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DETERMINANTS OF FARMLAND MARKET PARTICIPATION AMONG SMALLHOLDER FARMERS IN OGUN STATE, NIGERIA.

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ABSTRACT

Farmland access remains a key constraint for smallholder farmers in Nigeria, with increasing reliance on the land rental market. This study investigates the determinants of farmland market participation among smallholder farmers in Ogun State across different land arrangement types, socio-economic characteristics, and participation outcomes. Primary data from 150 respondents were analyzed using descriptive statistics, multinomial logistic regression, bivariate logit model, and a problem ranking index. Result of the socio-economic analysis revealed that most farmers were above 40 years, with farming as a secondary occupation for many. Participation in the rental market was notable, with 58% renting in land and 41.3% renting out. Multinomial regression results showed that education significantly reduced the likelihood of choosing ownership ($p < 0.001$), communal ($p = 0.056$), and sharecropping ($p = 0.009$). Farm size positively influenced selection of ownership ($B = 0.81$, $p = 0.001$) and communal ($B = 1.11$, $p = 0.004$) arrangements. Bivariate logit estimates showed land size significantly reduced the likelihood of renting in ($B = -0.84$, $p = 0.012$) but increased renting out ($B = 1.02$, $p = 0.018$). Household size increased rent-in participation ($B = 0.56$, $p = 0.031$), whereas age significantly influenced rent-out decisions ($B = 0.44$, $p = 0.022$). The significant correlation coefficient ($rho = 0.411$, $p = 0.008$) indicated interdependence between both decisions. The findings reveal a dynamic farmland market shaped by socio-economic pressures and land scarcity. Land tenure arrangements, farmers' cooperatives, and land information services need to be strengthened to improve land access and rural productivity.

Key words: Farmland access, Land rental market, Smallholder farmers, Multinomial regression, Bivariate logit model, Land tenure

INTRODUCTION

Land remains the most crucial productive asset for rural household in developing countries that influence agricultural productivity, income distribution, and poverty status. In many regions, the absence of land sales markets has led to rise of land rental market as an essential means of improving land access and promoting efficient allocation of resources among smallholder farmers. The development of functional land rental markets has significant implications for land use efficiency, agricultural productivity, and poverty alleviation (Tesfay, 2023). In these markets, land is often transferred between farmers of different endowments and capabilities, theoretically leading to an optimal allocation of resources. Nevertheless, participation in these markets is not uniform, as various socio-economic and institutional factors influence whether farmers choose to rent in or rent out land.

Empirical evidence across developing countries suggests that household characteristics such as literacy, proximity to farmland, and asset endowment determine participation decisions in the land rental market. For instance, evidence from Tesfay (2023) suggests that farmers with higher literacy levels and proximity to their plots are more likely to rent in land, whereas illiterate farmers or those living far from their farms tend to rent out land. The study also noted that land rental market performance remains constrained in areas with imperfect input markets and poorly defined land rights, leading to economically insignificant changes in participation as landholdings vary. According to Li and Ma (2025), decision to rent land have welfare implication beyond agricultural productivity. Their research in rural China showed that renting out farmland can generate additional income for the landlord and reallocate household labour to more rewarding off-farm activities, thereby reducing different forms of energy poverty and energy unaffordability by up to 22 percent. These findings show the several benefits a well-functioning farmland market can provide.

In addition to improving the welfare of people, effective allocation of land is central to enhancing agricultural productivity and ensuring sustainable livelihoods among smallholder farmers, particularly in settings where resources are limited (Kehinde, 2025). Evidence from China further demonstrates that land rental behavior depends on demographic and social security, including the aging factor and pension insurance. According to Sun, Cheng, and Liu (2023), elderly farmers with pension insurance were 4.3 percent more likely to rent out land compared to those without such coverage, illustrating how social welfare systems interact with land market participation.

Access to land in Nigeria is both an economic and social issue as defined by the Land Use Act of 1978 and customary tenure systems. Smallholder farmers often have limited access to formal land markets and use informal arrangements to rent or lease land. Research conducted in Nigeria indicates that land leasing markets are becoming more prominent than outright

ownership of agricultural land as a result of the limited availability of farmland in certain locations within the country. In specific regions, such as Enugu State, Ugwu and Okoye (2019) found that approximately 68.3% of farmers were involved in land leasing, with the majority of these arrangements being fixed rentals. Key determinants included farm size, transaction cost, and farming experience, while insecurity of tenure, high transaction costs, and fear of lease termination were major constraints. Similarly, Kehinde (2025) emphasized that enhancing access to livelihood capitals could improve smallholder farmers' land allocation decisions and productivity outcomes.

