e-ISSN 3050-9602
p-ISSN 2795-4340

10.5281/zenodo.15543613 Vol. 08 Issue 05 May - 2025 Manuscript ID: #01958

ANALYSIS OF CONTRIBUTION OF CREDIT FACILITITIES TO SMALL- SCALE COCOYAM (*Xanthosomasagittifolium (i) schott*) PRODUCTION IN IGALAMELA ODOLU LOCAL GOVERNMENT AREA OF KOGI STATE, NIGERIA

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Abstract:

This study analyzed the contribution of credit facilities to small-scale cocoyam (Xanthosomasagittifolium (I) Schott) production in IgalamelaOdolu Local Government Area of Kogi State, Nigeria. A multiple-stage sampling technique was employed for the study. A total number of one hundred and twenty (120) were selected for this study. Data collected were analyzed using simple descriptive statistics, Gross margin and return per naira invested analysis as well as profitability indices. The finding of the research show that the mean age is (43.4) which show they are in their productive age, (77.5%) were male and majority (50.8%) has secondary education and the cocoyam farmer has a mean of (8.7years) of farming experience in cocoyam production. The cost and return analysis and profitability indices were pointer indicating that cocoyam is profitable (for every one naira invested in cocoyam production, (29) kobo we be return indicating moderate profitability) with a Gross margin (₦ 1,010,348 per farmer). The result of multiple regression analysis identifies seed cost and fertilizer cost to be positively significant at (1%) respectively while cost of herbicide is negatively significant at (1%), Ridges which is negatively significant at (5%) as well cost of storage negatively significant at (10%). *And the table above shows a strong modern fit coefficient of multiple determination (R^2) of (96.82%), adjusted (R^2) of (96.43%). however, significant constraints include high cost of mechanization, poor road networks, and limited access to extension services. Recommendations includes, Stakeholders and Government intervention to provide input such as herbicides to farmers to aid production of cocoyam and to provide a conducive storage environment for the produce for all ward marketing.*

Keywords:

Cocoyam production, credit facilities, small-scale farmers, profitability, Igalamela Odolu, Nigeria.

How to cite: EGBEADUMAH, M. O., Akeredolu, D. T., Idoko O. J., Abali, O., BAKO, J. P. D. (2025). ANALYSIS OF CONTRIBUTION OF CREDIT FACILITITIES TO SMALL- SCALE COCOYAM (Xanthosomasagittifolium (i) schott) PRODUCTION IN IGALAMELA ODOLU LOCAL GOVERNMENT AREA OF KOGI STATE, NIGERIA. *GPH-International Journal of Agriculture and Research*, 8(05), 46-60. https://doi.org/10.5281/Zenodo.15543613

INTRODUCTION

Nigeria's domestic economy is significantly driven by agriculture, which contributes over 40% to the nation's Gross Domestic Product (Adeniyi et al., 2021). Despite the prominence of oil, agriculture remains a vital sector, sustaining millions of livelihoods, especially in rural areas. It provides employment, reduces poverty, ensures food security, and contributes to overall economic growth. Yet, the sector is still characterized by low yields, inadequate input use, and constrained land under cultivation (Hartmann et al., 2023). Among Nigeria's diverse agricultural crops, root and tuber crops form a critical component of the national food system, serving as staple foods in many households (Jikah et al., 2023). These include cassava (*Manihotesculenta*), yam (*Dioscorea*spp), sweet potato (*Ipomoea batatas*), and cocoyam (*Colocasia*spp and *Xanthosoma*spp), with cocoyam being particularly important in the southern and Middle Belt regions of Nigeria (Nzeh et al., 2023).

