

Impact of Cost-Sharing in Agricultural Extension Service Delivery on Farm Productivity and Income among Farmers in Kogi State, Nigeria

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Abstract

The study examined the impact of cost-sharing in agricultural extension service delivery on farm productivity and income among farmers in Kogi State, Nigeria. Specifically, it examined cost-sharing arrangements and farmers' financial contributions, assessed the relationship between cost-sharing and farm productivity, determined its effect on farmers' income, and identified constraints associated with participation in cost-sharing arrangements. A multistage sampling procedure was used to select 302 farmers from eight villages in Ibaji and Dekina Local Government Areas. Primary data were collected using a structured questionnaire and analysed using descriptive statistics, multiple regression analysis and a five-point Likert scale. The results indicated that 62.0% of the respondents participated in cost-sharing arrangements, with cash payments accounting for 48.7% of contributions. Participating farmers recorded a mean farm productivity of 2,180 kg/ha, compared with 1,790 kg/ha among non-participants. Cost-sharing participation had a positive and statistically significant association with farm productivity ($B = 310.50$, $(p = 0.009)$). Similarly, participating farmers recorded a mean annual net farm income of ₦1,245,000, compared with ₦985,000 among non-participants, while the regression coefficient for cost-sharing participation was positive and significant ($B = ₦178,500$, $(p = 0.018)$). Inability to afford financial contributions was the leading constraint (mean = 4.32), followed by high agricultural input costs (mean = 4.18). The study concluded that cost-sharing participation have supported improved farm productivity and income, although affordability and service-delivery challenges required attention. Flexible contributions, reliable extension services and transparent financial management were recommended.

Keywords: *Agricultural Extension, Cost-Sharing, Farm Productivity, Farm Income, Farmers' Contributions, Extension Financing.*

I. BACKGROUND OF THE STUDY

Agricultural extension services played an important role in disseminating improved farming technologies, providing technical advice and strengthening farmers' capacity to make informed production decisions. However, inadequate and unstable funding constrained the delivery of extension services in many developing countries, prompting the consideration of cost-sharing arrangements involving governments, farmers and other stakeholders. In Nigeria, Ozor et al. (2021) examined stakeholders' preferred arrangements for sharing the costs of agricultural technology transfer, while Agwu and Abah (2010) investigated farmers' attitudes towards cost-sharing under the Second National Fadama Development Project in Kogi State. These studies established the relevance of cost-sharing to extension financing, although its effects on farm productivity and income required further investigation. Cost-sharing in agricultural extension service delivery have both beneficial and adverse implications for farmers. Shared financing support more reliable extension activities, improve access to technical advice and encourage the adoption of improved farming practices. Evidence from northern Nigeria also showed that tailored extension recommendations improved maize yields, although increases in net revenue were relatively modest (Oyinbo et al., 2022). Conversely, farmers' financial contributions could restrict

access to extension services among those with limited resources. Therefore, an assessment of cost-sharing among farmers in Kogi State was warranted to establish whether the arrangement had contributed to improved farm productivity and income, while identifying the factors that had facilitated or constrained its benefits.

II. STATEMENT OF THE PROBLEM

Inadequate and irregular funding had constrained the effective delivery of agricultural extension services in many developing countries, including Nigeria. Cost-sharing had been considered an alternative financing arrangement through which governments, farmers and other stakeholders contributed to the provision of extension services. Although previous studies had examined farmers' attitudes towards cost-sharing and appropriate financing arrangements for agricultural technology transfer, questions remained about whether such arrangements had translated into measurable improvements in farm productivity and income. Also, farmers' financial contributions had limited access to extension services among those with inadequate resources, thereby creating differences in their ability to obtain technical advice and adopt improved farming practices.

In Kogi State, the extent to which cost-sharing in agricultural extension service delivery had contributed to improved farm productivity and income among farmers remained insufficiently established by the studies cited in this background. Without empirical evidence on these outcomes, it had been difficult to determine whether cost-sharing had delivered sufficient benefits to justify farmers' financial contributions or whether alternative financing arrangements were required. The problem, therefore, centred on the need to establish the impact of cost-sharing in agricultural extension service delivery on farm productivity and income among farmers in Kogi State, Nigeria. The findings provided evidence for extension policymakers and service providers in developing financing arrangements that supported effective extension delivery, improved agricultural productivity and enhanced farmers' income.

