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Review paper

Analysis of the Relative Performance of Smallholder Rice Farmers Under the Anchor Borrowers Programme in South-East, Nigeria

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ABSTRACT

This study analyzed the relative performance of smallholder rice farmers under the Anchor Borrowers' Programme (ABP) in South-East Nigeria. The research assessed the socioeconomic characteristics of beneficiaries and non-beneficiaries and examined the factors influencing the value of paddy rice among both groups. A multi-stage stratified random sampling technique was employed to select 720 rice farmers (360 beneficiaries and 360 non-beneficiaries) across Abia, Anambra, and Ebonyi States. Primary data were collected using structured questionnaires, while secondary data were sourced from the Central Bank of Nigeria, ADPs, and RIFFAN. The data were analyzed using descriptive statistics and multiple regression techniques. Results showed that male farmers dominated both groups, although female participation was relatively higher among beneficiaries. Beneficiaries had better educational attainment, smaller household sizes, and larger farm holdings on average. Regression analysis revealed that the value of paddy rice was significantly influenced by several factors: farming experience ($p < 0.01$), household size ($p < 0.05$ for beneficiaries; $p < 0.01$ for non-beneficiaries), gender ($p < 0.01$), cooperative membership ($p < 0.01$), farm size ($p < 0.01$), education ($p < 0.01$), and price of paddy ($p < 0.01$). Additionally, quantity of seed used was significant only for beneficiaries ($p < 0.01$), while income level significantly affected the value of paddy rice only for non-beneficiaries ($p < 0.05$). The suggested policy adjustments that promote inclusivity especially for female farmers, elderly farmers, and those with lower education. Enhanced extension services, simplified access procedures, and expanded cooperative frameworks are recommended to boost programme impact and close the productivity gap.

1. Introduction

Agriculture remains a cornerstone of Nigeria's economy, employing a significant proportion of the population and playing a pivotal role in ensuring food security. However, despite its enormous potential, the Nigerian agricultural sector continues to grapple with a myriad of challenges, especially the chronic underfunding of production activities. Among the crops affected by this capital deficiency is rice, Nigeria's most consumed staple. Ironically, while the country is endowed with vast arable land and suitable agro-ecological conditions for

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rice cultivation, it remains a net importer of the commodity. Emefiele (2016) reports that Nigeria spends over ₦356 billion annually on rice importation, a contradiction that bleeds foreign reserves and undermines local production.

Efforts to reverse this trend include policy interventions such as the Central Bank of Nigeria's Anchor Borrowers' Programme (ABP) launched in 2015. The ABP was designed to enhance access to finance and farm inputs for smallholder farmers (SHFs), reduce dependence on imports, and link producers directly with processors. Despite the initiative's objectives and increased investment in local rice production, the gap between domestic supply and national demand persists. Smallholder rice farmers, who contributed over 80% of total paddy production, often operated on a small plot (1–2 hectares), face restricted access to mechanization, and struggle with systemic productivity constraints (Grow Africa, 2017; FFI, 2016). These issues raise critical questions about the actual performance outcomes of the ABP on smallholder rice farmers in Nigeria's South-East region.

The persistent underperformance of the agricultural sector, especially among smallholder farmers, has posed a major obstacle to achieving food self-sufficiency in Nigeria especially the South-East. This is particularly evident in the rice value chain, where local production has failed to meet increasing consumer demand, despite interventions such as the ban on rice imports through land borders (CBN, 2016). The mismatch between high demand and insufficient supply continues to drive up rice prices, drain foreign reserves, and escalate food insecurity.

Smallholder rice farmers in Nigeria are frequently constrained by limited access to credit, poor adoption of technology, climate variability, low input usage, and outdated production practices (IITA, 2017; Akinniran & Faleye, 2020). These constraints are further worsened by the high-risk profile of agriculture, which discourages commercial banks from offering loans. While the Anchor Borrowers' Programme was established to mitigate these challenges by linking SHFs to input and output markets and facilitating access to finance, questions remain regarding its effectiveness. Despite the billions invested, the sector has recorded only modest increases in yield and area cultivated, prompting concerns about whether the ABP has significantly improved the performance of its targeted beneficiaries.

