DETERMINANTS OF MARKET PARTICIPATION AND PERFORMANCE OF SMALLHOLDER CASSAVA PRODUCTION AGRIPRENEURS IN ABIA STATE, NIGERIA

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ABSTRACT
The study examined the determinants and performance of smallholder cassava production agripreneurs market participation in Abia State, Nigeria. The study determined their level of market participation, estimated the determinants of cassava production agripreneurs' market participation, examined their performance, and the challenges faced by these cassava production agripreneurs. A multi-stage sampling technique was used in selecting 120 respondents for the study. Data collected using well-structured questionnaire administered to the respondents was analyzed with descriptive statistics (mean, frequency and percentage), market participation index, multiple regression, and net return analysis. The result showed that the market participation index was 97.78%.The determinants of market participation were labour, education, technology, credit, and market information which were all directly related to market participation and significant at 1%. Experience, selling price and capital were positively signed, and significant at 5%, while gender and income were negatively signed with 5% and 10% levels of significant respectively. The net-return analysis result showed that on the average, a cassava production agripreneur makes ₦997,158.63k profit for a production season. Using a mean score of 2.50, the mean rating from the four-point likert scale result indicated that lack of infrastructure (2.58), lack of suitable planting equipment (2.68), low capital base (2.65), lack of technical expertise (2.71), and lack of mechanization/power (2.63) were accepted as a major challenge faced by the cassava production agripreneurs. The study concluded that there is a high level of market participation by the cassava agripreneurs in the study area which will inevitably unlock their full potential, contribute to local economic development, and play a vital role in driving the growth of the cassava industry on a broader scale. Also, the cassava production enterprise is a profitable venture. It is therefore recommended that with the high level of cassava commercialization in the study area, youths and households are encouraged to actively participate in cassava production as it can create employment opportunities and generate income for individuals and communities, as well as being a pathway to international trade and global export market.

Keywords: Market, Participation, Agripreneurs, Performance, Smallholder.

1. INTRODUCTION
Market participation is the involvement of individuals, businesses, or entities in buying or selling goods, services, or financial assets within a market economy. It encompasses various activities such as purchasing goods, selling products or services, investing in stocks, and engaging in trading activities. Essentially, it's the act of actively engaging with the market in various capacities. Recent research shows that agripreneurs should pursue market orientation to gain long-term competitive advantages through market participation (Saleh *et al.,* 2021). An agripreneurs' capacity to participate in a market successfully and efficiently is referred to as "market participation." It is the active involvement of

producers, suppliers, and other stakeholders in the market ecosystem. It encompasses various activities such as production, distribution, promotion, and sales aimed at effectively reaching and satisfying customers within the target market. In the context of cassava, market participation involves ensuring that cassava producers, processors and traders have the necessary resources, information, and infrastructure to efficiently insert their products in markets, thereby contributing to economic growth and improved livelihoods within the cassava value chain. By participating in the market, agripreneurs becomes an active actor in the value chain of any agricultural product (Kyaw *et al.,* 2018; Adino *et al.,* 2021). It has been estimated that about 90% of smallholder farmers in West Africa cultivate cassava (*Manihot esculenta Crantz*) as a staple crop, making it a critical product for agripreneurs (Sanni *et al.,* 2009; Ojiakor *et al.,* 2017; Ikuemonisan *et al., 2020*). There are numerous ways in which agripreneurs can utilize cassava as a source of food, feed, and raw material. Cassava is grown by 98% of smallholder crop farmers in Abia State, which means that most of the state's agripreneurs relies heavily on the crop (Apu and Oragwam, 2009; Onyebinama and Onyejelem, 2010; Udensi *et al.,* 2011;; Onya *et al.,* 2016). The socio-economic conditions of the cassava production agripreneurs are significantly dependent on their ability to participate in the market actively (Onya *et al.,* 2016). The majority of cassava production agripreneurs are active participants in the cassava value chain and market (James *et al.,* 2011; Madu *et al.,* 2018). Agripreneurs are involved in cassava farming, and stem production, root processing and value addition, distribution, and supply. Agripreneurs ensure that there is enough production to meet market demand. Some agripreneurs, particularly in developed economies, engage in contract cassava production. Cassava production agripreneurs aggregate smallholder cassava farmers' output, thereby creating a market for them. Agripreneurs bridge the market gap between farmers, manufacturers, and end-users.

