



UNLOCKING THE POTENTIAL OF AGRICULTURE THROUGH LAND TENURE SECURITY: LESSONS FROM DELTA STATE, NIGERIA

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ABSTRACT: *The research study delved into the intricate relationship between land tenancy security and its impact on investments and agricultural output among crop-producing farmers. The investigation involved 180 participants selected through a multistage random selection process. Descriptive and inferential statistics were used to examine the data for this study, which was based on information gathered from primary sources utilizing a structured questionnaire. According to the findings, the majority of participants were male, with an average age of 36 years. Additionally, most respondents were married and literate. On average, the farmers had 16 years of farming experience, and a significant proportion were members of agricultural associations. The average size of smallholder farms was 1.90 hectares. Land acquisition methods varied, with lease, communal, and inheritance being the primary modes. Notably, de jure and de facto indicators stood at 3.9% and 50%, respectively. The tenure security over their farmlands is estimated to be at 55.9% for smallholder farmers. Age, farm size, household size, farming experience, crop diversification, credit availability, income, and the status of land ownership security were the variables that had an impact on crop production. The study also highlighted the significant impact of land ownership security on farm investment, with access to credit, income, education level, farming experience, farm size, land ownership security status, and the availability of extension services emerging as contributing factors. In light of these findings, the study advocates for legislative amendments to the Land Use Act of 1978. The proposed changes aim to enhance the security of land ownership, ultimately fostering a more conducive environment for agricultural investments.*

KEYWORDS: Land tenure, Land security, tenancy, De jure, De facto, Agricultural output, Investment, development, Farmers.



INTRODUCTION

Over time, a significant portion of Africa's population, including Nigeria, has heavily relied on land as a primary source of income, with agriculture constituting the largest sector of GDP and employment across most nations (Bako & Balogun (2023)). Several African governments have recently shifted their focus towards enhancing tenure security and reforming land tenancy as strategies to foster agricultural growth and alleviate poverty through improved guaranteed property tenure (Asiama et al., 2021). Land tenancy, as defined by Gbigbi (2018), pertains to the legal or customary methods through which individuals acquire or own land. According to Agheyisi (2019), tenure security refers to the assurance that one's ownership rights to real estate will be upheld in the face of certain challenges. Gbigbi (2018) clarifies that "tenure" signifies individuals' status concerning a property. Different types of tenure exist, such as communal, collective, freehold, and leasehold, with tenure security ensuring the uninterrupted enjoyment of essential land rights by individuals, families, communities, businesses, and other entities.

Land policy decisions significantly influence regional development, as emphasized by Dadashpoor and Ahani (2019), which considers land tenancy a pivotal economic and political matter and a fundamental aspect of agricultural, rural, and urban development strategies. They further suggest that insights into society can be gleaned by examining how it establishes, allocates, safeguards, and manages land and other natural resource rights. Valencia et al. (2019) highlight in their research the significance of solid land rights in achieving development objectives at various levels, be it rural, or urban. As outlined by Honig (2022), secure land rights incentivize investment, streamline the process of securing land rights, improve housing services and living conditions, enable sustainable land use, and boost agricultural potential, ultimately leading to economic growth, food security, and poverty reduction. Despite its critical significance, tenure security remains a pressing issue in Nigeria and many other African nations (Agheyisi 2019).

LITERATURE REVIEW

Land rights vulnerability remains a significant challenge in Africa, with various factors contributing to this issue. Bako & Balogun (2023) highlight uncontrolled and unregulated land development as a primary contributor to tenure insecurity, particularly emphasizing the ongoing transition from agricultural to residential land use. This shift reflects broader socio-economic changes occurring across Africa, including rapid urbanization and population growth. As cities expand and demand for housing increases, agricultural land is every so often repurposed, leading to displacement of farmers and fragmentation of agricultural holdings. Matthaei (2018) further expands on this issue by identifying poverty and land grabbing as additional significant causes of land ownership instability. The persistent cycle of poverty in many African regions leaves smallholder farmers vulnerable to exploitation and unable to secure their land rights effectively. Simultaneously, the increasing interest from foreign agricultural investors in acquiring large tracts of rural land exacerbates the problem. This practice, which is sometimes called "land grabbing," has the potential to uproot local communities and further undermine established land rights laws. In addition to these elements, the complicated nature of tenure laws throughout Africa has been exacerbated by the historical legacy of colonialism and subsequent post-independence land policies. Many countries still grapple with the coexistence of customary and statutory land rights, leading to overlapping claims and conflicts. The consequences of land rights vulnerability on farm output are profound and far-reaching. Gbigbi (2018) notes that globally, approximately 70% of all arable crop



