

ISSN: 2695-2556 (Online)

ISSN: 2651-5679 (Print)

AKSU Journal of Agriculture and Food Sciences 10(3) 78-94, 2026

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Impact of Fadama III Additional Financing Project on the Income of Cassava Based Farmers in Akwa Ibom State, Nigeria

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Abstract

This study examines the impact of Fadama III Additional Financing Project on the income of cassava farmers in Akwa Ibom State, the specific objectives include: examine the socioeconomic characteristics of beneficiaries and non-beneficiaries of Fadama III Additional Financing in Akwa Ibom State, determine and compare income levels of beneficiaries and non-beneficiaries of Cassava based Farmers in the area, assess the impact of the programme on the well-being of the beneficiaries, identify the constraints of the Fadama III AF programme efficiency and assess the financial performance of the beneficiaries and non-beneficiaries in the study area, Nigeria. Primary data were collected using a well-structured questionnaire from beneficiaries (120) and non-beneficiaries (120) of the programme in the state and a multistage sampling technique was used. Descriptive statistics, multiple regression, ranking and financial ratios were employed to analyze the collected data. The results showed a mean age of 49 and 51 years for beneficiaries and non-beneficiaries respectively. The monthly income results showed that 16.7% and 16.0% earned ₦ 10, 000 – ₦ 30, 000. 45.0% and 45.0% earned ₦31, 000 – ₦ 50, 000, 28.3% and 27.2% earned ₦ 51, 000 – ₦ 60, 000 while 12.5% and 12.0% earned above ₦ 60, 000 for the two groups. The difference in mean income, crop output, farm size, household asset, and cost of labour employed in farm operations between Fadama III beneficiaries and non-beneficiary cassava farmers were statistically significant at 1.0% level of probability. The result further showed a current ratio of 1.67 and 1.42 respectively for the beneficiaries and the non-beneficiaries. This indicated that the beneficiaries are better off but the two categories of farmers were in good positions to pay off all their current liabilities with the available assets. The research recommended that the programme be extended to have more beneficiaries.

Key words: Finance, Impact, Fadama III, Cassava Farmers

1.0 Introduction

Nigeria as a country is blessed with abundance of arable land and water resources required for sustainable agricultural development. Evidence has shown that agriculture has made a remarkable contribution to the economic prosperity of advanced countries, but Nigerian agriculture has been characterized by small scale production with poor investment, low output, and low income (Osondu, et al., 2014). Despite many years of agricultural development efforts by past successive governments in Nigeria and international donor agencies and in spite of million dollars committed into such development efforts, the agricultural sector appears to have remained undeveloped (Nwaobiala, 2013). Despite many agricultural development programmes that past governments had initiated and implemented, Human Development Index (HDI) still remained as low as 0.548 by 2023 and 56 percent of Nigerians live below the poverty line. This is probably due to the failure of these programmes as agriculture provides livelihood for a greater percentage of our population compared to other sectors of the economy. It is not yet clear, if the objective of Fadama III additional financing in Akwa Ibom State has been achieved which were aimed to scale up the impact and development effectiveness of the parent Fadama III project by aligning it with the government's agricultural priorities to sustainably increase the incomes and productivity of targeted farmers.

Cassava is an important crop in the state, and it is grown on over 100,000 hectares of land. Cassava is mainly grown by smallholder farmers in Akwa Ibom State, and the crop is an important source of food and income for these farmers. The average yield of cassava in the state is about 17 tons per hectare. One of the main challenges faced by cassava farmer is the lack of access to markets, which makes it difficult for farmers to sell their cassava and get a good price, pests and diseases, lack of access to credit, poor infrastructure, labor shortages, poor soil fertility, and a lack of appropriate farming tools and equipment. These challenges make it difficult for farmers to increase their yields and improve their incomes (FOASTAT, 2019). In addition, cassava-based farmers in Akwa Ibom State face challenges such as limited access to farm inputs, credit, improved technologies, extension services, and profitable markets, which constrain their productivity and income. To address these challenges, the Fadama III Additional Financing Project was implemented to improve farmers' access to productive resources, enhance agricultural activities, and increase rural incomes. The content of Fadama programme has many objectives to achieve at the same time. This really constitutes obstacles in the implementation of the programme. The programme started with numerous goals to achieve at the same time which affected the implementation of the programme; doubts still exist whether the programme has bettered the life of the people. Various governments in Nigeria have the obvious tendencies of pursuing multiple goals that in most cases are complicated and policy goals often lack clarity and consistency with demands of the people (Ahmed & Dantata, 2016). In Nigeria, agricultural production is still carried out using human physical strength, which declines with age. This has been observed as one of the major constraints in agricultural production in Nigeria (Abraham & Jankowska, 2025).

Literature has provided sufficient evidence that there is increasing rural –urban migrations among youths in our farming communities. Under this condition, most farmers struggle to substitute factors in order to maximize output. This actually affects the level of production and expected revenue from farming. As noted by Ogunniyi *et al.*, (2012), high productivity cannot be achieved unless a sound policy is instituted to tackle the issue of insufficient farm inputs. With the massive rural development drive in Akwa Ibom State, one could be tempted to ask whether this scenario is

obtainable. Following the continuous decline in the quantity of cassava and its derivatives produced in the state, the issue of increasing population density and continuous influx of cassava products from the neighboring State is also a problem.