Cocoyam (*Colocasiaesculenta* and *Xanthosomamafafa*) is valued not only for its carbohydrate content but also for its superior nutritional profile compared to cassava and yam. It contains higher levels of protein, minerals, and vitamins, as well as more digestible starch (Adiele et al., 2023). As a result, it plays a significant role in ensuring household nutrition and food security. In terms of national production, cocoyam ranks third after cassava and yam and is widely cultivated by smallholder farmers, particularly women, operating within the subsistence economy (Otekunrin et al., 2021). Nigeria alone accounts for 37% of global cocoyam output, with average production estimates reaching over 5 million metric tons (Nzeh et al., 2023). Cocoyam tubers are prepared in various forms including boiling, roasting, pounding, or milling into flour. The corms and cormels can be processed into flour for use in bread, puddings, or beverages, and even the peels are useful as animal feed (Nagar et al., 2023; Kadian et al., 2022).

Despite its socio-economic and nutritional importance, cocoyam remains under-researched compared to other staple crops (Nzeh et al., 2023). It was not until the last decade that systematic policy and research interest began to emerge, largely driven by biodiversity concerns (Abiri et al., 2023). However, production continues to face a downward trend, largely due to socio-economic, institutional, and technical constraints (Adiele et al., 2023). Among these constraints, access to credit stands out as a critical factor limiting farmers' ability to scale up production, invest in modern techniques, and improve productivity.

Credit access is fundamental to the viability of smallholder agriculture. It enables farmers to purchase quality inputs, adopt improved technologies, and enhance their production systems (Maryono et al., 2024). In rural areas such as IgalamelaOdolu Local Government Area of Kogi State, formal financial services are often inaccessible to small-scale cocoyam producers. These farmers usually lack the collateral demanded by financial institutions, face high interest rates, and struggle with bureaucratic loan processes (Adams et al., 2021; Abah et al., 2020). In addition, poor financial literacy and limited awareness of loan products further hinder access. Even when credit is available, agriculture is often deemed too risky by lenders due to factors such as climate variability, pest attacks, and volatile markets (Goyal et al., 2021; Adewumi et al., 2021). Consequently, many smallholder cocoyam farmers are trapped in a cycle of low investment and low returns.

In IgalamelaOdolu, where agriculture remains the primary economic activity, cocoyam production has the potential to improve livelihoods and food security. Yet, its contribution to household income and rural development remains under-realized due to limited credit access and production inefficiencies. While various financial institutions offer agricultural loans, the uptake among cocoyam farmers is constrained by structural and socio-economic barriers (Kambali et al., 2022). These include inadequate collateral, complex lending procedures, and

a lack of farmer education on financial management (Jabbouri et al., 2021). This situation has led to suboptimal productivity, perpetuating poverty and limiting agricultural transformation. Therefore, a comprehensive investigation into the relationship between credit facilities and cocoyam production is essential. This study aims to assess the contribution of credit access to small-scale cocoyam farming in IgalamelaOdolu, with particular focus on farmers' demographic characteristics, credit availability, profitability, productivity drivers, and the challenges encountered in accessing finance. The findings will offer insights into how targeted interventions can enhance credit access, boost productivity, and promote sustainable agricultural development in Kogi State and similar agrarian communities.

RESEARCH METHODOLOGY

Study Area

This study was conducted in IgalamelaOdolu Local Government Area of Kogi State, Nigeria. Bordered by the Niger River to the west and Enugu State to the east, the headquarters is located in Ajaka. The region lies between latitudes 7°05'N and 7.08°N and longitudes 6°49'E and 6.82°E, covering 2,175 square kilometers with an elevation of 139 meters above sea level. As of 2022, the estimated population was 198,200. The region exhibits a warm humid tropical climate, characterized by distinct wet and dry seasons. The wet season lasts from April to September/October, and the dry season extends from October to March/April. The area is primarily inhabited by the Igala people, who speak the Igala language and predominantly practice Christianity and Islam. Economically, the region is agrarian, with farmers cultivating crops such as maize, rice, cassava, yam, guinea corn, and cocoyam. Other economic activities include fishing, hunting, blacksmithing, mining, and trading. The area is also rich in natural resources such as limestone and coal.

