



## EFFECT OF THE ANCHOR BORROWERS PROGRAMME (ABP) ON RICE PRODUCTION IN EKITI STATE, NIGERIA

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**ABSTRACT:** *This study investigates the impact of the Anchor Borrowers Programme (ABP) on rice production in the Irepodun/Ifelodun Local Government Area, Ekiti State. Structured questionnaires were used to collect data from 150 smallholder rice farmers, with 75 having access to ABP loans and 75 without access. Descriptive statistics, binary logistic regression, multiple regression, and budgetary techniques were employed for data analysis. The return on investment (ROI) for farmers with ABP loans was 2.48, compared to 2.39 for those without, indicating higher profitability for loan beneficiaries. The average age of respondents was 60.3 years, with 87.3% males, 73.3% having formal education, and 62% married. The mean farming experience was 15.9 years, with an average household size of four members and a farm size of 3.8 acres. Significant factors influencing access to ABP loans included age, educational background, and household size ( $p < 0.05$ ). Additionally, educational background, household size, farm size, and access to ABP loans significantly affected net income from rice production ( $p < 0.05$ ). The study concludes that ABP loans positively impact rice production profitability and recommends that more farmers be given access to these loans to enhance rice production in the area.*

**KEYWORDS:** Rice, Production, Access to credit, Anchor Borrower Programme (ABP) and Profitability.



## INTRODUCTION

Rice is a staple food crop in Nigeria, with an annual consumption rate of approximately 7.9 million metric tonnes (Nigerian Institute for Social and Economic Research, NISER). Nigeria leads Africa in rice production, producing about 8,435,000 tonnes annually, followed by Egypt, Madagascar, Tanzania, and Mali (Food and Agriculture Organisation of the United Nations, FAO, 2022-2023). Agriculture forms the foundation of Nigeria's economy, providing livelihoods for most Nigerians and generating millions of jobs (FAO). Despite being a critical sector, domestic rice production in Nigeria falls short of meeting the rising demand, leading to a heavy reliance on imports, which impacts the economy, foreign exchange reserves, and food security (World Bank, 2019; Olagunju et al., 2019).

To address these challenges and promote self-sufficiency, the Nigerian government has implemented initiatives like the Anchor Borrowers Programme (ABP), launched in 2015 by the Central Bank of Nigeria (CBN). The ABP aims to provide affordable credit to smallholder farmers, enhancing their access to inputs, technical support, and market linkages (Ibrahim et al., 2019). In the Irepodun/Ifelodun Local Government Area (LGA) of Ekiti State, favorable climatic conditions and fertile soil create a conducive environment for rice cultivation (Ayodele et al., 2020). However, smallholder rice farmers face challenges that hinder their productivity and profitability, primarily due to limited access to credit and the high costs of farm inputs.

The lack of financial resources prevents farmers from investing in high-quality seeds, fertilizers, and modern farming machinery, limiting their ability to expand operations, adopt improved techniques, and maximize productivity. High input costs further exacerbate the situation, forcing farmers to use substandard inputs or reduce their application rates, leading to decreased productivity and lower-quality yields.

The ABP loan intervention has the potential to enhance rice production in Irepodun/Ifelodun LGA by providing affordable credit, enabling farmers to invest in high-quality inputs, expand operations, and adopt improved practices (Ibrahim et al., 2019). The program also aims to facilitate market linkages and provide technical support through collaboration with stakeholders such as agricultural extension services and input suppliers (Adu et al., 2019).

Despite the implementation of the ABP in Irepodun/Ifelodun LGA, the program's actual impact on rice production remains a subject of interest and investigation. While designed to revolutionize rice farming and uplift smallholder farmers, its effectiveness needs critical assessment. This study aims to evaluate the ABP's influence on rice production in the region by analyzing its implementation, mechanisms, and outcomes, providing a comprehensive understanding of its effects on rice farmers and the agricultural landscape.