The issue of limited access to credit and production inputs is a significant challenge for cassava production agripreneurs, as they struggle to find adequate capital to finance their investments and maintain healthy working capital to participate in the market (Christopher *et al.,* 2019).The cassava agripreneurship landscape is marked by various dimensions encompassing socio-economic characteristics, factors influencing market engagement, the impact on an agripreneurs performance, and challenges faced by agripreneurs involved in cassava production. However, there exists a gap in comprehensive understanding and analysis of these factors, hindering the development of effective strategies and policies to promote sustainable cassava agribusiness. Therefore, there is a pressing need for an in-depth investigation to bridge this gap and provide actionable insights for policy makers, researchers, and practitioners in the agricultural sector. Based on the socio-economic and other constraints that limit market participation of cassava agripreneurs, it is critical to analyze the market participation of cassava production agripreneurs in Abia State, Nigeria.

2. METHODOLOGY

The study was carried out in Abia State Nigeria. Abia State is one of the thirty-six (36) states of the Federal Republic of Nigeria which was created on 27th August, 1991 and is located in the South-east geo-political zone of Nigeria. It is between longitude 7^0 23′ and 8^0 02′E and latitudes 5^0 47′ and 6^0 12′N. The state has a population projection of 4,143,100 people, which is 2.4% annual population change (2006 -2022), NBS (2022). It covers a land area of 776,270 square kilometres. Abia State shares boundaries with Imo, Ebonyi, Enugu, Rivers and Akwa Ibom States. Abia State is made up of 17 local Government Areas (LGA), which are grouped into three (3) agricultural zones. The agricultural zones are Aba, Ohafia and Umuahia agricultural zones.

Two major seasons are experienced in the area: these seasons are the dry season which last from October to March and rainy season which starts in April and ends in September. Despite farming

constituting the major occupation of the rural people, there are other sources of livelihood in the area such as handicraft, processing, trading, hunting, civil service, transportation, and fishing.

In the state, there are agricultural based research institutes. These are the National Root Crops Research institute, Umudike, National Cereals Research Institute Amakama and Land Resources Ahieke, Umuahia. In addition, Michael Okpara University of Agriculture Umudike is situated in the state. The presence of these institutions has promoted agricultural activities and agro-related business in the state.

The study made use of multi-stage sampling technique in selecting the 120 respondents for the study. The first stage involved all the three (3) agricultural zones in Abia State. They are Umuahia, Ohafia and Aba agricultural zones. In the second stage, two (2) local governments was purposively selected from each of the agricultural zones, the local governments selected were Ikwuano and Umuahia South from Umuahia Agricultural Zone, Ohafia and Isiukwuato from Ohafia Agricultural zone and Osisioma Ngwa and Ugwunabo from Aba Agricultural Zone giving a total of six (6) L.G.As. These places were selected because of cassava farming and processing activities in the area. In the third stage, two (2) communities were randomly selected from each of the L.G.As giving a total twelve (12) communities. In the fourth stage, the assistance of Extension Officers of the Agricultural Development Programme were employed to help identify cassava agripreneurs in each community from which a random sample of ten (10) cassava agripreneurs were selected, giving a total of one hundred and twenty (120) respondents which constituted the sample size for the study. Data was collected from the respondents using structured questionnaire, complimented with oral interview and were analyzed using descriptive and inferential statistical tools. The socio-economic characteristics of the respondents were analyzed using descriptive statistics; commercialization index was used to examine the cassava production agripreneurs' market participation level. The determinants of participation were realized by estimating the Ordinary Least Squares (OLS) regression model. The cassava production agripreneurs' performance were determined using the net return ratio, while the challenges the cassava agripreneurs faced were analyzed using mean rating from the 4 point likert scale.

