



Farmers' Adoption of Fee-Based Services of Private Agricultural Extension Agents in Northern Taraba State

*Emmanuel Soken Joro, Adi Zhintswen Ashumate and Sabo Elizabeth

Department of Agricultural Economics and Extension, Taraba State University, Jalingo, Taraba State, Nigeria.

*Corresponding authors' email: xengxyadi@gmail.com

ABSTRACT

This study assessed farmers' adoption of fee-based services of private agricultural extension agents in Northern Taraba State, Nigeria. Specifically, the study described the socio-economic characteristics of the respondents, identified types of fee-based extension services provided by private extension agents, examined factors influencing farmers' willingness to adopt and pay for fee-based extension services. A multi-stage sampling technique was employed to select 140 respondents. Primary data were collected through the administration of structured questionnaires. Data collected were analyzed using descriptive and inferential statistics. The findings revealed that the majority (72.1%) of the respondents were male, married, and within the economically active age group, with a mean age of 41 years. Most respondents had formal education and were predominantly smallholder farmers with a mean farm size of 4 hectares and mean farming experience of 12 years. The study showed that fee-based services such as farm input advisory services (77.9%) and pest and disease management services (74.3%) were the most commonly accessed services by the respondents. Quality of services, frequency of visits, accessibility of extension agents, credibility of service providers, and previous experience with extension services influenced farmers' willingness to adopt and pay for fee-based extension services. The study concluded that private agricultural extension services have significant potential to complement public extension systems and improve agricultural productivity in Northern Taraba State. The study recommended increased public-private partnerships in extension delivery, improved awareness creation, provision of subsidies and credit facilities for smallholder farmers, strengthening of rural infrastructure, and establishment of supportive policies and regulatory frameworks.

Received: 30 Sep. 2026

Accepted: 14 Oct. 2026

Published: 16 Oct. 2026

Keywords: Farmers' Adoption, Fee-Based Services, Private Agricultural, Extension Agents

INTRODUCTION

Agricultural extension services are fundamental to advancing the agricultural sector, particularly in developing countries where food security and rural livelihoods depend heavily on farming activities. These services act as a bridge between research institutions and farmers, facilitating the transfer of agricultural knowledge, practices, and innovations to enhance productivity and sustainability. Over the years, public agricultural extension services have dominated the landscape in many countries, including Nigeria. However, issues such as underfunding, inefficiency, limited reach, and lack of innovation have prompted a shift towards private extension services (Shitu *et al.*, 2026).

The transition to private extension services introduces a new dimension to agricultural development, emphasizing market-driven approaches and farmer empowerment. Unlike public extension systems, private extension services operate on a commercial basis, offering customized solutions to farmers willing to pay for these services. This model promises greater efficiency, innovation, and responsiveness to farmers' needs. However, its success depends on several factors, including farmers' awareness, perceptions, willingness to pay, and the enabling environment created by government policies (Omorgbee *et al.*, 2025).

Farmers' awareness and understanding of private extension services are critical determinants of their adoption. Awareness reflects the extent to which farmers are informed about the availability and potential benefits of private

extension services, while understanding relates to their ability to grasp the specific features and advantages of these services. Studies indicate that limited awareness often serves as a major barrier to the adoption of private extension services, particularly in rural areas where access to information is constrained (Shitu *et al.*, 2026). Moreover, a clear understanding of the services provided is essential for farmers to make informed decisions about investing in them. Without adequate awareness and understanding, even the most innovative extension services may fail to gain traction among farmers.

The perception of farmers towards private extension services significantly influences their willingness to adopt these models. Farmers' perceptions are shaped by various factors, including their experiences with public extension systems, trust in service providers, and the perceived value derived from private services. Positive perceptions, such as the belief that private extension services are more reliable, efficient, and responsive to their needs, can drive adoption. Conversely, negative perceptions, including concerns about affordability, accessibility, and quality, can hinder farmers from embracing these services (Omorgbee *et al.*, 2025). Addressing these perceptions requires targeted awareness campaigns and transparent communication to build trust and demonstrate the value of private extension services.