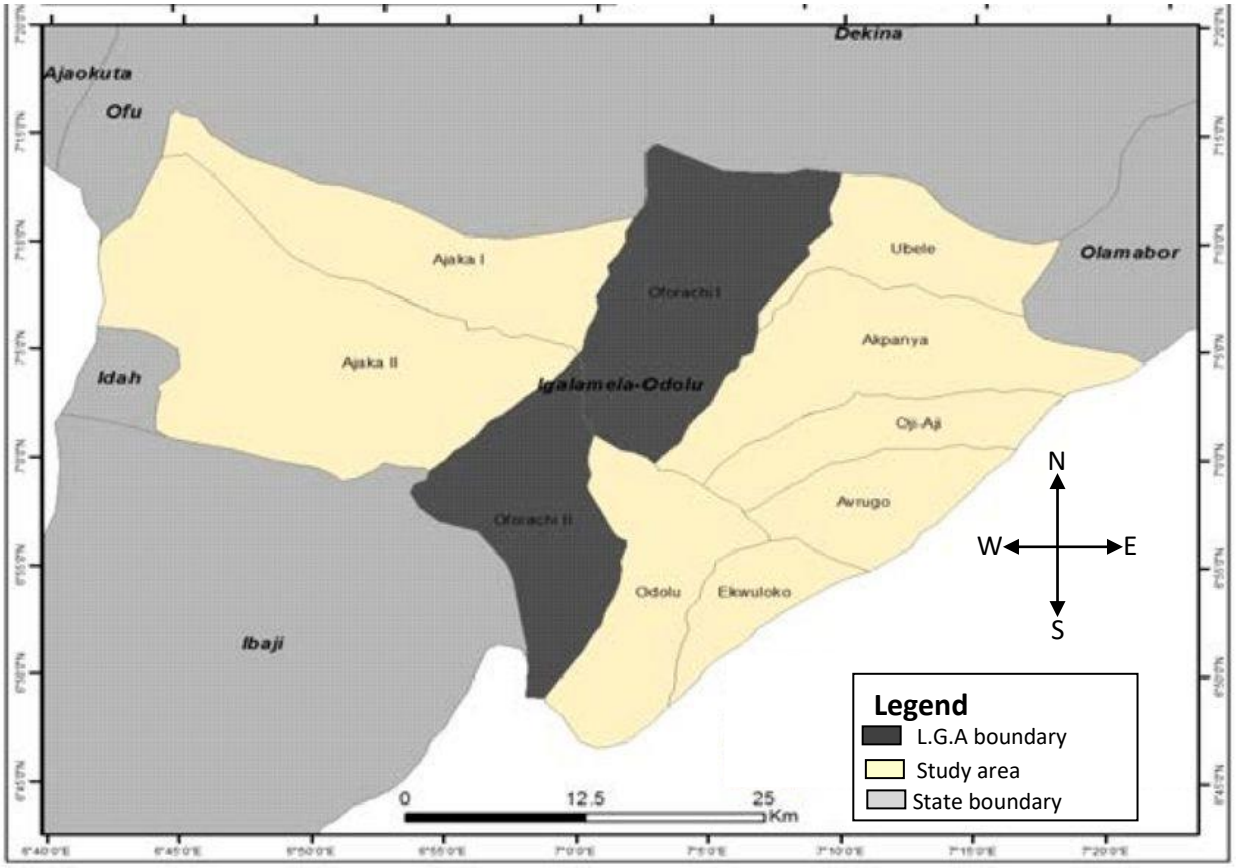

Figure 1: map of igalamelaodolu local government showing the study area. Source: Google search

Source and Method of Data Collection

Primary data was collected using a well-structured questionnaire administered to selected cocoyam farmers. This was complemented by scheduled interviews to gather detailed information. The questionnaire captured data on farmers' demographic characteristics, costs and revenue, credit facilities, and challenges affecting cocoyam production.