The models were specified as follows:

Commercialization index

$$CI = \frac{\textbf{\textit{Gross value of sales by each}}\ \text{agripreneur}}{\textbf{\textit{Gross value of crop produce by each}}\ \text{agripreneur}} * 100 \quad (1)$$

CI= commercialization index

Determinants of market participation

$$Y = (X_1, X_2, X_3, X_4 \ldots X_{12}) \quad (2)$$

Y = Level of market participation (commercialization index)

$$Y = \frac{\textbf{\textit{Gross value of sales by each}}\ \text{agripreneur}}{\textbf{\textit{Gross value of crop produce by each}}\ \text{agripreneur}} * 100 \quad (3)$$

where in Equation (2),

X_1 = income (in Naira), X_2=experience (in years), X_3 = cost of hired labour (number of workers), X_4 = education (years of formal education), X_5= Technology (modern =1, traditional= 0), X_6= gender (male=1. Female= 0), X_7= Age (in years), X_8= selling price (Price*kg), X_9 = Distance to market (km), X_{10} Credit (Yes=1, No=0), X_{11} = Market Information (Yes=1, No=0), X_{12} = Capital (naira)

Net Returns Analysis
This is specified as:
NR = TR – TC…… (4)
where in Equation (4),

NR = Net Returns (₦), TR = Total Revenue (₦), TC = Total Costs (Total variable cost + Total fixed cost)

Four-point rating scale:
The four point rating scale was categorized as follows:
Not a Challenge (1), Moderate Challenge (2), Severe Challenge (3), Extremely Severe Challenge (4). The Mean (cut off) score of 2.50 obtained by dividing 10 by 4 forms the basis for decision making. Any mean score from 2.50 and above is accepted as a major challenge, while below 2.50 is rejected as not a major challenge.

3. RESULTS AND DISCUSSION

3.1 Level of Market Participation:

The level of market participation by the cassava production agripreneurs is presented in Table 1. The result showed that majority (78%) of the small holder cassava production agripreneurs has a commercialization index of between 96-100%. The mean of the level of market participation by the cassava production agripreneurs' as measured by the commercialization index was 97.78%. This implies that there is a high level of market participation by the cassava production agripreneurs. According to Agwu *et al*. (2013) in Govereh *et al.* (1999) and Strasberg *et al.* (1999), the closer the index is to 100, the higher the degree of commercialization. The result shows that cassava has moved from subsistence to a commercial production as the commodity is majorly produced for sale in the market.

Table 1. Level of Market Participation

Level of Market Participation	**Frequency**	**Percentage (%)**
86-90	7	6
91-95	19	16
96-100	94	78
Total	**120**	**100**
Mean	**97.78**	

Source: Computed from survey Data, 2023

3.2 Determinants of Market Participation

The regression estimates of the determinants of market participation is summarized and presented in Table 2. The linear functional form was chosen as the lead equation based on statistical and econometric criteria such as the magnitude of the coefficient of multiple determination (R^2), number of significant variables, conformity with a priori expectation of the signs in the coefficients of the variables, and overall significance of the functional form (F-ratio). The F-ratio (31.18) was significant

at 1% which attests to the overall significance of the regression result. The R^2 value (0.761) of the lead equation shows that 76.1% of the variations observed in market participation were accounted for by the explanatory variables included in the model.

The coefficient of income was significant at 10% and negatively related to market participation. This implies that as the income of the agripreneurs increases, market participation decreases. This is not in line with a priori expectation, it could be as a result of the agripeneurs engaging or investing in other forms of businesses, thereby decreasing their participation in the market. This result is in contrast with the findings of Iheke *et al.* (2021) that increase in income would enable farmers purchase improved inputs and modern farm tools that are energy-saving, leading to increased productivity and hence commercialization.