Thus, one of the primary objectives of this study is to evaluate the effectiveness of the ABP in stimulating rice production. By examining the increase in rice cultivation, changes in yield, and adoption of modern farming practices, researchers can gauge the program's impact on the productivity of rice farming. The specific objectives of this study are to:

- i. Describe the socio-economic characteristics of rice farmers in the study area participating in the ABP;
- ii. Examine the factors affecting access to ABP for rice production in the study area;

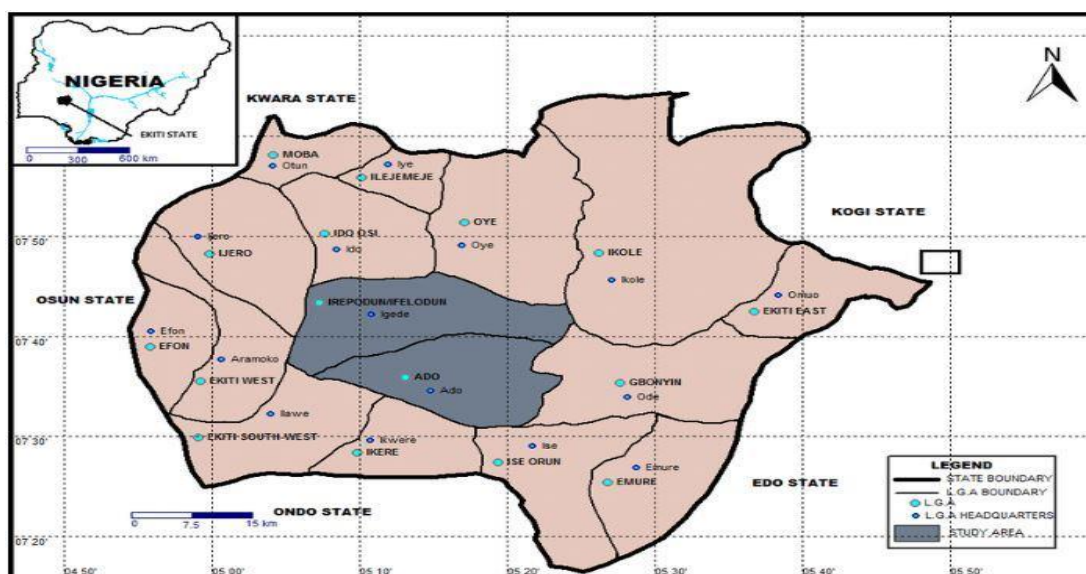
- iii. Analyze the effects of ABP credit on the net income of rice production in the study area; and
- iv. Determine the profitability of rice production in the study area.

## METHODOLOGY

The study was carried out in the Irepodun/Ifelodun Local Government Area of Ekiti State. It is a unique study area due to its rich agricultural landscape and its active participation in the Anchor Borrowers Programme (ABP) situated in the southwestern region of Nigeria. Irepodun/Ifelodun LGA encompasses a diverse range of farming activities, with a particular emphasis on rice production. The area's favorable geographical location, with access to abundant water resources from rivers and streams, has contributed to the development of agriculture as a primary economic activity. The region's fertile soil, suitable climatic conditions, and sufficient rainfall provide an ideal environment for rice cultivation. As a staple food in Nigeria, rice plays a significant role in the diets of both rural and urban populations, making its production and availability crucial for food security and sustainable economic growth.

The ABP, as an agricultural intervention program, has been instrumental in empowering smallholder rice farmers in the area. By offering financial assistance, access to credit, and improved inputs, the program has aimed to uplift the socio-economic conditions of rural farming communities. The ABP also provides technical support and capacity building, encouraging farmers to adopt modern and more efficient farming techniques.

Furthermore, the program's implementation has contributed to a sense of community cohesion and cooperation among rice farmers in the Irepodun/Ifelodun LGA. Participating farmers often form cooperative groups, pooling resources and knowledge to improve their productivity and marketing strategies. These collaborative efforts have the potential to amplify the program's impact on rice production and income generation within the region.



**Figure 1: Map showing Irepodun/Ifelodun Local Government Area of Ekiti State**



The study employed a multi-stage sampling technique to select the participants for data collection. The first stage involved the purposive selection of the Irepodun/Ifelodun Local Government Area of Ekiti State. The second stage involved the selection of five communities. These communities included Igede-Ekiti, Iyin-Ekiti, Awo-Ekiti, Iropora-Ekiti and Iworoko-Ekiti. The third stage involved the selection of 15 rice farmers who had access to the Anchor Borrower Programme loan and 15 rice farmers who had no access to the loan from each of the five communities. Thus, given a total sum of 150 respondents for the study, 75 respondents had access to loan while 75 respondents had no access to loan. The collected data were analyzed using descriptive statistics, binary logistic regression, multiple regression, and budgetary technique.