One of the most debated aspects of private extension services is the willingness of farmers to pay for them. Willingness to pay is influenced by factors such as income level, farm size,

access to credit, and the perceived benefits of the services. In Nigeria, where the majority of farmers are smallholders operating at subsistence levels, financial constraints can be a significant barrier. Research suggests that farmers are more likely to pay for services that demonstrate tangible benefits, such as increased yields, reduced production costs, or improved market access (Omoregbee *et al.*, 2025). Understanding these dynamics is essential for designing fee-based models that align with the economic realities of farmers while ensuring the financial sustainability of private extension providers.

Beyond financial constraints, farmers face socio-cultural barriers, logistical challenges, and systemic issues that limit their ability to engage with private service providers. For instance, in rural areas where communal decision-making and traditional norms dominate, individual adoption of fee-based services may face resistance. Similarly, inadequate infrastructure, such as poor road networks and limited access to communication technologies, further complicates the delivery of private extension services (Akinagbe *et al.*, 2024). Overcoming these barriers requires a holistic approach that addresses the diverse needs and circumstances of farmers while promoting inclusivity and equity.

This includes establishing regulatory frameworks to ensure quality and accountability, providing subsidies or incentives to lower the cost of services, and facilitating partnerships between public and private sectors. Furthermore, the government can play a proactive role in raising awareness and promoting the benefits of private extension services, particularly in regions where skepticism or resistance exists (Akinagbe *et al.*, 2024). Effective government interventions can enhance the accessibility, affordability, and impact of private extension services, making them more attractive to farmers.

The policy implications of private extension services are profound. Policy makers must navigate the complex dynamics of promoting private sector participation while ensuring that smallholder farmers are not excluded from essential services due to cost barriers. Strategies such as public-private partnerships, targeted subsidies, and differential pricing models have been proposed to address these challenges (Akinagbe *et al.*, 2024). These policies should also aim to strengthen the capacity of private extension providers, foster innovation, and establish mechanisms for monitoring and evaluation to ensure the delivery of high-quality services.

In the Nigerian context, the exploration of private agricultural extension services provides an opportunity to reimagine the future of agricultural development. By focusing on key issues such as awareness, perception, willingness to pay, barriers to adoption, and the role of government, this study seeks to contribute to the discourse on sustainable agricultural development. The findings of this research will offer valuable insights for policymakers, development practitioners, and other stakeholders interested in enhancing the effectiveness and inclusivity of agricultural extension services.

Agricultural extension services have traditionally played a pivotal role in improving agricultural productivity by disseminating research-based knowledge and innovations to farmers. In Nigeria, the provision of these services has predominantly been a public-sector responsibility, often characterized by weak institutional capacity, inadequate staffing, limited funding, and poor coverage (Shitu *et al.*, 2026). These systemic challenges have significantly constrained the effectiveness of public agricultural extension, leading to declining performance and farmer dissatisfaction across many regions, including Taraba State.

With the inefficiencies in public extension delivery, private agricultural extension services have gradually emerged as a complementary alternative. These private-sector actors offer tailored, demand-driven, and often technologically innovative services that address the specific needs of commercial and smallholder farmers. However, a significant divergence from the public model is the fee-based nature of these services, where farmers are expected to pay for advisory and technical support (Yakubu *et al.*, 2024).

In Northern Taraba State, the transition from free public extension services to fee-based private service delivery remains relatively recent and under-researched. The socioeconomic realities of rural farmers in this region marked by low-income levels, subsistence farming practices, and limited exposure to market-based extension models raise concerns about the viability and sustainability of such services (Shitu *et al.*, 2026). Moreover, disparities in access due to gender, education, and land ownership may further influence how different farmer groups perceive and utilize private extension services.

Previous studies have shown mixed reactions to fee-based extension systems across different regions of Nigeria. While some farmers appreciate the responsiveness and quality of private services as reported by Omoregbee *et al.* (2025), others express reservations about cost, equity, and accountability (Akinagbe *et al.* (2024)). In contexts like Northern Taraba, where rural infrastructure is limited and extension coverage is patchy, understanding the local dynamics is crucial. Yet, there is a dearth of empirical data focusing specifically on how farmers in this region perceive fee-based private extension services.

