

EFFECT OF TENURE SECURITY AND OTHER SOCIO-DEMOGRAPHIC FACTORS ON PRODUCTIVITY OF TOMATO PRODUCTION IN UYO AGRICULTURAL ZONE, AKWA IBOM STATE, NIGERIA

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Abstract

This study examined the effect of tenure security and other socio-demographic factors on the productivity of tomato farmers in Uyo Agricultural Zone of Akwa Ibom State, Nigeria. Primary data was collected from 120 tomato farmers who were purposively selected using a multi-stage sampling procedure and administered with structured questionnaire. Descriptive statistics and multiple regression analysis were used as tools for data analysis. Findings revealed that tomato production was dominated by women (79.1%) who were mostly married (78.36%). The mean age, educational attainment, farming experience, household size, and income were 45 years, 13 years, 13 years, 6 persons and N31,500.00, respectively. Result of the multiple regression analysis further shows that productivity of tomato production was significantly influenced by farming experience, farm size, credit access and tenure security status of farmers. The study concludes that tenure security and other demographic factors of tomato farmers significantly influenced tomato productivity in the study area. Hence, policies aimed at strengthening land tenure systems, improving access to agricultural land, and promoting sustainable land-use practices among tomato farmers should be pursued.

Keywords: *Tenure security, productivity, tomato farmers, Akwa Ibom State, Nigeria.*

Introduction

Agriculture remains one of the most important sectors of the Nigerian economy, contributing significantly to employment generation, food security, and rural livelihoods. Within the agricultural sector, vegetable production plays a critical role in enhancing nutrition and income generation. Tomato (*Solanum lycopersicum*) is among the most widely cultivated vegetable crops in Nigeria due to its nutritional, medicinal, and economic importance. According to Kehinde et al., (2026), Nigeria remains one of Africa's largest producers of tomatoes, with thousands of smallholder farmers depending on tomato cultivation as a major source of livelihood. Tomato farming requires substantial investment in land preparation, irrigation facilities, improved seeds, fertilizers, pesticides, and post-harvest handling technologies, making secure access to land particularly important for production efficiency and profitability (Kehinde et al., 2026).

Despite its importance, tomato production in Nigeria faces numerous constraints, including inadequate access to productive land, insecure land tenure arrangements, poor soil fertility, and unsustainable land-use practices. Land constitutes the primary resource for agricultural production, and the nature of farmers' rights over land significantly influences productivity,(Effiong , Udoyen, and Udoh, 2021). Farmers who possess secure rights to land are more likely to invest in long-term productivity-enhancing measures such as irrigation facilities, soil conservation practices, and improved crop management technologies. However, many tomato farmers operate on rented, borrowed, inherited, or communal lands, exposing them to varying degrees of tenure insecurity that may affect production decisions and investment behavior (Kehinde et al., 2023).

In many parts of Akwa Ibom State, as observed in Udousung, Udoumoh and Effiong, (2018), agricultural land is predominantly held under customary tenure arrangements. Such arrangements often create uncertainties regarding ownership rights, inheritance, transferability, and long-term access to land. These uncertainties may discourage investments capable of improving agricultural productivity. Furthermore, land-use practices such as farm size, cropping systems, land fragmentation, and soil fertility management influence the productive capacity of agricultural land. Although studies have investigated agricultural productivity and land tenure systems in Nigeria, empirical evidence on the combined effects of tenure security and land-use characteristics on tomato productivity in the Uyo Agricultural Zone remains limited. This study therefore seeks to fill this gap by examining the effect of tenure security and other socio-economic characteristics on the productivity of tomato farmers in Uyo Agricultural Zone, Akwa Ibom State, Nigeria.

Theoretical Framework

Theoretical framework is the foundational structure of a study. It highlights the existing, tested theories that explain why a research problem exists. It also serves as a road map, guides the research questions, methodologies and data analysis by routing your study in established academic knowledge. Having established this basis, this study is anchored on Property Rights Theory developed by Coase (1960) and further expanded by Demsetz (1967). The theory argues that clearly defined and enforceable property rights create incentives for efficient resource utilization and investment. The theory, according to Udoka, Umoh, and Etuk, (2020), suggests that farmers with secure land rights are more likely to invest in land improvements adopt improved technologies, access formal credit, implement sustainable land management practices.