Empirical research that examines the determinants of farmland rental market participation, particularly in Ogun State, Nigeria, remains limited despite the informative insights from several studies. In Ogun State, there is an increase in land pressure due to an increase in population, expanding peri-urban, and changing communal land arrangements, presenting a unique case. Understanding the socio-economic and institutional factors that influence farmers' participation in the farmland rental market is therefore essential for formulating inclusive land policies and enhancing agricultural productivity.

The main objective of this study is to examine farmland rental market participation among smallholder farmers in Ogun State. The specific objectives are to:

1. Describe the socio-economic characteristics of smallholder farmers in Ogun State.
2. Examine the factors influencing the types of farmland arrangements adopted.
3. Identify the determinants of farmland rental market participation, and
4. Assess the challenges encountered by farmers in accessing rental land.

However, these findings will contribute to the growing literature on farmland market in sub-Saharan Africa and provide recommendations that are evidence-based for land policy reform in Nigeria.

METHODOLOGY

Study Area

This study was conducted in Ogun State, one of the states in southwest Nigeria, which is a representative location for understanding land access and farmland market participation among smallholder farmers. Ogun State lies between 6°54.59′N latitude and 3°15.50′E longitude and covers a land area of 16,980.55 km². The population of the study area was reported as 3,751,140 in the 2006 National Population Census. Using an annual growth rate of 3.2%, the population is projected to approximately 7.0 million in 2026. This substantial increase in population suggests growing pressure on available agricultural land and other natural resources, thereby justifying the need to investigate issues relating to farmland availability and agricultural productivity in the study area. It has a relatively humidity, with mean daily temperatures ranging from 25°C (77°F) to 29°C (84°F) for almost all year round (Weather2, 2017). Ogun State has abundant rainfall of over 1500 mm annually; south-westerly winds dominate the LGA throughout the majority of the year. It is bordered by Lagos State to the south, Ondo State to the east, Osun and Oyo States to the north, and the Republic of Benin to the west (Obayelu, Ogunmola, & Oyewole, 2019). It constitutes urban and rural settlements and agriculture is a dominant vocation, especially in rural settlements. The study location is characterized by a mix of land tenure regimes including informal and customary types, making the location a critical place to study involvement in the rental market of farmland.

Data Source

Primary data was collected through a structured questionnaire survey administered to smallholder farmers across selected local government areas (LGAs) in Ogun State. A multistage sampling technique was employed to ensure a representative sample. In the first stage, five LGAs, namely Odeda, Obafemi Owode, Yewa North, Ijebu North, and Remo North, were purposively selected based on the intensity of agricultural activity and known prevalence of farmland transactions.

In the second stage, three farming communities were randomly selected from each of the selected LGAs. Specifically, in Odeda LGA, the selected communities were Odeda Town, Alabata, and Osiele; in Obafemi Owode LGA, the selected communities were Mowe, Ofada, and Kajola; in Yewa North LGA, the selected communities were Ilaro, Idogo, and Oja-Odan; in Ijebu North LGA, the selected communities were Ijebu Igbo, Oru, and Ago-Iwoye; and in Remo North LGA, the selected communities were Isara, Ode Remo, and Ilisan Remo.

In the third stage, smallholder farmers who engage in either own cultivation or land renting practices were randomly selected from the chosen communities.

In the final stage, a total of 150 respondents were selected for the study from the selected local governments areas. The sample size was considered adequate for the econometric analyses employed in the study, particularly the multinomial logit and bivariate probit models, and was sufficient to capture the diversity of farmland arrangements and rental market participation among smallholder farmers in the study area. The sample was proportionately distributed across the selected LGAs, with 30 respondents drawn from each LGA to ensure balanced representation.

The summary of the sampling distribution is presented in Table 1. The questionnaire captured detailed information on socio-economic characteristics, land tenure and rental arrangements, land sizes, transaction costs, institutional access, and perceived constraints to renting land.