Table 2. Determinants of Market Participation

Variable	**Linear (+)**	**Exponential**	**Double Log**	**Semi-Log**
Intercept	2.288	12.934	-9.384	-1.250
	(4.30)***	(10.56)***	(-1.19)	(-3.26)***
Income (X_1)	-613.419	-0.013	-0.785	-2675000
	(-1.68)*	(-1.57)	(-1.07)	(-0.75)
Experience (X_2)	9.921	0.020	0.174	1175384
	(2.31)**	(2.05)**	(1.36)	(1.89)*
Cost of Labour (X_3)	20.958	5.210	0.672	2661962
	(5.86)***	(6.33)***	(5.65)***	(4.61)***
Education (X_4)	28.641	-0.011	0.074	2331996
	(3.53)***	(-0.61)	(0.28)	(1.85)*
Technology (X_5)	15.040	0.268	0.231	-1499920
	(3.43)***	(2.65)***	(0.83)	(-1.11)
Gender (X_6)	-64.453	-0.091	-0.105	-1134251
	(-2.12)**	(-1.05)	(-1.34)	(-3.00)***
Age (X_7)	229.409	0.011	0.404	1710752
	(0.62)	(1.25)	(1.07)	(0.93)
Selling Price (X_8)	309.059	0.000	1.755	8393020
	(2.24)**	(2.27)**	(2.54)**	(2.50)**
Distance to market (X_9)	7.411	-6.410	0.053	775147.5
	(0.41)	(-0.02)	(0.46)	(1.38)
Credit (X_{10})	0.517	-3.280	-0.010	-75566.44
	(5.77)***	(-1.59)	(-1.62)	(-2.47)**
Market information (X_{11})	3.601	0.284	0.165	-26.495
	(2.66)***	(5.51)***	(1.33)	(-1.98)*
Capital (X_{12})	4.863	-5.550	-0.004	528353.8
	(2.46)**	(-0.12)	(-0.06)	(1.49)
R^2	0.761	0.688	0.668	0.682
Adjusted R^2	0.736	0.656	0.634	0.649
F-Ratio	31.18***	21.62***	19.77***	21.01***

Source: Computed from survey Data, 2023

*Significant at 10%, **Significant at 5% ***Significant at 1%

Note: Figures in parenthesis are t-values. + Lead Equation

The coefficient of experience was significant at 5% and positively related to market participation. This indicates that there is a direct relationship existing, and as such with an increase in experience, there is an increase in market participation. This is in agreement with the findings of Onu and Echebiri (2019) that the more the agripreneur stays long in farming, the more he tend to be more efficient, have better knowledge of the market, better knowledge of efficient allocation of resources and market situation and thus expected to participate more in the market.

Labour was significant at 1% and positively related to market participation. This implies that an increase in the number of labourers results to an increase in market participation. This result is consistent with report by Gebremedhin and Jaleta (2010) who noted that agripreneurs' that hires more labour aims to produce more, because the higher the labourers, the higher output, and hence get surplus harvest that would serve commercialization purposes.

The result also showed that the coefficient of education was positively signed and highly significant at 1%. This indicates that an increase in the level of education of the farmers can result to an increased market participation of the agripreneurs. Education can empower agripreneurs' in cassava participation by providing them with valuable knowledge and skills. With education, agripreneurs' can learn modern agricultural techniques, best practices and strategies for cassava cultivation, pest control, and post-harvest management. They can also gain an understanding of market trends, pricing, and value chain dynamics, which helps them make informed decisions about when and how to sell their cassava produce. Overall, education enhances farmers' capacity to improve their yields, income, and overall participation in cassava farming and marketing. This finding is in line with the observations of Onyenweaku and Nwaru (2005), who stated that the level of education of a farmer does not only increase his productivity, but also enhance his ability to understand, evaluate, and adopt new production techniques.

Technology was significant at 5% and positively related to market participation. This implies that an increase in improved technology will result to more participation in the market**.** Cassava is an important crop in the study area and around the world, and leveraging technology can improve various aspects of its production, processing and marketing. This result is in line with Mekonnen (2017) who noted that technology and innovation adoption boosts production and productivity and hence leads to increase level of market participation.