Consequently, tenure security is expected to positively influence agricultural productivity. Property rights are institutions (formal or informal) that define or provide a scope of privileges granted to individuals for certain resources or assets such as land (Joseph 2022). These rights include rights to use, obtain income from and exclude others from using the assets such as land. In a wider view, property rights can be described as

“bundle of rights” including the right to access and withdrawal, exclusion, management and alienation rights (Mbudzya, Gido and Owuor 2023). Formal property rights are legal and are allocated or recognized or supported by government authorities and enforced by the laws of the country. The rights are categorized into 4, namely, private, common, state and open access property rights. Private rights assign individual rights to physical objects and are viewed to be absolute and relative since it ensures transferability of rights to better use of the asset by others (Furubotnand Richter, 2018).

The classical theory of property rights argues that sustainable management of natural resources is only possible with individual property rights since it ensures tenure security (Chigbu et al., 2019). George (2022) and Joseph (2022) note that individual property rights are rational when making decisions relating to the private ownership system. Thus, land tenure security, which provides individual rights over the land, grants the owner the rights to use, transfer, mortgage and exclude other people from using the land. The theory of property rights holds that security of land tenure is the foundation of economic growth (Chigbu et al., 2019). Property right can be conceived as those social institution or settings which define limit or range of rights and privileges assign to individuals on specific resources such as water, piece of land etc. In terms of private ownership of resource, these rights may include right to debar non owners from access, right to appropriate, right to sell or transfer the resources in question to others. Institution in property right ranges from formal arrangements, which cut across constitutional provisions, status and judicial rulings to informed convention and custom which guide and directs the allocation and use of such properties.

The relevance of property rights theory to the study is supported by previous studies that have highlighted the importance of defined property rights in stimulating investment and improving productivity (Besley and Burgess, 2004). The theory also aligns with the findings of Olukoye et al. (2020), who highlighted the absence of defined property rights as a major challenge to tenure security among tomato farmers in Nigeria.

Empirical Review

Previous studies have consistently demonstrated the importance of land tenure security in agricultural productivity. Ali, Deininger, and Goldstein (2014) found that secure land rights significantly increased investment in soil conservation and agricultural productivity in Rwanda. Iheke (2024) reported that majority of arable crop farmers operating on owned land in southeastern Nigeria achieved higher technical efficiency than tenant farmers. Similarly, Igbokwe and Ogunniyi (2017), and found that secure land ownership positively influenced crop productivity among smallholder farmers.

Studies on land-use characteristics have also highlighted the importance of farm size, land management practices, and cropping systems. Mbudzya; Gido and Owuor (2023) observed that larger farm sizes positively affected agricultural output, while land fragmentation reduced productivity. According to Mbudzya et al (2023) , found that farm size, farming experience, and access to productive resources significantly

influenced tomato productivity among smallholder . A study byLwitiko, Ndakidemi and Mbega (2018), on household characteristics and tomato production among smallholder farmers in Nigeria revealed that education, household size, and income had a significant positive effect on tomato production among smallholder farmers. The study found that education had the strongest positive effect on productivity, as educated farmers were more likely to adopt improved technologies and practices.

Moreover, Lwitiko,Ndakidemi and Mbega (2018) asserted that household size and income significantly influenced productivity of tomato farmers in Nigeria, with larger households and higher incomes correlating with higher yields. Edeh, Mavrotas, Balana (2022), conducted a study on Effect of land tenure security on agricultural productivity in Nigeria. The study revealed that farmers with secure tenure had greater access to credit, which allowed them to invest more in their farms and ultimately increase their productivity.

The above studies show that, most of them were done outside Uyo Agricultural Zone of Akwa Ibom State. This study is expected to contribute to the literature by examining the combined effects of tenure security and land-use characteristics on tomato productivity in the Uyo Agricultural Zone.