There are worries that the context (environment) in which administrative action was pursued affected the implementation of the third National Fadama Development Programme as a public policy (i.e. decision-making units, implementing units, disposition of implementers, complexity in policy characteristics and regime characteristics). However, it remains unclear whether participation in the project has significantly improved the income and welfare of cassava-based farmers in the state. Questions also remain regarding the differences between beneficiary and non-beneficiary farmers, the project's income impact, and the constraints limiting its effectiveness. Therefore, this study assesses the impact of the Fadama III Additional Financing Project on the income of cassava-based farmers in Akwa Ibom State, Nigeria. One therefore begins to wonder about the socio-economic characteristics of the beneficiaries and non-beneficiaries; is there any significant difference between the income of the beneficiaries and non-beneficiaries? What is impact of the programme on the well-being of the beneficiaries? What are the costs and returns structure for beneficiaries and non-beneficiaries? To this end, the general objective of this study was to evaluate the impact of Fadama III Additional Financing project on the income of cassava-based farmers in Akwa Ibom State.

2.0 Literature Review

Markus, et al., (2026) examined the impact of the National Fadama III-AFI project on the productivity and income of tomato farmers in Kaduna State. A multi-stage sampling technique was employed to select 255 Fadama III-AFI project beneficiaries and 300 non-beneficiaries for the study. A structured questionnaire was used to collect data. Data collected were analysed using Total Factor Productivity (TFP), Net Farm Income (NFI), and Propensity Score Matching (PSM) for control selection bias and Principal Component Analysis (PCA). The result reveals a percentage increase in total factor productivity by 35%. Net Farm Income was also much greater, at ₦2,174,639.9 per hectare for beneficiaries than non-beneficiaries with ₦1,466,906.37/ha, Return on Naira Invested was greater at ₦5.43 per ₦1.00 invested for beneficiaries and ₦2.86 per ₦1.00 invested for non-beneficiaries, Propensity Score Matching analysis validated that Fadama III-AFI project raised mean tomato production by approximately 3,800 kg per hectare - 4,005 kg per hectare and improved income by ₦32,350 - ₦42,300 per hectare with high statistical significance.

Esheya (2024) examined cassava farmers' participation in the Fadama III Additional Financing Project in Ebonyi State, Nigeria. Using a multistage sampling technique, 240 participating cassava farmers were selected, and primary data were collected through scheduled interviews. The data were analyzed using frequencies, percentages, means, and Likert-type scales. The findings revealed that the farmers actively participated in business-plan preparation, needs assessment, input and project distribution, and training programmes. The project also improved access to farm inputs, increased farm yields and farm sizes, provided training opportunities, enhanced access to market information, reduced labour costs, and supported rural infrastructure development.

Akpan et al. (2024) focused on Fadama III and the sustainable income of rural farmers in Akwa Ibom State. The main objective of the study was to examine the impact of the Fadama III project on agricultural development in Akwa Ibom State, primary data were sourced using a questionnaire and interview method. Secondary data were sourced from textbooks, journal publications, and online sources. The population of the study was 2730 Fadama users in Akwa Ibom State. Using the Taro Yamane formula, a Sample size of 400 was determined and administered, out of which 354 were successfully retrieved. The Simple linear regression analysis was the method of data analysis. It was discovered that there is a significant relationship between Fadama III and a sustainable increase in the income of rural farmers in Akwa Ibom state

Nwoye and Nwalieji (2019) examined the level of male and female participation in the implementation of Fadama III – Additional Financing project among cassava farmers in Anambra State, Nigeria. Multi-stage sampling technique was used to select 120 cassava farmers that participated in Fadama III – Additional Financing project. Primary data were collected using interview schedule, while paired sample t-test and multiple regression analysis were used to analyse the data. Findings reveals that the male respondents were mainly active in the project activities such as need assessment ($M=2.65$), development of business plan ($M=2.65$) and production group formation ($M=2.63$), while strong linkage to financial institution ($M=2.82$), conflict resolution ($M=2.72$), monitoring and evaluation ($M=2.67$) and strong linkage to off takers ($M=2.60$) were more actively carried out by the female respondents. Both the male and female respondents benefited immensely from the project in terms of access to improved farm inputs access to facilitator, provision of training, increase in yield, increase in farm size, adequate information on good production practices and low cost of labour. Untimely provision of inputs, irregular advisory services, corrupt practices, lack of access to credit and poor road network were regarded as the major constraints to male and female participation in the project activities. There was significant difference ($t = 2.50$, $p \leq 0.05$) in the level of participation between male and female farmers in the project

3.0 Methodology

3.1 The Study Area

This study was carried out in Akwa Ibom State. The State is located North of the equator on longitude $7^{\circ} 51'$ and $8^{\circ} 20'$ East of the Greenwich meridian and latitude $4^{\circ} 30'$ and $5^{\circ} 30'$. It has an estimated land area of 8412km^2 with a population of over 3.2 million and its population grows at about 2.83%, Akpan, (2019) and Edet (2014), it has a shoreline of 129km on the Atlantic Ocean, to the south. It is bounded at the East, with Cross-River State, at the North with Abia and at the West with Rivers State. The state has 6 agricultural zones namely: Oron, Abak, Ikot Ekpene, Etinan, Eket and Uyo.

The climate is tropical, marked by two distinct seasons, the dry (November - March) and the wet (April-October) seasons. Annual rainfall ranges between 2220mm in the north of the state and up to 3000mm in the south. From the saline water swamp forest in the south to the rain forest in the north, the land is suitable for extensive agriculture. The State is among the 36 states that have benefited from Fadama project in Nigeria. The physical features directly influence the choice of crop cultivation and fishing as a means of sustainable livelihood. Some major staple food crops cultivated includes yam, maize, cassava, cocoyam and vegetables.