While a number of studies have evaluated the broad impact of the Anchor Borrowers' Programme at the national level, there is a dearth of empirical studies focusing specifically on the relative performance of smallholder rice farmers under the ABP in the South-East geopolitical zone. Most available literature either provides aggregated national-level assessments or fails to differentiate performance outcomes among participating and non-participating farmers. Moreover, few studies have dissected the technical and institutional bottlenecks affecting SHF productivity within the context of the ABP, such as credit utilization, input delivery timelines, output recovery rates, and farmer-anchor linkages.

Additionally, there's limited evidence on the variations in performance across regions and farmer demographics, which is critical for refining the programme and scaling what works. This study, therefore, seeks to fill this gap by providing a nuanced, region-specific analysis of smallholder rice farmers' performance under the ABP in South-East Nigeria. The outcome will serve as a guide for policymakers, development partners, and stakeholders seeking to optimize the impact of agricultural interventions in Nigeria.

This study, therefore, seeks to analyze the relative performance of smallholder rice farmers who participate in the ABP in South-East Nigeria. The focus is to determine whether this flagship intervention has translated into measurable improvements in productivity and efficiency among smallholder rice producers.
The following objectives were achieved;

i. describe the socio-economic characteristics of smallholder rice farmer beneficiaries and non-beneficiaries of Anchor Borrowers' Programme in the study area;
ii. determine factors influencing the Value of Paddy Rice of farmer beneficiaries and non- beneficiaries of Anchor Borrowers' Programme

2. Materials and Methods

The study was conducted in the South-East of Nigeria. The region is located between latitudes 4047′ 35′′N and longitudes 8027′10′′E (Olumba et al., 2021). The southeast geopolitical zone is made up of five states, namely, Abia, Anambra, Ebonyi, Enugu, and Imo States, with eighty-five (85) Local Government Areas (LGAs). The region had a population of 16,395,555 people according to the 2006 census (National Population Commission, NPC, 2006), and an estimated population of 22,012,828 people (NPC, 2021). The region has a total land area of 33,664 km2 (National Bureau of Statistics, NBS, 2019). The zone is bounded by the River Niger on the West, the riverine Niger Delta on the South, the flat North Central to the North, and the Cross River on the East. The region is predominantly agrarian, with agriculture serving as the primary livelihood source, particularly among rural households. It also serves as a hub for commercial activity, with widespread engagement in micro, small, and medium-scale enterprises, including agro-processing and trade. The agro-ecological

conditions of the zone are favorable to the cultivation of food crops such as yam, cassava, rice, cocoyam, and maize, and cash crops including oil palm, rubber, cocoa, banana, and various fruits. A multi-stage stratified sampling technique was employed to select respondents for the study. The sampling process involved three key stages:

Stage 1 involved the stratification and selection of Ebonyi, Abia, and Anambra purposively from the selected five States in the zone based on their active participation in the Anchor Borrowers' Programme (ABP) and their prominence in rice production. Each selected State was treated as a stratum.

Stage 2 involved the selection of ABP Beneficiary Farmers. A list of ABP-participating rice farmers was obtained from the Development Finance Offices of the Central Bank of Nigeria (CBN) in the selected States. From this list, a proportionate random sampling method was used to select 70% of registered rice farmers across the participating LGAs in each state. A total of 360 ABP beneficiaries were selected, and distributed as follows: Abia State (84 farmers), Anambra State (109 farmers), Ebonyi State (167 farmers).