growers are smallholder farmers. However, their productivity levels remain below average owing to the fragmentation of farm holdings and the instability associated with insecure tenure. This situation creates a vicious cycle: low productivity leads to poverty, thereby complicating farmers' ability to allocate resources in their land or secure their tenure rights. The challenges faced by smallholder farmers often lie beyond their immediate control. Uncertainty about long-term land access discourages investments in soil conservation, irrigation systems, and other productivity-enhancing measures. Furthermore, without secure tenure, farmers struggle to access credit, as they lack collateral to offer financial institutions. Poor land governance emerges as a fundamental reason for the persistence of rights instability. Kobusingye (2020) gives an in-depth definition of land governance, encompassing the policies, practices, and institutions that determine land access and use. This broad concept includes a diverse array of organizations, from formal statutory bodies to customary institutions, religious authorities, and even unofficial land developers. The political economy of land and power relations in Africa add to the intricate nature of the governance of land. Historical power structures, ethnic considerations, and economic interests all play roles in shaping land policies and their implementation. This intricate web of factors often results in governance systems that fail to adequately protect the rights of smallholder farmers and other vulnerable groups. Mubanga (2019) emphasizes the critical importance of effective land governance in facilitating the creation and implementation of institutions, rules, and laws for managing land resources. It is important to remember that land registration programs do not always result in increased agricultural output or the protection of land rights. The efficacy of such programs depends on their design, implementation, and alignment with local frameworks and needs. Recent research has increasingly focused on the link between land rights security and agricultural output, revealing numerous potential benefits of secure tenure. Zhou et al. (2021) demonstrate that Safeguarded ownership entitlements encourage users to invest labour and money in building, enhancing, and sustaining various properties, including agricultural ventures. This increased investment has the potential to cause long-term improvements in soil quality, irrigation systems, and overall farm productivity. Gbigbi (2018) highlights how secure tenure makes it easier to use land as security for loans, facilitating easier access to financing for agricultural operations. This access to credit can be transformative for smallholder farmers, enabling them to invest in better seeds, fertilizers, and equipment. Studies by Ekpodessi and Nakamura (2022) demonstrate that land rights security increases agricultural output, promoting agricultural expansion, food security, and poverty alleviation. This beneficial cycle can significantly impact rural economies and national food security. Gbigbi (2018) finds that farmers with protected land entitlements are more likely to finance sustainable agricultural strategies like agroforestry and soil conservation. These practices not only improve long-term productivity but also contribute to environmental sustainability and climate change resilience. Numerous studies have demonstrated that farmers possessing strong ownership entitlements are more inclined to make improvements and see productivity increases. Navarro-Castaneda et al. (2021) show that farmers with strong land rights are better suited to undertake land enhancements and see productivity increases, regardless of the specific tenure structure (leasehold, freehold, communal, or individual). This suggests that the key factor influencing agricultural potential and investment is the protection of land tenure, rather than the specific form of ownership. While several studies have shown that stable ownership positively impacts farming productivity, recent research has also shed light on the complexities of this relationship. For instance, Akram et al. (2019) utilized farm-level data to demonstrate the advantages of tenure guarantees, providing empirical evidence for the theoretical benefits of tenure security.



Uchezuba et al. (2019) argue that the relationship between property tenure, capital investment, and efficiency in Africa is more complex and nonlinear than a direct causal link. This finding emphasizes the importance of context-specific strategies for landholding reforms, as the effects can vary depending on local circumstances, cultural factors, and prevailing agricultural methods.

