extension services.

Variables	Severe constraint		Mild constraint		Not a constraint		x′
	Freq	%	Freq	%	Freq	%	
Inadequate training of extension personnel	42	42	33	33	25	25	1.86
Lack of trust in extension agent	46	46	50	50	4	4	1.65
Low literacy rate	35	35	63	63	2	2	1.56
Limited access to information and technology	43	43	54	54	3	3	1.53
High input cost	69	69	25	25	6	6	1.48
Inadequate knowledge and skills of extension agents	63	63	32	32	5	5	1.43
Poor infrastructure	61	61	34	34	5	5	1.37
Inadequate extension agents	76	76	23	23	1	1	1.34
Inadequate resources	88	88	7	7	5	5	1.18

Source: Field Survey, 2023
Mean response≥2.0

Table 3.3.2 Extension workers perceived constraints toeffectiveness of agricultural extension services

Variables	Severe constraint		Mild constraint		Not a constraint		x′
	Freq	%	Freq	%	Freq	%	
High input cost	0	-	20	100	-	-	2.00
Lack of trust in extension agent	0	-	20	100	-	-	2.00

Inadequate training of extension personnel	7	35.0	6	30.0	7	35.0	2.00
Inadequate extension agents	4	20	16	80.0	-	-	1.80
Inadequate knowledge and skills of extension agents	11	55	9	45	-	-	1.45
Limited access to information and technology	17	85.0	2	10.0	1	5.0	1.20
Inadequate resources	18	90.0	0	-	2	10	1.20
Poor infrastructure	20	100	0	-	-	-	1.00
Low literacy rate	20	100.0	0	-	-	-	1.00

Source: Field Survey, 2023
Mean response≥2.0

3.4 Solutions to constraints to effectiveness of agricultural extension services by contact farmers and extension agents

The suggested solutions to constraints to effectiveness of agricultural extension services by the contact farmers as presented in Table 3.4. are agricultural extension centers should be equipped with instructional materials for disseminating agricultural information or new innovations (x′ =1.26);employment of more extension personnel to improve the effectiveness of extension service delivery (x′ =1.20);farmers should be ready to work with the extension personnel and accept the services rendered to them (X=1.18);funds should be provided for extension personnel in order to work effectively (x′ =1.14); scope of area to be covered by extension personnel should not be too wide for individual extension personnel to cover (X=1.12) and extension programmes should be planned well before been shared with farmer (x′ =1.10).

Table 3.4. Contact farmers solutions to constraints to effectiveness of agricultural extension services

Variables	Yes		No		
	Freq	%	Freq	%	x′
Agricultural extension centers should be equipped with instructional materials for disseminating agricultural information or new innovations	74	74	26	26	1.26
Employment of more extension personnel to improve the effectiveness of extension service delivery.	80	80	20	20	1.20
Farmers should be ready to work with the extension personnel and accept the services rendered to them.	82	82	18	18	1.18
Funds should be provided for extension personnel to work effectively	86	86	14	14	1.14
The coverage area of extension personnel should not be too wide for individual extension officers	88	88	12	12	1.12
Extension programmes should be well planned before launching out to the farmers	90	90	10	10	1.10

Source: Field Survey, 2023

Table 3.4.2. Extension workers suggested solutions to constraints to effectiveness of agricultural extension services.

Variables	Yes		x′
	Freq	%	
Agricultural extension centres should be equipped with instructional materials for disseminating agricultural information or new innovations	20	100	1.5
Farmers should be ready to work with the extension personnel and accept the services rendered to them.	20	100	1.5
Extension programmes should be planned well before beingshared the farmer	20	100	1.5

The scope of area to be covered by extension personnel should not be too wide for individual extension officers	20	100	1.5
Employment of more extension personnel to ease the effectiveness of extension services delivery.	20	100	1.5
Funds should be provided for extension personnel to work effectively	20	100	1.5

Source: Field Survey, 2023

4.0. Hypothesis testing

4.1Difference between socioeconomic characteristics of rural farmers and constraints towards the effectiveness of agricultural extension services

Table 4.1 reveals that the socioeconomic characteristics of rural farmers has no significant (P>0.05) difference with the constraints to the effectiveness of agricultural extension services This implies that the socioeconomic characteristics of contact farmers does not influence the constraints to effectiveness of agricultural extension services

Table 4.1: Difference between the socio-economic characteristics of farmers and constraints to the effectiveness of agricultural extension service delivery

Variables	Coefficient	t-values	p-values	Decision
(Constant)	117.636	0.384	0.738	Not Significant
Sex	24.747	0.045	0.968	Not significant
Marital status	35.907	-0.136	0.905	Not significant
Religion	16.058	0.352	0.759	Not significant
Educational qualification	32.116	0.302	0.791	Not significant
Years of experience	21.743	0.255	0.822	Not significant

P > 0.05
Source: Field Survey, 2023

4.2 Difference between socio-economic characteristics of Extension personnel and constraints to the effectiveness of agricultural extension services