The coefficient of gender was significant at 5%, and negatively related to market participation. This implies that the females participates more in the market than the males, a result in contrast to the expected outcome, but possibly because women often play a significant role in cassava marketing due to various reasons such as its compatibility with their traditional roles, flexibility, and ease of involvement. Moreso, cassava cultivation and marketing can align with local gender norms, allowing women to actively participate in these activities while managing household responsibilities. Economic factors and opportunities for income generation also contribute to their increased participation. Additionally, women are better at bargaining power. This result is in line with Okoye, et al. (2016) that women are more inclined to sell their cassava than men, having a female head increases a households' chances of selling its cassava by a greater amount than the male. Some past studies had also indicated that women are more involved in the processing and marketing of cassava products, (Opondo *et al*., 2017; Yusuf and Opeyemi, 2020), this result agrees to that.

The coefficient of selling price was significant at 5% and positively related to market participation. This implies that an increase in the selling price of the cassava product will result to a corresponding

increase in the market participation. Note that increase in selling price leading to increased market participation is in line with a priori expectation. The law of supply states that increase in price of goods leads to a corresponding increase in the quantity supplied. Following this, increase in the selling price definitely will lead to increased market participation of cassava production agripreneurs since it is believed that more profit will be made. This result is in line with Mugonola*et al*. (2017) who noted that lower prices kill marketing incentives leading to low participation.

The coefficient of credit was significant at 1%, and directly related to market participation. This indicates that an increase in the credit of the agripreneur, will lead to an increase in market participation. This Increase in credit would enable the agripreneurs to purchase improved inputs and modern farm tools that are energy saving, leading to increased productivity and hence more participation. This is in agreement with Lerman (2004) and Martey *et al.*(2012) that credits are expected to enhance farmers skills, and knowledge, link farmers with modern technology through the purchase of inputs (planting materials, fertilizer and crop protection), pay wages, invest in machinery, or to smooth consumption as well as markets, ease liquidity and input supply constraint, thus are expected to increase agricultural productivity, induce market orientation and participation, and thus greater commercialization.

The coefficient of market information was directly related to market participation and significant at 1%. This implies that an increase in market information would result to an increase in market participation. It is expected that as the cassava production agripreneurs' have adequate information in respect to the market, it would influence the farmers' efficiency, hence market participation.

The result also showed that the coefficient of capital was positively signed and significant at 5%. This implies that an increase in the capital of the agripreneur, will result to a corresponding increase in market participation. With more capital, the cassava production agripreneurs' can invest in modern machinery, equipment, and inputs to boost cassava production, leading to higher yields and a larger quantity of cassava available for sale in the market. This result is in agreement with Donkor *et al*. (2018) who noted that a farmer's increase in capital elevates its production capacity, marketing efforts, and reach, which will contribute to increased market participation and potential success in the agricultural sector.

3.3 Performance of the Cassava Agripreneurs

The performance of the cassava production agripreneurs as shown by the net returns analysis is presented in Table 3. The result showed that a cassava production agripreneur incurs an average total cost of ₦1,002,341.37k out of which ₦715,716.31k was variable cost, while ₦286 625.06k was fixed cost for the production season. The agripreneurs' sold an average quantity of 93 bags at a unit cost of ₦21,500.00k. The average total revenue realized from sales of bags of cassava was ₦1,999,500.00k for the production season. The average net return for the production season was ₦997,158.63k. On the average, a cassava production agripreneur makes ₦83,096.55k profits per month. The above analysis is a confirmation that cassava production is a viable and profitable business in the study-area. In the light of the agripreneurs net profit, youths and households are encouraged to participate in the business. This is because; cassava is a high-yielding crop, which obviously generates profit for farmers. Its versatility and demand in various industries such as food processing, animal feed, and bioenergy also contributes to its potential for generating more income. This result is in line with Enete *et al*. (2009) that a farm household will choose to participate in the cassava market if the net present value of the expected benefits from participation is greater than the net present value of remaining autarkic-net of costs. Costs here include all transaction costs the household faces in the process of market participation.

