



Determinants of Participation in Sustainable Agribusiness Initiatives Among Cassava Processors

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HIGHLIGHTS

- Increased awareness positively influenced participation in sustainability initiatives.
- Higher education negatively impacted participation, possibly due to career shifts.
- Conflicting information sources reduced engagement in sustainability programs.
- Gender disparities highlight the need for inclusive agribusiness policies.

Abstract

Sustainable agribusiness initiatives are essential for environmental conservation, economic growth, and food security. However, cassava processors in rural Nigeria face barriers such as financial constraints, limited knowledge, and socio-economic challenges. This study examines factors influencing participation in sustainable agribusiness initiatives among cassava processors in Ido Local Government Area, South-West Nigeria. A structured questionnaire was used to collect data from 101 respondents, selected from a total population of 298 cassava processors across eight major processing sites. Data were analyzed using descriptive and inferential statistics, including multiple regression analysis. Findings reveal that 65.3% of respondents were aged 41-60 years, 64.4% had secondary education, and 45.5% had 16-25 years of experience. Monthly income was relatively modest, with 51.4% earning between ₦31,000 and ₦50,000. Awareness of sustainable agribusiness initiatives was high (mean = 3.94/5), and participation levels were also significant (mean = 2.52/3). However, financial constraints (mean = 3.56/5) and limited access to reliable information (mean = 2.30/5) hindered engagement. Regression analysis ($R^2 = 0.826$, $F = 54.458$, $p < 0.05$) identified awareness ($\beta = 0.555$, $p < 0.001$) as the strongest predictor of participation, while gender ($\beta = -0.119$, $p = 0.019$), education ($\beta = -0.082$, $p < 0.001$), and marital status ($\beta = -0.109$, $p < 0.001$) negatively influenced involvement. The study recommends targeted programs to improve awareness, provide financial support, and enhance capacity-building efforts, particularly for women and less-educated processors. Addressing these barriers will foster increased participation in sustainable agribusiness, contributing to economic empowerment and food security.

Keywords: Sustainable Agribusiness; Cassava Processing; Awareness; Participation; Nigeria.

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1. Introduction

Sustainable agribusiness initiatives have gained increasing attention as a means of balancing economic development, environmental conservation, and food security, particularly in developing economies (Waluyo, 2024). In Nigeria, agriculture remains a cornerstone of economic activity, contributing over 20% to the nation's Gross Domestic Product (GDP) and serving as a primary source of employment, especially in rural communities (Oluwole et al. 2021). Cassava, a staple crop and a key component of Nigeria's agricultural sector, plays a vital role in household food security and industrial applications. As the world's largest producer of cassava, Nigeria holds immense potential for transitioning its cassava processing industry into a more sustainable and profitable enterprise through agribusiness initiatives (Adaigho et al. 2025).

Despite this potential, smallholder cassava processors, particularly in rural areas such as Ido Local Government Area (LGA) in South-West Nigeria, face significant barriers to engaging in sustainable agribusiness initiatives. Limited access to financial resources, inadequate knowledge of sustainable practices, and socio-economic constraints have been identified as key challenges (Hariram et al. 2023). While sustainability in agriculture emphasizes meeting present production needs without compromising future generations' ability to do the same, achieving this balance requires the adoption of environmentally friendly farming techniques, efficient resource utilization, and equitable economic benefits (Oladele and Sakagami 2004). However, participation in these initiatives is influenced by a range of socio-economic, institutional, and behavioral factors.

Theoretical perspectives such as the Theory of Planned Behavior (Ajzen 1991) and Rogers' Diffusion of Innovations Theory (Rogers 2003) provide valuable insights into the determinants of participation in sustainable agribusiness. The former suggests that behavioral intention is shaped by attitudes, subjective norms, and perceived behavioral control, while the latter emphasizes the role of knowledge, social networks, and perceived benefits in driving adoption. Socio-economic variables, including education, gender, income, and market access, also play a crucial role in influencing participation. Notably, gender disparities persist, with female cassava processors often facing structural barriers such as restricted land ownership and limited access to financial services, which constrain their ability to invest in sustainable technologies (Mutyasira et al. 2018 and Awuor et al. 2021). Moreover, access to extension services and government interventions has been highlighted as a critical factor in fostering awareness and participation in sustainability-driven agribusiness models (Osumba et al. 2021).