Table 4.2 revealed that the socioeconomic characteristics of extension agents has no significant (P>0.05) difference with constraints to the effectiveness of agricultural extension services. This also implies that the socioeconomic characteristics of extension officers does not constrain the effectiveness of agricultural extension services

Table 4.2: Difference between the socio-economic characteristics of extension personnel and constraints of the effectiveness of agricultural extension service delivery

Variables	Coefficient	t-values	P-values	Decisions
(Constant)	15.446	1.101	.351	Not Significant
Sex	11.513	-.449	.684	Not Significant
Religion	10.614	.369	.737	Not Significant
Educational qualification	7.281	-.183	.866	Not significant

P > 0.05
Source: Field Survey, 2023

4.3 Relationship between contact farmers' and extension personnel's constraint to effectiveness of agricultural extension services

Table 4.3 revealed there is a significant relationship between contact farmers' and extension personnel's constraints to effectiveness of agricultural extension services in the study area as the variables are positively correlated (r= 0.678, P<0.05). This implies that when farmers are constrained, extension personnel are also constrained in terms of effectiveness of agricultural extension services.

Table 4.3: PPMC result showing relationship between contact farmers' constraint and extension personnel's constraint to effectiveness of agricultural extension services.

Correlates	Mean	SD	r-value	p-value	Decision
Contact farmers' constraint	58.11	17.79	0.678	0.047	Significant
Extension personnel constraint	13.86	6.52			

P<0.05
Source: Field Survey, 2023

5.1 Conclusion

Based on the findings, there is a similarity between the contact farmers and extension personnel perception of constraints to extension service delivery. The results also showed that rural farmers and extension personnel have favorable perception about the effectiveness of agricultural extension services. The farmers and extension personnel perceived constraints include inadequate training of extension personnel, lack of trust in extension agent, low literacy rate and limited access to information and technology.

5.2 Recommendation

More extension personnel should be employed and fortified with necessary equipment and facilities to enhance effective dissemination of information for transformation of agriculture in the state. Proper planning of extension programmes should be made before its being carried out to be able to know and meet the needs of the rural farmers. Extension personnel should be well motivated to enhance them to work more efficiently.

References

Abraham, O. A., Merianchris, E. E., Oludare, O. O., Olayemi, S. S. and Mongalaku, B. T. (2022). Effect of social media in enhancing agricultural extension services among farmers in Gwagwalada Area Council, Abuja, Nigeria. *Science and Technology*, 3(4), 24-32.

Adeloye, K. A., Torimiro, D. O., Omoboyede, D. A., Arowolo, B. D., Adedipe, I. E. and Alao, A. N. (2022). Knowledge, attitude and practice analysis of inclusive extension service among agricultural extension workers in Southwestern Nigeria. *Contemporary Agriculture*, 71(1-2), 81-86.

Ademola, A. O. (2016). Livelihood outcomes of beneficiaries of university-based agricultural extension system in southwestern Nigeria (Doctoral dissertation).

Adesoji, S. A., Famakinwa, M. and Eghosa, A. E. (2019). Assessment of Agricultural Extension Students' Interest in Providing Private Extension Services in Nigeria. *Journal of Agricultural Sciences* (Sri Lanka), 14(1).

Adeyemi, O., Adejoh, V., Anjorin, O., Ariyo, O., Makanjuola, B., Sablah, M. and Onabolu, A. (2023). Nutrition capacity assessment of agriculture extension services in Nigeria. *Food and Nutrition Bulletin*, 03795721231158417.

Alemu, A.E., Maetens, M., Deckers, J., Bauer, H. and Mathijs, E. (2016). Impact of supply chain coordination on honey farmers' income in Tigray, Northern Ethiopia. *Agricultural Food Economics*, 4:9.

Alzahrani, K., Ali, M., Azeem, M. I. and Alotaibi, B. A. (2023). Efficacy of public extension and advisory services for sustainable rice production. *Agriculture*, 13(5), 1062.

Antwi-Agyei, P. and Stringer, L.C. (2021). Improving the effectiveness of agricultural extension services insupporting farmers to adapt to climate change: Insights fromnortheastern Ghana. *Climate Risk Management*, 32, 100304.

Apantaku S.O., Aromolaran A. K., Shobowale, A. A. and Sijuwola, K. O. (2015). Farmers and Extension Personnel View of Constraints to Effective Agricultural Extension Services Delivery in Oyo State, Nigeria. *Journal of Agricultural Extension*. ttp://www.ajol.info/index.php/jae (Accessed 10 November, 2023).

Bashir, M. B., Adam, A. G., Abubakar, J. A., Faruk, A. U., Garuba, H. S. and Francis, N. B. (2020). The role of national farmers helps line in agricultural information dissemination among crop farmers in Nigeria: a case study of farmers help-line centre, NAERLS ABU Zaria. *Journal of Agricultural Extension*, 25(1), 93-103.

