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DO FARMERS DERIVE INCOME FROM YAM PRODUCTION? EMPIRICAL EVIDENCE FROM IMO STATE, NIGERIA

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ABSTRACT: *Yam is one of the most critical crops in Nigeria, mainly in Imo State, and contributes significantly to employment, income generation, and food security. However, despite Nigeria being the largest producer of yam globally with 43.1 million tones, the extent to which farmers derive income from yam production remains a subject of debate. It was against this backdrop that the study analyzed. The study was conducted from January, 2024 through April, 2025 with sample size comprising of seventy (70) yam farmers selected for critical yam-producing communities in Imo State. Structured questionnaire was the main tool for data collection. The data collected were analyzed using descriptive statistical tools, gross income analysis, and multiple regression analysis. Results show that the mean age was 44.00 years. Greater proportions (78.00%) were male. The majority (66.00%) were married, with an average household size of 7 persons. Average farm size and annual farm income were 1.38 hectares (29.71 plots of farmland) and ₦405,000.00 ($281.61) respectively. Reasonable proportions (75.71%) were members of cooperative societies. The result shows that 2,000 tonnes of yam were produced from 1.30 ha (28 plots of farmland). Positive net farm return and return per capita invested were ₦231,819.33 and ₦5.21, respectively. The estimated regression result showed that the F-ratio (41.812), which determines the overall significance of the regressor, was highly significant at the 1% level of probability. Finding further shows that farmers are deriving reasonable income from yam production in the area. However, yam farmers identified inadequate production capital (100.0%) among others as the constraints that negatively affect their productivity and net farm return in the study area. It was recommended that yam farmers, particularly on their own, should judiciously put resources together through a strengthened cooperative society group, as this would increase their access to capital to enhance their output and net return in the area.*

KEYWORDS: Yam; Income; Constraints, Gross Income Analysis and Multiple Regression Analysis, Imo State, Nigeria.

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INTRODUCTION

Yam (*Disocorea spp*) is one of the major staple crops in Sub Saharan Africa (SSA) and mainly in Nigeria where it provides food for over 200 million people [(International Institute of Tropical Agriculture (IITA), 2024)]. It plays a crucial role in household consumption, cultural practices, and as a source of income for millions of smallholder farmers (Ariyo et al., 2020). Yam is an important carbohydrate-based crop in Nigeria, although its importance in the diets of the various tribes in the country differs (Anugwo & Egwue, 2024). Traditionally, the tuber can be cooked, fried or roasted. Alternatively, it can be processed into pounded yam, yam flour, yam chips or porridge (Cornet et al. 2023). Yam is also presented in traditional and marriage ceremonies. Medicinally, the mucilaginous tuber milk contains allantoin, a cell proliferates that speed up the healing process when applied externally to ulcers, boils and abscesses (Adejoh et al., 2024).). Its decoction is also used to stimulate appetite and to relieve irritation and cough (Mignouna et al., 2020). Yams are more nutritious than cassava or sweet potato and highly prized for its taste and source of protein, fat and vitamin than cassava (Asem et al., 2024). Although Nigeria is currently the world's largest producer of yam with total production output estimate of 43.1 million tonnes accounting for about 68% of world production [(Food and Agriculture Organisation (FAO), 2024)]. Yam is the fifth most harvested crops in Nigeria, following after cassava, maize, guinea corn, and beans/cowpeas. More so, after cassava, yams are the most commonly harvested tuber crops in the country (IITA, 2024). The price of yam has continued to increase due to rising demand contrary to lagging supply. This development could be attributed to high rate of population growth and production problems such as inadequate credit facilities, scarcity and high cost of inputs, diseases and pests attacks among others (Boafo et al., 2025). Jude and Augustine (2024) affirmed that irrespective of the growing attentions given to yam production in Nigeria, its production is still below average and this could be as a result of some limitations occasioned by the activities of yam production coupled with pests and diseases that could retard its growth. Hence, deliberate effort to increase production of yam in Nigeria needs to be urgently put in place if the challenges of food security must be put under control. These production challenges results in production inefficiency and low profits. However, the extent to which yam farmers derive income from its production varies across Nigeria and particularly in Imo State, due to differences in production costs, market dynamics, and access to inputs, and infrastructural challenges. Additionally, market price fluctuations, inadequate storage facilities leading to post-harvest losses, and poor rural infrastructure further hinder yam farmers from maximizing their income (Adeshina et al., 2020). While some studies [(Verter & Bečvářová, 2015; National Root Crops Research Institute (NRCRI), 2024)] suggest that yam production is profitable, there is limited empirical evidence on the extent to which farmers derive sustainable income from it. It was against this backdrop that the study on do yam farmers derives income from yam production? New evidence from Nigeria was analyzed. The finding is crucial for policymakers, agricultural stakeholders, and farmers in designing strategies to improve yam production and enhance farmers' income. From the specific objective, the study described the socio-economic characteristics of yam farmers in the study area, ascertained yam varieties cultivated and the production systems practiced, estimated the cost and returns of yam production, and identified constraints faced by the yam farmers in the study area. The hypothesis of the study was that the socio-economic characteristics of the yam farmers do not significantly influence their net return.