Research methodology

Study Area

The study was conducted in Uyo agricultural zone, Akwa Ibom State, Nigeria. The zone comprises Uyo, Itu, Ibiono Ibom, Nsit Atai, Nsit Ibom, NsitUbium, IbesikpoAsutan, and Uruan Local Government Areas. The zone which lies between latitude 4⁰58' and 5005' N and longitudes 7⁰54' and 8⁰0.0' E which comprises of seven local government area namely; Itu, Ibiono Ibom, Uyo, NsitAtai, Nsit Ibom, NsitUbium and Uruan respectively.

It is classified under the humid tropical rainforest zone, and has a very rich potential for agricultures and is suitable for food and tree crops, fish and livestock farming. There are two distinct seasons characterized five months (November – March) of dry season. Mean annual rainfall in the zone is 3500mm while temperature ranges from 29⁰c to 33⁰c.

The people are mainly farmers and traders. Major crop grown include cassava, Yam, oil palm, citrus, rubbers, Kola nut and vegetables such as fluted pumpkin, tomatoes etc. in addition rural households keep few goats, sheep, local chicken and pays. The total population of this zone is 5.41 million (NBS, 2016).

Sources and method of data collection

Primary data used for the study was collected using questionnaires. The questionnaires were administered to 120 (one hundred and twenty) tomato farmers in the study area.

Sampling procedures and Sample Size

A multi-stage sampling procedure was adopted to randomly select one hundred and twenty (120) tomato farmers for the study. In the first stage 5 extension blocks were purposively selected (in order to capture areas of intense tomato production) from the existing eight blocks in Uyo Agricultural Zone. In the second stage, 4 extension circles were purposively selected from each of the selected blocks considering where to tomato were extensively cultivated in order to select only tomato farmers, and in the last stage 6 tomato farmers were randomly selected from each of the chosen extension cells giving a total of one hundred and twenty (120) tomato farmers that was used for the study.

Method of Data analysis

In addition to descriptive statistics, the effect of tenure security and other socioeconomic characteristics of farmers on tomato productivity was estimated using the multiple regression analysis. The implicit form of the linear regression model that was estimated is shown as follows:

$$Y = b_0 + b_1 X_1 + b_2 X_2 + \dots + b_n X_n + U \quad (1)$$

Where Y = Productivity of tomato farmers measured as ratio of total value of tomato to total value of inputs used for tomato production

$X_1 - X_n$ are the explanatory variables, $b_1 - b_n$ are the estimated coefficients and U is the stochastic error term

X_1 = Education (years)

X_2 = Household size (Number of persons)

X_3 = Farming experience (years)

X_4 = Labour (mandays)

X_5 = Fam size (Hectare)

X_6 = Credit access (yes =1, otherwise 0)

X_7 = Total household income (naira)

X_8 = Planting material (kg)

X_9 = Tenure security status (Secured 1, non-secured 0)

Results and Discussion

Socioeconomic characteristics of tomato farmers

Table 1, shows that majority (79.1%) of respondents were females while the remaining (20.9%) were males. This probably reflects that females are more involved in tomato production in the study area than male. This result is in agreement with the findings of Patrick et al., (2019), and Bassey et al., (2015) who reported the dominance of female farmers in vegetable production in the study area. Table 1, further revealed that majority (88.18%) of the respondents was above 41 years. A breakdown of their ages shows that 11.82% were less than 30 years, 27.82% represented the age bracket of 31-40 years while 31.82%, 21.82% and 7.27% of respondents were within the age bracket of 41-50, 51-60 and above 60 years respectively. The mean age of respondents was 45.1 years. This depicts that tomato farmers in the study area were relatively young and active to engage in farm production.

This finding corresponded to the study of Ipingbemi and Adeoye (2019); Udoka, Nkeme

and Sunday (2018); Patrick et al., (2019), who discovered that an average age of tomato farmers was 46 years in their studies. This study is also in line with Udoka et al. (2018) who opine that people who are young are more prone to risk taking than the old people hence, tends to be productive in agricultural sector. In terms of marital status, majority (76.36%) of tomato farmers were married while 23.64% were single. Since marriage is sometimes associated with child bearing, findings may imply that there will be higher household size in the study area that can be used for tomato production. Patrick et al., (2019) explained that marriage is an institution that confers responsibilities on individuals to take care of their families and participate in other communities' activities. This result also lends credence to the findings of Patrick et al., (2023) and Lwitiko et al. (2018) who observed that most couple was involved in tomato farming in order to provide for their family.