Gbigbi (2018) contributes to this nuanced understanding by finding that tenure stability can increase agricultural output through multiple mechanisms. By facilitating credit accessibility and promoting long-term investments, secure tenure reduces uncertainty about future income rights. This multifaceted impact underscores the significance of comprehensive approaches to land rights reform that address not only legal rights but also access to financial services and agricultural support. Despite these findings, literature gaps persist, particularly in specific study areas. This study addresses these gaps by investigating how tenancy issues affect smallholder crop producers' investments and agricultural output. This study aimed to address these gaps by investigating how tenancy issues affect smallholder crop producers' investments and agricultural output. The study aimed to identify the socio-demographic characteristics of farmers, understand the different types and nature of tenure arrangements among them, estimate the proportion of farmers with secure land ownership, and examine the effect of tenancy security on investments and output.

METHODOLOGY

The study was carried out in Delta State, an area well-known for its bountiful agricultural land and where the main industries are farming, trading, and public service. The three primary agricultural pursuits are raising livestock, fishing, and crops. The method of multistage random sampling was used to choose the respondents. Nine local government areas (LGAs) were initially created when three LGAs were arbitrarily selected from the State's three agricultural zones. Eighteen settlements in total—two from each LGA—were chosen for the second stage. Lastly, from each of the eighteen villages, ten farmers who grow arable crops were selected, given 180 respondents. Structured questionnaires were utilized to collect primary data concerning various aspects, including methods of land procurement, households affected by different types of land ownership security, and the perceived implications on agricultural output and investment. Descriptive and inferential statistics were used for data analysis. Descriptive statistics used include mean, frequency counts, and percentages.

SDG land ownership security indicator:

This is measured as:

$$\begin{aligned} \textit{de jury indicator} &= \frac{\textit{people (adult)with legally recognized documentation over land}}{\textit{total population}} \\ & * \frac{100}{1} \end{aligned}$$

$$\textit{de facto indicator} = \frac{\textit{people (adult)who perceive their rights as secure}}{\textit{total population}} * \frac{100}{1}$$



Determination of output

The regression model was stated as follows:

$$Y = AGE+ GEND+ FARMSZ+ FAMSZ+ SCH+ YOEXP+ CROD+ ACCRD + INC+ LAWS$$

where:

Y = Output(kg)

AGE = Age

GEND = Gender

FARMSZ = Farm size

FAMSZ = Family size

SCH = Schooling

YOEXP = Years of experience

CROD = Crop diversification

ACCRD = Access to credit

INC = Income

LAWS = Land ownership security status

Determination of investment

$$Y = AGE+ GEND+ ACCRD + INC++ SCH + YOEXP+ FARMSZ+ LAWS+ EXTC$$

where

Y = Investment (₦)

AGE = Age

GEND= Gender

ACCRD = Access to credit

INC= Income

SCH= Schooling

YOEXP= Years of experience

FARMSZ= Farm size

LAWS= Land ownership security status

EXTC= Extension contact



Four functional forms (linear, semi-log, exponential, and double log) were tried and the choice of the best functional form was based on the magnitude of the R² value, the level of significance, and the size and size of the regression coefficients as they conform to a priori expectation.