Objectives of the Study

The broad objective of the study was to assess the impact of cost-sharing in agricultural extension service delivery on farm productivity and income among farmers in Kogi State, Nigeria.

The specific objectives were to:

1. Examine the Cost-Sharing Arrangements and the Extent of Farmers' Financial Contributions towards Agricultural Extension Service Delivery in the Study Area,
2. Assess the Relationship Between Cost-Sharing in Agricultural Extension Service Delivery and Farm Productivity among Farmers in the Study Area,
3. Determine the Effect of Cost-Sharing in Agricultural Extension Service Delivery on Farmers' Income in the Study Area, and
4. Identify the Constraints Associated with Farmers' Participation In Cost-Sharing Arrangements For Agricultural Extension Service Delivery in the Study Area.

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

H₀₁: There was no statistically significant relationship between participation in cost-sharing arrangements for agricultural extension service delivery and farm productivity among farmers in Kogi State, Nigeria.

H₀₂: Cost-sharing in agricultural extension service delivery had no statistically significant effect on farmers' income in Kogi State, Nigeria.

III. JUSTIFICATION OF THE STUDY

The study was justified by the need to establish whether cost-sharing in agricultural extension service delivery had contributed to improved farm productivity and income among farmers in Kogi State, Nigeria. Although cost-sharing had been considered an alternative approach to financing extension services, its benefits depended on farmers' ability to contribute financially, the quality of services received and the extent to which extension advice had supported the adoption of improved farming practices. Assessing these outcomes provided empirical evidence on the effectiveness of cost-sharing as a financing arrangement and its implications for agricultural development.

The study was also justified by its relevance to agricultural extension policy and practice. Its findings would assist agricultural extension agencies and policymakers in evaluating the adequacy of existing cost-sharing arrangements and identifying barriers that had limited farmers' participation. In addition, the findings provided guidance for designing more accessible and sustainable

extension financing mechanisms, particularly for farmers with limited financial resources. By examining farm productivity and income alongside farmers' contributions and participation constraints, the study contributed to evidence-based decisions on extension service financing, improved agricultural performance and rural livelihood development in Kogi State.

Description of the Study Area

The study was conducted in Kogi State, Nigeria. The state was located in the North-Central geopolitical zone of Nigeria, with its capital at Lokoja. It shared boundaries with several states, including Niger, Kwara, Ekiti, Ondo, Edo, Anambra, Enugu, Benue and Nasarawa. The state occupied a strategic geographical position at the confluence of the River Niger and River Benue.

Agriculture constituted an important livelihood activity in Kogi State, where farmers cultivated crops such as cassava, maize, rice, yam and cashew, alongside other agricultural activities. Agricultural extension services were relevant to farmers' access to improved technologies, production information and farm management advice. The state's agricultural setting therefore provided an appropriate context for examining cost-sharing in extension service delivery and its relationship with farm productivity and income among farmers.

Sampling Procedure and Sample Size

The study employed a multistage sampling procedure to select farmers from Ibaji and Dekina Local Government Areas of Kogi State, Nigeria. In the first stage, two local government areas, namely Ibaji and Dekina, were selected. In the second stage, four villages were selected from each local government area, giving a total of eight villages. The selected villages were Odeke, Unale, Iyano and Echeno in Ibaji Local Government Area, and Abocho, Olowa, Acharu and Ajiyolo in Dekina Local Government Area. In the third stage, a sample size of 302 farmers was selected from a sampling frame of 1,235 farmers. The sample size represented approximately 24.45% of the sampling frame. The respondents were allocated proportionately to the eight villages according to their respective population sizes, after which simple random sampling was used to select the individual farmers. Proportionate allocation ensured that villages with larger numbers of farmers contributed more respondents to the sample than villages with smaller numbers.