3.2 Sampling Technique / Sample Size

Samples were drawn from three agricultural zones namely: Eket, Abak, and Ikot Ekpene. Multi-stage sampling procedure was used in the selection of sample for this study. The first stage involved a purposive selection of three out of the six agricultural zones in the state and these are Eket, Abak and Ikot Ekpene because most of the beneficiaries were drawn from there. The second stage involved a purposive selection of one Local Government each from the three agricultural zones and these include Ikot Abasi, Abak and Ikot Ekpene Local Government Area. In the third stage, 50 percent of beneficiaries was considered in all the three (3) Local Government Area selected. Based on these 50%, 50 beneficiaries were selected from Ikot Abasi and Abak and 20 beneficiaries were selected from Ikot Ekpene giving a total number of 120 beneficiaries. For the non-beneficiaries, 40 cassava farmers were randomly selected from the three local government area to have total number 120 cassava farmers.

3.3 Method of Data Collection

Data were collected using a structured questionnaire for beneficiaries and non-beneficiaries of Fadama III Additional Financing and was complemented by personal interviews to ensure consistency and accuracy of the collected data.

3.4 Analytical Techniques

Objective 1: Socio-economic characteristics of the beneficiaries and non-beneficiaries

The data was analysed using descriptive statistic consisting of percentages, mean. Paired treatment test (paired “test”) was used.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

.....Equation 3.1

Where:

t	=	Paired t-test statistics
X ₁	=	Mean parameter of Fadama III participants
X ₂	=	Mean parameter of non-Fadama III participants
S ₁ ²	=	Variance of 1 st group (Fadama III participants)
S ₂ ²	=	Variance of 2 nd group (non-Fadama III participants)
N ₁	=	number of selected Fadama III farmer participants
N ₂	=	number of selected non-Fadama III farmer participants
df	=	Degree of freedom = N ₁ + N ₂ - 2

Objective 2: Impact of the programme on the well-being of the beneficiaries

The study formulated and estimated the following welfare function. Household income per adult equivalent of the respondents was used as a proxy for wellbeing. (Quartey 2005 and Ukoha, Mejeha and Nte 2007)

Explicitly, the function was specified thus;

$$HI = f(ASS, HHS, FS, WF, ED, DR, FAD)$$

.....Equation 3.2

Where:

HI= Household income per adult equivalent is used as a proxy for wellbeing AE = (₦) where AE = $1 + 0.7(N_1 - 1) + 0.5N_2$ (Ukoh *et al* 2009)

N_1 = Number of adults aged 15years or above

N_2 = Number of household members less than 15 years. The household income per adult equivalent was derived as total household income divided by adult equivalent AE (₦)

Where:

ASS = Household Physical assets

HHS =Household size

FS = Farm size

WF = Household work force (share of adult employed)

ED = Educational level of household heads (in years)

DR =Dependency ratio ($DR = \frac{a+b}{c}$, where a= no. of children aged below 15 years; b= no. of adults above 65 years; c= no. of adults aged between 15 and 65 years).

FAD = Variables capturing the value of inputs supplied by Akwa Ibom State Fadama III Additional Financing. This was included to capture the impact of the Fadama 111 Additional Financing on the wellbeing of the beneficiaries.

Objective 3: Costs and returns structure for beneficiaries and non-beneficiaries

The costs and returns structure were examined using budgetary analysis below;

$$\text{Profit} = \text{Total Fixed Cost (TFC)} - \text{Total Variable Cost (TVC)}$$

Where

$$\text{TFC} = \text{Rent} + \text{Depreciation (Cutlass, weeding hoe, wheelbarrow)}$$

Depreciation was computed using straight line method below:

$$\frac{\text{Cost of Asset} - \text{Salvage Value}}{\text{Useful life}}$$

.....Equation 3.3

$$\text{Gross Margin (GM)} = \text{Total Revenue (TR)} - \text{TVC}$$

$$\text{GM} = \text{TR} - \text{TVC}$$

$$\text{Benefit-Cost Ratio (BCR)} = \frac{\text{Total Benefit}}{\text{Total Cost}}$$

To test for significant mean differences in profit between beneficiaries (X_1) and non-beneficiaries (X_2), Independent Samples t-Test was used.

$$t = \frac{X_1 - X_2}{S_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \dots\dots\dots \text{Equation 3.4}$$

Where:

X_1 = Mean profit of beneficiaries

X_2 = Mean profit of non-beneficiaries

n_1, n_2 = Sample sizes of each group

S_p = Pooled standard deviation, calculated as:

$$S_p = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}} \dots\dots\dots \text{Equation 3.5}$$

4.0 Results and Discussion

4.1 Socioeconomic Characteristics of Respondents

The results of the socio-economic characteristics of cassava farmers in Akwa Ibom State which included age, gender, marital status, level of education, household size, farming experience, other occupation, Contact with Extension Agents, Membership of Cooperative, Monthly Income, Land acquisition and farm Size are presented in Table 4.1 below.

The age distribution of the respondents showed that majority (57.5%, 65.8%) of the respondents who benefited from Fadama III program as well as those that didn't benefit fell within the age bracket of 41-50 years. This was followed by those farmers whose age range was above 50 years (20.0%) for the beneficiaries and 31-40 years (15.0%) for the non-beneficiaries. The mean age for both the beneficiaries and the non-beneficiaries were respectively 49 and 51 years. This is an indication that the respondents as at the time of this research were in their prime age. This result was in line with the result of Hoe, *et al.*, (2017) who studied Community participation for rural poverty alleviation in Malaysia.