Stage 3 involved the selection of 360 Non-Beneficiary Farmers using the same procedures for the beneficiary to ensure comparability, and equivalent number of non-beneficiary rice farmers were selected from the lists of non-beneficiary farmers were obtained from the Agricultural Development Programmes (ADPs) and Rice Farmers Association of Nigeria (RIFFAN) representatives in each State. Using the same sampling proportions, 360 non-beneficiaries were randomly selected: Abia State (84 farmers), Anambra State (109 farmers), and Ebonyi State (167 farmers) making a total of sample size of 720 rice farmers. The study used both Primary and secondary data.

Primary data were collected through a structured questionnaire administered to the 720 sampled rice farmers. Secondary data were obtained from official records of the Central Bank of Nigeria, ADPs, and RIFFAN, particularly lists of registered ABP participants, disbursed input records, and repayment performance data. Data collected were analyzed using a combination of descriptive and econometric model.

3. Model Specification

Factors Influencing the Value of Paddy Rice of farmer Beneficiaries and Non-beneficiaries

Multiple regression technique was used to determine the factors influencing the value of paddy rice of farmer beneficiaries and non-beneficiaries in the area. In this case, separate regression analysis was done for each farmer group equation. The model is implicitly represented as used by Nwosu (2014) and adopted for this study as:

$$Y_i = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where:

Y_1= Value of paddy rice (Naira)
X_1 = Years of experience (Years)
X_2 = Household size (Number of persons)
X_3 = Level of income (Naira)
X_4 = Extension contact (1= Yes; 0 = Otherwise)
X_5 = Gender (1 = Male; 0 = Female)
X_6 = Cooperative membership (Member 1, Otherwise 0)
X_7 = Marital status (Married 1, Otherwise 0)
X_8 = Age (Years)
X_9 = Farm size (Hectares)
X_{10} = Level of education (Years)
X_{11} = Cost of labour (Naira)
X_{12} = Quantity of seeds used (kg)
X_{13} = Cost of agrochemicals (Naira)
X_{14} = Price of paddy per 100 kg bag (Naira)
e = Error term

4. Results and Discussion

4.1 Socio-Economic Characteristics of Rice Farmer Beneficiaries and Non-Beneficiaries of the Anchor Borrowers' Programme

Table 1 presents the socio-economic profiles of rice farmer beneficiaries and non-beneficiaries of the Anchor Borrowers' Programme (ABP) in South-East Nigeria.

Among the ABP beneficiaries, 54.72% were male, while 45.28% were female. For non-beneficiaries, males constituted a higher proportion (60.28%), with females accounting for 39.72%. Although men dominated both groups, the proportion of female beneficiaries (45.28%) was notably higher than that of female non-beneficiaries (39.72%), indicating a slight improvement in female access to the programme. This aligns with the findings of Balogun et al. (2021), who reported male dominance (65%) in ABP participation, attributing it to the patrilineal structure of African societies, which favors male control over productive resources. The observed trend underscores the importance of integrating gender-sensitive approaches in agricultural financing schemes to ensure equitable access.

The age distribution revealed that 51.11% of beneficiaries were within the 41–60 years age bracket, followed by 24.72% aged 20–40 years, and 24.17% above 60 years, with a mean age of 50 years. For non-beneficiaries, a higher proportion (59.44%) also fell within the 41–60 years category, while 28.06% were above 60 years and only 12.50% were in the 20–40 range. The mean age for non-beneficiaries was 54 years. These findings suggest that rice farming in the region is predominantly undertaken by middle-aged individuals, who are still within their productive years. However, the relatively high proportion (28.06%) of non-beneficiaries above 60 years raises concerns about aging farmers' access to financial and institutional support. These results are consistent with earlier findings by Balogun et al. (2021), Nwoke (2016), and Ayinde (2018), who reported a national average farming age of approximately 47.2 years.

A striking 93.61% of ABP beneficiaries were married, compared to 72.78% among non-beneficiaries. Conversely, 27.22% of non-beneficiaries were single, compared to only 6.39% of beneficiaries. This suggests that marital status may influence programme participation, potentially due to enhanced social capital, household stability, and improved access to collateral or support networks. This supports the assertions of Ajah, Igiri, and Ekpenyong (2017), who found that being unmarried significantly reduces the probability of accessing agricultural credit.