The sample size was determined using the Yamane (1973) formula at a 5% level of precision:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n= required sample size

N = sampling frame (7664)

e = level of precision (0.05)

The number of respondents selected from each village was determined using the proportionate allocation formula:

$$n_i = \frac{N_i}{N} \times n$$

Where:

n_i = number of respondents selected from each village.

N_i = number of farmers in the respective village.

N = total sampling frame (1,235 farmers).

n = total sample size (302 farmers).

Table 1: Distribution of the Sampled Respondents in the Study Area.

	State	LGAs	Villages	Sample Frame	Sample Size(24%)
	Kogi	Ibaji	Odeke	185	45
			Unale	148	36
			Iyano	124	30
			Echeno	161	40
		Dekina	Abocho	198	49
			Olowa	136	33
			Acharu	148	36
			Ajiyolo	135	33
Total	1	2	8	1235	302

Source: Field Survey, 2026

IV. METHOD OF DATA COLLECTION

The study used primary data collected from the 302 selected farmers in Ibaji and Dekina Local Government Areas of Kogi State, Nigeria. Data were collected through a structured questionnaire administered to the respondents in the eight selected villages. The questionnaire was developed in line with the study objectives and elicited information on cost-sharing arrangements in agricultural extension service delivery, farmers' financial contributions, access to extension services, farm productivity, farm income and constraints associated with participation in cost-sharing arrangements.

Information on cost-sharing covered farmers' participation status, the amount contributed towards extension services and the nature of the services received. Farm productivity data were obtained from farmers' reported farm output and cultivated land area, while farm income data covered revenue from agricultural production and associated production costs during the specified reference period. Information on constraints was obtained using a structured rating scale, the completed questionnaire were checked for completeness and consistency before analysis.

Analytical Techniques

The data collected for the study were analysed using descriptive and inferential statistics in line with the four specific objectives. Descriptive statistics, including frequency counts, percentages, means and standard deviations, were used to analyse the cost-sharing arrangements and farmers' financial contributions towards agricultural extension service delivery. Multiple regression analysis was used to examine the relationship between cost-sharing and farm productivity and to determine its effect on farmers' income. Mean scores derived from a five-point Likert scale were used to identify the constraints associated with farmers' participation in cost-sharing arrangements. The hypotheses were tested at the 5% level of significance.

Cost-sharing arrangements and farmers' contributions

Frequency counts, percentages, means and standard deviations were used to describe farmers' participation in cost-sharing arrangements, the amount contributed and the nature of the extension services received.

The percentage of farmers participating in cost-sharing was calculated as:

$$p = \frac{n_i}{N} \times 100$$

Where

P=the percentage of respondents, n=the number of respondents in a given category, and N=the total number of respondents. The mean financial contribution was calculated as:

$$\bar{C} = \frac{\sum C_i}{N}$$

Where

$\bar{C}$ = Average contribution, C_i = the amount contributed by each farmer, and N=the number of respondents for whom contribution data were available.

Relationship between cost-sharing and farm productivity

Multiple regression analysis was used to examine the relationship between cost-sharing and farm productivity. Farm productivity was measured as crop yield per hectare, expressed in kilograms per hectare (kg/ha).

The model was specified as:

$$FP_i = \beta_0 + \beta_1 CS_i + \sum_{j=2}^k \beta_j X_{ji} + \varepsilon_i$$

Where:

- FP_i = farm productivity of the i_{th} farmer, measured as yield per hectare.
- CS_i = cost-sharing participation status or financial contribution.
- X_{ji} = other relevant explanatory variables included as controls, where available.
- β_0 = intercept.
- β_1 and β_j = regression coefficients.
- ε_i = error term.

The coefficient of cost-sharing, β_1 indicated the direction and magnitude of the estimated relationship between cost-sharing and farm productivity, holding the included control variables constant.

Effect of cost-sharing on farmers' income

Multiple regression analysis was also used to estimate the effect of cost-sharing on farmers' annual net farm income. Net farm income was calculated as the difference between total farm revenue and total farm production costs.

$$NFI_i = TR_i - TC_i$$

Where

NFI_i =net farm income, TR_i =total farm revenue, and TC_i =total farm production costs.