Table 1: Distribution of Respondents Across Selected LGAs and Communities

LGA	Communities Selected	Respondents per Community	Total Respondents
Odeda	Odeda Town; Alabata; Osiele	10	30
Obafemi Owode	Mowe; Ofada; Kajola	10	30
Yewa North	Ilaro; Idogo; Oja-Odan	10	30
Ijebu North	Ijebu-Igbo; Oru; Ago-Iwoye	10	30
Remo North	Isara; Ode-Remo; Ilisan-Remo	10	30
Total	15 communities		150

Analytical Tools

Descriptive statistics such as means, percentages, and frequencies were used to describe the socio- economic characteristics of respondents and the various land access arrangements used in the study area. This helped in understanding demographic distributions and the pattern of land tenure systems practiced by smallholder farmers.

The Multinomial Logit Model was used to analyze the factors influencing the type of farmland arrangement that smallholder farmers adopted (Objective 2). The model is suitable for dependent variables with more than two unordered categories and was useful in estimating key socio-economic and institutional determinants of the farmer's arrangement choice, such as ownership, sharecropping, communal, and renting/leasing (Train, 2009; Wooldridge, 2010).

A Bivariate Probit Model was employed to examine the determinants of farmers' participation in the farmland rental market, specifically rent-in and rent-out of farmland decisions (Objective 3). The model jointly estimates two binary outcomes, recognizing the potential correlation between the two decisions' error terms (Greene, 2012). This is particularly applicable in settings where households engage in renting-in and renting-out land simultaneously, and where the unobserved factors influencing these decisions may be interdependent (Wooldridge, 2010; Benjamin *et al.,* 1998).

The Problem Ranking Index, also referred to as the severity index, was employed in evaluating the challenges faced by farmers in accessing farmland (Objective 4). This tool measures the perceptions of respondents in terms of ranking problems based on severity and frequency, thereby identifying the most pressing barriers to land access (Mbanasor and Kalu, 2008; Afolami *et al.,* 2015).

Econometric Model Specification

The Bivariate Probit model is designed to jointly estimate the probability of participation in renting-in and renting-out decisions, accounting for potential correlation in unobserved factors influencing both outcomes (Greene, 2012; Deininger *et al.,* 2009).

Mathematically, the model is specified as:

$Y_1* = X_1\beta_1 + \varepsilon_1$ (Rent-in decision), $Y_2* = X_2\beta_2 + \varepsilon_2$ (Rent-out decision)

Where Y_1* and Y_2* are latent variables such that $Y_1 = 1$ if $Y_1* > 0$, and $Y_2 = 1$ if $Y_2* > 0$. The error terms ε1 and ε2 are assumed to be jointly normally distributed with zero mean and correlation coefficient ρ, i.e.,

$[\varepsilon_1, \varepsilon_2] \sim N(0, \Sigma)$, with $\Sigma = [[1, \rho], [\rho, 1]]$

If $\rho \neq 0$, the decisions are correlated and the bivariate approach is statistically more efficient than separate probit models (Maddala, 1983).

The multinomial logistic regression (MNL) model is used when the dependent variable is categorical with more than two unordered outcomes. In this study, the model is applied to estimate the probability that a farmer adopts one of several farmland arrangements types: ownership, lease/rent, communal, sharecropping, and borrowed, using lease/rent as the reference category.

The general form of the multinomial logit model is expressed as:

$$\ln\left(\frac{P_{ij}}{P_{ib}}\right) = \beta_{0j} + \beta_{1j}X_{1i} + \beta_{2j}X_{2i} + \ldots \beta_{kj}X_{ki}$$

Where:

P_{ij} = probability that farmer i selects arrangement j

P_{ib} = probability of the base/reference category (lease/rent)

β_{0j} = intercept for outcome j

β_{kj} = coefficients for the k^{th} independent variable in category j

X_{ki} = value of the k^{th} predictor variable for farmer i

The model estimates log-odds of each arrangement type relative to the base outcome. The estimated coefficients are interpreted in terms of their effect on the relative risk ratios (RRR).