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METHODOLOGY

The study was carried-out in Imo State of Nigeria. Imo State is located in the South Eastern zone of Nigeria and lies between latitudes 5º 45´N and 6^0 35´N of the equator and longitude 6^0 35´E and 7^0 28´ E of the Greenwich Meridian [(Nigerian Meteorological Agency (NiMET), 2020)]. The State is bordered by Abia State on the East and Northeast, Rivers State on the South, Anambra State to the North and Rivers State to the South. Imo State is divided into three (3) agricultural zones of Owerri, Orlu and Okigwe and twenty-seven (27) Local Government Areas. With a total land area of 5,530km^2, the State has an estimated population of about 4.8 million persons and an annual growth rate of 3.35 percent [(Nigeria Populations Commission (NPC), 2006)]. The population of Imo State varies from 230 persons per kilometer square in Oguta/Egbema areas to about 1400 persons per kilometer square in Mbaise, Mbano, Orlu and Mbaitoli areas [(National Boundary Commission (NBC) of Nigeria, 2020)]. The study was conducted from January, 2024 through April, 2025. Multistage sampling procedure was used to select the sample for the study. The three (3) agricultural zones (Owerri, Orlu and Okigwe) of the State were purposively selected. Purposive sampling procedure was used to select area with high intensity of yam production. The second (2) stages involved the purposive selection of two local government areas (LGAs) in each of the zones, giving rise to six (6) Local Government Areas (LGAs). In the fourth (4) stages, three (3) communities were purposively selected from each of the six (6) LGAs, giving eighteen (18) communities. The eighteen (18) communities includes Ihitte-Ogada, Naze, Emii, Eziama, Ntu, Obike, Emekuku, Elelem, Akabo, Amaimo, Amakohia, Eziama-Ikeduru, Eguoma, Umuoha, Okoro-okwara, Umuduru, Eluama and Egwe. In the fifth (5) stages, five (5) farmers were purposively selected from each of the selected from eighteen (18) communities to a give a total of seventy-two (72) yam farmers for the study. However, before the data analysis only seventy (70) questionnaire from the yam farmers were found useful and then used for data analysis. The study employed descriptive statistical tools in analyzing the data for the study. Precisely, descriptive statistical tools such as the frequency distribution, flow-chat, percentages and mean ($\bar{x}$) and inferential statistics such as multiple regression analysis were used to realize the objectives. The multiple regression model was stated as follows:

$Y = f(X_1, X_2, X_4, X_5, X_6, X_7, X_8, X_9, e_i)$……..….(2.1)

Y = Net Return (Naira)

X_1 = Age (years)

X_2 = Sex (Male = 1, Female = 0)

X_3 = Educational level (Number of years spent in school)

X_4 = Household size (Number of persons)

X_5 = Farm income (Naira)

X_6 = Membership of social organization (member = 1, non-member = 0)

X_7= Farming experience (Years)

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X_8 = Farm Size (hectares)