Descriptive statistics such as frequency counts, percentages and mean were used to analyze the demographic characteristics of the respondents, including age, gender, education level, marital status, household size, farm size, and years of farming experience.

A binary logistics regression model was used to analyze the factors affecting access to ABP loans. The socio-economic variables were used in the binary logistic regression analysis and specified explicitly as:

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \mu$$

...(1)

where

$L_i$  = Logit of cross-sectional data

$P_i$  = Probability of rice farmers having access to ABP loan

$1-P_i$  = Probability of rice farmers not having access to ABP loan

$X_1$  = Sex

$X_2$  = Age

$X_3$  = Marital status

$X_4$  = Educational background

$X_5$  = Household size

$X_6$  = Farm size

$\mu$  = Error term.

The multiple regression model was used to analyze the effect of ABP credit on the net income of rice production. The multiple regression model is given and explained below. The regression model in its implicit form is given as:



$$Y_i = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7).$$

where

$Y$  = Net income of rice production (₦)

$X_1$  = Sex

$X_2$  = Age of farmers (years)

$X_3$  = Marital status

$X_4$  = Level of education (years)

$X_5$  = Household size

$X_6$  = Farm size in hectares

$X_7$  = Access to ABP credit (dummy; 1 = Yes; 0 = No)

$U$  = Error term.

The following functional forms were estimated for the production function and the one that best satisfies the theoretical, statistical, and econometric criteria for a production function was selected as lead equation. The functional forms that were estimated were linear, semi-log, double log, and exponential.

#### **Linear Function:**

$$Y_i = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + U_i$$

#### **Semi-log:**

$$Y_i = b_0 + b_{1\log}X_1 + b_{2\log}X_2 + b_{3\log}X_3 + b_{4\log}X_4 + b_{5\log}X_5 + b_{6\log}X_6 + b_{7\log}X_7 + U_i$$

#### **Exponential:**

$$\log Y_i = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + U_i$$

#### **Double Log**

$$\log Y_i = b_0 + b_{1\log}X_1 + b_{2\log}X_2 + b_{3\log}X_3 + b_{4\log}X_4 + b_{5\log}X_5 + b_{6\log}X_6 + b_{7\log}X_7 + U_i$$

A budgetary technique was used to determine the profitability of rice production in the study area. The budgetary technique that was employed was return on investment (ROI). This indicator was used to determine the worthiness of rice production in the study area.

$$NFI = TR - TC \dots \dots \dots (3)$$

where

NFI = Net farm income (naira/ha)

TR = Total revenue (naira/ha)





$$TC = TVC + TFC$$

Total cost (TC) = Total variable cost (TVC) + Total fixed cost (TFC)

Return on investment (ROI) was obtained by dividing the gross revenue (TR) by the total cost (TC)

$$ROI = \text{Return on investment} = TR/TC$$

TR = Total revenue

TC = Total cost

## RESULTS AND DISCUSSION

### Socio-economic Characteristics of Rice Producers in the Study Area

This chapter presents the analysis and discussion of the socio-economic attributes of rice producers in the study area, focusing on variables such as age, gender, educational background, marital status, years of experience, household size, and farm size. The age distribution of respondents, as shown in Table 1, indicates that 11.3% were aged 40-50 years, 15.3% were 51-60 years, 20.7% were 61-70 years, and the majority (52.7%) were 71 years and above. The average age of respondents was 60.3 years, suggesting that rice producers in the study area are predominantly older. This contradicts Sodimu's (2020) report that the majority of African farmers are youths but aligns with findings by Abiodun et al. (2019), Badamosi et al. (2023) and Adeyeye et al. (2024).

Table 1 also shows that 87.3% of the respondents were males, while 12.7% were females. This male dominance in rice production may be attributed to the labor-intensive nature of the work. These findings are consistent with those of Olutumise et al. (2019), Dolapo et al. (2022), Oladoyin et al. (2023), and Ijigbade et al. (2023), who reported that agricultural activities in Southwestern Nigeria are predominantly undertaken by male farmers.

The distribution of respondents by educational level in Table 1 indicates that 73.3% had formal education (primary, secondary, or tertiary), while 13.3% had no formal education. This suggests a high level of efficiency in rice production, as educational attainment is linked to better farm output and the adoption of improved practices (Dibie, Ojukwu, & Nweke, 2021; Olubunmi-Ajayi et al., 2023).