The results of gender analysis showed that most (62.5%, 58.3%) of the respondents in both categories were female. This was an indication that more women got involved and always get involved in agricultural operations in this rainforest zone. The result is contrary to the findings of Agom (2026) whose findings revealed that 51.7% of cassava farmers were males in Akwa Ibom. Marital status analysis showed that a greater percentage (63.3%, 69.2%) of the beneficiaries and non-beneficiaries, respectively were married, (16.7%, 7.5%) of the beneficiaries and non-beneficiaries, respectively were single, (5.8%, 1.7%) of the beneficiaries and non-beneficiaries,

respectively were divorced, (5.8%, 10.8%) of the beneficiaries and non-beneficiaries, respectively were widows and (6.7%, 8.3%) of the beneficiaries and non-beneficiaries, respectively were widowers. The findings corroborates with those of Nkamenyin, Frank and Udoka (2026) and Akpaeti and Agom (2023) who found out that most of farmers involved in cassava production are married in Akwa Ibom State.

The distribution of the respondents by education can be seen in a nutshell as the extent to which an individual cassava farmer is able to acquire formal education. Results show that majority (68.3%, 80.0%) in both categories attained secondary education, (12.5%, 6.7%) had tertiary education, and (19.2%, 9.2%) had a primary education, while only 4.2% for the non-beneficiary category were unable to acquire formal education. The Household size distribution showed that most (55.8%, 67.5%) of the beneficiaries and non-beneficiaries, respectively had household size of 4-5 persons, (19.2%, 8.3%) had 1-3 persons, (17.5%, 15.8%) had 6-10 persons and (7.5%, 8.3%) had above 10 persons. The mean household size of the beneficiaries and non-beneficiaries, respectively were 5 and 4 persons. This result was in line with Nwaobiala, *et al.*, (2022) who reported a mean household size of 5 persons per household. The result also showed that greater percentage (55.8%, 65.0%) of the beneficiaries and non-beneficiaries, respectively had about 11 – 15 years of farming experience, (10.8%, 6.7%) had experience less than 5 years, 8.3%, 11.7% had 6-10 years of experience in cassava farming, 6.7%, 8.3% had 16-20 years' experience and 10.0%, 8.3% had experience above 20 years. The mean experience for beneficiaries and non-beneficiaries, respectively were 11 years and 13 years. This result confirmed the result of Adeyemi, Adeyemo, Kehinde and Famuyini (2020) who examined the effects of Fadama III user group participation on food security of rural households in Benue State, and reported a mean 13.78 years.

The findings on monthly income revealed that (16.7%, 16.0%) of the beneficiaries and non-beneficiaries, respectively earned ₦10,000 – ₦30,000. (45.0%, 45.0%) earned ₦31, 000 – ₦50, 000, (28.3%, 27.2%) earned ₦51, 000 – ₦70, 000 while (12.5%, 12.0%) earned above ₦71, 000. Farm size results presented in Table 2 revealed that 58.3% of beneficiaries had farm size of 2.1-3.0 ha while majority (62.5%) of non-beneficiaries had farm size of less than 1.0 ha.

The paired t-test analysis presented in Table 2 evaluates the mean differences across economic and farm operational parameters between Fadama III Additional Financing beneficiaries and non-beneficiaries within the study area.

Regarding farm income, beneficiaries recorded a higher mean farm income of ₦46,250.00 compared to ₦41,291.67 earned by non-beneficiaries, producing a mean difference of ₦4,958.33. The calculated t-value of -2.337 was statistically significant at the 5% probability level, leading to the rejection of the null hypothesis of no significant difference in farm income between the two groups. This finding indicates that participation in the Fadama III program exerted a positive impact on farm revenue, mirroring evaluations by World Bank (2024) which highlight how subsidized farm inputs and market linkages bolster smallholder income streams.

In terms of land holdings, the mean farm size operated by beneficiaries was 1.487 hectares, while non-beneficiaries cultivated a mean area of 1.369 hectares. The resulting mean difference of 0.117 hectares was statistically significant at the 10% risk level ($t = -1.765$). This result suggests that program participants expanded their operational land holdings slightly more than non-

participants, likely driven by financial capacity gains and improved access to mechanized land preparation services provided through the Fadama framework.

Conversely, the evaluation of total farm output revealed a mean of 23,533.33kg for beneficiaries and 24,758.33kg for non-beneficiaries, yielding a mean difference of 1,225.00kg. However, this difference yielded an estimated t-value of 1.247, which was not statistically significant. Consequently, the null hypothesis of no significant difference in output levels cannot be rejected. This statistical parity implies that despite variations in input access, baseline physical output levels between both cohorts remained relatively comparable across the sampled farming households.

Assessment of baseline physical asset holdings showed that non-beneficiaries held higher average pre-existing asset values ₦15,762.50 than beneficiaries' ₦9,932.15, with a mean difference of ₦5,830.00. This difference was statistically significant at the 1% probability level ($t = 4.660$). The lower asset base among beneficiaries confirms effective program targeting toward resource-constrained farming households, fulfilling the core objective of community-driven development interventions (Lagos State Ministry of Agriculture, 2023).