Camillone, N., Duiker, S., Bruns, M. A., Onyibe, J. andOmotayo, A. (2020). Context, challenges, and prospects for agricultural extension in Nigeria. *Journal of International Agricultural and Extension Education*, 27(4), 144-156.

Danso-Abbeam, G., Ehiakpor, D.S. and Aidoo, R. (2018). Agricultural extension and its effects on farm productivity and income: insight from Northern Ghana. *Agriculture and Food Security*, 7:74

Davis, K., Lion, K. and Arokoyo, T. (2019). Organizational capacities and management of agricultural extension services in Nigeria: current status. *South African Journal of Agricultural Extension*, 47(2), 118-127.

Ehiakpor, S.D., Danso-Abbeam, G., Zutah, J. and Hamdiyah, A. (2016). Adoption of cocoa farm management practices in PresteaHuni-Valley District, Ghana. *Russian Journal of Agricultural Social Science*, 5(53):117–24.

Emeana, E. M., Trenchard, L., Dehnen-Schmutz, K. and Shaikh, S. (2019). Evaluating the role of public agricultural extension and advisory services in promoting agro-ecology transition in Southeast Nigeria. *Agroecology and Sustainable Food Systems*, 43(2), 123-144.

Etuk, U. R., Okoro, G. I. and Tombere, R. J. (2023). A Review of E-Agricultural Extension in Nigeria. IN: Ayandele, IA, 19-26.

Ezima, N., Anyaegbunam, H. N., Nwaekpe, J. O. and Ibrahim, C. J. (2023). Extension services delivery in Nigeria; Challenges and Prospects. *Centennial*, 416.

Food and Agriculture Organization (FAO) of the United Nations. Ethiopia Country Brief; 2016. Retrieved from www.fao.org/count ries/55528 /en/eth/. (Accessed 10 December, 2023).

Ibitoye, S.J. (2015). Survey of the Performance of Agricultural Co-operative Societies in Kogi State, Nigeria. *European Scientific Journal*, 8928: 98-114.

Issa, F. O. (2020). Funding Of Agricultural Extension in Nigeria. *Nigerian Journal of Agricultural Extension*, 21(3), 118-129.

Kassem, H. S., Alotaibi, B. A., Muddassir, M. and Herab, A. (2021). Factors influencing farmers' satisfaction with the quality of agricultural extension services. *Evaluation and Program Planning*, 85, 101912.

Maake, M. M. S. and Antwi, M. A. (2022). Farmer's perceptions of effectiveness of public agricultural extension services in South Africa: an exploratory analysis of associated factors. *Agriculture and Food Security*, 11(1), 34.

Maulu, S., Hasimuna, O. J., Mutale, B., Mphande, J. and Siankwilimba, E. (2021). Enhancing the role of rural agricultural extension programs in poverty alleviation: A review. *Cogent Food and Agriculture*, 7(1), 1886663.

Musa, U. R., Abdullahi, S. and Sulaiman, A. (2023). Farmers assessment of extension services delivery in Bauchi State, Nigeria. *Nigerian Journal of Agriculture and Agricultural Technology*, 3(1), 111-120.

Mustapha, S., Man, N., Shah, J. A., Kamarulzaman, N. H. and Tafida, A. A. (2022). Factors influencing the adoption of ICT'S in extension service delivery among the extension agents in North-East, Nigeria. *Sarhad Journal of Agriculture*, 38(1).

Nwafor, C. U., Ogundeji, A. A. and Nwafor, I. C. (2021). Review of agricultural extension and advisory services in Sub-Saharan African countries. Progress with private sector involvement. *Journal of Agribusiness and Rural Development*, 3.

Okello, D. M., Akite, I., Atube, F., Kalule, S. W. and Ongeng, D. (2023). Examining the relationship between farmers' characteristics and access to agricultural extension: Empirical evidence from northern Uganda. *The Journal of Agricultural Education and Extension*, 29(4), 439-461.

Onemolease, E. A., Ehilenboadiaye, C. O. and Omoregie, O. (2021). Perception of the role of agricultural extension services by cassava processors in Edo State, Nigeria. *ADAN Journal of Agriculture*, 2(01), 70-81.

Ovharhe, O. J., Emaziye, P. and Okwuokenye, G. F. (2020). Farmers' satisfaction with agricultural extension services in Delta State, Nigeria. *International Journal of Agricultural Technology*, 16(6), 1463-1474.

Owolabi, A. O. and Yekinni, O. T. (2022). Utilization of information and communication technologies for agricultural extension service delivery in public and non-public organizations in southwestern Nigeria. *Heliyon*, 8(9).

Raidimi, E.N. and Kabiti, H.M. (2017). Agricultural Extension, Research and Development for Increased Food Security: The Need for Public-Private Sector Partnerships in South Africa. *South African Journal of Agricultural Extension*, 45(1): 49-63.

Wiredu, A.N., Zeller, M. and Diagne, A. (2015). What determines the adoption of fertilizers among rice-producing households in Northern Ghana? *Journal of International Agriculture,* 54(3):263–83