According to Table 1, 62% of the respondents were married, 19.3% were divorced, 12.7% were widowed, and 6% were single. This demographic distribution may influence the stability and labour availability within farming households.

The years of experience among respondents, as shown in Table 1, reveal that 32.7% had 5-9 years of experience, 20.7% had 10-14 years, 26.6% had 15-19 years, and 20% had 20-25 years. The mean years of experience were estimated to be 15.9 years, indicating that most respondents have been in rice production for a considerable period. This experience likely enhances their productivity and resource management skills (Akerele, Dada, & Akomolede, 2019).



Table 1 shows that 64% of respondents had a household size of 1-3 persons, 26.6% had 4-6 persons, 6.7% had 7-9 persons, and 2.6% had 10-12 persons. The average household size was approximately 4 persons. This suggests that rice producers may have access to family labor, which can aid in rice production. This finding is consistent with Lawal and Fakayode's (2021) study, which highlighted the positive impact of family labor on production efficiency.

The farm sizes of respondents, as presented in Table 1, show that 52.7% had farms smaller than 1 acre, 11.3% had 2-4 acres, 15.3% had 5-7 acres, and 20.7% had 8-10 acres. The mean farm size was estimated to be 3.8 acres. This result aligns with Nkang et al. (2019), who reported that the majority of rural farmers in their study area had an average farm size of 4 acres.

By understanding these socio-economic characteristics, we gain insights into the factors influencing rice production in the Irepodun/Ifelodun Local Government Area, enabling more targeted interventions and support for these farmers.

**Table 1: Socioeconomic Characteristics of the Respondents**

Gender	Frequency	Percentage	Mean
Male	131	87.3	
Female	19	12.7	
Total	150	100.0	
<b>Marital Status</b>			
Single	9	6.0	
Married	93	62.0	
Widowed	19	12.7	
Divorced	29	19.3	
Total	150	100.0	
<b>Age</b>			
40-50	17	11.3	
51-60	23	15.3	
61-70	31	20.7	
71 and above	79	52.7	
Total	150	100	
<b>Educational Status</b>			
No formal Education	40	26.7	
Primary school education	39	26.0	
Secondary school education	51	34.0	
Tertiary	20	13.3	
Total	150	100	
<b>Household Size</b>			
1-3	96	64.0	
4-6	40	26.6	
7-9	10	6.7	



10-12	4	2.6	4.3
Total	150	100.0	
Experience			
5-9	49	32.7	
10-14	31	20.7	
15-19	40	26.6	
20-25	30	20.0	15.9
Total	150	100.0	
Farm Size			
≤ 1	79	52.7	
2-4	17	11.3	3.8
5-7	23	15.3	
8-10	31	20.7	
Total	150	100.0	

**Source: Field Survey, 2024**

### **Factors Affecting Access to ABP Loan**

Table 2 shows the factors affecting access to ABP loans in the study area. The result showed that age, educational background, and household size were the factors affecting access to ABP loans. The coefficient of age was positive and significant at 0.05 with a coefficient value of .002. This coefficient suggests that a 1% increase in the age of rice producers significantly increases the probability of having access to ABP loans by 0.2%. This could be justified that older farmers are more responsible in handling loans compared to younger rice farmers. This result aligns with the findings of Epundu (2019) who reported a positive relationship between the age of the farmers and access to credit.

Educational background was also observed to be positive and significant at 0.05. The coefficient value of educational background stood at 1.695 which indicated that an increase in the educational background of the rice farmer significantly increases the likelihood of having access to ABP loan by 169.5%. This result corroborates the earlier report of Ezedinma (2020) which reported that an increase in educational attainment was more likely to increase access to credit.

Furthermore, the result in the table below shows that the coefficient of household size was positively significant at 0.05. The coefficient was estimated to be .370 which means that a unit increase in the number of persons in a household significantly leads to an increase in the likelihood of having access to an ABP loan. This result contradicts the findings of Ezedinma (2020) who reported no significant effect of household size on access to credit.