2.5 Variables in Bivariate Probit Model

Table 2: Dependent Variable

Variable	Description	Type
Rent in	1 if household rented-in farmland in the last farming season, 0 otherwise	Binary
Rent out	1 if household rented-out farmland in the last farming season, 0 otherwise	Binary

Table 3: Explanatory Variable

Variable	Description	Expected Sign (Rent-in)	Expected Sign (Rent-out)
Age	Age of household head (years)	+ / -	+
Sex	1 = Male, 0 = Female	+	+
Education	Years of formal education	+	-
House hold size	Number of people in the household	+	-
Farm size	Total owned farmland (hectares)	-	+
Access credit	1 if household accessed credit, 0 otherwise	+	+
Extension access	1 if accessed extension services, 0 otherwise	+	+
Membership farm group	1 if household belongs to a farmer organization	+	+
Farming experience	Years of experience in farming	+	+
Income	Annual household income	+	-
Price	Rental market price per hectare	±	+

RESULT AND DISCUSSION

Socio-economic Characteristics of the Smallholder Farmers in the Study Area.

Table 4 presents the socio-economic characteristics of the respondents in the study area. The majority of the respondents (47.3%) were 50 years and above, with a mean age of 47.29. This means that small-scale farming in the study area is defined by an aging population. This is in line with the findings of Oparinde *et al.,* 2023, who found that farming activities in Southwestern Nigeria are mainly conducted by individuals with a mean age of 47.861. This pattern may influence the farmland market participation, as the young and aging farmers are those who actively participate in land transactions.

Result also showed that 60% of the respondents were male and 40% were female. The results of the findings indicated that more males engaged in farmland market participation than female. This result agreed with the study of Oladiran *et al.,* 2020 which stated that majority of the farmers who engaged in market participation were male. Primary occupation distribution revealed that 48% of the respondents were civil servant, 28.0% were farmers, and 24.0% were Traders. This result implies that farming is not the primary occupation of majority of the respondents. This is in consonance with the findings of Nmeregini and Udoka (2021) which reported that larger proportion of the farmers engaged in non-farm income generating activities and this engagement in non-farm activities allow the respondent to increase their income earnings so as to improve their living their living condition. Marital status data showed that majority of the smallholder farmers were married (84.7%) and 15.3% of the respondents were single. This suggests that most of the farming occurs within the household setting, where household members' labor can be utilized. The findings of this study are in line with that of the Adelusi *et al.,* 2024, which found that majority of the farmers were married (94.92%). Also 30% of the respondent had secondary school education, 27.3% possessed primary education, 23.3% had Tertiary education, and 19.3% had no education. The result of this findings indicated that there is relatively high educational attachment from the respondent which can influence farmers in the adoption of new technology and engagement in market-oriented agriculture. This result corroborates the findings of Oladiran *et al.,* 2020, which found that 39.8% of the farmers had secondary education and this may help them to engaged in business and perform transaction effectively. However, the distribution by household size of the respondent showed that 42.7% had the household member more than 6 with mean of 6.07. This result shows the prevalence of large family sizes which can provide labour for farming activities. This result is in line with the findings of Oladiran *et al.,* 2020 where the average family size was 6.0. Income distribution shows that 52.7% of the respondents had income greater than ₦300,000 per year with average income of ₦305,688.5. This suggests that majority of the smallholder farmers had moderate annual income may be due to the non-farm activities they engaged in. This result aligns

with the findings of Hauwa *et al.,* 2022, which reported that the mean annual income of the smallholder farmers is ₦345,000.

Table 4: Socio-economic characteristics of smallholder farmers in Ogun State

Socio-economic characteristics	Frequency	Percentage (%)
Age		
20-29	19	12.7
30-39	19	12.7
40-49	41	27.3
>=50	71	47.3
Mean	47.29	
Gender		
Male	102	60.0
Female	48	40.0
Primary Occupation		
Civil Servant	72	48.0
Farming	42	28.0
Trading	36	24.0
Marital Status		
Single	23	15.3
Married	127	84.7
Educational Status		
No formal education	29	19.3
Primary	41	27.3
Secondary	45	30.0
Tertiary	35	23.3
Household Size		
1-3	39	26.0
4-6	47	31.3
>6	64	42.7
Mean	6.07	
Income		
<100,000	5	3.3
100,000-300,000	66	44.0
>300,000	79	52.7