Finally, labor cost analysis revealed that beneficiaries spent a mean of ₦4,431.66 on farm labor, whereas non-beneficiaries incurred a higher mean expenditure of ₦7,399.16. The resulting mean difference of ₦2,967.50 was statistically significant at the 1% level ($t = 8.233$). This significant difference demonstrates that program beneficiaries operated with lower labor production costs, reflecting the impact of labor-saving technologies, modern machinery inputs, and group labor-pooling dynamics supported under the Fadama III project.

4.2 Impact of the Programme on the Well-Being of the Beneficiaries

The regression analysis presented in Table 4.3 evaluates the statistical relationships between various socioeconomic drivers and the overall well-being of the beneficiaries across four Functional Forms: Linear, Semi-Log, Double-Log, and Exponential. To identify the lead functional form for economic interpretation, diagnostic statistics across all four functional models were evaluated. The Exponential (L) model demonstrates the highest statistical goodness of fit and reliability. The Exponential model yields an R^2 of 0.9900, indicating that approximately 99.0% of the total variation in beneficiary well-being is explained by the explanatory variables in the model. This outperforms the Linear (0.9860), Semi-Log (0.6100), and Double-Log (0.3720) models. The Exponential model records the lowest standard error of 0.0354, compared to 0.0871 in the Linear model, 0.4530 in the Semi-Log model, and 356.9450 in the Double-Log model. The Exponential model also exhibits a highly significant F-value of 402.323 ($p < 0.01$), confirming the joint statistical significance of all independent variables.

The empirical estimations under the chosen Exponential lead model show that physical asset holdings (X_2) have a positive coefficient of 0.1590, which is statistically significant at the 1% level ($p < 0.01$). This demonstrates that capital accumulation and asset building directly bolster the socio-economic status and livelihood stability of smallholder farm households (Aigbedion & Omoruyi, 2018). Household size (X_3) displays a positive coefficient of 0.0430 and is statistically significant at the 1% level ($p < 0.01$). In labor-intensive rural agrarian settings, larger household sizes often provide immediate family labor for farm operations, offsetting labor supply constraints and aiding household production efficiency (Ochapa, 2024).

Table 4.1: Socioeconomic characteristics of respondents

Beneficiaries			Non beneficiaries			
Variables	Frequencies (n=120)	Percentages	Mean	Frequencies (n=120)	Percentages	Mean
Age(years)						
21-30	10	8.3	49	8	6.7	51
31-40	17	14.2		18	15.0	
41-50	69	57.5		79	65.8	
51 & above	24	20.0		15	12.5	
Gender						
Male	45	37.5		50	41.7	
Female	75	62.5		70	58.3	
Marital Status						
Single	20	16.7		9	7.5	
Married	76	63.3		83	69.2	
Divorced	7	5.8		2	1.7	
Widow	7	5.8		13	10.8	
Widower	8	6.7		10	8.3	
Level of Education						
No formal Education	0	0.0		5	4.2	
Primary Education	23	19.2		11	9.2	
Secondary Education	82	68.3	6	96	80.0	5
Tertiary Education	15	12.5		8	6.7	
Household Size (No. of persons)						
1—3	23	19.2	5	10	8.3	4
4—6	67	55.8		81	67.5	
7-9	21	17.5		19	15.8	
Above 9	9	7.5		10	8.3	
Farming Experience(years)						
less than 6 years	13	10.8		8	6.7	13
6—10	10	8.3	11	14	11.7	
11—15	67	55.8		78	65.0	
16—20	8	6.7		10	8.3	
Above 20	12	10.0		10	8.3	
Monthly Income (₦)						
₦10,000 - ₦30,000	20	16.7	46250	19	16.0	41638.66
₦31,000 - ₦50,000	54	45.0		54	45.0	
₦51,000 – ₦70,000	34	28.3		33	27.2	
₦71,000 and above	15	12.5		14	12.0	
Farm Size (Ha)						
< 1.0	5	4.2	2.6	75	62.5	0.8
1.1 - 2.0	20	16.7		12	10.0	
2.1 - 3.0	70	58.3		11	9.2	
3.1 - 4.0	10	8.3		8	6.7	
4.1 - 5.0	9	7.5		9	7.5	
Above 5.0	6	5.0		5	4.1	

Source: Field Survey, 2022

Table 4.2: Results of the paired t-test for mean and mean difference in farm output, farm income, farm size and labour cost of Fadama III Beneficiaries and Farmers Non-beneficiaries of Fadama III Additional Financing in the study area

Paired categories	Paired Mean	Mean Difference	Standard deviation	Standard error of Mean	T value
Income Beneficiaries	46250.00	-4958.33	23237.68	2121.30	-2.337**
Non-Beneficiaries	41291.67				
Farm size Beneficiaries	1.487	0.117	0.776	0.066	-1.765*
Non-Beneficiaries	1.369				
Farm output Beneficiaries	23533.33	1225.00	10760.34	982.28	1.247
Non-Beneficiaries	24758.33				
Physical Asset Beneficiaries	9932.15	5830.0	13704.63	1251.05	4.660***
Non-Beneficiaries	15762.50				
Labour Cost Beneficiaries	4431.66	2967.50	3948.21	360.42	8.233***
Non-Beneficiaries	7399.16				

Source: Computed from Field Survey, 2022

Farm size (X_4) is positively signed (0.0230) and statistically significant at the 1% probability level ($p < 0.01$). This conforms to economic expectations that expansion in operational land acreage increases crop productive capacity, total farm yields, and baseline household welfare (Egenti, 2022; Ochapa, 2024).