**Table 2: Factors Affecting Access to ABP Loan**

Variables in the Equation		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 <sup>a</sup>	Sex	.173	.912	.036	1	.849	1.189
	Age	.002	.025	.005	1	.043	.998
	Marital status	.503	.603	.696	1	.404	1.653
	Educational background	1.695	.368	21.221	1	.000	5.447
	Household size	.370	.188	3.884	1	.049	.691
	Farm size	.020	.102	.037	1	.847	.981
	Constant	1.387	2.500	.308	1	.579	.250

a. Variable(s) entered on step 1: sex, age, marital status, educational background, household size, farm size.

### Effect of ABP Loan on Net Income of Rice Production

Tables 3 and 4 show the multiple regression model of the effect of ABP loans on the net income of rice production. The findings from the table show that the R-square square of the model was estimated at .885 while the adjusted R-square of the model stood at .755. The value of R-square suggests that independent variables such as access to ABP loans, age, marital status, farm size, sex, household size, and educational background explained 88.5% variation in net income of rice production. The result shows that the educational background, household size, farm size, and access to ABP loans had a significant ( $p < 0.05$ ) effect on the net income of rice production. The coefficient of educational background was positively significant at 0.05. The coefficient was estimated to be 3.106 which means that an increase in the educational background of rice farmers will significantly increase the net income of rice production by 31%. This result corroborates the findings of Fakayode (2020) and Adegoroye et al. (2023) who reported that farmers' income is significantly influenced by their level of education. The result of household size is statistically significant at 0.05 with a coefficient value of .0239. This coefficient suggests that a unit increase in the household size of the respondents leads to a 2.39% increase in the net farm income of rice production. This could be because rice farmers with large family sizes are likely to have children or family members who could assist them on the farm and this may increase their farm output. This result is supported by the findings of Cadoni and Angelucci (2020) and Olutumise et al. (2024) who reported that an increase in the farmers' household size significantly increases their farm output.

The result also shows that the coefficient of farm size was statistically and positively significant at 0.05 with a coefficient value of 7.885%. This coefficient implies that a 1% increase in farm size significantly leads to an increase in the net income of rice production. This means that the larger the farm size used for rice production, the higher the net income of rice production. This result is in line with the findings of Cadoni and Angelucci (2020) which reported that farm size significantly influenced the output of farm produced.

The result of access to ABP is significant at 0.05 with a coefficient positive value of 2.692. This result indicates that excess to ABP loan significantly increased the net income of rice production by 26.92%. This result correlates with the findings of Fakayode (2020) which showed that access to credit is positively related to the output of farm output.

**Table 3: Model Summary**

Model Summary					
Model	R	R Square	Adjusted Square	RStd. Error of the Estimate	Durbin-Watson
1	.765 <sup>a</sup>	.885	.755	13526.919	2.068

a. Predictors: (Constant), access to ABP loan, age, marital status, farm size, sex, household size, educational background

b. Dependent Variable: net income of rice production

**Table 4: Effect of ABP Loan on Net Income of Rice Production**

Coefficients						
Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	70.214	79.044		5.641	.000
	Sex	-3.647	4.190	-.470	-5.777	.580
	Age	-1.568	0.932	-.115	-1.197	.234
	Marital status	51.360	10.864	.018	.282	.779
	Educational Background	3.106	5.336	.038	.399	.011
	Household size	.0239	1.808	.514	6.133	.000
	Farm size	7.885	9.856	.169	2.565	.012
	Access to ABP loan	2.692	7.493	.435	5.732	.000

a. Dependent Variable: net income of rice production

### Profitability of Rice Production in the Study Area

The result in Table 5 shows the profitability of rice production in the study area. The table shows that the total fixed cost of rice farmers who had access to ABP loans was ₦185,643.9 while the total fixed cost of rice farmers who had no access to ABP loans was ₦179,267.51. The depreciation value of all items under the fixed cost of rice farmers who had access to ABPT loan and rice farmers who had no access to ABP loan was estimated to be ₦96,381.39 and ₦93,616.48 respectively. The estimation of the total variable cost of rice farmers who had access to ABP loans was ₦1,107,124.00, while the total variable cost of rice farmers who had no access to ABP loans was ₦824,550.00. The total cost which is the addition of depreciation values of fixed cost and total variable cost (Depreciation Values + TVC) of rice farmers who had access to ABP loan and rice farmers who had no access to ABP loan was estimated to be ₦1,203,505 and ₦918,166.48 respectively. The total generated revenue of rice farmers who had access to ABP loan stood at ₦2,982,000.00 while the total generated revenue of rice farmers who had no access to ABP loan stood at ₦2,193,000.00. The profit margin of rice farmers who had access to ABP loans and rice farmers who had no access to ABP loans stood at ₦1,778,495.00 and ₦1,274,833.52 respectively. The return on investment (ROI) of rice