Table 3. Net Return Analysis of Cassava Agripreneurs

Item	Quantity	Unit cost (₦)	Amount (₦)
Variable costs			
Fuel			112500.00
Planting material			19550.00
Cost of labor:			
Land clearing/development			125000.00
Weeding			45500.00
Agrochemicals			65000.00
Harvesting			50000.00
Total cost of labor			285500.00
Transportation			59033.34
Fertilizer			45000.00
Herbicide			16080.00
Storage			80968.75
Processing			49184.22
Machine maintenance			47900.00
Total variable cost			**715716.31**
Fixed costs			
Rent			98157.89
Levies			14575.00
Capital consumption allowance			173892.17
Total fixed cost			**286625.06**
Total cost			**1002341.37**
Revenue: Bags of cassava (50kg)	**93**	**21500**	**1999500.00**
Net return			**997158.63**

Source: Computed from survey Data, 2023

3.4 Challenges faced by the Cassava Agripreneurs

The challenges faced by the cassava production agripreneurs are presented in Table 4. From the result, it is observed that lack of technical expertise was a major challenge experienced most by the cassava production agripreneurs with a mean score of 2.71, followed by lack of suitable planting equipment with a mean score of 2.68, low capital base (2.65), lack of mechanization and power (2.63), and finally lack of infrastructure, with a mean score of 2.58. These variables were accepted as a major challenge faced by the cassava production agripreneurs'. However, insufficient land preparation and soil infertility was rejected as not a major challenge faced by the cassava production agripreneurs' because of its low mean score of 2.41 and 1.93 respectively. Pelemo (2016) noted that farmers are faced with several constraints which include inadequate storage facilities, high cost of credit, among others.

Some studies have reported that availability of basic infrastructure such as good road networks play a vital role in increasing commercialization (Okoye *et al*., 2016; Otekunrin and Sawicka 2019). This result agrees to that. The inference that can be drawn from these findings is that cassava production agripreneurs are faced with several challenges in the study area, which requires attention for improved and optimum production.

Table 4. Challenges Faced by the Cassava Agripreneurs

Challenges	4	3	2	1	Total score	Mean score	Rank	Decision
lack of infrastructure	6	58	56	0	310	2.58	5th	Accept
Insufficient land preparation	0	52	65	3	289	2.41	6th	Reject
Lack of suitable planting equipment	3	81	30	6	321	2.68	2nd	Accept
Low capital base	12	54	54	0	318	2.65	3rd	Accept
Lack of technical expertise	3	79	38	0	325	2.71	1st	Accept
Lack of mechanization/power	0	75	45	0	315	2.63	4th	Accept
Soil infertility	0	9	93	18	231	1.93	7th	Reject

Source: Computed from survey Data, 2023

Cut off score: ≥ 2.5 was accepted as a major challenge, while <2.5 was rejected as not a major challenge

Note: Extremely Severe Challenge (4), Severe Challenge (3), Moderate Challenge (2), Not a Challenge (1)

4. CONCLUSION AND RECOMMENDATION

From the result of this study, it could be concluded that there is a high level of market participation by the cassava production agripreneurs in the study area which will inevitably unlock their full potential, contribute to local economic development, and play a vital role in driving the growth of the cassava industry on a broader scale. Also, the cassava enterprise is profitable venture. It is therefore recommended that with the high potential for cassava commercialization in the study area, youths and households are encouraged to actively participate in cassava production as it can create employment opportunities and generate income for individuals and communities, as well as being a pathway to international trade and global export market. Furthermore, the government can improve road networks and transportation infrastructure to facilitate the movement of cassava from farms to markets or processing units, provide subsidies or low-interest on loans to farmers to acquire suitable planting equipment such as cassava cutters, planters, and harvesters, establishing machinery service centers where farmers can access and rent modern agricultural equipment, making it affordable for small-scale farmers.

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