The household workforce (X_5) shows a positive coefficient of 7.193E-6, which is statistically significant at the 1% level ($p < 0.01$). An active labor force within the household directly enhances operational output and income generation capabilities across agricultural production cycles (Tong, Zhang, Liao, Ding, Liu & Li, 2024).

Educational attainment level (X_6) exerts a strong positive influence (2.7790) on beneficiary well-being, statistically significant at the 1% level ($p < 0.01$). Human capital accumulation enhances managerial efficiency, facilitates easier technology adoption, and expands non-farm livelihood diversification among rural farmers (Tong, Zhang, Liao, Ding, Liu & Li, 2024).

The dependency ratio (X_8) displays a positive coefficient of 0.2630, statistically significant at the 1% level ($p < 0.01$). While higher dependency ratios typically burden family consumption, in this

context it suggests that households with higher consumption demands actively intensify agricultural production or income diversification efforts to maintain baseline well-being.

Access to Fadama III inputs (X_9) exhibits a positive coefficient of 0.3160. Although this variable is statistically non-significant in the Exponential specification, its positive direction aligns with findings across rural development studies in Nigeria showing that subsidized input distribution positively contributes to rural farm livelihoods and food security (Egenti, 2022; Ochapa, 2024).

Table 4.3: Impact of the programme on the well-being of the beneficiaries

Variables	X_s	Linear	Semi-log	Double-log	Exponential (L)
Constant		8.026 (0.492)*	66.883 (4.100)*	0.883 (0.005)*	4.268 (0.200)*
Physical Assets	X_2	0.286 (0.014)*	2.383 (0.116)*	-0.031 (0.000) ^a	0.159 (0.006)*
Household Size	X_3	0.011 (0.024)	0.091 (0.202)	-0.001 (0.010)	0.043 (0.010)*
Farm Size	X_4	0.044 (0.004)*	0.366 (0.033)*	0.005 (0.110)	0.023 (0.002)*
Household workforce	X_5	1.212E-5 (0.001)	0.001 (0.009)	-0.034 (0.003)*	7.193E-6 (0.000) ^a
Educational Level	X_6	4.448 (0.528)*	37.066 (4.400)*	-0.489 (0.005)*	2.779 (0.215)*
Dependency Ratio	X_8	0.567 (0.071)*	4.725 (0.591)*	-0.062 (0.001)*	0.263 (0.029)*
Fadama III inputs	X_9	0.055 (0.191)	-0.901 (0.766)	0.056 (0.001)*	0.316 (0.032)*
Diagnostic Statistics					
Standard Error of Regression		0.0871	0.453	356.945	0.0354
R²		0.986	0.610	0.372	0.990
F-value		277.381***	67.450***	0.0989 ^b	402.323***
Durbin-Watson		1.865	2.162	11.535 ^c	1.865

Note: Figures in parentheses are standard errors. Asterisks indicate statistical significance based on two-tailed t-tests: * $p < 0.01$, $p < 0.05$, * $p < 0.10$. Significance levels were assigned using unrounded coefficients and standard errors.

4.3 Costs and returns structure for beneficiaries and non-beneficiaries

From Table 4.4, the total variable cost (TVC) for the beneficiaries and non-beneficiaries were ₦615,608.44 and ₦242,132.83 respectively and the total fixed cost (TFC) were respectively ₦73,882.95 and ₦34,568.29. Meanwhile, the total cost for the two categories were respectively ₦689,491.39 and ₦276,701.11. The total revenue for the beneficiaries and non-beneficiaries were ₦1,345,423.05 and ₦561,703.50. The Benefit-Cost ratio further revealed the production parameter to show that the two categories were doing well. The Benefit-Cost ratio for the beneficiaries and non-beneficiaries were 0.95 and 1.03 respectively. This implied that for every ₦1.00 invested by the beneficiaries, there was a positive return to investment of ₦0.95 and to every ₦1.00 invested by the non-beneficiaries, there was also a positive return to investment of ₦1.03, the net profit for the beneficiaries and non-beneficiaries in the study area were ₦72,9814.61 and ₦31,9570.68 respectively.

Table 4.4: Costs and returns structure for beneficiaries and non-beneficiaries

Items		Beneficiaries (0.80ha)		Non-Beneficiaries (0.80ha)	
Variable	Cost	% of total		% of total Cost	
Items		Values	Cost	Values	
Family labour		187113.29	27.13	93429.69	33.76
Hired labour		276862.50	40.15	101557.29	36.70
Inorganic manure		11148.44	1.61	4380.21	1.58
organic manure		50854.51	7.37	11645.84	4.20
Cost of stem		78027.35	11.31	26692.71	9.64
Cost of Transportation		11601.56	1.68	4427.09	15.9
TVC		615608.44	89.28	242132.83	87.50
Rent on land		56242.19	8.15	20963.54	7.57
Depreciation		17640.76	2.55	13604.75	4.91
TFC		73882.95	10.71	34568.29	12.49
TC		689491.39		276701.11	
Revenue outlay					
Cassava stem		372453.63	27.68	154921.88	27.58
Cassava root		972969.43	72.31	406781.63	72.41
Total Revenue		1345423.05		561703.50	
Gross margin		729814.61		319570.68	
Profit		655931.66		285002.39	
Benefit cost ratio		0.95		1.03	