Educational levels differed markedly between the two groups. Among beneficiaries, 83.33% held university degrees, 15% had secondary education, and only 1.67% had primary education. No beneficiary reported having no formal education. In contrast, among non-beneficiaries, only 32.78% held university degrees, 51.39% had secondary education, and 2.22% lacked formal education. These results highlight education as a critical determinant in accessing the ABP. Higher education likely enhances farmers' ability to navigate bureaucratic processes, understand programme requirements, and manage resources efficiently. This is in line with Ajah et al. (2017), who observed that years of formal education positively influence participation in credit programmes by increasing awareness, social capital, and financial literacy.

The majority of both beneficiaries (54.17%) and non-beneficiaries (57.22%) had household sizes ranging from 6 to 10 persons. The mean household size was 8 persons for beneficiaries and 9 persons for non-beneficiaries. While large households can offer labor advantages, the findings suggest that larger household sizes may be linked to reduced access to the ABP, possibly due to increased consumption pressure or financial strain. This contrasts with Irohibe and Agwu (2014), who argued that larger households are typically advantageous in providing farm labor and absorbing agricultural risks.

A notable proportion of beneficiaries cultivated rice on 0.41 to 0.60 hectares, with a mean farm size of 0.51 hectares. In contrast, most non-beneficiaries farmed on 0.21 to 0.40 hectares, with a mean farm size of 0.38 hectares. The larger average farm size among beneficiaries suggests that farm size positively correlates with ABP participation, possibly due to perceived economies of scale and the increased likelihood of loan repayment. Larger farms may also serve as collateral or evidence of farming commitment, making such farmers more attractive to programme administrators.

The majority of ABP beneficiaries (52.78%) had between 11–15 years of rice farming experience, with a mean of 14 years. Non-beneficiaries, however, were slightly more experienced: 50.56% had between 16–20 years of experience, with a mean of 16 years. Although non-beneficiaries had greater average experience, this variable does not appear to be a decisive factor for programme participation. This finding supports Balogun et al. (2021), who noted that while experience enhances farming efficiency, it may not guarantee access to institutional credit or development programmes, especially when other criteria such as education, farm size, and documentation are prioritized.

Table 1 Socio-Economic Characteristics of Rice Farmer Beneficiaries and Non-Beneficiaries of the Anchor Borrowers' Programme

Gender	Beneficiaries		Non-Beneficiaries	
	Frequency	% Distribution	Frequency	%Distribution
Male	197	54.72	217	60.28
Female	163	45.28	143	39.72
Total	360	100	360	100
Age				

20-40	89	24.72	45	12.50
41-60	184	51.11	214	59.44
Above 60	87	24.17	101	28.06
Total	360	100	360	100
Mean	50.3		53.5	
Marital Status				
Married	337	93.61	262	72.78
Single	23	6.39	98	27.22
Total	360	100	360	100
Level of Education				
No formal education	0	0.00	8	2.22
Primary education	6	1.67	49	13.61
Secondary education	54	15.00	185	51.39
University education	300	83.33	118	32.78
Total	360	100		100
Household Size				
1-5	95	26.39	24	6.67
6-10	195	54.17	206	57.22
11 -15	70	19.44	130	36.11
Total	**360**	100	**360**	100
Mean	7.7		9.47	
Farm Size				
0.01 - 0.20	25	6.94	48	13.33
0.21 - 0.40	45	12.50	207	57.50
0.41 - 0.60	195	54.17	60	16.67
0.61 - 0.80	80	22.22	20	5.56
0.81 - 0.90	15	4.17	25	6.94
Total	360	100	360	100
Mean	0.51		0.38	
Farming Experience				
1-5.	0	0.00	3	0.83
6-10.	45	12.50	4	1.11
11-15.	190	52.78	149	41.39
16-20.	120	33.33	182	50.56
>20	5	1.39	22	6.11
Total	360	100	360	100
Mean	14.2		16.0	