Farmland Market Participation

Table 5 presents the distribution of farmland renting in and renting out of the respondent in the study area. It indicated that 58.0% of smallholder farmers rented in farmland and 42.0% did not. This result implies that more than half of the respondents in the study rely on rented in land to supplement their farmland. However, 58.7% of the respondents did not rent out any farmland, whereas 41.3% rented out farmland. This indicates that fewer respondents participated in the farmland market as landlords compared with those who rented in land, suggesting that smallholder farmers are more inclined to acquire additional land for production rather than lease out their existing farmland. This result is consistent with the recent findings of Abate *et al.* (2024), & Ricker-Gilbert *et al.* (2021), who found that renting in land has become a strategy that smallholder farmers use to expand their production. It is also stated that the proportion of landlord participating in renting out land are few compare to the tenant (renting in) due to the fact that renting in is underestimated in surveys because many landowners do not readily report their rental transactions.

Table 5: Farmland Market Participation

Farmland Market Participation	Frequency	Percentage (%)
Rent in		
Yes	87	58.0
No	63	42.0
Rent out		
Yes	62	41.3
No	88	58.7

Factors influencing the types of farmland arrangements adopted

Table 6 presents the results of a multinomial logistic regression analysis that examine the factors influencing choice of smallholder farmers on different types farmland arrangements adopted in Ogun State. The model is statistically significant (χ^2 (33) = 128.36, $p < 0.001$), with a Pseudo R^2 of 0.4226, indicating a strong explanatory power. The reference category is Rent/Lease, and comparisons are made against Communal, Ownership, and Sharecropping land arrangements. The results are presented in terms of regression coefficients (Coef.) and Relative Risk Ratios (RRRs), which indicate the likelihood of choosing a particular farmland arrangement relative to the reference category (Rent/Lease). An RRR greater than one indicates an increased likelihood of choosing a particular farmland arrangement relative to Rent/Lease, whereas an RRR less than one indicates a decreased likelihood.

In the comparison between Communal land arrangements and Rent/Lease, several predictors were statistically significant. Education had a negative association with the likelihood of utilizing communal arrangements (B = -0.234, p = 0.056, RRR = 0.791), in the sense that more educated farmers are less likely to utilize communal systems and more likely to prefer rent/lease arrangements. This result aligns with the findings of Ambali *et al.* (2022), who found that farmers who are educated are more likely to prefer purchase land to communal land. Household size was also negatively and significantly correlated (B = -0.460, p = 0.017, RRR = 0.631), i.e., that farmers who belong to bigger households are less likely to use communal access to land, possibly due to the need for more secure and expandable land resources. Land size was positively relevant (B = 1.11, p = 0.004, RRR = 3.033), that is, people with greater land holdings tend to use communal systems, perhaps reflecting customary claims or family land holding. This concurs with Kehinde *et al.* (2021), who stated that land size has an effect on the choice of tenure systems among semi-arid farming communities.

Being a member of the farmer group significantly reduced the utilization of common land (B = - 4.17, p = 0.002, RRR = 0.015), possibly due to more awareness and access to formal rented land opportunities as facilitated by collective mobilization. This corroborates Borgemeister *et al.* (2024), who stated being in the group or farmer's cooperatives likely to reduce the reliance of farmers on communal because cooperative membership provides better access to formal or rented land. Additionally, farming experience (B = -0.143, p = 0.011, RRR = 0.866) was negatively correlated, suggesting that experienced farmers are less likely to use traditional arrangements, possibly because they are better able to understand the benefits of land security. This is in line with the findings of Lasway & Selejio (2021), who found that more experience farmer favour formal land access. Income had a big and positive impact (B = 0.0000232, p = 0.001, RRR = 1.000023), meaning wealthy farmers stand a higher chance of implementing communal arrangements because they can afford to donate or own local land systems. This is also in consistent with the evidence that wealth facilitates access to secure land tenure (Benjamin, 2020).