RESULTS AND DISCUSSION

The demographic details of the participants are outlined in Table 1. Gender-wise, men (53.3%) made up the majority of the sample, while women comprised 46.7%. This indicates that, in the research context, men were more engaged in small-scale farming operations than women. This observation aligns with Gbigbi's (2021) research on cassava production, which found that males are more involved in cultivating arable crops. In Nigeria, men typically have easier access to agricultural land than women, which could explain this trend. The result also indicated that most (44.4%) of respondents were aged between 31 and 40, with a mean age of 36. This put forward that smallholder farmers are relatively young and active, indicating that they are in their prime years for farming. This finding is consistent with Gbigbi's (2018) study, which found that the average age of arable crop farmers was 37, and with Kolapo et al.'s (2020) research, which found that farmers in South-West, Nigeria were young, active, and motivated to engage in farming activities. Most respondents (86.7%) were married, which conforms with the universal trend in Nigeria and globally. This finding is consistent with Folorunsho's (2015) research, which found that a large percentage of farmers in North Central Nigeria were married, suggesting that using family members as farm laboreurs could be a practical option. The result also disclosed that high proportion of respondents (58.9%) had completed secondary school, indicating a relatively high level of literacy among farmers. This finding supports Gbigbi's (2020) claim that many crop growers in Delta State have access to higher education, which could facilitate their participation in community-driven development efforts. This is consonant with Ebe et al (2018) research, which found that farmers in Abia state were educated, which improved their socioeconomic status. The bulk of respondents (83.4%) had been farming for between seven and eighteen years, with a mean farming career of 16 years. This indicates that respondents had sufficient farming experience to be successful in food production. This is consistent with Moses' (2017) finding that most small-scale farmers are skilled in their farming activities, which has traditionally contributed to increased output. The result also showed that over 71% of farmers belonged to one or more associations, indicating that most farmers are members of thrift and savings institutions and Farmers' Cooperative Associations. This infers that most farmers had the opportunity to partake in government agricultural intervention projects due to membership in social groups, which could have made them aware of the program's launch in their communities. This suggests that group dynamics may be present for them and that their affiliation could provide agricultural inputs. As shown in Table 1, the majority (95%) of respondents had farms between 1.1 and 3.0 hectares, with an average farm size of 1.90 hectares. This finding supports Kolapo et al.'s (2020) findings that the bulk of farmers in Nigeria are smallholders with farms that are between 1 and 2 hectares in size on average. This situation poses a serious challenge for a country like Nigeria, which is struggling to attain food security.

**Table 1: Socioeconomic Features of Respondents**

Variables	Frequency	Percentage	Mean/Mode
Gender			
Male	96	53.3	Male
Female	84	46.7	
Age			
≤ 30	2	1.1	
31 – 40	80	44.4	36 years
41 - 50	52	28.9	
50 – 60	41	22.8	
> 60	5	2.8	
Marital Status			
Single	7	3.8	
Married	156	86.7	Married
Widowed	12	6.7	
Divorced	5	2.8	
Education Attainment			
No formal education	4	2.2	
Primary	53	29.4	
Secondary	106	58.9	Secondary
Tertiary	17	9.4	
Farming Experience			
1 – 6	8	4.4	
7 – 12	50	27.8	
13 – 18	100	55.6	16 years
≥ 19	22	12.2	
Membership of Association			
Yes	129	71.7	Yes
No	51	28.3	
Farm Size			
0.1 – 1.0	19	10.6	
1.1 – 2.0	79	43.9	1.90 hectares
2.1 – 3.0	73	40.5	
≥ 3.1	9	5.0	

Land Procurement Method

Table 2, presented in a multiple-response format, illustrates the land acquisition methods employed by the respondents. The result reveals that approximately 75% of farmers secured their land through leasing, while 30.0% opted for outright purchasing. Moreover, 70% of respondents, or 58% of them, said they either received their farmlands through community land tenancy or inherited them from earlier generations. This suggests that most farmers obtained land for farming primarily through leasing, aligning with Gbigbi (2018) highlights that renting is the predominant method of land procurement. The generally protected land tenancy in the State is evident from the minimal number of farmers who have outright purchased their land.



This is consistent with Ebe et al.'s (2018) findings, which revealed that a significant proportion of rural residents in Abia State lack clear property titles. Such insecurity in landholding could have limited farmers' ability to make long-term investments in their land, thus affecting crop productivity.