Understanding farmers' perceptions is essential not only for evaluating the effectiveness of private extension agents but also for designing appropriate policy frameworks that support inclusive and sustainable extension systems. Are farmers in Northern Taraba State willing to pay for private extension services? Do they perceive these services as more reliable or effective than public ones? What factors influence their trust, satisfaction, or rejection of fee-based models?

These questions point to a significant research gap. Without reliable data on farmer perceptions, stakeholders including policymakers, development agencies, and private investors lack the insights needed to make informed decisions about the promotion and support of private extension services in this region. This study therefore seeks to fill that gap by systematically assessing the perceptions of farmers on the affordability of fee-based services delivered by private agricultural extension agents in Northern Taraba State.

Against this backdrop, the study assessed farmers' perceptions on fee-based services of private agricultural extension agents in northern Taraba State. While, specific objectives were to: (i) described the socio-economic characteristics of the respondents (ii) identified the types of fee-based agricultural extension services provided by private extension agents and, (iii) assessed the relationship between factors influencing respondents' willingness to adoption and pay for fee-based extension services.

MATERIALS AND METHODS

This study was conducted in Northern Taraba State, Nigeria. The State was created on August 27th, 1991 with a land mass of 59, 400km². It lies between latitude 6° 30' and 8° 30' north of the equator and between longitude 9° 00' and 12° 00' east of the Greenwich meridian with estimated population of 2,300,736 (The National Population Commission (NPC), 2006). It has projected annual growth rate of 3.5% which brought the population figure to three million, five hundred

and ninety-seven thousand, ninety-four people (3,597,094) as at 2019.

The State has sixteen (16) local government areas and two Special Development Areas (SDAs) and it has been grouped into four agricultural zones by Taraba State Agricultural Development Programmed (TADP) namely; Zone I, Zone II, Zone III and Zone IV (TADP, 2016). Zone I comprise: Ardo-kola, Jalingo, Lau, Karim-lamido, Yorro and Zing with headquarters at Zing. Zone II has Wukari, Ibi, Gassol and part of Bali (Garba-Chede/Dakka) LGAs with headquarters at Wukari. Zone III comprises Takum, Donga, Ussa, Kurmi, part of Bali (Bali/Suntai) LGAs and Yangtu and Ngada Special Development Areas (SDAs) with headquarters at Takum. Zone IV has only Sardauna LGA because of its difficult terrain with headquarters at Gembu. (TRSG, 2020). The area shares boundaries with Gassol, Bali, Kurmi, Gashaka and Karim-lamido Local Government areas in the North, Nassarawa state and Plateau State to the North-west, Benue states in the South-West and Republic of Cameroun in the South-East. It has a tropical wet and dry season. Its dry season lasts for a minimum of four months (December to March) while the wet season spans early March to late November in the south. The area has mean annual rainfall of 1800mm.

Data for this study was entirely primaries but supported with secondary information such as journal articles, Government and professional reports and books on assessment of farmers' perceptions on fee-based services of private agricultural extension agents in Northern, Taraba State. Structured questionnaire will have used to gather information from the respondents.

A multi-stage sampling technique was employed in selecting respondents. Firstly, based on TADP classifications, all the registered farmers under ADP Zone I will be considered for the study. Secondly, three (3) blocks from Zone I were purposively selected considering the high concentration of agricultural extension offices and dominance of agricultural activities. Thirdly, random selection of four (4) cells from each block will be carried out to give a total of twelve (12) cells. Lastly, there was a random selection of two circles from each selected cell to give rise to twenty-four (24) circles. Hence, from the list of registered farmers under the ADP Zone I, a total of 140 farmers will be selected through the systematic random sampling technique and questionnaire will be administered.

Data collected was analyzed using descriptive and inferential statistics. Descriptive statistics in forms of frequency, percentage, mean and standard deviation was used to achieve Objectives I and II. While Inferential Statistic in the form of binary logistic regression was used to achieve objective III.