Source: *Computed from Field Survey Data, 2024*

4.2 Factors influencing the Value of Paddy Rice of farmer beneficiaries and non-beneficiaries of Anchor Borrowers' Programme

Table 2 presents the multiple regression estimates assessing the factors influencing the value of paddy rice among beneficiaries and non-beneficiaries of the Anchor Borrowers' Programme (ABP) in South-East Nigeria. Four functional forms linear, exponential, double-log, and semi-log—were initially tested. Based on statistical criteria including R^2, F-statistics, number of significant predictors, and conformity with a priori expectations, the linear functional form was selected as the lead equation for the three models (beneficiaries, non-beneficiaries, and pooled data). The coefficient of multiple determination (R^2) was 0.5123 for the beneficiaries' model and 0.5265 for the non-beneficiaries' model, indicating that approximately 51.23% and 52.65%, respectively, of the variation in the value of paddy rice was explained by the independent variables. The remaining variation (48.77% for beneficiaries and 47.35% for non-beneficiaries) could be attributed to factors not captured in the models.

The F-statistics for the models 25.8879 (beneficiaries) and 27.3993 (non-beneficiaries) were both significant at the 1% level, indicating the overall models were statistically significant. Consequently, the null hypothesis that socioeconomic and resource-use variables have no significant effect on paddy rice value was rejected. The findings suggest that these factors play a crucial role in influencing productivity and returns in rice farming under the ABP framework.

Several explanatory variables were found to significantly influence the value of paddy rice, with many showing strong consistency across the two groups:

The coefficients for farming experience (P<0.01) were significant for (beneficiaries) and (non-beneficiaries), and positively influence the value of paddy rice. This suggests that each additional year of farming experience increases the value of paddy rice, likely due to enhanced technical know-how, better agronomic practices, and superior market navigation. These findings are consistent with Nelson et al. (2024), who highlighted experience as a major predictor of rice yield.

The coefficient of household size was significant at (P<0.05) for beneficiaries, (P<0.01) for the non-beneficiary and positively influenced paddy value. Larger households may contribute more labor, thus increasing productivity. This corroborates the results of Nelson et al. (2024) but contrasts earlier findings by Irohibe and Agwu (2014), which suggest diminishing marginal returns with increased household size.

The coefficient of gender was positive for both beneficiaries and non-beneficiaries and significantly related to the value of paddy rice at (P<0.01). This implies that being male significantly increased the value of paddy for beneficiaries and for non-beneficiaries. This highlights a persistent gender disparity in agricultural performance, potentially stemming from unequal access to resources, information, and decision-making autonomy.

The coefficient of membership in a cooperative was positive for both beneficiaries and non-beneficiaries and statistically significant at (P<0.01). This implies that being a member of cooperative increase the value of paddy for beneficiaries and non-beneficiaries. This supports the assertion by Chandra, Emmanuel, and Emmanuel (2025) that cooperatives enhance access to credit, information, inputs, and markets, ultimately improving farm output and profitability.

The coefficient of farm size was positive and significantly related to the value of paddy rice for both beneficiaries and non-beneficiaries at (P<0.01). this implies that increase in the farm size significantly improved quantity of paddy and also leading to an increase in the value of paddy rice for the two groups. The positive relationship reflects economies of scale and more efficient resource allocation. This is consistent with studies by Osanyinlusi and Adenegan (2016) and Nelson et al. (2024).

The coefficient of education was also a positive and significant predictor of paddy value at (P<0.01) for beneficiaries and non-beneficiaries. This implies that for each additional year of schooling, paddy value increased by one percent for the beneficiaries and non-beneficiaries. Education enhances farmers' decision-making, adoption of innovation, and ability to interpret market trends key drivers of productivity.