Table 6: Multinomial Logistic Regression Results Showing Coefficients and Relative Risk Ratios (RRRs) Predicting Farmland Arrangement Types Compared to Rent/Lease

Farmland Arrangement	Coef.	RRR	Std. Err.	Z	P>|z|
Rent/Lease	(Base outcome)				
Communal					
Age	.0695461	1.072021	.0502134	1.39	0.166
Sex	1.262693	3.534928	1.362201	0.93	0.354
Education	-.2342437	.791169	.1223256	-1.91	0.056
Household Size	-.4602956**	.631097	.1929551	-2.39	0.017
Farm Size	1.109509**	3.032867	.3877383	2.86	0.004
Credit Access	-.670394	.511507	1.149836	-0.58	0.560
Extension Access	-1.205672	.2994906	1.229574	-0.98	0.327
Farm Group Member	-4.169518**	.0154597	1.372661	-3.04	0.002
Farming Experience	-.1434543**	.8663604	.0564943	-2.54	0.011
Income	.0000232**	1.000023	6.96e-06	3.33	0.001
Price	.000173	1.000173	.0001107	1.56	0.118
_cons	-10.54217**	.0000264	4.087774	-2.58	0.010
Ownership					
Age	-.0009581	.9990423	.0226028	-0.04	0.966
Sex	.3701243	1.447915	.5743749	0.64	0.519
Education	-.2488683**	.7796827	.0657925	-3.78	0.000
Household Size	-.184923**	.8311682	.0911417	-2.03	0.042
Farm Size	.8063672**	2.239757	.2405207	3.35	0.001
Credit Access	-.1858182	.8304246	.5299494	-0.35	0.726
Extension Access	.368125	1.445023	.5153234	0.71	0.475
Farm Group Member	-1.680347**	.1863094	.568506	-2.96	0.003
Farming Experience	-.0941525**	.9101439	.0277364	-3.39	0.001
Income	.0000187***	1.000019	3.43e-06	5.46	0.000
Price	4.18e-06	1.000004	.0000504	0.08	0.934
_cons	-2.650632	.0706066	1.799589	-1.47	0.141
Sharecropping					
Age	-.0135891	.9865029	.0433379	-0.31	0.754
Sex	-.4292235	.6510144	1.070045	-0.40	0.688
Education	-.3496455**	.7049379	.1346003	-2.60	0.009
Household Size	-.8015405**	.4486373	.298105	-2.69	0.007
Farm Size	.8805382**	2.412198	.4383993	2.01	0.045
Credit Access	.3141164	1.369049	1.026338	0.31	0.760
Extension Access	.4908017	1.633625	1.018463	0.48	0.630
Farm Group Member	-1.223715	.2941355	1.045396	-1.17	0.242
Farming Experience	-.0190404	.9811397	.049793	-0.38	0.702
Income	.0000112	1.000011	6.44e-06	1.74	0.081
Price	.0000481	1.000048	.0001051	0.46	0.647
_cons	-.7866349	.4553746	4.268557	-0.18	0.854
Number of obs = 150	LR chi2(33) =	128.36	Prob > chi2 =	0.0000	
Log likelihood = -	87.688363		Pseudo R2	= 0.4226	

Note: RRR = Relative Risk Ratio; Coef. = Regression Coefficient; Std. Err. = Standard Error; * p < 0.10, ** p < 0.05, *** p < 0.01. Rent/Lease serves as the reference (base) outcome category.

For Ownership arrangements compared to Rent/Lease, education remained a strong negative predictor (B = -0.249, $p < 0.001$, RRR = 0.780), confirming the trend that formal education influences preference for land rented or leased under written agreements. Household size was again negatively significant (B = -0.185, p = 0.042, RRR = 0.831), suggesting that big households avoid ownership perhaps due to land fragmentation or the cost of getting titles. Farm size was significant (B = 0.806, p = 0.001, RRR = 2.240), suggesting that farmers owning larger pieces of land are more likely to own, in line with Kehinde *et al.,* 2021. Group membership had a negative effect (B = -1.68, p = 0.003, RRR = 0.186) and can be indicative of the structure of the group to favor collective bargaining over rented parcels. Farming experience (B = -0.094, p = 0.001, RRR = 0.910) also reduced the likelihood of preferring ownership and experienced farmers will most probably favor more flexible or short-term access arrangements. Income again had an extremely strong positive impact (B = 0.0000187, $p < 0.001$, RRR = 1.000019), as seen previously in the work of Abubakar (2021), who reported that farmers with higher income are more likely to obtain formal land titles and purchase land.