e_i = error term

RESULTS AND DISCUSSION

Socio-economic Characteristics of Yam farmers

Result from Table 1 shows that the average age of the farmers was 43.00 years. The yam farmers could be said to be within their productive age and are expected to be energetic age. This indicates that yam production is mostly done by farmers who are still in their active and productive age in the area. Younger farmers are known to be full of energy and ready to practice modern production techniques to increase their yield and income. The result shares view with the study of Kalu et al. (2023) who reported that younger farmers have physical and mental capacity to be engaged in yam production in order to increase yield, income and standard of living. In the same way, greater proportions (78.00%) of farmers were males. The finding implies that both sexes are involved in yam production but males were more in number than females in the area. This is true and could be attributed to the fact that yam production could be labour intensive requiring substantial energy, strength and time, therefore, female may not have the much needed physical energy to be involved in it than their male counterpart. The finding is in line with the study of Adejoh et al. (2023) who described yam as a token of masculinity. In addition, majority of the yam farmers had 12 years of formal education which is equivalent to secondary school education in Nigeria. The finding reveals that most of the farmers were literate enough in understanding and communicating effectively with extension agents and prospective investors. Education has always been known to play a positive role in the efficient use of productive resources for increased yield, income and standard of living. Increased level of education would determine the quality of skills of farmers, their management abilities, and how well informed they are of the innovations and technologies around them (Asem et al., 2024). Also, in Table 1, reasonable proportions (66.00%) of the farmers were married. The finding implies that most of the yam farmers in the area are married. Married farmers have tends to have more access to productive resources (land, labour and capital) and are expected to have some of its households members contribute in yam production. This finding supports the work of Esiobu et al. (2025) who asserted that married individual tend to have easy access to joint financially resources to enhance yield, income and standard of living. Result of yam farmers distribution based on farming experience is computed in Table 1. The mean farming experience was 23.00 years. This implies that the farmers have reasonable years of experience in yam production and are expected to produce to the best possible frontier for increased yield and net return in the area. The result is corresponds with the study of Jude and Augustine (2024) who asserted that increase in years of experience in farming, improves decision making in addressing production challenges to increase yield, income and standard of living of farmers. Finding of yam farmers distribution based on household size is compiled in Table 1. The mean household size was 7.0 persons. The result indicates that the farmers had large households which could serve as labour in their yam production in the area. This findings support the result of Esiobu (2024) who reported that large household size is a proxy to labour availability, expansion of farm while reducing the cost of hired labour. Outcome of yam farmers distribution on membership of social organization is conveyed in Table 1. It

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shows that greater proportion (68.00%) of farmers in the area belong to one form of cooperative or the other. The finding implies that most of the yam farmers are members of cooperative which afford them opportunity to share information, credit and labour. The result is in agreement with the study of Ariyo et al. (2020) who reported that membership of cooperative gives farmers access to pull labour, credit, information, bulk purchase to increase their yield, income and standard of living. Result of yam farmers distribution on annual income is unveiled in Table 1. The average annual income was ₦405,000.00 ($270.23). This could be said to be relatively high, that despite some challenge farmers are facing they still realize reasonable farm income in the area, it is also an indication the yam production is viable in the area. Mignouna et al. (2020) reported that with sustainable income over time, farmers are able to purchase productive inputs, increase output, income, expand their farms, and improve significantly their standard of living. Similarly, the mean farm size was 1.38 hectares. This could be said to be a small farm size. Farmers may continue to intensively farm on these small plot to increase yield, quantity to be produce and income. However, farmers with large farm size are more likely to have increased yield, quantity, income and standard of living. The study of Esiobu (2020) found that large farm size increases farmers yield, income and standard of living. The mean extension contact was two (2) times per month in the study area. This implies that most of the yam farmers do not have much contact with extension agents, and which may negatively affect their farming activities and understanding of the best approach to yam production for increased yield and income. Anugwo and Egwue (2024) noted that extension agents provide farmers with training on improved yam production techniques, such as the use of high-yielding and disease-resistant seed varieties, proper land preparation, and efficient planting methods. This helps farmers increase their yield and overall productivity.

Table 1: Socio-economic Characteristics of Yam Farmers

S/No	Variables	Mean ($\bar{x}$)/Percentage (%)
1	Age (years)	43.00
2	Sex (percentage of male)	0.78
3	Marital status (percentage of married farmers)	0.66
4	Household size (number of persons)	7.00
5	Education (years spent in school)	12.00
6	Number of extension visits (number of visits per season)	2.00
7	Farming experience (years)	23.00
8	Farm size (hectares)	1.38
9	Membership of cooperative (percentage of members)	0.68
10	Annual Farm income (Nigerian Naira)	₦405,000.00

Source: *Field survey data, 2025*

Yam Varieties Produced by the Farmers in the Study Area

The output of the yam farmers distribution based on yam varieties cultivated in the area is presented in Figure 1. It reveals that greater proportion (97.00% and 94.00%) of the farmers cultivates **white yam (*Dioscorea rotundata*)** and **water yam (*Dioscorea alata*)** respectively in the area. The study of Mondo et al. (2024) found that these two varieties (white and water yam) are the most popular yam in West Africa and mainly in Nigeria. Popular varieties like white yam and water yam have high consumer demand due to their taste, texture, and