Coefficient of price pf paddy was positive and significantly influenced the value of paddy at (P<0.01) for both the beneficiaries and non-beneficiaries. Each ₦1 increase in the market price of paddy (per 100kg) led to increase to the value of paddy by one percent for the beneficiaries and non-beneficiaries. This underscores the importance of fair and stable market pricing mechanisms in ensuring sustainable income for farmers.

Among the groups, only, the coefficient seed quantity was significant at (p<0.01) for beneficiaries but not significant at non-beneficiaries at all level of significant. This indicated that higher quality of seed input used by the beneficiaries directly increases output value. This finding supports Emmanuel and Mundia (2019), who emphasized the role of adequate seed supply in maximizing rice yield and value.

For non-beneficiaries, income was also a significant factor (p<0.05), with a positive coefficient. This means that as farmers' income increases, the value of paddy rice they produce or sell also increase. The positive and significant coefficient of income implies that higher household income levels contribute to increased value of paddy rice produced. This may be attributed to improved access to production inputs and services that enhance yield and market value. It suggests that income enhancement strategies could be a viable pathway to boosting paddy rice production value among farmers, suggesting that wealthier farmers are better able to invest in inputs and technologies, leading to higher-value production outcomes.

Table 2 Estimated regression results of the factors influencing the value of paddy rice of farmer beneficiaries and non-beneficiaries of Anchor Borrowers' Programme

Variables	Beneficiaries	Non-Beneficiaries	Pooled effects
	Linear	Linear	Linear
Constant	-1341249 (-3.85996)*	-2050237 (-6.0385)*	-2512769 (-9.36659)*
Years of experience	14943.38 (4.6321)*	12046.68 (3.7822)*	14452.6 (5.747352)*
Household size	24559.54 (2.4674)**	41764.01 (4.2576)*	30500.4 (3.936711)*
Level of income	9627.043 (0.1767)	106409.1 (1.9743)**	74808.3 (1.754765)***
Extension contact	-18557.29 (-0.3777)	3839.255 (1.2366)	1459.131 (0.424207)
Gender	105618	162142.5	195958.7

	(2.5942)*	(4.0959)*	(6.261422)*
Cooperative membership	278325.9 (6.0345)*	259453.6 (7.0461)*	274986.7 (9.435845)*
Marital status	-0.49502 (-1.9647)	-0.55353 (-2.2262)**	-0.7583 (-3.85575)*
Age	-14678.4 (-6.8734)*	-16988.4 (-8.0855)*	-17089.4 (-10.282)*
Farm size	182287.1 (3.3812)*	191200 (3.5759)*	177369.5 (4.197497)*
Education	43206.31 (9.7530)*	37922.82 (8.6231)*	41060.09 (11.82464)*
Cost of labour	-0.14732 (-0.9423)	-0.19222 (-1.2688)	-0.38961 (-3.2503)*
Quantity of Seeds (kg)	6888.603 (4.1164)*	220.8767 (1.2811)	115.2437 (0.604553)
Cost of Agrochemicals	-0.4598 (-0.263)	-2.88013 (-1.7156)	-2.02736 (-1.52679)
Price of paddy per 100kg bag	141.943 (8.1295)*	164.847 (9.5032)*	195.300 (14.2604)*
R-square	**0.5123**	**0.5265**	**0.5013**
F-value	**25.8879***	**27.3993***	**50.62351***
Observations	**360**	**360**	**720**
Sum of Square Residuals	**3.99808E+13**	**1.14136E+11**	**1.00703E+14**

Source: *Computed from Field Survey Data, 2024*

5. Conclusion

The findings of this study reveal a significant disparity in the performance of smallholder rice farmers who participated in the Anchor Borrowers' Programme compared to their non-beneficiary counterparts in South-East Nigeria. Socioeconomic characteristics such as education level, gender, and farm size were more favorable among beneficiaries, suggesting that access to ABP improved farmers' capacity to utilize inputs efficiently and enhance output value. Regression results further confirmed that key variables, including farming experience, household size, cooperative membership, and farm size positively influenced the value of paddy rice. The Chow test confirmed a structural difference between the two farmer categories, reinforcing the transformative potential of the ABP when well-targeted.