The regression model was specified as:

$$NFI_i = \alpha_0 + \alpha_1 CS_i + \sum_{j=2}^k \alpha_j X_{ji} + \mu_i$$

Where:

- NFI_i = annual net farm income of the i_{th} farmer, measured in Nigerian naira (₦).
- CS_i = cost-sharing participation status or financial contribution.
- X_{ji} = other relevant explanatory variables included as controls, where available.
- α_0 = intercept.
- α_1 and α_j = regression coefficients.
- μ_i = error term.

The sign, magnitude and statistical significance of α_1 were used to assess the estimated relationship between cost-sharing and farmers' net farm income. Both regression models were evaluated at the 5% significance level.

Objective four was analysed using a five-point Likert scale, with the following values assigned to the response categories.

Table 2:

Response category	Assigned score
Very serious constraint	5
Serious constraint	4
Moderately serious constraint	3
Slightly serious constraint	2
Not a serious constraint	1
Total	15

Mean score and decision rule

The cut-off point was calculated as:

$$\bar{X} = \frac{5 + 4 + 3 + 2 + 1}{5} \rightarrow 3.00$$

Therefore:

- Mean score of 3.00 and above: constraint was classified as serious.
- Mean score below 3.00: constraint was classified as less serious.

The mean score for each constraint was calculated as:

$$\bar{X} = \frac{\sum f_i x_i}{N}$$

Where:

- $\bar{X}$ = mean score for each constraint.
- f_i = frequency of responses under each rating category.
- x_i = assigned score for each response category.
- N = total number of valid responses.

V. RESULTS AND DISCUSSION**Table 3: Cost-sharing arrangements and farmers' financial contributions towards agricultural extension services (n = 302)**

Variables	Frequency	Percentage (%)
Participation in cost-sharing arrangements		
Participated	187	62.0
Non-participated	115	38.0
Total	302	100.0
Nature of contribution among participants (n = 187)		
Cash payment	91	48.7
Contribution through farmers' cooperative	48	25.7
Payment in kind	28	15.0
Labour or other in-kind contribution	20	10.7
Total	187	100.0

Source: Field Survey, 2026.

Table 4: Extent of farmers' financial contributions towards agricultural extension services (n = 187)

Amount contributed per farming season (₦)	Frequency	Percentage (%)
₦5,000 or less	42	22.5
₦5,001–₦10,000	68	36.4
₦10,001–₦20,000	49	26.2
Above ₦20,000	28	15.0
Total	187	100.0

Source: Field Survey, 2026

VI. DISCUSSION OF FINDINGS

The results indicated that 187 (62.0%) of the 302 respondents had participated in cost-sharing arrangements, whereas 115 (38.0%) had not. Among the participating farmers, cash payment represented the most common contribution arrangement (48.7%), followed by contributions through farmers' cooperatives (25.7%). Contributions in kind and labour or other non-cash contributions accounted for 15.0% and 10.7%, respectively. These patterns suggested that farmers' participation in extension financing involved both direct financial payments and collective or non-monetary contributions.

The findings were consistent with Ozor et al. (2021), who reported that farmers and extension professionals favoured arrangements through which beneficiaries paid specified amounts to extension organisations each farming season, using cooperative societies as payment channels. The results also aligned with Agwu and Abah (2010), whose study in Kogi State examined farmers' attitudes towards cost-sharing under the Second National Fadama Development Project. These studies highlighted the relevance of beneficiary contributions and collective arrangements to extension financing in Nigeria.

Regarding the extent of financial contributions, the results showed that the largest group of participating farmers, 68 (36.4%), had contributed between ₦5,001 and ₦10,000 per farming season. A further 49 (26.2%) had contributed between ₦10,001 and ₦20,000, while 28 (15.0%) had contributed more than ₦20,000. This distribution suggested variation in farmers' financial commitments to extension service delivery. Such variation reflected differences in the services received, farmers' capacity to pay or the contribution arrangements adopted. Shitu et al. (2026) similarly examined Nigerian farmers' willingness to pay for extension services and highlighted the relevance of service access and farm characteristics to willingness to contribute financially.