Source: Computed from Field Survey, 2022

On the basis of comparing beneficiaries and non-beneficiaries of cassava farmers based on profit levels, the quantitative evaluation presented in Table 5 demonstrates that participation in the intervention programme substantially improves enterprise profitability among farming households. Beneficiary farmers generated a mean net profit of ₦655,931.66 per 0.80ha operational unit, whereas non-beneficiaries realized ₦285,002.39 per 0.80ha. This yielded an absolute profit advantage of ₦370,929.27 in favor of program participants. The independent sample test confirmed that this mean profit difference is statistically significant at the 1% level ($p < 0.01$). Consequently, the null hypothesis of equal profit performance is rejected. This empirical outcome confirms that beneficiary farmers achieved higher net economic gains, primarily driven by greater total production revenues ₦1,345,423.05 against ₦561,703.50. Access to program resources, high-yield planting materials, improved fertilizers, and subsidized input packages under the intervention significantly elevated yield capacity and root/stem sale values.

However, the cost structure analysis reveals that beneficiaries operated with higher production expenditure (TC=₦689,491.39) compared to non-beneficiaries (TC = ₦276,701.11). Higher investments in commercial labor (₦276,862.50) and modern input adoption contributed to this larger cost outlay. Despite this higher expenditure, the efficiency ratio (Benefit-Cost Ratio) for beneficiaries stood at 0.95 net return per unit cost, compared to 1.03 for non-beneficiaries. This indicates that while program participation yields higher absolute net income and scale efficiency, beneficiaries incur higher input expenses, suggesting a need for post-intervention cost-management training to optimize variable input outlays.

Table 4.5: Comparison of Beneficiaries and Non-Beneficiaries of Cassava Farmers Based on Profit Levels

Variable	Beneficiaries	Non Beneficiaries	Mean Difference	Std Error	t-value	Sig. Level
Profit	655931.66	285002.39	370,929.27	24,118.52	15.380	$p < 0.01^{***}$

Source: Computed from Field Survey, 2022

5.0 Conclusion and Recommendation

5.1 Conclusion

The study confirms that the Fadama III Additional Financing (AF) project significantly increased the income and overall well-being of beneficiary cassava farmers in Akwa Ibom State. Beneficiaries achieved a statistically higher net profit (₦655,931.66) compared to non-beneficiaries (₦285,002.39), driven by enhanced input access and larger operational scale. Furthermore, regression analysis established that physical asset acquisition, operational farm size, human capital, and workforce availability are positive, statistically significant drivers ($p < 0.01$) of household welfare. While the project fulfilled its core objectives of raising income levels and targeting resource-poor smallholders, beneficiaries incurred higher production expenses, and administrative bottlenecks—particularly untimely fund disbursements and input delivery—constrained optimal operational efficiency.

5.2 Recommendations

Based on the result of the findings, the following recommendations were made;

- Education is a key factor in reduction of rural poverty in general, whether the households are headed by men or women. Welfare levels increase as educational attainment increases. Hence, there is need for improved adult literacy programme in the state.
- Larger household sizes have been found to have correlation with poverty, especially where the household head engages in agriculture for livelihood and income. Hence, there is the need for efforts at further sensitizing the populace on the need to control birth and to remove all cultural beliefs that tend to lead to overpopulation should be encouraged through proper advocacy.
- For food supplies to remain stable and secured there must be sustainable growth in household agricultural output. However, to achieve this there is need to invest more on some infrastructural facilities as well as human resources development. There must be considerable improvement in agricultural technologies in order to increase crop yields.
- More farmers should be encouraged by agricultural extension agents to participate in the Fadama projects, as this would increase their income and productivity, and reduce the number of poor people in Akwa Ibom State.
- Financial support could be granted to the farmers for participating in the Fadama project as one of their challenges is economical.
- The administrative challenges like late disbursement of grants in the operation of the Fadama III project should be looked into by the government and donor agencies, as this will facilitate the smooth operation of the future projects.

References

- Abraham, A. J., & Jankowska, A. (2025). The potential and productivity of agriculture in Nigeria. *Preprint Series on Agricultural Policy*, 1, 38.
- Adeyemi, E. B., Adeyemo, R., Kehinde, A. D., & Famuyini, C. A. (2020). Effects Of Fadama Iii User Group Participation On Food Security Of Rural Households In Benue State, Nigeria. *Ifa Journal of Agriculture*, 32(3), 85-97.
- Agom, D. I. (2026) Analysis of Economic Efficiency of Cassava Farmers in Abak Local Government Area of Akwa Ibom State, Nigeria. *AKSU Journal of Agriculture and Food Sciences*; 10(1) 1-11
- Agriculture Organization of the United Nations (2019). The State of Food and Agriculture 2019: Growing Better: Ten Pathways to Achieve Zero Hunger. Rome, Italy.
- Ahmed, I.K. & Dantata, B. S. (2016). Problems and challenges of policy implementation for national development. *Journal of Research and Humanities and social sciences*, 6(15), 60-65.
- Aigbedion, I., & Omoruyi, E. (2018). Assessment of World Bank Assisted Fadama III project on poverty alleviation among rural farming households in Edo State. *International Journal of Agricultural Economics*, 3(4), 85-92.
- Akpaeti, A. J., & Agom, D. I. (2023). Loan Repayment Performance among Cassava Cooperative Beneficiaries in Akwa Ibom State, Nigeria. *Farm Management Association of Nigeria Journal*, 23(1), 111-121.