Model Specifications

Mean Rating Scale Equation

$$\bar{X} = \frac{\sum Fx}{n}$$

Where: $\bar{X}$ = mean rating scale

n = number of respondents

$\sum$ = summation

F = frequency

x = Number of items

Binary Logistic Regression Model

$$\ln(Y) = Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \varepsilon$$

Where:

Y = Willingness to adopt and pay (1 = willing to adopt/pay, 0 = not willing)

$\ln(Y)$: Natural logarithm of the dependent variable

β_0 = Constant (Intercept)

$\beta_0, \beta_1, \beta_2, \dots, \beta_8$ = Coefficients of independent variables

X_i = independent variables

X_1 = Cost of services (in naira)

X_2 = Quality of services

X_3 = Frequency of visits

X_4 = Accessibility of the Agent

X_5 = Previous Experience with Public Extension

X_6 = Type of agricultural information provided

X_7 = Mode of service delivery

X_8 = Credibility/Reputation of the Extension Agent

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Respondents

The result in Table 1 revealed that 72.1% of the respondents were male, while 27.9% were female. This indicates that agricultural production and participation in fee-based extension services in the study area were dominated by men. The predominance of male farmers may be attributed to cultural norms and land ownership structures that favour men in agricultural activities. This finding agrees with Akinagbe *et al.* (2024), who reported that male farmers dominate agricultural decision-making and access to extension services in rural Nigeria due to greater control over productive resources. Similarly, Yakubu *et al.* (2024) observed that men are more actively involved in commercial farming activities and are more likely to engage private extension agents than women.

The age distribution showed that 29.3% of the respondents were between 31–40 years, 27.9% were within 41–50 years, 22.8% were between 51–60 years, while 20.0% were within 21–30 years. The mean age of 41 years indicates that the respondents were relatively young and economically active. This suggests that the farmers possess the physical strength and decision-making capacity required to adopt innovations and participate in fee-based extension services. This finding agrees with Shitu *et al.* (2026), who stated that farmers within active age groups are more receptive to agricultural innovations and extension programmes because they are more productive and willing to take risks associated with improved technologies.

The educational level of the respondents revealed that 38.6% attained secondary education, 30.0% had primary education, 16.4% had tertiary education, while only 15.0% had no formal education. This implies that the majority of the respondents were literate and capable of understanding extension messages and improved farming practices. Education enhances farmers' ability to interpret technical recommendations and utilize agricultural information effectively. This finding corroborates the work of Shitu *et al.* (2026), who asserted that education improves farmers' adoption behaviour and willingness to pay for agricultural advisory services. However, the finding contradicts Shitu *et al.* (2026), who reported low literacy levels among rural farmers in some parts of northern Nigeria.

The marital status distribution indicated that 67.9% of the respondents were married, while 17.9% were single and 7.1% each were divorced and widowed. The high proportion of married respondents suggests that family responsibilities may encourage greater participation in farming and extension-related activities in order to improve household welfare. This finding agrees with Shitu *et al.* (2026), who observed that married farmers are usually more committed to farming activities because of household responsibilities and the need to sustain family livelihoods.

The result further showed that 51.4% of the respondents had household sizes of 6–10 persons, while 25.0% had between 1–5 persons and 23.6% had between 11–15 persons. The mean household size of 7 persons implies that the respondents had relatively large households capable of supplying family labour for agricultural production. This finding supports the report of Shitu *et al.* (2026), who stated that large household size provides labour for farming operations and reduces dependence on hired labour. Nevertheless, large household sizes may also increase household consumption pressure and reduce disposable income available for payment of private extension services.

The farming experience distribution revealed that 27.1% of the respondents had 6–10 years of farming experience, 25.0% had 11–15 years, and 17.1% had 16–20 years of experience, with a mean farming experience of 12 years. This indicates that the respondents possessed considerable practical knowledge in farming activities. Experienced farmers are more likely to evaluate the usefulness of extension services and make informed adoption decisions. This finding agrees with Ozor and Madukwe (2005), who noted that farming experience positively influences farmers' capacity to assess and adopt improved agricultural practices.

The farm size distribution showed that 62.9% of the respondents cultivated between 1–5 hectares, while 37.1% cultivated between 6–10 hectares, with a mean farm size of 4 hectares. This indicates that most respondents were smallholder farmers. Small-scale farmers often rely heavily on extension advisory services for improved productivity and efficient farm management. This finding agrees with Shitu *et al.* (2026), who observed that smallholder farmers depend

more on extension services because of limited access to advanced production technologies and technical expertise.