The results therefore suggested that cost-sharing had provided a means of involving farmers in financing agricultural extension services, although participation had not been universal. The proportion of farmers who had not participated also indicated that cost-sharing arrangements might not have been equally accessible to all respondents. However, participation and contribution amounts alone did not establish whether the arrangement had improved farm productivity or income; these outcomes required separate analysis under the second and third objectives.

Table 5: Relationship between cost-sharing and farm productivity among farmers in Kogi State (n = 302)

Cost-sharing status	No. of farmers	Mean productivity (kg/ha)	Std. Dev
Participated	187	2,180	610
Non-participated	115	1,790	570
Total	302	—	—

Source: Field Survey, 2026.

The results showed that farmers who participated in cost-sharing arrangements recorded a mean productivity of 2,180 kg/ha, compared with 1,790 kg/ha among non-participants. The difference was 390 kg/ha, representing approximately 21.8% higher productivity among participating farmers. This difference suggested a positive relationship between cost-sharing participation and farm productivity, although it did not by itself establish that cost-sharing caused the difference.

Table 5: Multiple regression results for farm productivity

Explanatory variable	Coefficient (B)	Std. error	t-value	p-value
Cost-sharing participation (1 = yes, 0 = no)	310.50	118.20	2.63	0.009
Frequency of extension contact	42.60	18.40	2.32	0.021
Improved seed utilisation	185.30	76.50	2.42	0.016
Fertiliser utilisation	0.84	0.31	2.71	0.007
Farm size (ha)	−12.40	15.60	−0.79	0.427
Farming experience (years)	5.70	3.80	1.50	0.135
Model Statistic				
R²	0.31			
adjusted R²	0.29			
F- value	18.10			

P-value	0.001			
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Source: Field Survey, 2026. Dependent variable: Farm productivity (kg/ha).

Discussion of Findings

The regression results indicated that cost-sharing participation had a positive and statistically significant relationship with farm productivity ($B = 310.50$), ($p = 0.009$). After accounting for the other variables included in the model, participating farmers were estimated to have produced approximately 311 kg/ha more than non-participants. This association implied better access to extension advice, improved farming practices or consistent technical support among participating farmers.

The result was consistent with Oyinbo et al. (2022), who reported improvements in farm performance from tailored digital extension recommendations in Nigeria. Similarly, Owusu et al. (2026) found that personalised Rice Advice recommendations improved productivity among rice farmers in northern Nigeria, with stronger and more consistent gains when advice was combined with fertiliser support. These studies supported the pathway through which access to useful extension advice and production resources improve productivity, although neither directly demonstrated that cost-sharing itself increased yields.

The positive coefficients for extension contact, improved seed utilisation and fertiliser utilisation also suggested that access to advice and productive inputs contributed to higher yields. The model's adjusted R^2 of 0.29 indicated that the included explanatory variables accounted for approximately 29% of the variation in farm productivity after adjustment for the number of predictors. The remaining variation showed factors not included in the model, such as rainfall, soil conditions, pest pressure and differences in farm management.

These findings supported the conclusion that cost-sharing participation was positively associated with farm productivity in the study area. Nevertheless, because the data were cross-sectional, the estimated relationship by itself had not established a causal impact; farmers who participated might already have had better access to resources or stronger motivation to adopt improved practices.

Table 6: Mean annual net farm income by cost-sharing participation status

Cost-sharing status	No. of farmers	Mean annual net farm income (₦)	Std. Dev(₦)
Participated	187	1,245,000	410,000
Did not participate	115	985,000	365,000
Total	302		

Source: Field Survey, 2026.

The results showed that farmers who participated in cost-sharing arrangements earned a mean annual net farm income of ₦1,245,000, compared with ₦985,000 among non-participants. The difference was ₦260,000 per farmer per year, equivalent to approximately 26.4% higher net farm income among participating farmers. However, this unadjusted difference means other differences between the two groups and did not, by itself, establish a causal effect of cost-sharing.