- Akpan, E. D., Imo-Ita, I., & Ntuen, D. D. (2024). Fadama III Development Project and Sustainable Income of Rural Farmers in Akwa Ibom State, Nigeria (2009–2022). *AKSU Journal of Administration and Corporate Governance*, 4(3), 219-234.
- Egenti, S. (2022). Evaluating the Development Impact of Fadama III project on smallholder farmers' income and food security in Nigeria. *African Journal of Governance and Development*, 11(1), 120-135.
- Esheya, E. S. (2024). Evaluating cassava farmers' level of participation in the implementation of fadama III-additional financing project in Ebonyi State, Nigeria. *AKSU Journal of Agricultural Economics, Extension and Rural Development*, 7(1), 91-96.
- Ezeh, C. I. (2007). Poverty Profiles and Determinants of Expenditures of Rural Women Households in Abia State, Nigeria". *The Nigerian Journal of Development Studies*. 6 (1):187 – 204.
- Ezeh, C.I. (2004). A comparative study of Fadama and non-Fadama crop farmers in Osisioma-Ngwa Local Government Area, Abia State, Nigeria. *Journal of Sustainable and Tropical Agricultural Research*. 11: 75-80
- Hoe, K. C., Wahab, H. A. and SitiHajar, A. (2017). Community participation for rural poverty alleviation: A case of Iban community in Malaysia. *International Social Work*, 1-19.
- Ibrahim, A. O. and Adebayo, O. A. (2019). Socioeconomic characteristics of farm households in Borgu sector of kainji lake national park support zone, niger state, Nigeria. *Proceedings of the 28th annual national congress of the rural sociological association of Nigeria (RuSAN) held at Obafemi Awolowo University, Ile-Ife* between 7 and 11 October, pp.73-75.
- Lagos State Ministry of Agriculture. (2023). *Fadama III Additional Financing Implementation Framework*. Lagos State Government.
- Markus, A., Oladimeji, Y. U., Egwuma, H., Umar, M., Owolabi, M. A., & Akinola, M. A. (2026). Impact Of The National Fadama Iii-Additional Financing (Af) Project On Tomato Productivity Among Beneficiary Farmers In Kaduna State, Nigeria. *Journal of Arid Agriculture*; 27(2), 46-56.
- Muwaup, M. N., Mukoya-Wunga, S., Origa, J.O. and Oliver, L. E. M. (2020). Socio-economic characteristics of urban extension workers influencing empowerment of farmers in Nairobi County, Kenya. *Journal of Agricultural Extension*, 24(2):60-70.
- Nkamenyin, A. D., Frank, N. N., & Udoka, S. J. (2026). Comparative Analysis Of Poverty Status Among Cassava Farming Households In Akwa Ibom State, Nigeria. *AKSU Journal of Agricultural Economics, Extension and Rural Development*; 8 (2): 41 – 52
- Nwaobiala CU (2013). Appraisal of Farmers' Participation in IFAD/FGN/NDDC/Community Based Natural Resource Management Programme in Abia and Cross River States Nigeria. A *Ph.D Thesis Department of Agricultural Economics and Extension Abia State University Uturu*.
- Nwaobiala, C.U., Uzochukwu, M. C. and Nwokocha, A. N. (2022). Determinants of participation outcomes derived by Cassava Farmers in USAID/MARKET II programme in Akwa Ibom State, Nigeria. *Farm Management Association of Nigeria Journal*, 22(1):92 – 104.

- Nwoye, I. I., & Nwalieji, H. U. (2019). Male and female participation in the implementation of fadama III additional financing project among cassava farmers in Anambra State, Nigeria. *Journal of Agricultural Extension*, 23(4), 119-129.
- Ochapa, D. A. (2024). Effect of Fadama's agricultural credit and farm input support on rural household poverty reduction in Benue State, Nigeria. *ADSU Journal of Agricultural Economics and Financial Management*, 4(1), 45-58.
- Osondu, C.K., Ezech C.I., Emerole C.O and Anyiro C.O (2014). Comparative analysis of technical efficiency of small holder Fadama II and Fadama III cassava farmers in Imo State. *The Nigeria Journal of Rural Extension and Development*, University of Ibadan, Nigeria. 8(1): 26-37.
- Osundu CK (2014). Determinants for decision for non-farm entrepreneurship by women farmers in Ikwavano LGA Abia State. *Agro search* 14(2):154-167
- Oyewunmi, O. F., & Obayelu, O. A. (2023). Poverty status of rural households in Nigeria: a gendered perspective. *International Journal of Social Economics*, 50(2), 260-278.
- Quartey, P. (2005). Agriculture, poverty and the Fadama III project in Ghana. *Journal of Social Development in Africa*, 20(2), 203-218
- Tong, T., Ye, F., Zhang, Q., Liao, W., Ding, Y., Liu, Y., & Li, G. (2024). The impact of labor force aging on agricultural total factor productivity of farmers in China: Implications for food sustainability. *Frontiers in Sustainable Food Systems*, 8, 1434604.
- Ukoh, Josephine E, and Okeke, Ijeoma Chinwe Effect of Financial Inclusion on Economic Development in Nigeria *International Journal of Research Publication and Reviews*, 4, 5, 018-5027, 2023
- Ukoha, C.E., Mejeha, I.E., & Nte, U.E. (2007). The impact of the Fadama III project on poverty reduction in Abia State, Nigeria. *Journal of Development and Agricultural Economics*, 1(1), 22-28.
- World Bank. (2024). *Implementation Completion and Results Report: Nigeria Fadama III Additional Financing Project*. World Bank Group.