Educationally, tomato farmers were quite educated (94.5%) with a mean of 13 years of educational attainment indicating that an average had at least secondary education. Further breakdown of this figure shows that about 46.3% attended tertiary institution, 30.9% attended secondary school and 17.3% attended primary school. Education is very important for effective and efficient management activities. Higher educational status of farmers accelerates information dissemination, learning and skill acquisition to develop, maintain and sustain technology. The finding conforms to the position of Patrick et al., (2019) and Bassey et al., (2015) who also reported a higher level of educational attainment in the study area. Regarding experience in tomato farming, result shows that majority (59.1%) of respondents had 6 – 10 years' experience, 27.3% had less than 5 years' experience while 13.6% had had more than 11 years. The mean years of farming experience was 11 years. This shows that tomato farmers have put appreciable years into farming activities which can translate to better management of their farms. This study is in conformity with the study of Bassey et al. (2015) and Patrick et al., (2019) who reported an average experience of 12 years among pumpkin producers in the study area. This finding also agrees with that of Patrick et al., (2023) that years of farming experience play a vital role in any farming enterprise that when farmers spend more years in farming they tends to reduced risk associated with farming.

The household size of respondents ranged from 1 to 11 with a mean of 6 persons. Majority (52.7%) of the respondents had a household size of 1-4 persons, about 40.9% had household size of 5-8 persons while only 6.4% of the sampled households had household size above 8 persons. The higher household size could have an impact on tomato production. For instance, where the majority of household members comprise working adults, the probability of involving in tomato production could be high. Similarly, if the majority of the household members are dependents on the household head, the probability of production will be less because money that would have been used for production will be channeled to family consumption. The study is in line with that of Bassey *et al.* (2015) who reported a higher household size of 1-4 persons in his study on Fluted pumpkin.

Considering the income status of tomato farmers, Table1 reveals that about 18.2% of the respondents were within the income category of less than or equal to N30,000, 46.4% were within the income category of N30,001 - N50,000, while 19.1% of them fell within the income category of N50,001 and N100,000. Only 11.8% of the respondents were within the income category of above N 100,000. This implies that majority of tomato farmers in the study area were peasants whose level of production was still at subsistence level. This finding is in accordance with Patrick, et al., (2021). Regarding method of land acquisition, majority (46.4%) of respondents acquired their land through rent/lease, 22.7% of respondents owned their land while 19.1% and 11.8% of respondent acquired their land through communal and family inheritance respectively. This finding is in conformity with the study of Ebe et al (2018) who reported that 46% of respondents acquired their land through lease, while others acquired theirs through outright purchase.

Table 1: Socio-economic characteristics of tomato farmers

Socio-Economic Characteristics of Tomato marketers	Frequency	Percentages	
Gender			
Female	87	79.1	
Male	23	20.9	
Total	110	100	
Age			
≤30	13	11.82	
31-40	30	27.27	
41-50	35	31.82	Mean = 45.1
51-60	24	21.82	
Above 60	8	7.27	
Total	110	100	
Marital Status			
Single	26	23.64	
Married	84	76.36	
Total	110	100	
Educational Status			
No formal	6	5.5	
Primary	19	17.3	
Secondary	34	30.9	Mean = 13
Tertiary	51	46.3	
Total	110	100	
Years Experience			
≤ 5	30	27.3	
6 – 10	65	59.1	mean = 13
> 11	15	13.6	
Total	110	100	
Household Size			
≤4	58	52.7	
5-8	45	40.9	Mean = 5.9

Above 8	7	6.4	
Total	110	100	
Land Acquisition			
Owned	25	22.7	
Rent/Leased	51	46.4	
Communal	21	19.1	
Family	13	11.8	
Total	110	100	
Income			
≤30,000	20	18.2	
30,001-50,000	35	31.8	
50,001-100,000	40	36.4	Mean = 31,500
Above 100,000	15	13.6	
Total	110	100	

Source: Field survey, 2025

The effect of tenure security and other socio-economic characteristics on productivity of tomato farmers in the study area

Table 2 presents the results of the linear form of the multiple regression estimates that was used to estimate the effect of tenure security on productivity of tomato production in the study area. Result revealed a R^2 value of 0.736 indicating that about 73.6% of the variability in tomato productivity was explained by tenure security status and other variables included in the model. The constant term and the F statistic were significant denoting the goodness of fit and the overall significance of the estimated model.