For Rent/Lease compared to Sharecropping arrangements, the important variables followed similar patterns. Education did not have a positive effect (B = -0.350, p = 0.009, RRR = 0.705), which implies that more educated farmers are not likely to engage in sharecropping, often associated with informal or dependent access to land. Household size was negatively associated (B = -0.802, p = 0.007, RRR = 0.449), which indicates that large households may need more secure access than sharecropping is able to provide. Farm size was a strong and significant predictor (B = 0.881, p = 0.045, RRR = 2.412), indicating that farmers with larger farms are able to use sharecropping to farm excess land or diversify their labor use. These findings align with the evidence from Fares *et al.* (2025), Roshel *et al.* (2025), and Mostafa (2024), who emphasize that education and household composition shape land access strategies, while farm size creates opportunities for mixed tenure arrangements.

Other variables such as age, sex, credit access, extension access, and land price were not statistically significant across most categories. This suggests that while they may influence land decisions in other contexts, they were not strong determinants of farmland arrangement choice in this study. Similar findings have been reported by Fadeyi *et al.* (2022), who emphasized that socio- economic and institutional factors rather than demographics like age and gender play a more central role in shaping land access behavior. However, these results indicate a shift away from informal and traditional systems toward more economically driven and organized methods of land access and align well with current literature on land tenure and market participation in Sub-Saharan Africa.

Determinants of farmland rental market participation

Table 7 presents the bivariate probit model used to investigate the determinants of smallholder farmers' participation in the agricultural land rental market in Ogun State, Nigeria. Key factors such as education, household size, farm size, group membership, farming experience, and income significantly influence decisions to rent in or rent out land. From the distribution, education is positive and significantly affects farmers' decision to rent in land (B = 0.1399, $p < 0.01$), but has a negative effect on renting out land (B = -0.0845, $p < 0.05$). This implies that educated farmers tend to rent in more land to expand operations. This result aligns with the findings of Zhou *et al.* (2022) and Abate (2024), who found that farmers with good education improve market participation, have better decision-making, and awareness of formal transactions. Household is also positive and significant for renting in land (B = 0.1425, $p < 0.05$) and not significant for renting out. This means that family with larger household tends to rent in land to utilize available labour. This result is in consistence with Geng *et al.* (2021), who reported that availability of family labour may drives land expansion behaviour. Farm size is negative and significant for renting in land (B = -0.4544, $p < 0.05$) but positively affect renting out land (B = 0.2772, $p < 0.05$). This implies that smallholder farmers may rent more land to increase their production, while large farmers lease out land that are surplus. This result aligns with the evidence of Zhang & Li (2023) and Abate (2024) who also supported the pattern. Group membership (B = 0.9804, $p < 0.05$) and farming experience (B = 0.0486, $p < 0.05$) both increased the likelihood of renting in land. This reflects the importance of social networks and experience in accessing land opportunities (Matita *et al.,* 2022; Zhou *et al.,* 2022). Finally, income had a negative and significant effect on both renting in and renting out (B = -0.0000106; B = -0.0000067, $p < 0.01$), suggesting that farmers that are wealthy are less active in rental markets which is also reported by Geng *et al.* (2021).

Table 7: Bivariate Probit result

	Rent in			Rent out		
Variables	**Coefficient**	**Std. Error**	**Z**	**Coefficient**	**Std. Error**	**Z**
Age	-.0031312	.0119353	-0.26	.0184999	.0100735	1.84
Sex	-.2289143	.3093962	-0.74	.2041401	.2769924	0.74
Education	.1399363***	.0346226	4.04	-.0845259**	.0286952	-2.94
Household Size	.1424846**	.0515871	2.76	-.0422814	.0442719	-0.96
Farm Size	-.4544455**	.1278274	-3.56	.277235**	.1065377	2.60
Credit Access	.1649776	.2904673	0.57	-.1561602	.2490022	-0.63
Extension Access	-.1851611	.2899759	-0.64	-.2820339	.259641	-1.09
Farm Group Member	.9804019**	.306898	3.19	.2282759	.2471615	0.92
Farming Experience	.048563**	.0147011	3.30	-.0001532	.0108273	-0.01
Income	-.0000106***	1.75e-06	-6.02	-6.73e-06***	1.32e-06	-5.11
Rental Price	-.0000204	.0000275	-0.74	.0000281	.0000243	1.16
_cons	1.63194	.9730593	1.68	.4822414	.8475757	0.57