The study concludes that participation in the Anchor Borrowers' Programme significantly enhances smallholder rice farmers' productivity and income. However, disparities in access and performance between beneficiaries and non-beneficiaries suggest the need for policy adjustments that promote inclusivity especially for female farmers, elderly farmers, and those with lower education. Enhanced extension services, simplified access procedures, and expanded cooperative frameworks are recommended to boost programme impact and close the productivity gap.

References

1. Ajah, J., Igiri, B. E., & Ekpenyong, I. E. (2017). *Determinants of farmers' access to agricultural credit in Nigeria*. Nigerian Journal of Agricultural Economics, 7(2), 34–42.
2. Akinniran, T. A., & Faleye, T. (2020). *Financial challenges of rural farmers in Nigeria and the way forward*. Journal of Rural Development Studies, 5(1), 22–33.
3. Balogun, A. L., Ojo, O. A., & Afolabi, M. A. (2021). *Gender disparities in access to agricultural financing in Nigeria: Evidence from Anchor Borrowers' Programme*. African Journal of Agricultural Research, 16(6), 732–740.
4. Central Bank of Nigeria (CBN). (2016). *CBN Anchor Borrowers' Programme guidelines*. Abuja: CBN Publications.
5. Chandra, V., Emmanuel, T., & Emmanuel, A. (2025). *The role of farmer cooperatives in improving access to credit in developing countries*. Journal of Development Finance and Rural Economics, 9(1), 55–69.
6. Emmanuel, J., & Mundia, R. (2019). *Input use and output value among smallholder rice farmers in sub-Saharan Africa: Evidence from Zambia*. Journal of Agricultural Development, 6(4), 221–230.
7. Emefiele, G. I. (2016). *The role of CBN in promoting agriculture: Anchor Borrowers' Programme*. Abuja: Central Bank of Nigeria.
8. FFI. (2016). *Farming Finance and Inclusion: The challenge of credit access in Nigeria's agriculture*. FFI Working Paper No. 11.

9. Grow Africa. (2017). *Transforming agriculture in Nigeria: A case study of the rice value chain*. Retrieved from https://www.growafrica.com
10. International Institute of Tropical Agriculture (IITA). (2017). *Challenges of low productivity among Nigerian farmers*. IITA Policy Brief Series No. 12.
11. Irohibe, I. J., & Agwu, A. E. (2014). *Household size and agricultural labor supply in sub-Saharan Africa*. African Journal of Food, Agriculture, Nutrition and Development, 14(4), 9089–9102.
12. National Bureau of Statistics (NBS). (2019). *Statistical abstract for the South-East region*. Abuja: NBS Publications.
13. National Population Commission (NPC). (2006). *2006 Housing and population census*. Abuja: NPC.
14. National Population Commission (NPC). (2021). *Projected population estimates by geopolitical zone*. Abuja: NPC.
15. Nelson, R., Ugwu, G., & Musa, A. (2024). *Determinants of rice yield in Nigeria: A multivariate analysis*. Journal of Agricultural Policy and Research, 14(2), 91–105.
16. Nwoke, C. I. (2016). *Age dynamics in agricultural performance among rural farmers in Nigeria*. Nigerian Journal of Agricultural Extension, 17(1), 88–95.
17. Nwosu, F. O. (2014). *Determinants of access to agricultural credit among smallholder farmers in Nigeria*. Journal of Rural Economics and Development, 28(2), 145–153.
18. Olumba, U. C., Okonkwo, N., & Uchenna, A. (2021). *Geospatial characterization of South-East Nigeria and implications for agricultural planning*. GeoAgro Journal, 5(3), 233–246.
19. Osanyinlusi, T. F., & Adenegan, K. O. (2016). *Effect of farm size on rice output in South-West Nigeria*. Nigerian Journal of Agricultural Economics, 6(1), 54–62.