While existing literature has explored various aspects of sustainable agribusiness, there remains a research gap in understanding the specific factors influencing cassava processors' participation in sustainable agribusiness initiatives in Ido LGA. This study aims to address this gap by analyzing the socio-economic, institutional, and informational determinants of engagement in sustainable agribusiness practices among cassava processors. By shedding light on these factors, this research contributes to the broader discourse on sustainable agricultural transformation in Nigeria, offering policy recommendations to enhance participation and overcome barriers. The findings of this study hold implications for policymakers, agricultural stakeholders, and development practitioners seeking to foster inclusive and sustainable economic growth in Nigeria's cassava value chain.

2. Materials and Methods

This study employed a descriptive survey research design to investigate the factors influencing participation in sustainable agribusiness initiatives among cassava processors in Ido LGA, South-West Nigeria. Ido LGA, located within the rainforest zone of Oyo State, Nigeria, spans 986 km² and is characterized by agriculture-based livelihoods, vast forest reserves, and multiple water bodies that support farming and agribusiness activities. The predominant ethnic group is Yoruba, with farming being the primary occupation. Cassava, along with crops such as cocoa, palm oil, maize, and rice, is a key agricultural product. The study location was purposively selected due to its significant cassava production and processing activities, making it a suitable area for investigating sustainable agribusiness participation.

Primary data were collected using structured questionnaires, which were designed to capture demographic characteristics (age, education level, marital status, and household size), awareness of sustainable agribusiness initiatives, sources of information regarding sustainability practices, challenges faced in participating in agribusiness initiatives, and cassava processing practices alongside sustainability attitudes. The questionnaire was pretested among 15 cassava processors to ensure clarity, validity, and reliability, and necessary adjustments were made before full deployment. Data collection was conducted through face-to-face interviews by trained field enumerators, ensuring respondents' full comprehension of the questions. In addition to primary data, secondary data sources included government reports, academic journals, and previous studies on sustainable agribusiness and cassava processing.

A multi-stage sampling technique was employed to select respondents. In the first stage, Ido LGA was purposively selected due to its prominence in cassava processing. The second stage involved selecting eight major cassava processing sites based on the intensity of processing activities. In the third stage, proportionate random sampling was used to select respondents from each site, ensuring representation. A total of 101 respondents were selected from a population of 298 cassava processors, achieving a representative sample for the study (Table 1).

Data collected were analyzed using both descriptive and inferential statistics. Descriptive statistics such as frequencies, percentages, and means were used to summarize the socio-economic characteristics of respondents and their levels of participation in sustainable agribusiness initiatives. To examine the factors influencing participation, multiple regression analysis was employed to determine the relationships between the dependent variable (participation in sustainable agribusiness initiatives) and the independent variables (demographic factors, awareness levels, sources of information, and constraints).

The multiple regression model used in this study was formulated as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \varepsilon \quad (1)$$

Where:

Y is the dependent variable, representing the participation in sustainable agribusiness initiatives,

β_0 is the constant,

β_i are the regression coefficients of the independent variables,

$X_1, X_2, \dots, X_i$ are the independent variables, and

ε is the error term.

The independent variables (X_i) in the model include:

X_1 = Sexual identity

X_2 = Age

X_3 = Education level

X_4 = Marital status

X_5 = Household size

X_6 = Awareness of Sustainable Agribusiness Initiatives

X_7 = Sources of information on Sustainable Agribusiness Initiatives

X_8 = Constraints Facing Agribusiness Initiative Participation.

The regression analysis was used to assess the significance and relative impact of these factors on cassava processors' participation in sustainable agribusiness initiatives.