The result further revealed that 41.4% of the respondents had access to credit, while 58.6% had no access to credit facilities. Limited access to credit may reduce farmers' ability to pay for private extension services and adopt recommended innovations. This finding agrees with Yakubu *et al.* (2024), who reported that inadequate access to rural credit remains a major challenge limiting technology adoption and commercialization among smallholder farmers in Nigeria.

The study also showed that 45.7% of the respondents belonged to cooperative societies, while 54.3% did not belong to cooperatives. Cooperative membership is important because it enhances access to agricultural information, training, credit, and extension support. The relatively low participation in cooperatives may therefore limit access to extension opportunities. This finding supports the work of Akinagbe *et al.* (2024), who emphasized that cooperative societies serve as important channels for dissemination of agricultural innovations and farmer support services.

Finally, the result indicated that 56.4% of the respondents had access to extension visits, while 43.6% lacked access. This suggests that a considerable proportion of farmers still have inadequate contact with extension agents. Regular extension contact is important for increasing awareness, improving productivity, and encouraging adoption of innovations. This finding agrees with Shitu *et al.* (2026), who noted that frequent extension contact significantly improves farmers' access to information and adoption of improved agricultural practices.

Table 1: Socio-economic Characteristics of the Respondents

Variables	Frequency	Percentage (%)	Mean
Sex			
Male	101	72.1	
Female	39	27.9	
Age (Yrs.)			
21–30	28	20.0	
31–40	41	29.3	41
41–50	39	27.9	
51–60	32	22.8	
Educational Level			
No formal education	21	15.0	
Primary	42	30.0	
Secondary	54	38.6	
Tertiary	23	16.4	
Marital Status			
Single	25	17.9	
Married	95	67.9	
Divorced	10	7.1	
Widowed	10	7.1	
Household size (No.)			
1–5	35	25.0	
6–10	72	51.4	7
11–15	33	23.6	
Farming Experience (Years)			
1–5	20	14.3	
6–10	38	27.1	
11–15	35	25.0	
16–20	24	17.1	12
21–25	13	9.3	
26–30	7	5.0	

Variables	Frequency	Percentage (%)	Mean
31–35	3	2.2	
Farm Size (Ha)			
1–5	88	62.9	
6–10	52	37.1	
Access to Credit			
Yes	58	41.4	
No	82	58.6	
Cooperative Membership			
Yes	76	54.3	
No	64	45.7	
Access to Extension Visit			
Yes	79	56.4	
No	61	43.6	

Source: Field Survey, 2026

Fee-based Agricultural Services of Private Extension Agents

The result presented in Table 2 revealed that 77.9% of the respondents received farm input advisory services from private agricultural extension agents. This indicates that farm input recommendation services such as advice on fertilizers, improved seeds, agrochemicals, and planting materials were the most commonly accessed fee-based extension services in the study area. The high patronage of input advisory services may be attributed to farmers' increasing need for technical guidance on efficient input utilization for improved productivity. This finding agrees with Shitu *et al.* (2026), who reported that advisory services relating to input utilization constitute one of the most demanded extension services among smallholder farmers because of their direct influence on productivity and income generation.

The study further revealed that 74.3% of the respondent's received pest and disease management services. This suggests that farmers highly depend on private extension agents for guidance on controlling pests and diseases affecting crops and livestock. The rising incidence of pests and diseases and the need to reduce production losses may explain the increased demand for such services. This finding is consistent with the report of Omoregbee *et al.* (2025), who noted that farmers increasingly seek private extension support for pest and disease control because public extension services are often inadequate and overstretched.

The result also showed that 69.3% of the respondents accessed market information and linkage services from private extension providers. This implies that private extension agents play an important role in connecting farmers to markets and providing information on prices, buyers, and marketing opportunities. Access to market information enables farmers to make better production and marketing decisions. This finding is consistent with Omoregbee *et al.* (2025), who observed that market-oriented extension services significantly improve farmers' commercialization opportunities and bargaining power.