farmers who had access to ABP loans was estimated to be 2.48 while the return on investment (ROI) of rice farmers who had no access to ABP loans was estimated to be 2.39. This ROI suggests that rice farmers who had access to ABP loan will get a return of ₦2:48k while rice farmers who had no access to ABP loan will get a return of ₦2:39k in every ₦1 invested in rice production. Thus, access to ABP loan had a significant effect on rice production in the study area. Also, rice production in the study area was profitable. The profitability accrued by the respondents is in line with several studies in the literature (e.g., Oseni et al., 2018; Bobola et al., 2019; Oladoyin et al., 2023) in their studies on agricultural products.

**Table 5: Analysis of Profitability of Rice Production in the Study Area**

Item	Access to ABP loan			No Access to ABP loan		
	Value in (₦)	Expected Life Span	Depreciation Value	Value in (₦)	Expected Life Span	Depreciation Value
<b>FIXED COST</b>						
Hoe	₦25,232.11	2	₦12,616.06	₦21,641.11	2	₦10,820.56
Cutlass	₦31,102.21	2	₦15,551.11	₦30,921.33	2	₦15,460.67
Knapsack	₦23,212.72	2	₦11,606.36	₦23,232.12	2	₦11,616.06
Sprays	₦22,802.32	3	₦7,600.77	₦22,302.22	3	₦7,434.07
Wheel Barrow	₦51,431.17	3	₦17,143.72	₦49,328.41	3	₦16,442.80
Basket/Sack	₦30,232.84	1	₦30,232.84	₦30,221.11	1	₦30,221.11
File	₦1,630.53	1	₦1,630.53	₦1,621.21	1	₦1,621.21
<b>TFC</b>	<b>₦185,643.9</b>		<b>₦96,381.39</b>	<b>₦179,267.51</b>		<b>₦93,616.48</b>
<b>VARIABLE COST</b>						
Rice seeds	₦48,221.00			₦43,250.00		
Labour	₦ 373,00.00			₦ 251,000.00		
Fertilizer	₦572,000.00			₦447,000.00		
Herbicide	₦54,500.00			₦38,000.00		
Transportation	₦59,403.00			₦45,300.00		
<b>TVC</b>	<b>₦1,107,124.00</b>			<b>₦824,550.00</b>		
<b>TOTAL</b>	<b>₦2,982,000.00</b>			<b>₦2,193,000.00</b>		
<b>REVENUE</b>				0		
<b>TOTAL COST (Depreciation Values + TVC)</b>	<b>₦1,203,505</b>			<b>₦918,166.48</b>		
<b>PROFIT TR-TC</b>	<b>= ₦1,778,495.00</b>			<b>₦1,274,833.5</b>		
<b>ROI=TR/TC</b>	<b>2.48</b>			<b>2.39</b>		
<b>BCR=</b>	<b>248</b>			<b>239</b>		
<b>ROI*100</b>						

Source: Field Survey, 2023



## CONCLUSION

The study concluded that age, educational background, and household size were the factors affecting access to ABP loans ( $p < 0.05$ ). Also, educational background, household size, farm size, and access to ABP loans had a significant ( $p < 0.05$ ) effect on the net income of rice production. The return on investment (ROI) of rice farmers who had access to ABP loans was estimated to be 2.48 while the return on investment (ROI) of rice farmers who had no access to ABP loans was estimated to be 2.39. This ROI suggests that rice farmers who had access to an ABP loan will get a return of ₦2:48k while rice farmers who had no access to an ABP loan will get a return of ₦2:39k in every ₦1 invested in rice production. Thus, the study concluded that ABP loan had a significant effect on rice production in the study area. Therefore, it is recommended that the organizers of Anchor Borrowers Programmes (ABP) are encouraged to ensure that loans are made available to all rice farmers in the study area. Rice producers in the study area are encouraged to invest more in rice production as it has been proven from the study to be a profitable business in the study area. Rice producers are encouraged to improve their level of education as this has been reported to affect the net income of rice farmers.

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