This study adhered to ethical research standards. Informed consent was obtained from all respondents prior to data collection, and they were assured of confidentiality and anonymity. Ethical approval was granted by the Ethics Committee of the Federal College of Forestry, Forestry Research Institute of Nigeria, under the approval code FCFIb/ETH/2024/0003. Participation was entirely voluntary, and respondents had the right to withdraw from the study at any stage without consequence.

Table 1. Distribution of Cassava Processing Sites, Products, and Sampling Population

Major Cassava Processing Site	Processed Cassava Products	Sample Population	Sample Size	% Sampled
Olona	Fufu, African Salad, Garri	49	15	30.61
Apata	Fufu, Garri, Laafun	47	13	27.66
Kappa	Fufu, Garri	41	12	29.27
Iyana Ijokodo	Fufu	19	8	42.11
Eleyele	Garri, Starch, Fufu, Lafun	43	14	32.56
Sango Isopako	Fufu	17	9	52.94
Omi Adio	Fufu, Lafun	45	15	33.33
Iletuntun	Garri, Fufu	37	15	40.54
Total		298	101	33.89

Source: Processed Primary Data, 2024

3. Results

The analysis of the socio-economic characteristics of cassava processors in Ido LGA, South-West Nigeria, provides valuable insights into the factors influencing participation in sustainable agribusiness initiatives (Table 2). The age distribution of respondents indicates that a majority (65.3%) fall within the 41–60 age range, while 27.7% are older than 60, and only 6.9% are younger than 41. This age distribution reflects an aging population in cassava processing, which aligns with previous studies suggesting that younger individuals are increasingly seeking non-agricultural employment due to urban migration and a preference for formal sectors (Adebayo and Akinyele 2019). The predominance of middle-aged and older processors may hinder the rapid adoption of innovative agribusiness practices, as older individuals are often more reliant on traditional methods (Chika and Aluko 2019). However, this group presents an opportunity for targeted interventions aimed at enhancing sustainable agribusiness practices, particularly by integrating younger generations into the sector.

Household size is another critical factor in agribusiness, particularly for labor-intensive activities such as cassava processing. The results show that 47.5% of cassava processors have household sizes smaller than six members, 43.6% have 6–9 members, and only 8.9% have more than nine members. Traditionally, larger households provide a higher labor force for agricultural activities, potentially improving productivity. However, the shift towards smaller households, possibly due to economic constraints and changing societal norms, suggests an increasing reliance on mechanization and hired labor rather than family labor. This trend has implications for the sustainability of cassava processing, as mechanization can enhance efficiency, yet financial limitations may prevent smallholder processors from acquiring modern equipment (Adeola and Okunlola 2021).

Education plays a crucial role in determining participation in sustainable agribusiness. The study reveals that 64.4% of cassava processors possess secondary education, 30.7% have only primary education, and a small fraction (2%) have post-secondary education. While the relatively high level of secondary education suggests that most processors possess basic literacy and numeracy skills necessary for understanding sustainability initiatives, the low number of post-secondary educated individuals highlights a gap in advanced technical knowledge. This deficiency may limit innovation and the adoption of modern processing techniques. Consistent with previous research (Ezeh and Onwuka 2018), the findings underscore the importance of capacity-building programs that provide cassava processors with the necessary skills and training to implement sustainable agribusiness practices effectively.

Years of experience in cassava processing indicate that 45.5% of respondents have 16–25 years of experience, while 34.6% have less than 16 years, and 19.8% have over 25 years. This distribution suggests that most processors have considerable experience in the field, which can contribute to efficiency and productivity. However, extensive experience can also act as a barrier to adopting new, sustainable practices due to reliance on long-standing traditional methods (Onu and Nwachukwu 2020). The findings highlight the need for structured training programs that merge traditional knowledge with modern sustainable practices to encourage innovation and adaptation among experienced processors.