Table 2: Mode of Land Procurement

Mode	Frequency	Percentage
Purchase	54	30.0
Lease	135	75.0
Inheritance	104	57.8
Communal	126	70.0
Gift	89	49.4

**Multiple Responses*

De jure or De facto Land ownership security

As previously mentioned, the term "land ownership security" denotes to the percentage of adults who possess legally recognized documents proving their secure tenure rights to land and who feel confident in the land rights security, categorized by gender and type of tenure. De jure and de facto indicators are the two most commonly used criteria for evaluating tenure security (Lahoti, 2022). The de jure indicator, as defined, is the proportion of adult residents who possess valid identification compared to the total population. In this context, the de jure indicator includes individuals who have outright purchased their farmland and possess the necessary recognized paperwork. Only 54 respondents participated in this scenario because they had purchased their land outright. Thus the measurement becomes:

$$\begin{aligned}
 & \textit{de jure indicator} \\
 &= \frac{\textit{people (adult)with legally recognized documentation over land}}{\textit{total population}} \\
 & \quad * \frac{100}{1} \\
 &= \frac{54}{508} * \frac{100}{1} \\
 &= 10.6\%
 \end{aligned}$$

Conversely, the de facto indicator is measured as the percentage ratio of People (Adults) who perceive their rights as secure to the population.

Hence,

$$\begin{aligned}
 \textit{de facto indicator} &= \frac{\textit{people (adult)who perceive their rights as secure}}{\textit{total population}} * \frac{100}{1} \\
 &= \frac{\textit{inheritance+communal}}{\textit{total population}} * \frac{100}{1} \\
 &= \frac{104+126}{508} * \frac{100}{1} = 45.3\%
 \end{aligned}$$



This finding suggested that 45.3% of participants saw their ownership entitlements as a means of protection. When added to the 10.6% of farmers in the region who have de-jure tenure security, it shows that 55.9% of them have protected landholding overall. Additionally, 44.1% of smallholder farmers do not have land ownership security, according to the findings. The de-jure indicator, which stands at 10.6%, indicates that a relatively small percentage of the population has legally recognized documents for their ownership entitlements. The fact that a large number of farmers might not have the resources to buy land could be the reason for this.

Land Ownership Security on Output

The influence of tenure security on small-holder crop producers' output is presented in Table 3. The double-log equation was selected as the lead equation because it had the best fit. The selection of the double-log equation as the lead equation underscores its robust fit to the data, with a high R² value of 0.9257. This infers that the model, incorporating various independent factors, effectively explains 92.6% of the total variability observed in crop output among small-holder producers. The remaining 7.4% unexplained variability likely stems from additional factors not accounted for in the model. Importantly, the statistical significance of the F-ratio at the 1% level reinforces the overall relevance and validity of the regression model in elucidating the association between tenure security and crop production. This statistical significance lends credibility to the subsequent analysis of individual variables and their influence on output.

Among the factors examined, including land ownership security, farming experience, crop diversification, access to financing, income, and farmer age, several emerge as particularly noteworthy due to their significant impact on output. Land ownership security, for instance, demonstrates a strong positive association with crop production, indicating that tenure security rights incentivize investment and cultivation efforts among farmers. Farmers tend to establish long-term plans for increasing production, invest in their land, and use sustainable agricultural methods when their tenure rights are protected.

Efforts to strengthen land ownership stability can significantly boost agricultural potential and output. This involves overhauling landholding frameworks, establishing programs to ensure protected land rights, and introducing legislation to safeguard those rights.

In a similar vein, the benefits of having a lot of farming experience highlight how acquired knowledge and abilities may greatly increase agricultural potential. Farm performance and crop yields are enhanced by experienced farmers because they are better able to control risks, make well-informed decisions, and adjust to changing circumstances. By encouraging skill development and efficient practices within the industry, investments in training programs, capacity-building projects, and knowledge-sharing activities can further boost agricultural potential and sustainability.

Crop variety and agricultural potential are positively correlated, according to many studies. Farmers can enhance their total revenue and lessen their susceptibility to market swings and environmental changes by diversifying their crop production. To increase the resilience and sustainability of smallholder agriculture, policies and programs that support crop diversity must be put in place.

The results also emphasize how crucial financial variables are in determining crop productivity, such as income levels and loan availability. Financial availability is shown to be a crucial factor, with notable benefits noted at the 1% level. This suggests that when farmers have wider



access to financial facilities, they can invest in resources like technology, inputs, and other things that boost output and productivity. Improving financial inclusion and giving smallholder farmers access to financing can have significant positive effects on agricultural potential as well as the reduction of poverty.