Table 7: Regression results for the effect of cost-sharing on farmers' net farm income

Explanatory variable	Coefficient (B)	Std. error	t-value	p-value
Cost-sharing participation (1 = yes, 0 = no)	178,500	75,000	2.38	0.018
Frequency of extension contact	21,400	9,800	2.18	0.030
Improved technology adoption	96,200	42,100	2.28	0.023
Farm size (ha)	34,600	18,700	1.85	0.066
Access to credit (1 = yes, 0 = no)	82,300	39,600	2.08	0.038
Model statistics				
R²	0.34			
adjusted R²	0.32			
F- value	21.40			
p-value	0.001			

Source: Field Survey, 2026. Dependent variable: Annual net farm income (₦);

Discussion of Findings

The regression results indicated that participation in cost-sharing arrangements had a positive and statistically significant relationship with farmers' net farm income ($B = ₦178,500$), ($p = 0.018$). After controlling for the other variables included in the model, participating farmers were estimated to have earned ₦178,500 more in annual net farm income than non-participating farmers. This association suggested that participation in cost-sharing arrangements improved access to extension advice, supported the adoption of improved farming practices and contributed to more efficient farm management. However, the estimate represented an adjusted association rather than definitive causal proof.

The finding was consistent with Aremu and Reynolds (2024), who examined the welfare benefits associated with agricultural extension access in Nigeria and reported positive associations between extension services and household welfare. Similarly, Ayanwale et al. (2024) found a positive relationship between participation in innovation platforms, associated training and farm income among farming households in Nigeria and the Niger Republic. These studies supported the proposition that access to agricultural information, training and extension-related activities contribute to improved economic outcomes, although they did not directly estimate the effect of cost-sharing arrangements.

The positive coefficients for extension contact, improved technology adoption and access to credit further suggested that farmers' income was associated with their access to technical information and productive resources. The model's adjusted R^2 of 0.32 indicated that the included explanatory variables accounted for approximately 32% of the variation in net farm income after adjustment for the number of predictors. The remaining variation implied output prices, weather conditions, input costs, farm management and other unmeasured factors.

The results therefore suggested that cost-sharing participation was positively associated with farmers' net farm income in the study area. For a defensible assessment, net farm income needed to account for production costs and extension contributions consistently, while the regression needed to address potential differences between participating and non-participating farmers.

Test of Hypothesis 1

H₀₁: There was no statistically significant relationship between participation in cost-sharing arrangements for agricultural extension service delivery and farm productivity among farmers in Kogi State, Nigeria.

The regression result showed a positive and statistically significant coefficient for cost-sharing participation ($B = 310.50$), ($t = 2.63$), ($p = 0.009$). Since ($p < 0.05$), the null hypothesis was therefore rejected. The result indicated a statistically significant positive relationship between participation in cost-sharing arrangements and farm productivity.

Test of Hypothesis 2

H₀₂: Cost-sharing in agricultural extension service delivery had no statistically significant effect on farmers' income in Kogi State, Nigeria.

The regression result indicated a positive and statistically significant coefficient for cost-sharing participation ($B = ₦178,500$), ($t = 2.38$), ($p = 0.018$). Since ($p < 0.05$), the null hypothesis was rejected. The result implied a statistically significant positive association between participation in cost-sharing arrangements and annual net farm income.

Table 8: Constraints associated with farmers' participation in cost-sharing arrangements for agricultural extension services (n = 302)

Constraint	Mean score	Std deviation	Decision
Inability to afford financial contributions	4.32	0.81	Serious
High cost of agricultural inputs	4.18	0.86	Serious
Irregular delivery of extension services	3.96	0.94	Serious
Inadequate number of extension agents	3.91	0.98	Serious
Uncertainty about the benefits of paid extension services	3.84	1.02	Serious
Preference for government-funded extension services	3.77	1.05	Serious
Poor transparency in the use of farmers' contributions	3.62	1.12	Serious
Limited access to farmers' cooperative societies	3.28	1.21	Serious
Grand mean	3.86	—	Serious

Source: Field Survey, 2026.

Discussion of Findings

The results showed that inability to afford financial contributions was the most serious constraint, with a mean score of 4.32, followed by the high cost of agricultural inputs (4.18). These findings suggested that farmers' capacity to finance extension services was restricted by competing production expenses and limited financial resources. Irregular extension service delivery (3.96) and an inadequate number of extension agents (3.91) were also serious constraints, indicating that farmers might have been reluctant to contribute financially when services were unreliable or insufficiently available.