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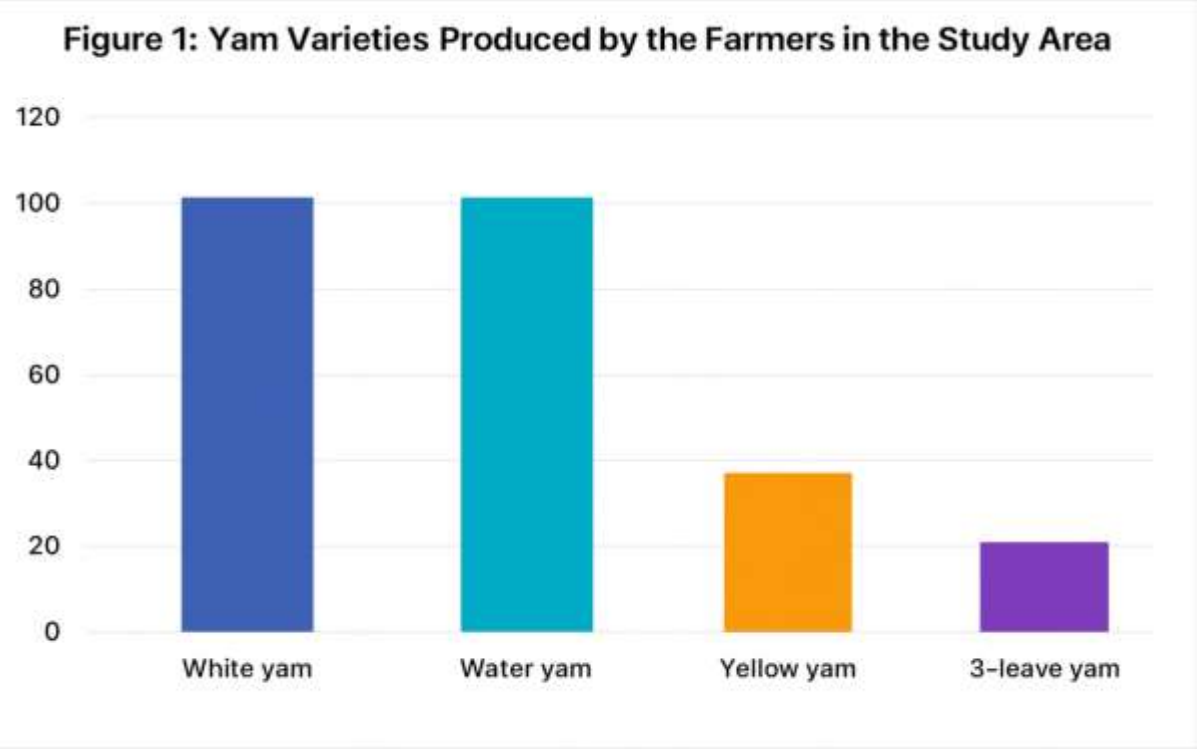
suitability for processing into yam flour and pounded yam (Kalu et al., 2023). Farmers growing preferred yam varieties tend to enjoy better prices and increased income. Also yellow yam (30.00%) and 3-leave yam (*Dioscorea dumetorum*) (5.00%) were also cultivated by farmers in the area. The study of Dansi et al. (2024) noted that **yellow yam (*Dioscorea cayenensis*),** are rich in essential nutrients like beta-carotene, which improves dietary diversity. Promoting nutritionally rich yam varieties can enhance food security and public health. The result implies while white yam is the most popular yam varieties in the area, farmers cultivate also other varieties of yam to increase diversification, yield, income and standard of living in the area.

Figure 1: Yam Varieties Produced by the Farmers in the Study Area



Production Systems Practiced by the Yam Farmers

From Figure 2, majority (95.00%) of the yam farmers practiced mixed cropping while 5.00% practice sole cropping in the area. Mixed cropping, the practice of growing multiple crops on the same piece of land is widely used by yam farmers in Nigeria to optimize land use, increase productivity, and improve income stability. The study of Brooker et al. (2024) reported that mixed cropping allows farmers to make efficient use of farm inputs like fertilizers, herbicides, and irrigation, as they benefit multiple crops. Labour is also optimized since different crops may have different planting and harvesting times, ensuring continuous farm activity and employment (Leite et al., 2024). In cases of adverse weather conditions, such as drought or excessive rainfall, some crops may survive while others fail. This reduces the risk of complete crop loss, ensuring food security and economic stability for farmers. Sole cropping enabled the yam farmers to grow exclusively one type of yam crop and harvesting it before planting another on the same piece of land. The small proportion of farmers that