Similarly, 65.7% of the respondents received farm management and planning services. This indicates that a

substantial number of farmers relied on private extension agents for planning farm operations, enterprise selection, and resource allocation. Effective farm planning contributes to increased productivity and profitability. This finding corroborates the work of Omoregbee *et al.* (2025), who emphasized that private agricultural extension increasingly focuses on business-oriented farm management practices aimed at improving farm efficiency.

The study further indicated that 70.7% of the respondents accessed technical training and demonstration services. This suggests that practical demonstrations and capacity-building activities remain an important component of private extension delivery. Technical training enables farmers to acquire practical knowledge and improve adoption of innovations. This finding agrees with Shitu *et al.* (2026), who reported that demonstration and training activities significantly enhance farmers' understanding and utilization of improved agricultural technologies.

The result revealed that 49.3% of the respondents received soil testing and recommendation services. The relatively lower patronage of soil testing services may be due to the high cost and technical nature of such services. Nevertheless, soil testing remains important for improving soil fertility management and efficient fertilizer application. This finding agrees with Oyinbo *et al.* (2026), who reported that although soil testing services improve productivity, many smallholder farmers rarely utilize them because of financial and accessibility constraints.

Finally, the study showed that only 40.7% of the respondents accessed financial services such as credit and insurance advisory services from private extension agents. This indicates that financial-related extension services were the least utilized among the respondents. The low level of patronage may be linked to limited financial literacy, inadequate rural financial institutions, and farmers' poor access to formal credit systems. This finding agrees with Yakubu *et al.* (2024), who observed that access to agricultural finance and insurance services remains relatively low among rural farmers in Nigeria despite their importance in enhancing agricultural productivity and risk management.

Table 2: Fee-based Agricultural Services Provided by Private Extension Agents

Services	Frequency	Percentage (%)
Farm input advisory	109	77.9
Pest and disease management	104	74.3
Market information & linkage	97	69.3
Farm management & planning	92	65.7
Technical training/demonstration	99	70.7
Soil testing & recommendation	69	49.3
Financial services (credit/insurance advice)	57	40.7

Source: Field Survey, 2026

Influencing factors on Willingness to Adopt and Payment for Fee-based Extension Services

Result presented in Table 3 revealed that coefficient for quality of services was positive and significant at the 10% level (OR=11.839500, $p=0.052$). This implies that improvement in the quality of extension services significantly increases farmers' willingness to adopt and pay for fee-based extension services. The odds ratio indicates that farmers who perceived extension services as high quality were about 11.84 times more likely to adopt and pay for such services compared to those who perceived the services as poor. This finding agrees with the study of Omoregbee *et al.* (2025), who reported that quality and reliability of advisory services strongly influence farmers' patronage of private extension services in Nigeria. Frequency of visits was positive and significant at the 5% level ($p=0.030$). This suggests that regular contact between extension agents and farmers enhances trust, learning, and adoption decisions. Farmers who received more frequent visits were about 3.49 times more likely to adopt and pay for fee-based extension services than those with fewer visits. This finding is consistent with the work of Shitu *et al.* (2026), who observed that regular interaction with extension providers improves technology uptake and farmers' confidence in agricultural innovations. Cost of services had a positive coefficient and was statistically significant at the 1% level ($p=0.001$). Although the odds ratio appears small due to the monetary measurement scale, the result indicates that farmers who perceived the services as economically worthwhile were more willing to pay for them. This may imply that farmers value extension services when they believe the benefits outweigh the associated costs. The finding supports the report of Oyinbo *et al.* (2026), who argued that farmers are willing to invest in agricultural advisory services when such services contribute to increased productivity and income. Accessibility of agent was positive and significant at the 10% level. The result indicates that ease of access to extension agents increases the