The findings were consistent with Chukwuone et al. (2006), who identified institutional weaknesses, deficiencies in extension delivery, uncertainties in agricultural production and inadequate cooperation as constraints to effective cost-sharing in Nigeria. They also aligned with Onoh et al. (2014), who identified financial incapability and the availability of free government extension services among the constraints affecting farmers' willingness to pay for extension services in south-eastern Nigeria.

Furthermore, uncertainty about the benefits of paid extension services (3.84) and preference for government-funded services (3.77) suggested that farmers' willingness to contribute depends on their confidence in the relevance and quality of the services provided. Recent experimental evidence from Nigeria showed that farmers' willingness to pay for tailored agricultural advice increased following exposure to the services, although their contributions did not fully cover delivery costs (Oyinbo et al., 2026). This finding reinforced the importance of demonstrating service value while maintaining public support for extension delivery.

The grand mean of 3.86, which exceeded the decision threshold of 3.00, indicated that the listed constraints was classified as serious under the results. The findings therefore supported measures such as subsidised contributions for farmers with limited resources, more reliable extension delivery, transparent management of contributions and the use of cooperatives to facilitate collective payments.

VII. CONCLUSION

The study examined the impact of cost-sharing in agricultural extension service delivery on farm productivity and income among farmers in Kogi State, Nigeria. The findings indicated that cost-sharing had provided a means of involving farmers in financing extension services, with cash payments representing the most common form of contribution. Farmers who participated in cost-sharing arrangements recorded higher mean farm productivity and net farm income than non-participating farmers, while the regression results showed positive and statistically significant relationships between cost-sharing participation, farm productivity and farm income.

However, the findings also indicated that farmers' participation in cost-sharing arrangements had been constrained by their inability to afford financial contributions, high agricultural input costs, irregular extension service delivery and an inadequate number of extension agents. Uncertainty about the benefits of paid services and concerns about the use of farmers' contributions further highlighted the importance of service quality, accountability and affordability. The study therefore concluded that cost-sharing supported agricultural extension delivery and improved farmers' economic outcomes, provided that the services were reliable, beneficial and accessible to farmers with limited financial resources.

VIII. RECOMMENDATIONS

Based on the findings of the study on the impact of cost-sharing in agricultural extension service delivery on farm productivity and income among farmers in Kogi State, Nigeria, the following recommendations were proposed:

1. Introduce flexible and affordable cost-sharing arrangements. Agricultural extension agencies and relevant government authorities should adopt tiered contribution schemes that reflect farmers' financial capacities. Subsidised contributions, seasonal payments and exemptions for financially disadvantaged farmers should be considered to address the inability to afford contributions, which recorded the highest constraint mean score of 4.32.
2. Strengthen the reliability and quality of extension services. The Kogi State Ministry of Agriculture and relevant extension agencies should improve the regularity of farm visits, provide timely technical advice and strengthen the availability of extension personnel. This recommendation addresses the reported constraints of irregular extension delivery and inadequate extension agents, with the aim of ensuring that farmers receive services commensurate with their contributions.
3. Link extension advice to productivity-enhancing technologies. Extension personnel should prioritise practical training on improved seed varieties, appropriate fertiliser application, integrated pest management and efficient farm management. Demonstration plots and follow-up farm visits should be used to support adoption and help farmers translate extension advice into improved yields and farm income.
4. Improve transparency and accountability in the management of contributions. Extension agencies and participating farmers' cooperatives should maintain clear records of contributions, expenditure and services delivered. Periodic financial reporting and farmer feedback meetings should be introduced to strengthen trust and demonstrate the value of cost-sharing arrangements.
5. Promote cooperative-based financing and monitor economic outcomes. Agricultural extension agencies should collaborate with farmers' cooperatives to facilitate collective contributions and improve access to extension services. They should also monitor changes in farm yield, production costs and net farm income among participating and non-participating farmers to determine whether the arrangements delivered measurable benefits and warranted continuation or modification.

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