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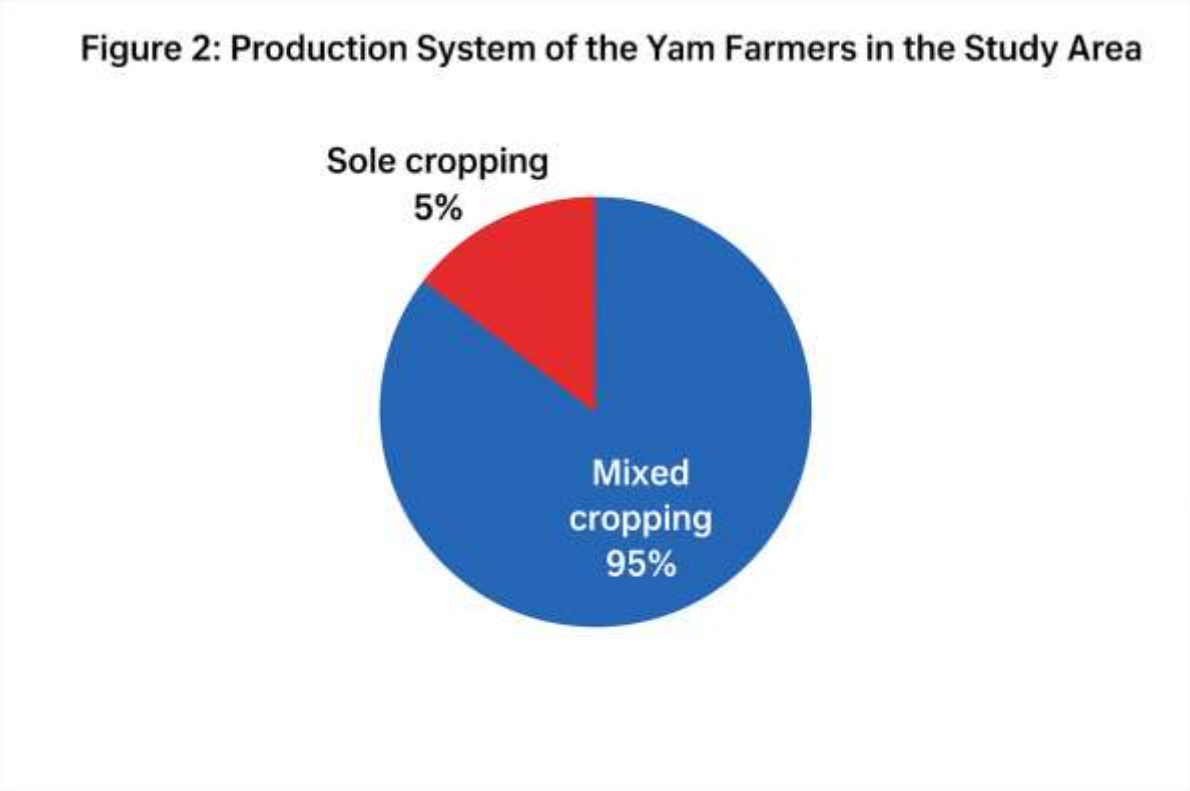
practiced sole cropping could be as a result of limited availability of farmland prevalent in the area. The study of Nyamayevu et al. (2024) asserted that since yams are planted without competition from other crops, they have full access to soil nutrients, water, and sunlight, which can lead to higher yields per plant.

Figure 2: Production System of the Yam Farmers in the Study Area



Costs, Return and Profitability of Yam Production (Naira)

The result of the farmers distribution based on costs and return of yam production is compiled in Table 2. The result revealed that greater proportion (84.38%) of the cost was recorded in the total variable cost. About 44.00% of the variable cost was from seed yam; approximately 14.66% of the variable cost was recorded in fertilizer input while about 7.41% of the variable cost was recorded in miscellaneous expenses. In a similar way, about 3.66% variable cost was from transportation. These may be connected to poor motorable network and high cost of Petroleum Motor Spirit (PMC) in the area. About 2.93% each of the total variable cost was utilized in land preparation, planting operation, weeding operation, harvesting operation, and fertilizer application. Moreover, several studies (Wumbei et al., 2023) on yam production in Nigeria have confirmed that the cost of labour input is the most important of all cost components incurred in yam production. The contribution of the fixed cost was relatively low compared to the variable costs incurred in production. The fixed cost contributed approximately 15.58% of the cost involved in yam production in the area. The study of Ariyo et al. (2020); Adeyeye et al. (2023), also confirmed that fixed cost the least cost incurred in yam production in Nigeria. The return on capital (ROC) invested was found to be ₦5.21. It could be inferred that for every naira invested, there is 5.21kobo returns for