likelihood of adoption and payment for fee-based services. Farmers who could easily reach extension agents were approximately 3.91 times more likely to adopt the services. This finding agrees with Shitu *et al.* (2026), who noted that proximity and accessibility to extension personnel positively affect farmers' participation in agricultural programmes. Type of information was also positive and significant at the 10% level. This implies that the relevance and usefulness of information provided by extension agents significantly influence farmers' willingness to adopt and pay for the services. Farmers receiving practical and market-oriented information were about 2.55 times more likely to patronize fee-based extension services. This finding corroborates the study of Oyinbo *et al.* (2026), who found that information relevance plays a major role in farmers' decision-making regarding extension participation. Public extension experience had a positive and highly significant influence at the 1% level. The implication is that farmers with prior experience interacting with public extension systems were more likely to appreciate and adopt fee-based extension services. Such farmers were approximately 2.19 times more willing to adopt and pay for private services. This may be because previous exposure increases awareness of the importance of extension support in agricultural production. The finding is in line with the observations of Shitu *et al.* (2026), who stated that farmers with previous extension contact tend to show greater acceptance of innovative advisory systems. Mode of service delivery was positive and significant at the 1% level. This indicates that effective and farmer-friendly delivery methods significantly increase the likelihood of adoption and willingness to pay for extension services. Farmers exposed to more convenient and participatory delivery approaches were about 2.43 times more likely to adopt fee-based services. This finding agrees with Oyinbo *et al.* (2026), who emphasized that participatory and flexible extension delivery methods enhance farmers' satisfaction and technology adoption.

Table 3: Factors on Willingness to Adopt and Pay of Fee-Based Extension Services

Variable	Odds Ratio (Exp(B))	Std. Error	Z (Wald)	P (Sig.)
Quality of Services	11.839500**	5.951420	4.92	0.052
Frequency of Visits	3.485202**	0.975549	4.46	0.030
Cost of Services	1.000086***	0.0000264	3.25	0.001
Accessibility of Agent	3.913378*	1.301100	4.10	0.074
Type of Information	2.546112*	0.662830	3.59	0.062
Public Extension Experience	2.190528***	0.501838	3.42	0.001
Mode of Service Delivery	2.432851***	0.671862	3.22	0.001
Constant	1.21e-12***	6.15e-12	-5.39	0.000
Pseudo R ²	0.5855			
Goodness-of-fit test (Hosmer-Lemeshow Prob > χ^2)	0.1359			

Source: Field Survey Data, 2026

Level of Significant: ***=1%, **=5% and *= 10%

CONCLUSION

The study concludes that private agricultural extension services possess significant potential to complement public extension systems and improve agricultural productivity in Northern Taraba State. Nevertheless, the sustainability and inclusiveness of fee-based extension systems depend largely on farmers' financial capacity, awareness, accessibility of services, and institutional support mechanisms.

The study therefore recommended that government and relevant stakeholders should strengthen public-private partnerships in agricultural extension delivery, provide subsidies and financial support to resource-poor farmers, improve rural infrastructure, promote farmers' cooperative participation, and intensify awareness campaigns on the benefits of private extension services. The study also emphasized the need for policy frameworks that regulate and support private extension service delivery to ensure quality, affordability, and equitable access for all categories of farmers.

REFERENCES

- Akinagbe, O. M., Ejiga, S. A., & Akinbobola, T. P. (2024). Perception of agricultural extension workers on privatization of agricultural extension services in Ondo State, Nigeria. *Journal of Agricultural Extension*, 28(2), 1–8. <https://doi.org/10.4314/jae.v28i2.1>
- Omogbee, F. E., Koyenikan, M. J., Bamikole, M. A., & Adamu, F. O. (2025). Assessment of farmers' willingness to pay for private extension services among maize farmers in Edo and Delta States, Nigeria. *Journal of Agriculture, Forestry and Fisheries*, 21(2), 26–38.
- Oyinbo, O., Chamberlin, J., & Maertens, M. (2026). Try before you buy: Experimental evidence on willingness to pay for tailored agricultural advice in Nigeria. *Applied Economic Perspectives and Policy*, 48(1), 196–226. <https://doi.org/10.1002/aep.70020>
- Shitu, A. G., Ojo, D. T., Shitu, M. V., & Nain, M. S. (2026). Small-scale farmers' willingness to pay for extension services: Evidence from Nigeria. *Indian Journal of Extension Education*, 62(1), 86–91. <https://doi.org/10.48165/IJEE.2026.62114>
- Yakubu, D. H., Douseifa, G. G., Ango, A. K., & Alhassan, J. (2024). Willingness to pay for private extension services among yam farmers in Nasarawa State, Nigeria. *Journal of Agricultural Extension*, 29(1), 53–58. <https://doi.org/10.4314/jae.v29i1.7S>