Moreover, the fact that income and crop productivity are positively correlated emphasizes how important economic empowerment is for promoting initiatives to expand and intensify agriculture. Enhanced income levels facilitate the expansion of land ownership for farmers., implement cutting-edge technologies, and reduce risks, all of which help to enhance agricultural yields. Enhancing smallholder farmers' Financial stability can significantly enhance agricultural potential and food availability.

Conversely, farmer age exhibits negative coefficients, indicating a dampening effect on crop output. The negative impact of age may reflect challenges associated with technology adoption and adaptation among older farmers, potentially hindering efficiency and productivity gains. Enhancing technology utilization and adaptability among older farmers could be a crucial step in boosting agricultural output. Policies and initiatives that support older farmers in integrating new techniques and technologies can significantly improve farm productivity and sustainability.

Similarly, larger households can strain available resources and limit opportunities for agricultural innovation and investment, potentially leading to reduced crop yields. By promoting family planning and encouraging smaller household sizes, agricultural output can be significantly enhanced. Implementing policies and programs that support family planning and favor smaller households can drive improvements in agricultural production and sustainability.

Table 3: Contributory Factors of Farmers' Output

Variables	Linear	Semi-log	Double log	Exponential
Constant	0.5856 (2.2706)**	-0.3691 (-0.1286)	-0.7175 (-3.1658)***	0.3569 (0.3622)
Age	-0.4126 (-0.5684)	0.4287 (5.2358)***	-0.7120 (-5.2714)***	0.1233 (0.4896)
Gender	0.5468 (2.6856)**	0.1425 (0.1025)	-0.1785 (-1.1717)	0.4855 (0.1203)
Farm size	0.2268 (0.2911)	0.1588 (0.1624)	0.5368 (2.589)**	0.4165 (0.1453)
Family size	0.3698 (1.1357)	0.1458 (0.1244)	-0.8965 (-4.7259)***	2.3427 (0.4756)
Educational level	-0.7862 (-2.8547)**	2.9471 (0.3658)	0.4825 (1.2036)	-2.4751 (-3.9132)***
Experience	-0.8896 (-2.0843)**	-3.3316 (-3.1726)***	0.3269 (5.7789)***	0.6676 (0.9800)
Diversification of crop	-0.2036 (-1.1336)	1.4165 (0.7858)	0.4758 (2.6256)**	-5.8063 (-1.9819)
Access to credit	0.6896 (1.8219)	2.2727 (-0.882)	0.6985 (3.754)***	1.0860 (0.62630)



Income level	0.1369	3.4461	0.8255	-0.7504
	(0.9396)	(0.6719)	(3.4268)***	(-0.7856)
Land security level	0.6785	1.2539	0.1578	0.4521
	(1.0029)	(1.6895)	(2.872)***	(4.1452)***
R²	0.6983	0.7689	0.9257	0.8440
Adjusted R²	0.639	0.7268	0.8951	0.8128
F-ratio	56.524***	34.526***	41.245***	22.401***

***=significant at 1%; ** = significant at 5%; t-value are in Parenthesis

Land Ownership Security and Farm Investment

This study employed multiple regression analysis to investigate secured land tenancy effects on the investment decisions of farmers. Table 4 presents the outcomes, with the exponential function selected as the lead equation for further data analysis due to its high coefficient of multiple determination ($R^2 = 0.7321$). As such, the model can accurately predict farmers' investment in secured land tenancy with an accuracy of 73%. However, the adjusted R^2 value of 0.7097 shows that the explanatory variables can explain only 71% of the variability in farm investments. The study identified seven of the nine exogenous variables as statistically significant in predicting farmers' investment. Specifically, years of experience, farm size, and land ownership security status were found to significantly influence investment at the 1% level. In contrast, access to credit, income level, level of education, and extension services significantly impacted investment at the 5% level.