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yam production in the area. The result also revealed that the total revenue (TR), gross margin (GM) and net farm income (NFI) were ₦300,000.00, ₦242,450.00 and ₦231,819.33 respectively. The finding also shows that net return on investment (NROI) (profitability index) was ₦4.40, which implies that yam production is a profitable enterprise and would yield more output/income when invested in a larger scale and efficiently managed in the area. This also implies that for every naira earned as revenue from the yam production enterprise, 4.40kobo returned to farmer as net farm income. The result obtained implies that yam production is profitable, hence confirmed the evidence of the finding of Verter & Bečvářová (2015); Adejoh et al. (2024) who revealed that yam production is profitable and that farmers would realize good yield as well as income after sales when efficiently and effectively managed. The finding also suggests that yam production is a profitable and lucrative venture. These figures could yield more income if production scale is enhanced in the area and maybe beyond. The implication of the findings is that when efficiently, effectively, carefully and heavily invested and managed yam production is capable of producing good output/yield as well as reasonable net return overtime to any agribusiness entrepreneur.

Table 2: Estimated Costs, Return and Profitability Analysis of Yam Production/Naira

Items	Average Cost (₦)	Quantity	Unit	Total Value (PxQ) (₦)	Percentage (%)
A. Revenue					
Yam tuber	1,500.00	2,000	Tonnes	300,000.00	
Total Revenue	**---**		---	**300,000.00**	
B. Variable Cost					
Seed Yam	500	60	Tonnes	30,000	44.00
Land preparation	1,000.00	2.0	Man hour	2,000.00	2.93
Fertilizer	5,000.00	2.0	Bag	10,000.00	14.66
Transportation	500.00	5.0	Km	2,500.00	3.66
Planting operation	1,000.00	2.0	Man hour	2,000.00	2.93
Fertilizer application	1,000.00	2.0	Man hour	2,000.00	2.93
Weeding operation	1,000.00	2.0	Man hour	2,000.00	2.93
Harvesting operation	1,000.00	2.0	man hour	2,000.00	2.93
Miscellaneous cost	5,050.00	---	---	5,050.00	7.41
Total Variable Cost				**57,550.00**	
C. Fixed Costs					
Depreciation Equipments	6,834.67	---	---	6,834.67	10.02
Depreciation on Land	2,920.00	1.30	Hectare	3,796.00	5.56
B. Total Fixed Cost				**10,630.67**	
D. Total Cost (TFC+TVC)				**68,180.67**	**100.00**
Net farm income **[A-(B+C)]**	231,819.33	----	----	231,819.33	
Gross Margin	242,450.00				
Return on Capital Invested	5.21				
Net Return on Investment	4.40				

Source: *Field Survey Data, 2025; Depreciation on equipment was calculated using the Straight Line Depreciation Method (SLDM)*

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Estimated Influence of Yam Farmers Socio-economic Characteristics on their Net Return

In order to determine the influence of yam farmers socio-economic characteristics on their net return as displayed in Table 3, a multiple regression analysis was carried out in four functional forms (linear, semi-log, double-log and exponential forms). Based on the statistical significance of the coefficient and goodness of fit, the double-log function was chosen as lead equation. The double-log regression function was chosen as lead equation based on the values of R^2 (83.00), F-Ratio value (41.812), highest number of significant variables and conformity of the signs with *a priori* expectations. The coefficient of multiple determinations (R^2) was found to be 0.83 (83.00%). This is a strong and significant indication that 83.00% of the variation in the profit from yam production was explained by the explanatory variables (socio-economic characteristics), while the remaining 17.00% was accounted-for due to stochastic error in the model. Hence the study presents the marginal effect as follows.

Age (X_1): Age was found to be negatively related to net return of yam of yam production but still statistically significant at 5% level of probability. This implies that increase in the magnitude of age, leads to a significant decrease in profit of yam production. This is an indication that younger farmers had more profit than their older counterparts. Younger farmers have energy and strength to produce optimally and are always ready to try new production technique to increase yield and income than their older counterpart. This finding is in agreement with the studies of Adejoh et al. (2024) who opined that younger farmers are more receptive to agricultural innovation, ready to learn new ideas for the benefit of its production goal than older farmers who are afraid to change.