3.3 Sampling Technique and Sample Size

A multi-stage sampling technique was employed. In the first stage, five wards (Akpanya, Avrugo, Odolu, Oji-Aji, and Ubele) were purposively selected from the ten council wards due to their prominence in cocoyam farming. The second stage involved the purposive

selection of three villages from each ward. In the final stage, eight farmers were randomly selected from each village, culminating in a total sample size of 120 respondents.

Analytical Techniques

Three major analytical techniques were employed:

- **Descriptive Statistics:** Used for analyzing socio-economic characteristics.
- **Profitability Analysis:** Involves calculating Gross Margin (GM = TR – TVC) and Return per Naira Invested (RNI = NFI/TC).
- **Multiple Regression Analysis:** Employed to assess the determinants of cocoyam output using the following model:

$$Y=\beta0+\beta1X1+\beta2X2+\cdots+\beta13X13++\mu$$

Where:

Y = Cocoyam output (kg);

X_1–X_{13} = Age, farming experience, cost of inputs (seed, transport, fertilizer, herbicide), labor (land preparation, heap making, planting, weeding, harvesting), storage cost, and level of education;

μ = error term;

$\beta0$ = constant;

β = parameters to be estimated.

RESULTS AND DISCUSSION

SOCIO-ECONOMIC CHARACTERISTICS OF COCOYAM FARMERS

The results indicate that cocoyam farming is primarily undertaken by middle-aged individuals, with 61% aged between 31 and 50 years. Most farmers (45%) had household sizes of 3–5 members, potentially contributing family labor. Farming experience was notable, with 42.5% of respondents having 6–10 years of experience. Farm sizes were small, with 87.5% cultivating between 0.5 and 1 hectare. The enterprise was male-dominated (77.5%),

and 50.8% had attained secondary education. Although 98.3% had access to land (mainly through family inheritance), 71.7% lacked access to credit facilities. The major source of capital was personal savings (78.2%), while contact with extension agents was minimal (5.8%), reflecting weak institutional support systems.

Table 1: Socio-Economic Characteristics of Cocoyam Farmers

Variables	Frequency	Percentage
Age		
21- 30	18	15.0
31-40	35	29.2
41-50	38	31.7
51-60	21	17.5
61-70	08	6.7
Household Size		
1-2	27	22.5
3-5	54	45.0
6-8	34	28.3
9-10	05	4.2
Years of Experience in production		
1-5	41	34.2
6-10	51	42.5
11-15	17	14.2
16-20	07	5.8
21-30	04	3.3
Farm Size devoted to Cocoyam production. (ha)		
0.5	56	46.7
1	49	40.8
2	15	12.5
Sex		
Male	93	77.5
Female	27	22.5
Marital Status		
Single	52	43.3
Married	64	53.3
Divorced	1	0.9
Widowed	3	2.5
Membership of Association		
Member	34	28.3
Not member	86	71.7
Contact with Extension Agents		
Having contact	7	5.8
No contact	113	94.2

Level of Education		
Primary school	20	16.7
Secondary school	61	50.8
Tertiary	31	25.8
No Formal Education	08	6.7
Primary Occupation		
Farming	88	73.3
Trading	20	16.7
Civil service	12	10.0
Access to Credit/ loan		
Access	34	28.3
No Access	86	71.7
Access to Land		
Yes	118	98.3
No	02	1.7
Source of Land		
Family	73	60.8
Hired	30	25.0
Both	17	14.2
Source of Capital		
Personal Savings	94	78.2
Agric./Commercial Banks	1	0.9
Cooperatives/Thrift	4	3.3
Family & Friends	20	16.7
Others	1	0.9

Source: Field Survey, 2025

AVAILABILITY OF CREDIT FACILITIES FOR COCOYAM PRODUCERS

Only 28.3% of farmers had access to any form of credit. Among them, 16.7% sourced funds from family and friends, 3.3% from cooperatives, and only 0.9% accessed loans from formal banks. The overwhelming reliance on personal savings (78.2%) constrained investment in improved inputs and technology adoption. This underscores a critical financial gap in small-scale cocoyam production and the need for inclusive agricultural finance initiatives.