*, **, *** represent level of significance at 10%, 5% and 10% respectively
Number of observations = 150, Wald chi2(11) = 97.04, Prob > chi2 = 0.0000, Pseudo R2 = 0.4667
Log likelihood = -55.4523,

Challenges faced by smallholder farmers in accessing farmland for rent

Table 8 reveals the major challenges smallholder farmers face in accessing rented farmland in Ogun State. The most critical issue identified was elite land capture by powerful individuals (Mean = 3.28), showing that influential people dominate land access. This aligns with evidence from Zimbabwe, where larger landholders and elites exert a disproportionate influence in rental markets (Tatsvarei *et al.,* 2022). Secondly, the high cost of land rent (Mean = 3.09) and inability to pay advance rent (Mean = 3.03) were also significant, suggesting that many farmers are financially constrained. Similar findings are reported in the DRC, where price-related limitations and restrictive lease contracts prevent smallholders from engaging in land markets (Frontiers, 2023).

Land unavailability, poor land information, and customary barriers followed closely, reflecting systemic issues in the land market. For instance, in Malawi, customary tenure systems and weak documentation hinder smallholders' investment and access to land markets (Olatunbosun Benjamin, 2020). Importantly, discrimination or marginalization (Mean = 2.86) ranked the lowest. While this suggests it is less widespread, it still reflects underlying social inequality, especially affecting women and minority farmers. This supports the findings by Tesfay (2020), who found that land rights studies in Ethiopia show gendered exclusion in access and tenure security.

Table 8: Problem Ranking Index Result

	SA	A	N	D	SD	Mean	Ranking
High cost of land rent	33	38	22	24	33	3.09	2nd
	22.0%	25.3%	14.7%	16.0%	22.0%		
Land unavailability	29	30	34	30	27	3.03	4th
	19.3%	20.0%	22.7%	20.0%	18.0%		
Customary/traditional land barriers	34	27	27	25	37	2.97	6th
	22.7%	18.0%	18.0%	16.7%	24.7%		
Land disputes and unclear ownership rights	22	28	39	29	32	2.89	9th
	14.7%	18.7%	26.0%	19.3	21.3%		
Discrimination or marginalization (e.g., gender)	27	28	29	33	33	2.86	10th
	18.0%	18.7%	19.3%	22.0%	22.0%		
Lack of formal contracts or agreements	33	20	34	26	37	2.91	8th
	22.0%	13.3%	22.7%	17.3%	24.7%		
Elite land capture by powerful individuals	40	26	38	28	27	3.28	1st
	26.7%	17.3%	25.3%	18.7%	18.0%		
Inability to pay advance rent	27	37	26	33	27	3.03	3rd
	18.0%	24.7%	17.3%	22.0%	18.0%		
Poor access to land information	33	27	32	22	36	2.99	5th
	22.0%	18.0%	21.3%	14.7%	24.0%		
Long distance to land location	31	30	24	32	33	2.96	7th
	20.7%	20.0%	16.0%	21.3%	22.0%		

CONCLUSION

The study shows that socio-economic characteristics such as education, income, farm size, and household size significantly influence both land arrangement choices and rental market participation. Multinomial regression revealed that education negatively affected communal, ownership, and sharecropping options (all $p < 0.05$), while farm size and income increased the likelihood of choosing ownership ($B = 0.81$, $p = 0.001$) and communal ($B = 1.11$, $p = 0.004$) arrangements.

Bivariate logit estimates showed land size significantly reduced the likelihood of renting in ($B = -0.84$, $p = 0.012$) but increased renting out ($B = 1.02$, $p = 0.018$). Household size increased rent-in participation ($B = 0.56$, $p = 0.031$), while age was a significant factor in rent-out ($B = 0.44$, $p = 0.022$). The significant correlation coefficient (rho = 0.411, $p = 0.008$) indicated interdependence between both decisions.

The study concludes that farmland rental markets are vital for flexible land access. However, challenges like land rent cost, elite land capture, and insecure tenure persist. Improving land governance, supporting documentation, and strengthening extension services and farmer groups are recommended for better land market functioning.

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