Farming experience was significant at 5% probability level and positively influences the productivity of tomato production. The positive coefficient suggests a positive sign indicated that productivity of tomato will increase with increasing farming experience of tomato farmers. This is justified because experienced tomato farmers may have acquired in-depth practical knowledge and have also learned through several years of trial and error. Hence, they can leverage in their experience to boost their productivity.

The estimated coefficient of credit access was significant at 5% probability level and negatively influences the productivity of tomato in the study area. The negative coefficient suggests that increasing access to credit by tomato farmers in the study area will decrease the productivity of tomato in the study area. This result is surprising because access to credit was expected to increase the productivity of tomato production. However, finding might be a reflection of the poor access to formal credit by farm households in the study area as reported by empirical studies by Bassey, Offor, Ntekim and Akpan, (2025) and Bassey, Ajah and Nkeme, (2022).

Farm size of farmers was significant at 5% probability level and positively influences the productivity of tomato farmers. The positive coefficient suggests a positive influence on tomato productivity in the study area. The plausible justification for this is that there are

higher chances for tomato farmers with larger farm sizes to enjoy economic of scale acquired through bulk purchase of inputs. Beyond this, they can pledge some part of their farm land as collateral for formal loans which they can in turn leverage on to expand their scope of production.

The estimated coefficient for tenure security was positive and significantly influenced tomato productivity at 5% probability level. This is justified in that tomato farmers with secured legal title to land will more likely invest in long-term productivity enhancing technologies than those with unsecured status. This finding support those of Tsue et al., (2019 😊 and Iheke et al (2019) who reported that farmers who possess stronger tenure rights are more likely to undertake capital-intensive agricultural investments and adopt improved production technologies than those operating under temporary or uncertain land arrangements

Table 2: Multiple regression estimates for the effect of tenure security and other socioeconomic characteristics of farmers on productivity of tomato production

Variables	Coefficient	Standard Error	Z	P> z
Constant	4120921	.5388551	-0.68	0.4
Education attainment	.9799839	.0541169	-0.37	0.714
Household size	1.139198	1162668	1.28	0.202
Farming experience	.4466653	.148655	2.42**	0.015
Labour	1.270252	.824551	0.37	0.712
Farm size	42.31092	39.12904	4.05***	0.000
Credit access	.1765348	1163561	-2.63**	0.009
Total household income	1.493764	8615486	0.70	0.487
Planting material	1.043496	.6893491	0.06	0.949
Tenure security status	0.048132	0.023012	2.09**	0.031
R ²	0.736			
Adjusted R ²	0.604			
F statistic	21.75			

Note: ***, ** and * indicate Significant at 1%, 5% and 10% levels, respectively

Source: Field survey 2025

Conclusion

The study evaluated the effect of tenure Security and other land use and socio-economic characteristics on Productivity of tomato production in UyoAgricultural zone, Akwa Ibom State, Nigeria. Findings have shown that tenure security and othersocio-demographic factorsof tomato farmerssignificantly influenced tomato productivity in the study area.Hence, it is concluded that productivity of tomato production in the study area can be enhanced by securing appropriate legal tittles to land.

Recommendations

The following policy recommendations are offered by the research:

- (i) Adequate and viable land use reform policy should be formulated by the government that will facilitate effective, efficient and timely land access and title registration.
- (ii) Moreover, the Government should strengthen land administration systems to enhanced tenure security, while farmers should be encouraged to obtain documented land rights.
- (iii) Agricultural extension services should promote sustainable land-use practices and access to agricultural credit should be improved through land-backed financing mechanisms.
- (iv) Finally, consolidation programs should be encouraged to reduce fragmentation, while tomato farmers should be supported through the provision of basic production inputs and improved production technologies.

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