

Determinants of Investment in the Production of Value-Added Products of Yam and Cassava in Benue State, Nigeria

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DOI: [10.56201/wjfir.v8.no3.2024.pg13.19](https://doi.org/10.56201/wjfir.v8.no3.2024.pg13.19)

Abstract

The study examined the determinants of investment in the production of value-added products of yam and cassava in Benue State, Nigeria. Data were collected from 450 root and tuber crops producers from three Local Government Areas using multistage sampling technique. The collected data were analysed using multiple regression model. The multiple regression analysis showed that farm size ($\beta = 0.67$) and household size ($\beta = -0.92$) influenced investment in the production of value-added products of yam and cassava in the study area. Evidence from the study shows that increase in farm size increases this investment by 0.67% while increase in household size decreases this investment by 0.92%. The study recommended that policies and programmes aimed at increasing the production of value-added products of yam and cassava should take into consideration the socio-economic characteristics of the root and tuber crop farmers especially their farm size and household size, in their design and implementation; the State ministry of agriculture through its extension department should annually organize workshops targeted at training of root and tuber crop farmers on value-added products these farmers could process their produce into; and campaigns targeted at discouraging these farmers on having large household should be promoted.

Key Words: Investment, Production, Value Addition, Yam, Cassava, Benue State, Nigeria

INTRODUCTION

Post-harvest losses have continued to limit the performance of root and tuber sub-sector. Root and tuber crops are known to be highly perishable, hence most rural farmers do not get the desired reward for their work as most of their produce are lost a day or two after harvest (Aniedu and Aniedu, 2014). Most root and tuber crops are lost to insect attack, rodents, and micro-organisms. Losses also occur during harvesting handling; packaging, pressing and storage of these agricultural produce. Survey carried out on post-harvest food losses in some communities in Nigeria revealed that as much as 30 – 50% of root and tuber are lost with a substantial amount recorded during storage (Yahaya, 2002).

These post-harvest losses have great consequences on the contribution of root and tuber sub-sector and the agro-economic sector at large. Post-harvest losses of root and tuber poses a challenge for government, non-government organization and international organization with it high contribution to high food insecurity, thus hampering the vast contribution this sub-sector could make to the economy at large (Bolarin and Bosa, 2015).

In addressing these post-harvest losses in the root and tuber sub-sector, an understanding of factors that influence of agripreneurs investments in value-added products of these crops is paramount. This is because such understanding will stimulate innovative strategies from stakeholders responsible for the development of the root and tuber sub-sector in the country.

There are several studies on investment in value-added agricultural products such as Daramola *et al.* (2007), that looked at export potentials of value-added agricultural products; Eboh *et al.* (2012) that studied value-added agricultural products as drivers of agricultural growth in Nigeria; Hartwich *et al.* (2010) that looked at unleashing agricultural development in Nigeria through value chain financing; Olukunle (2013) that considered the challenges and prospects of agriculture in Nigeria: the way forward, suggesting investment in value-added agricultural products as a way forward, and Okeke *et al.* (2022) that investigated investment decision and level of investment in marketing of value-added products of yam and cassava in Benue State, Nigeria etc. However, none of such study has been done on the determinants of investment in the production of value-added products of yam and cassava among root and tuber crops producers in the study area. Thus, this study was aimed at bridging this knowledge gap.

The study broadly examined the determinants of investment in the production of value-added products of yam and cassava in Benue State, Nigeria. The study specifically sought to identify and analyse the socio-economic variables influencing root and tuber crops producers' investment in the value-added products of yam and cassava in the study area. The findings on the determinants of investment in value-added products of yam and cassava which this study provided will assist in policy and programmes design tailored towards boosting production of value-added products of yam and cassava in the State and the country at large.

METHODOLOGY

The Study Area

The study was carried out in Benue State which is situated within the lower river Benue trough in the middle belt region of Nigeria. The geographical coordinates of the State are Longitude 7°47' and 10°0' East. Latitude 6°25' and 8°8' North and occupies a land mass of 34,059 km². The State is one of the North Central States in Nigeria and has a population of about 4, 253,641 in the 2006 census. According to Brinkhoff (2022), the projected population of the Benue State in 2022 was 6,141,300.

The State derives its name from the Benue River which is the second largest river in Nigeria and borders Nasarawa State to the North; Taraba State to the East; Kogi State to the West; Enugu State to the South-West; Ebonyi and Cross-Rivers State to the South. The State has an international border with Cameroon. Farmers who involved in arable crop production like rice, yam, cassava, sweet potato, maize, vegetables, soybeans as well as livestock like poultry, goat, sheep, piggery, cattle and fish abound in the State.

Population of the Study

The population for this study included root and tuber producers involved in producing value-added products of yam and cassava in Otukpo, Ukum, and Gwer-East Local Government Areas of Benue State, Nigeria.

Sampling Technique and Data Collection

Multi-stage sampling technique was employed to select a sample of 450 root and tuber crops producers. The data for the study were collected using structured questionnaire.

Analytical Techniques

The data collected were subjected to econometric analysis. Multiple regression model was used to identify and analyse the determinants of investment in the production of value-added products of yam and cassava among root and tuber crop producers. The four functional forms: linear, exponential, semi-log, and double-log were tried. The double-log was selected as the lead equation based on the magnitude of R^2 , the *a priori* expectation, and number of significant coefficients of the independent variables.