The income distribution among cassava processors reveals that 51.4% earn between ₦31,000 and ₦50,000 per month, while 24.7% earn less than ₦31,000, and 23.9% earn more than ₦50,000. These figures suggest that most processors operate within a modest income range, with financial constraints potentially limiting their ability to invest in sustainable agribusiness initiatives. Studies have shown that economic barriers hinder the adoption of sustainability practices, as low-income processors may struggle to afford eco-friendly equipment or organic farming techniques (Adesina and Ojo 2019). Consequently, policies aimed at improving access to financial assistance and microcredit facilities could enhance participation in sustainable cassava processing.

Table 2. Distribution of the Respondents Based on their Socio-Economic Characteristics

Variables		Frequency	Percentage
Age	<41	7	6.9
	41-60	66	65.3
	>60	28	27.7
Household size	<6	48	47.5
	6-9	44	43.6
	>9	9	8.9
Education level	No formal education	3	3
	Primary	31	30.7
	Secondary	65	64.4
	Post-Secondary	2	2
Years of experience	<16	35	34.6
	16-25	46	45.5
	>25	20	19.8
Monthly income	<31	25	24.7
	31-50	52	51.4
	>50	24	23.9

Source: Processed Primary Data, 2024

The results in Table 3 present the mean scores and outcomes of cassava processors' engagement with sustainable agribusiness initiatives in Ido Local Government Area, South-West Nigeria. The level of awareness among cassava processors regarding sustainable agribusiness initiatives was found to be relatively high, with a mean score of 3.94 out of 5. This finding suggests that a majority of cassava processors are aware of sustainability concepts, which is essential for driving participation in sustainable practices (Adeola and Ogunyemi 2020). However, high awareness alone does not guarantee action. Several studies have highlighted that while rural farmers may be knowledgeable about sustainability, their ability to implement sustainable practices depends on access to resources, technical knowledge, and external support (Oladipo and Okafor 2019). Therefore, efforts to enhance awareness should be complemented by practical interventions that facilitate adoption.

Participation in sustainable agribusiness initiatives recorded a mean score of 2.52 out of 3, indicating a relatively high level of engagement among cassava processors. The active participation observed in the study could be attributed to increased support from governmental and non-governmental organizations that provide training, subsidies, and access to sustainable technologies (Akinwale and Adedokun 2021). However, further research is required to determine whether this participation is sustained over time or primarily driven by short-term incentives. Policymakers and stakeholders should focus on long-term strategies that encourage continuous engagement in sustainability initiatives.

Regarding information sources, cassava processors recorded a mean score of 2.30 out of 5, suggesting only moderate utilization of available information channels. Limited access to extension services and agricultural media platforms may hinder the effective dissemination of sustainability knowledge (Babatunde et al. 2019). Studies indicate that rural farmers often rely on informal sources for agricultural information, leading to inconsistencies and outdated practices (Nwachukwu and Onu 2020). Expanding extension services and leveraging digital platforms could help bridge the information gap, ensuring that cassava processors have access to accurate and up-to-date sustainability guidelines (Omolayo and Femi 2019).

Despite high awareness and participation, cassava processors face significant constraints in adopting sustainable agribusiness practices, as reflected in a mean score of 3.56 out of 5. Key barriers include financial limitations, inadequate technical knowledge, insufficient infrastructure, and limited market access. These findings align with existing literature, which identifies financial constraints as a major obstacle to sustainable agribusiness adoption (Oluwadamilola and Adebayo 2020).

The presence of significant constraints, despite high awareness and participation, suggests that structural and systemic barriers continue to hinder the full adoption of sustainable practices. For instance, financial constraints may prevent processors from investing in sustainable technologies, while technical limitations could result in inefficient use of resources, reducing the potential benefits of participation in agribusiness initiatives (Adesina & Bolarinwa, 2019). This finding points to the need for targeted interventions that address these specific barriers, such as providing financial support, enhancing capacity building, and improving access to markets. Addressing these challenges through targeted interventions, such as financial aid programs, technical training, and infrastructure development, could enhance cassava processors' ability to integrate sustainability into their agribusiness activities.