Educational Level (X_3): Education had a positive coefficient with the net return of yam farmers in the area and was statistically significant at 1% level of probability. This is indications that increase in the magnitude of education leads to a significant increase in profit of yam production. It is expected that the higher level of education will contribute significantly to understanding the best production method that will give the best result for the farmers. Education has always been known to play a positive role in the efficient use of productive resources and increased yield among farmers (Verter & Bečvářová, 2015).

Household Size (X_4): Household size had a positive coefficient with net return of the yam farmers hence, was statistically significant at 1% level of probability. This is an indication that farmers who have large households size had more profit than farmers with small household size. It also implies that increase in the magnitude of household size, leads to a significant increase in profit of the farmers in the area. Large household size is a proxy for labour and opportunity for farmers to expand their production frontiers. The finding share view with the study of Adeshina et al. (2020) who opined that large households can promote the access to labour, finance and agricultural information as every household member is a potential source of labour, information and fund.

Farm Income (X_5): Farm income had a positive coefficient with net return of the yam farmers in the area and it was statistically significant at 1% level of probability. This is indications that increase in the magnitude of income leads to a significant increase in profit of the farmers. Anugwo and Egwue (2024) found that farmers with higher farm income make superior economic decision, manage risk and apply the best production technologies in farming to increase yield and income.

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Membership of Cooperative (X_6): Membership of cooperative had a positive coefficient farmers net return in yam production and it was significant at 1% level of probability. Membership of cooperative society affords farmers the opportunity of sharing information, fund, pooled labour and relate with several group for this own benefit. The findings also share view with the study of Mignouna et al. (2020) who asserted that membership of cooperative society enable farmers to share relevant information, ideals and project as collective demand.

Farming Experience (X_7): Farming experience had a positive coefficient with net return of yam farmers and it was statistically significant at 1% level of probability. It is expected that farmers with more experience will understand the best way to address production challenges to increase yield and income than their counterpart with less years of farming experience in the area. The result is in parity with the study of Esiobu et al. (2025) who reported that experience in farming enhances decision making, better knowledge of use of the most appropriate methods to improve farm output, income and farmers standard of living.

Farm size (X_8): Farm size had a positive coefficient with yam farmers net return and it was statistically significant at 1% level of probability. This implies that increase in magnitude of farm size, increase profit. Farmers with large farm size will try many production method as well as plant large quantity of seed yam to increase yield, income and standard of living. The study of Ariyo et al. (2020) found that large farm size increases farmers yield, expansion and income. The F-ratio (41.812), which determines the overall significance of the regression model is highly significant at 1% level of probability implying that the regression model has very high explanatory power, hence the study concludes that the socio-economic characteristic of the yam farmers have a significant influence on their profit in the area.

Table 3: Estimated Influence of Yam Farmers Socio-economic Characteristics on their Net Return

Explanatory variables	Linear	Semi-log	Double-log	Exponential
Intercept	8.569	2.213	19.948	1.642
	(5.379)***	(7.994)***	(8.088)***	(8.327)***
Age (X_1)	-0.005	-0.001	-1.080	-0.000
	(-0.460)	(-0.377)	(-2.414)**	(-0.205)
Sex (X_2)	0.001	3.497E-005	0.578	5.265E-013
	(0.058)	(0.009)	(0.361)	(0.047)
Education (X_3)	0.040	0.007	0.137	1.000E-013
	(2.801)***	(1.877)*	(4.595)***	(1.844)*
Household Size (X_4)	0.080	0.016	0.958	1.007E-013
	(2.818)***	(3.149)***	(3.595)***	(2.689)***
Farm Income (X_5)	2.887E-005	5.365E-006	1.920	4.293E-006
	(2.132)**	(2.281)**	(2.626)***	(1.770)*
Membership of Cooperative (X_6)	0.048	0.008	0.668	-4.953E-005
	(0.448)	(0.415)	(4.143)***	(-0.309)
Farming Experience (X_7)	-0.009	-7.234E-005	2.556	0.003
	(0.092)	(-0.004)	(2.780)***	(0.196)
Farm Size (X_8)	1.170	0.030	2.260	1.939E-005
	(1.614)*	(1.659)*	(2.332)***	(1.478)*

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R^2	71.90	80.00	83.00	73.50
F-Ratio	21.868***	32.281***	41.812***	23.700***

Values in Parenthesis are t-values *Statistically Significant at 10%; **Statistically Significant at 5%; * Statistically Significant at 1%; Source: Computer Printout of SPSS (2025)**