The four functional forms were specified as follows:

Linear:

$$Y = a_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + b_{13}X_{13} + \varepsilon_i \dots (1)$$

Exponential:

$$[n Y = a_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + b_{13}X_{13} + \varepsilon_i \dots (2)$$

Semi-log:

$$Y = a_0 + b_1 [n X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 [n X_5 + b_6 [n X_6 + b_7 [n X_7 + b_8 X_8 + b_9 X_9 + b_{10} [n X_{10} + b_{11} [n X_{11} + b_{12} [n X_{12} + b_{13} [n X_{13} + \varepsilon_i \dots (3)$$

Double-log:

$$[n Y = a_0 + b_1 [n X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 [n X_5 + b_6 [n X_6 + b_7 [n X_7 + b_8 X_8 + b_9 X_9 + b_{10} [n X_{10} + b_{11} [n X_{11} + b_{12} [n X_{12} + b_{13} [n X_{13} + \varepsilon_i \dots (4)$$

Where:

\ln = Natural logarithm

Y = Investment in value added products (₦)

a_0 = constant

$b_1 - b_{13}$ = coefficient of the predictors

X_1 = Age (years)

X_2 = Sex (male =1, female =2)

X_3 = Marital Status (married = 1, single = 2)

X_4 = Status as a farmer (full time=1, part time =2)

X_5 = Farm size (ha)

X_6 = Processing Experience (years)

X_7 = Household Size (number)

X_8 = Access to Credit (accessed =1, did not access =0)

X_9 = Membership of Cooperative (member =1, non-member =0)

X_{10} = Annual Farm Income (₦)

X_{11} = Annual Non-Farm Income (₦)

X_{12} = Total Output (kg)

X_{13} = Total Return (₦)

ε_i = Error term

The *a priori* expectation was that the coefficients of sex, status as a farmer, farm size, processing experience, access to credit, membership of cooperative, annual farm income, annual non-farm income, total output, and total return would be positive, while those of age, marital status and household size would be negative.

RESULTS AND DISCUSSION

Factors Influencing Yam and Cassava Producers' Investment in Value-added products of yam and cassava

The result of the multiple regression analysis of the factors that influence investment in the production of value-added products of yam and cassava is presented in Table1. The F-ratio was

8.00 and significant at 1% level. Thus, confirming that socio-economic variables significantly influence investment in the production of value-added products of yam and cassava. The R^2 was 0.8667 which implies that 86.67% of the variation of investment in value-added products of yam and cassava was accounted for by the independent variables in the model.

The coefficient of farm size showed a significance of 1% level and positively related to investment in the production of value-added products of yam and cassava. This suggests that the more farm size a farmer employs in producing yam and cassava, the more likely he is to invest in value-addition of his produce. This is possible because a larger farm size implies a larger farm output which is turn will likely compel the farmer to employ value addition to some of his produce for additional returns. A larger farm output due to larger farm size will provide the farm with the opportunity to diversify his investment. Ilyas (2010) reported that farm managers tend to take opportunities that will attract more return to their business. The venture of value addition provides such opportunity to farmers for additional return.

The coefficient of household size was significant at 5% level but was negatively related to investment in the production of value-added products of yam and cassava. This means that as household size increases, the farmer would tend to decline from investing in value addition of his produce. As household size increases, so does the requirements for its welfare increases. Thus, the farmer is forced to divert resources into the welfare of his household, which he would have otherwise employed into value addition of his produce. Sam and Dapaah (2009) reported that farmers with large household sizes shy away from diversifying their farming enterprise. This is attributed to the need to meet up with family welfare and needs.

Table 1: Determinants of investment in the production of value-added products of yam and cassava

Variables	Coefficient	Standard Error	t-value	P> t
Age	0.63 ^{NS}	0.63	0.99	0.339
Sex	-0.31 ^{NS}	0.28	-1.11	0.282
Marital Status	0.02 ^{NS}	0.30	0.07	0.944
Status as a farmer	0.05 ^{NS}	0.05	1.02	0.321
Farm Size	0.67 ^{***}	0.18	3.74	0.002
Processing Experience	0.36 ^{NS}	0.32	1.13	0.276
Household Size	-0.92 ^{**}	0.38	-2.42	0.028
Access to Credit	0.18 ^{NS}	0.26	0.68	0.505
Membership of Cooperative	-0.43 ^{NS}	0.26	-1.66	0.117
Annual Farm Income	0.12 ^{NS}	0.15	0.83	0.417
Annual Non-Farm Income	-0.04 ^{NS}	0.20	-0.20	0.846
Total Output	-0.07 ^{NS}	0.12	-0.55	0.590
Total Return	0.08 ^{NS}	0.09	0.92	0.370
Constant	9.08 ^{***}	2.71	3.36	0.004
R Square	0.8667			

Adjusted R Square	0.7584
F-Value	8.00***

Source: Field survey data, 2018. ***=sig@1% **=sig@5% NS=not significant.

CONCLUSIONS

Evidence from the study shows that the socio-economic characteristics of root and tuber producers influence their investment in the production of value-added products of yam and cassava. Increase in farm size increases this investment by 0.67% while increase in household size decreases this investment by 0.92%. Based on the findings of the study, the following were recommended:

- Policies and programmes aimed at increasing the production of value-added products of yam and cassava should take into consideration the socio-economic characteristics of the root and tuber crop farmers especially their farm size and household size, in their design and implementation.
- The State ministry of agriculture through its extension department should annually organize workshops targeted at training of root and tuber crop farmers on value-added products these farmers could process their produce into.
- Campaigns targeted at discouraging these farmers on having large household should be promoted. This can be achieved by the Benue State government through offering scholarships to children from smaller households.
- Benue State government should come up with policies that would make root and tuber crop farmers easily access farm inputs especially farm land. This would encourage the farmers to increase their production of these crops and by implication, increase their investment in value addition of the crops.

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