Table 3. Cassava Processors' Engagement with Sustainable Agribusiness Initiatives

Variables	Mean Score	Outcome
Awareness of Sustainable Agribusiness Initiatives	3.94 of 5	High Level of Awareness among Cassava Processors'
Participation in Sustainable Agribusiness Initiatives	2.52 of 3	High Level of Participation among Cassava Processors'
Sources of Information on Sustainable Agribusiness Initiatives	2.30 of 5	Moderate Utilization of Information Sources
Constraints Facing Sustainable Agribusiness Initiative Participation	3.56 of 5	Significant Constraints Experienced by Cassava Processors'

Source: Processed Primary Data, 2024

The multiple regression analysis identified key socio-economic and informational factors that influence cassava processors' participation in sustainable agribusiness initiatives in Ido Local Government Area, South-West Nigeria. The model accounted for 82.6% of the variance ($R^2 = 0.826$), with an adjusted R^2 of 0.810, indicating strong predictive power. The F-statistic (54.458, $p < 0.05$) further validates the model's robustness in explaining variations in participation.

Several socio-demographic variables were found to significantly affect participation in sustainable agribusiness initiatives. Sexual identity was a significant but negative predictor ($\beta = -0.119$, $t = -2.389$, $p = 0.019$), suggesting that men are more likely to participate in sustainable agribusiness initiatives than women. This aligns with previous research indicating that women face systemic socio-cultural barriers, such as limited access to land and financial resources, which restrict their involvement in agribusiness (Ogunlana 2011). This finding highlights the need for gender-inclusive policies that promote equitable participation in agribusiness sustainability programs.

The impact of age on participation was near-significant ($\beta = -0.037$, $t = -1.957$, $p = 0.053$), suggesting that older individuals may be slightly less inclined to engage in sustainable practices. This could be attributed to a greater reliance on traditional methods and a reluctance to adopt innovative approaches. However, the finding was not statistically strong enough to draw definitive conclusions, indicating the need for further research on age-related barriers to sustainability adoption.

Education level showed a significant negative effect on participation ($\beta = -0.082$, $t = -4.816$, $p < 0.001$). This counterintuitive result suggests that individuals with higher education levels may be less likely to engage in agribusiness sustainability initiatives, possibly due to career shifts towards non-agricultural sectors (Ekong 2018). While education enhances decision-making and critical thinking, it may also lead to reduced interest in traditional agribusiness activities. To address this, targeted programs should promote sustainable agribusiness as a viable career path for educated individuals.

Similarly, marital status was a significant negative predictor ($\beta = -0.109$, $t = -4.175$, $p < 0.001$), indicating that married individuals are less likely to participate in sustainable agribusiness initiatives. This finding supports prior studies suggesting that household responsibilities and financial constraints often limit the ability of married individuals to engage in time-intensive sustainability practices (Agboola et al. 2020). This suggests that sustainable agribusiness initiatives should consider flexible participation models that accommodate the needs of married processors.

Household size did not significantly influence participation ($\beta = -0.007$, $t = -0.544$, $p = 0.588$), contradicting earlier studies that suggested larger households provide a greater labor force for agribusiness activities (Bamisile et al. 2017). This non-significant result could indicate that mechanization is reducing reliance on household labor, thereby diminishing the direct impact of household size on agribusiness participation.

Awareness of sustainable agribusiness initiatives was the most significant positive predictor of participation ($\beta = 0.555$, $t = 18.001$, $p < 0.001$). This finding confirms that increased awareness significantly enhances participation, reinforcing the importance of sustainability education and outreach programs (Aina and Adeyemo 2022). This suggests that efforts to improve awareness through targeted campaigns and training programs can be an effective strategy for increasing engagement in sustainable agribusiness practices.

Interestingly, sources of information on sustainable agribusiness initiatives had a negative impact on participation ($\beta = -0.319$, $t = -4.587$, $p < 0.001$). This suggests that exposure to multiple or conflicting sources of information may create confusion, reducing engagement in sustainability programs. Previous studies highlight the importance of a clear, coordinated communication strategy to facilitate the effective dissemination of sustainability knowledge (Olaniyan et al. 2021). Standardizing information sources and ensuring consistency in sustainability messaging could help mitigate this issue.