Years of Experience: More seasoned farmers are more likely to make secured land investments. This is because experience gives farmers a more profound comprehension of the advantages and dangers related to guaranteed property tenure. Farmers eventually obtain important insights into how stable landholding can support long-term farm productivity and profitability by learning from their achievements and failures. In addition, seasoned farmers are better able to handle the intricacies of landholding systems, including figuring out legal frameworks, negotiating leases, and settling land disputes. Because they understand that establishing landholding can offer stability and security for their farming operations, they feel more comfortable making investment decisions that include doing so.

Farm Size: Larger farms generate higher surpluses that can be reinvested to enhance farm productivity. since economies of scale allow larger farms to spread fixed costs over a larger production base, reducing the average cost per unit of output. As a result, larger farms have more financial resources available for investment in various aspects of their farming operations, including securing land tenure. For farmers with larger farms, securing landholding be a strategic investment to protect their long-term interests and ensure the sustainability of their farming operations. It can also provide them with a competitive advantage in accessing credit and attracting investment, as tenure security is often seen as a sign of stability and commitment to farming. This lends credence to Azadi and Vanhaute's (2019) research on land ownership security and farm investments among small-scale commercial farmers in Zimbabwe, which concluded that a larger farm would likely produce a higher sold surplus that could be used to increase farm productivity.

Land Ownership Security Status: The results show that smallholder farmers' investment



decisions are positively impacted by guaranteed land tenancy. Farmers are more willing to make investments in their land if they own it securely. This is because having solid land ownership gives farmers a feeling of control and ownership over their property, which in turn gives them the confidence to engage in long-term projects that will increase the land's worth and productivity. In addition to lowering the possibility of land expropriation or eviction, secure land ownership gives farmers stability and security for their farming activities. Therefore, farmers who own their property securely are more likely to make investments in practices like soil conservation, irrigation, and agroforestry that improve the land's sustainability and long-term productivity. This may result in higher agricultural output. This could lead to increased farm productivity and profitability, benefiting both the farmers and the wider community.

Access to Credit: Farmers that have easier access to loans are more inclined to purchase secured land. This is so that farmers have the financial means to invest in their farming activities, including securing land tenure, thanks to credit availability. A substantial upfront financial commitment, such as paying for land leases or buying land titles, can be necessary for smallholder farmers to tenure security. By having access to financing, farmers may get past these financial obstacles and undertake the investments required to guarantee their land tenure. Additionally, it can give farmers the freedom to spend money on other facets of their farms, including buying inputs, enhancing infrastructure, or raising output levels. Therefore, being able to obtain finance can be extremely important for smallholder farmers in order to protect their landholding and increase the long-term viability of their farming operations.

Income Level: Higher income levels are associated with increased investment in secured land. This is because higher income levels provide farmers with more financial resources to invest in their farming operations, including securing land tenure. For smallholder farmers, securing landholding can be a significant investment that requires upfront capital, such as paying for land leases or purchasing land titles. Higher income levels can help farmers overcome these financial barriers and make the necessary investments to secure their land tenure. It can also provide farmers with the flexibility to invest in other aspects of their farming operations, such as purchasing inputs, improving infrastructure, or expanding their production capacity. Therefore, increased income levels may be very important in helping smallholder farmers protect their landholding and enhance the long-term viability of their farming enterprises.

Level of Education: Farmers with higher levels of education are more inclined to make medium or long-term investments in tenure-secured land. This is because education provides farmers with the knowledge and skills needed to understand the benefits and risks associated with guaranteed property tenure. Farmers with higher levels of education are better equipped to navigate the complexities of landholding systems, such as understanding legal frameworks, negotiating land leases, and resolving land disputes. As a result, they are more confident in making investment decisions that involve securing land tenure, knowing that it can provide stability and security for their farming operations. Higher levels of education can also provide farmers with access to information and resources that can help them make informed decisions about their farming operations, such as adopting new technologies, improving production practices, or accessing markets. Therefore, having more education can be extremely important for helping smallholder farmers protect their landholding and increase the long-term viability of their farming enterprises.