Constraints Faced by the Farmers in Yam Production

Result of the yam farmers distribution based on constraints they face in yam production in the area is displayed in Table 4. It shows that inadequate production capital (100.00%), limited availability of farmland (97.14%), high cost of labour (90.00%), and incidence of climate change (85.71%) were identified by yam farmers as the constraints faced in yam production in the area. Farmers with insufficient capital struggle to purchase high-yielding and disease-resistant yam seed varieties, leading to lower productivity. Inability to afford fertilizers, pesticides, and herbicides results in poor soil fertility management and increased pest and disease infestation, reducing yield (Esiobu, 2019). Farmland is one of the important determinants for increased output, hence poor access to it, will negatively affect farmers yield, net return and standard of living. Farmers with restricted access to land can only cultivate small plots, leading to lower total yam production in yield and in net return. According to Esiobu and Onubuogu (2014) limited space prevents farmers from expanding their operations, restricting potential increases in yield and income. The study of Ariyo et al. (2020); Anugwo and Egwue (2024); Adejoh et al. (2024) reported similar result on constraints facing yam production. In the same way, high transportation cost (82.85%), pest and disease attack (78.57%), poor storage facilities (75.71%), unavailability of good yam species (71.42%), poor road network (64.28%) and unstable price changes (57.14%) were stated by the farmers as the constraints they face in yam production in the area. there is no denying that the constraints is responsible for poor yield of yam in the area. Critically addressing these identified constraints will be keys in not just increasing yam yield, but also net return and food security and yam production sustainability in the area and maybe beyond.

Table 4: Constraints Faced by the Farmers in Yam Production

S/No	Items	Frequency	Percentage (%)
1	Inadequate production capital	70	100.00
2	Limited availability of farmland	68	97.14
3	High cost of labour	63	90.00
4	Incidence of climate change	60	85.71
5	High transportation cost	58	82.85
6	Pest and disease infestation	55	78.57
7	Poor storage facilities	53	75.71
8	Unavailability of good yam species	50	71.42
9	Poor road network	45	64.28
10	Unstable Price changes	40	57.14

Multiple responses were recorded; *Source: Field Survey Data, 2025

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CONCLUSIONS

Yam production plays a significant role in the agricultural sector of Nigeria, particularly in States like Imo, where farming is one of the major sources of livelihood. As one of the staple crops widely cultivated in Imo State, yam contributes greatly to food security, employment, income and economic growth. However, despite its importance, the extent to which yam farming serves as a reliable source of income for farmers remains a subject of interest. It was against these backdrops that the study as systematically conducted. Conclusively, majority of the yam farmers were married, with an average household size of 7 persons. The mean educational level and farming experience were 12 years and 23 years, respectively. Average farm size and annual farm income were 1.38 ha (29.71 plots) and ₦405,000.00 ($281.61) respectively. Reasonable proportions were members of cooperative societies. The result shows that 2,000 tonnes of yam were produced from 1.30 ha (28 plots) of farmland. Positive net farm return and return per capita invested were ₦231,819.33 and ₦5.21, respectively. The study provides empirical evidence on the income-generating potential of yam production in Imo State, Nigeria. Findings suggest that yam farming contributes significantly to the net return of farmers, serving as a primary or supplementary source of income. However, net return was significantly influenced by age, education, household size, farm income, membership in a cooperative, farming experience and farm size and they were all significant at the 1% level of probability. While yam production remains viable and profitable to invest in, challenges like inadequate production capital, limited availability of farmland, high cost of inputs, and pest and disease infestation could hinder optimal income generation.

RECOMMENDATIONS

The following recommendations were made based on the major findings of the study.

i) The study found that education was critical for farmers in generating revenue from yam production. Therefore, the yam farmers through their various cooperative societies should develop educational training programme that focus on sustainable yam production in the study area.

ii) The study found that inadequate production capital was among the challenges of the yam farmers in increasing yield, and income in the area. Hence, the yam farmers, particularly on their own, should judiciously pool financial resources together through a strengthened cooperative society group, as this would increase their fund size, access to fund private and government fund available in the area.

iii) The yam farmers identified limited availability of farmland in the area. Therefore, through strengthened cooperative society, the farmers can access large farmland to enhance both output and area of land cultivated for increased sale and profit in the area.

iv) Effective government agricultural policies and programs should also focus on granting farmers improved access to farmland, farm credit and farm inputs, as these would enable them to increase their production frontier and sustain the realization of huge returns over time in the area.

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v) The study found that there were poor agricultural extension service systems and poor contact between yam farmers and extension agents in the area. Hence, it is paramount that agricultural extension programs be strengthened by the government to educate farmers on best practices in yam production, management, pest control, and sales for increased income and standard of living.

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