Table 2: Types of Credit Facilities Available to the Respondents

Types of Credit	Frequency	Percentage
Personal Savings	94	78.2%
Family and Friend	20	16.7%
Cooperative/Thrift Societies	04	3.3%
Agricultural/CommercialBank	02	0.9%
Total	120	100%

Source: Field Survey, 2025

PROFITABILITY ANALYSIS OF COCOYAM FARMING

The gross margin analysis revealed that cocoyam production is profitable. On average, the total revenue per farmer was ₦1,791,613, while the total variable cost stood at ₦781,265, yielding a gross margin of ₦1,010,348. The return per naira invested (RNI) was 1.29, indicating a 29% return on investment. The most significant cost components were cocoyam seed (₦337,088) and fertilizer (₦223,731), which together accounted for over 70% of the total input cost. The results demonstrate the economic viability of cocoyam farming, though profitability could be further enhanced through improved access to inputs and cost-reduction strategies.as presented in Table 3.

Table 3: Cost and Return of Cocoyam Production

Variable	Cost (₦)	Average (₦)
Input Costs		
Cocoyam Seed	40,450,500	337,088
Loading/Offloading	1,304,200	10,868
Fertilizer	26,847,700	223,731
Herbicide (Quantity in Litres)	7,211,300	60,094
Transportation	3,875,850	32,299
Labour& Other Variable Costs		
Land Clearing	2,697,800	22,482
Heap Making	2,583,900	21,533
Planting	1,889,600	15,797
Weeding	1,035,400	8,628
Harvesting	2,240,500	18,671
Storage	541,500	4,513
Bagging	1,900,950	15,841
Sorting	1,172,650	9,772
Total Variable Cost (TVC)	**93,751,850**	**781,265**
Total Revenue (TR)	**214,993,500**	**1,791,613**
Gross Margin (GM = TR - TVC)	**121,241,650**	**1,010,348**
Return per Naira Invested (RNI =	**1.29**	**1.29**

GM/TVC)

Source: Field Survey, 2025

FACTORS INFLUENCING COCOYAM PROFITABILITY

Multiple regression analysis identified several significant determinants of cocoyam output. Seed cost (β = 2.568) and fertilizer cost (β = 3.375) had positive and statistically significant effects at the 1% level, reflecting their direct contribution to yield. Conversely, herbicide cost (β = -3.310), cost of ridges (β = -1.848), and storage cost (β = -2.692) negatively influenced profitability, possibly due to inefficient usage or post-harvest losses. The model explained 96.82% of the variation in profitability (R^2 = 0.9682), and the F-statistic confirmed its overall significance (p < 0.001). These findings highlight the need for cost-effective input management and improved storage infrastructure.

Table 4: Multiple Regression of Factors Affecting Cocoyam Profitability

Variable	Estimate (β)	Standard Error	t-value	p-value	Significance
Intercept	3.79000	3.10500	1.221	0.225	.
Age (X_1)	-9.434	6.188	-1.525	0.130***	Significant
Farming Experience (X_2)	-1.887	1.247	-1.513	0.880	NS
Seed Cost (X_3)	2.568	1.637	1.569	0.001***	Significant
Transportation Cost (X_4)	-1.847	1.218	-1.516	0.132	NS
Fertilizer Cost (X_5)	3.375	5.142	0.656	1.001***	Significant
Herbicide Cost (X_6)	-3.310	9.351	-0.354	0.0006***	Significant
Land Preparation (X_7)	9.162	4.937	1.856	0.066	NS
Ridges (X_8)	-1.848	6.155	-0.300	0.003**	Significant
Planting Cost (X_9)	4.157	3.014	1.379	0.980	NS
Weeding Cost (X_{10})	1.646	4.145	0.397	0.692	NS
Harvesting Cost (X_{11})	6.879	7.066	0.974	0.333	NS
Cost of Storage (X_{12})	-2.692	1.269	-2.121	0.036*	Significant