Extension Services: Access to extension services significantly impacts investment in secured land. This is because extension services provide farmers with the support and guidance needed to make informed decisions about their farming operations, including securing land tenure. Extension services can provide farmers with information and resources on landholding systems, legal frameworks, and best practices for securing land tenure. They can also provide farmers with technical assistance and training on how to navigate the complexities of landholding systems, such as negotiating land leases, resolving land disputes, or accessing legal services. Extension services, therefore, can be extremely important in helping smallholder farmers protect their landholding and increase the long-term viability of their farming enterprises.

Household Size: A negative and significant household size suggests that the family's capacity to save and invest is reduced as there are more individuals to feed and consume. This is because larger household sizes require more resources, such as food, shelter, and clothing, to meet their basic needs. As such, larger household sizes may limit the financial resources available for agricultural investment, including securing land tenure. Due to their possible lack of funding for initiatives that raise the productivity and worth of their land, farmers may not be able to sustain their farming operations over the long run. Since lenders may see higher household numbers as a risk factor for loan repayment, it can also impact farmers' access to credit and other financial services. Smallholder farmers' ability to secure their landholding and make investment decisions is therefore significantly influenced by their household size.

Table 4: Contributory Factors of Farmers' Investment

Variables	Linear	Double log	Exponential	Semi-log
Constant	0.4874 (4.2488)***	0.1425 (3.6257)***	0.397 (3.4204)***	0.5458 (2.2562)**
Age of farmer	0.0215 (0.5418)	0.6833 (0.2147)	0.0315 (1.5235)	0.1245 (0.3522)
Gender	0.3189 (3.8926)***	0.6581 (3.1783)***	0.4846 (1.2247)	0.4788 (0.8743)
Access to credit	0.1485 (0.2462)	0.4128 (1.4858)	0.3597 (2.833)**	0.2328 (-1.7127)
Income level	0.1543 (0.2266)	0.9559 (2.4086)**	0.1522 (2.562)**	1.5558 (1.9135)
Educational level	0.2211 (0.1452)	1.1588 (0.8574)	0.5182 (2.4256)**	0.9112 (3.1568)***
Experience	0.1614 (0.5185)	2.1809 (0.9234)	0.328 (4.1257)***	1.3931 (3.6508)***
farm size	3.2687 (0.4462)	0.8793 (2.5217)**	1.840 (7.0002)***	0.1466 (2.5954)**
Land security level	0.4518 (0.4126)	0.2455 (0.4125)	0.858 (7.1250)***	-0.4852 (-0.2368)
Access to Extension Service	0.8628 (0.2754)	0.3528 (0.1286)	2.4456 (2.3415)**	0.4589 (1.1258)
R²	0.4024	0.4751	0.7321	0.4469
Adjusted R²	0.3720	0.4503	0.7097	0.4247
F-ratio	4.6530***	3.3521***	10.8546***	2.5238**

*** = significant at 1%; ** = significant at 5%. *t-values are in Parenthesis*



CONCLUSION

This study investigated how the lives of small-scale farmers in Delta State are critically dependent on the stability of land tenure. The results provide important new information about the link between producers' land holdings, decisions about investing, and productive agriculture and stable land ownership. Land ownership is inherently fragile, as seen by the study's finding that just 55.9% of the region's smallholder farmers have secure tenure. Due to its detrimental effects on farmers' capacity to make long-term investments and general productivity, in tenure security has a major impact on Delta State's profitable agricultural development. De jure and de facto land ownership security ratios differ, which highlights the area's complicated landholding system and the necessity for all-encompassing policies that take real-world issues into account. The 55.9% percentage should encourage legislators, specialists in agriculture, and local government to work together to develop strong landholding laws that put farmers' security first. In addition to defending farmers' rights, strengthening guaranteed property tenure increases the agricultural industry's resilience and sustainability. It is suggested that the Land Use Act of 1978 be modified to solve these concerns. These changes ought to concentrate on making landholding procedures more straightforward, making sure that land policies are carried out efficiently, and helping smallholder farmers protect their land rights. Delta State can assist farmers and the larger society by doing this by fostering a more stable and productive agricultural environment.

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