Variable	Estimate (β)	Standard Error	t-value	p-value	Significance
Level of Education (X_{13})	-8.741	4.862	-1.798	0.075	NS
Model Summary					
R Square (R^2)	0.9682				
Adjusted R-Squared	0.9643				

Std. Error of the Estimate

Keys: ***p < 0.001 (Highly Significant), **p < 0.01 (Significant) *p < 0.05 (Moderately Significant), p < 0.10 (Marginally Significant)

CONSTRAINTS FACED BY COCOYAM FARMERS

Farmers reported a broad range of constraints affecting cocoyam production. The most severe challenges, each cited by all 120 respondents, included high cost of mechanization, poor access roads, high cost of inputs, and limited access to innovation and information. Other prominent issues were lack of training, post-harvest losses, market access (119 responses), high transport costs, and weak extension services (118 responses). Financial barriers were also significant, with inadequate capital and lack of credit cited by 116 respondents. Additional constraints included insecurity, high labor costs, and poor storage facilities. These findings illustrate systemic limitations along the cocoyam value chain—from input access to post-harvest handling—and suggest the need for comprehensive agricultural support interventions.

Table 5: Constraints Associated with Cocoyam Farmers

Constraints	Frequency	Rank
High cost of Mechanization	120	1
Poor access Road network	120	1
High cost of Inputs	120	1
Innovation information	120	1
Lack of Training	119	2
Post-Harvest losses	119	2
Ready market	119	2
Transportation cost	118	3
Inadequate extension services	118	3
Inadequate capital	116	4
Lack of credit facilities	116	4
Improved Seeds	77	5
Insecurity	70	6
High cost/unavailable Labor	69	7
Inadequate storage facilities	62	8
Poor storage facilities	62	8

Source: Field Survey, 2025

Conclusion

The study established that small-scale cocoyam production in IgalamelaOdolu Local Government Area of Kogi State is a viable agricultural enterprise with moderate profitability. The majority of farmers were male, within their productive age, and had moderate educational backgrounds and farming experience. Although cocoyam farming generated a positive gross margin and a favourable return on investment, its full potential is hindered by critical constraints such as limited access to credit, high cost of inputs and mechanization, poor rural infrastructure, and weak extension support. Furthermore, the regression analysis confirmed that profitability is significantly influenced by key input costs such as seed and fertilizer, while inefficient use of herbicides, poor ridging practices, and storage limitations negatively affect output.

Recommendations

In light of the findings, the following recommendations are made:

1. Expand Access to Affordable Credit:Financial institutions and agricultural development agencies should design farmer-friendly loan schemes with minimal collateral requirements to enhance capital availability for cocoyam farmers.
2. Subsidize and Regulate Input Supply:The government should ensure timely availability and affordability of key inputs, particularly improved seeds and fertilizers, through targeted subsidy programs and input distribution networks.
3. Strengthen Agricultural Extension Services:Increased recruitment and deployment of extension agents will improve farmers' access to modern agronomic practices, efficient input use, and post-harvest handling techniques.
4. Promote Farmer Cooperatives:Organizing farmers into cooperatives will enhance collective bargaining power, facilitate access to credit and inputs, and improve marketing opportunities.
5. Invest in Rural Infrastructure:Rehabilitation of access roads and improvement in transport systems will reduce post-harvest losses, facilitate input supply, and improve market access.
6. Support Storage and Post-Harvest Technologies:Provision of affordable and efficient storage facilities and training in post-harvest management will help reduce losses and improve product quality and profitability.

By addressing these structural and institutional barriers, cocoyam farming can become a more productive, sustainable, and income-generating venture for rural households in Kogi State and similar agro-ecological regions in Nigeria.

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