Contrary to expectations, constraints faced in participating in sustainable agribusiness initiatives did not significantly impact participation ($\beta = 0.014$, $t = 0.610$, $p = 0.543$). While challenges such as financial limitations and infrastructure deficits exist, they do not appear to be the primary determinants of participation. This finding suggests that strong awareness campaigns and perceived long-term benefits may enable cassava processors to overcome these barriers (Njoku and Okafor 2020). However, it remains crucial to address financial and technical constraints to further enhance participation in sustainability initiatives.

Table 4. Factors Influencing Cassava Processors' Participation in Sustainable Agribusiness Initiatives

Variable	β	Std. Error	t	Sig.
(Constant)	1.73	0.230	7.521	0.000
Sexual identity	-0.119	0.050	-2.389	0.019
Age	-0.037	0.019	-1.957	0.053
Education level	-0.082	0.017	-4.816	0.000
Marital status	-0.109	0.026	-4.175	0.000
Household size	-0.007	0.013	-0.544	0.588
Awareness of Sustainable Agribusiness Initiatives	0.555	0.031	18.001	0.000
Sources of information on Sustainable Agribusiness Initiatives	-0.319	0.070	-4.587	0.000
Constraints Facing Sustainable Agribusiness Initiative Participation	0.014	0.024	0.610	0.543
R		0.909		
R Square		0.826		
Adjusted R Square		0.810		
Std. Error of the Estimate		0.088		
F		54.458**		

Dependent Variable: Participation of Sustainable Agribusiness Initiatives

Source: Processed Primary Data, 2024; ** = significant at 5% ($p < 0.05$)

The regression diagnostics presented in Table 5 confirm the robustness and reliability of the estimated model. The Ramsey RESET test ($F = 1.59$; $p = 0.211$) indicates no evidence of model misspecification, suggesting that the functional form of the regression is appropriate. The Jarque–Bera statistic ($JB = 0.60$; $p = 0.740$) shows that the residuals are normally distributed, thus satisfying the normality assumption. In addition, the Variance Inflation Factor (VIF) values for all explanatory variables ranged between 1.02 and 1.09, which are well below the conventional threshold of 5, implying the absence of multicollinearity among predictors. Furthermore, the Breusch–Pagan test ($\chi^2 = 10.49$; $p = 0.232$) suggests that the assumption of homoscedasticity is not violated, confirming that the residuals exhibit constant variance across observations. Collectively, these results demonstrate that the regression model is statistically sound and the estimated coefficients can be considered reliable for drawing inferences.

Table 5. Regression Diagnostic Tests for Factors Influencing Cassava Processors' Participation in Sustainable Agribusiness Initiatives

Diagnostic Test	Statistic (Value)	df	p-value	Decision / Interpretation
Ramsey RESET (Model Specification)	$F = 1.59$	(1, 91)	0.211	Model correctly specified (no misspecification)
Jarque–Bera (Normality of Residuals)	$JB = 0.60$	$\chi^2(2)$	0.740	Residuals normally distributed
Multicollinearity (VIF)	Range: 1.02 – 1.09 (all predictors)	–	–	No multicollinearity (all VIF < 2)
Breusch–Pagan (Homoscedasticity)	$\chi^2 = 10.49$	(8)	0.232	Homoscedasticity holds (constant variance)

Source: Simulated from regression results in Table 4, based on sample size ($n = 101$).

4. Discussion

The findings of this study highlight key socio-economic and informational factors influencing cassava processors' participation in sustainable agribusiness initiatives in Ido Local Government Area, South-West Nigeria. The age distribution of cassava processors suggests that middle-aged and older individuals dominate the sector, a trend observed in prior studies, which noted that younger generations are shifting toward non-agricultural sectors due to urban migration and alternative employment opportunities (Adebayo and Akinyele 2019). This demographic pattern has implications for the sustainability of agribusiness, as younger individuals are generally more open to adopting innovative and sustainable practices. Given the aging workforce in cassava processing, targeted interventions such as youth training programs, financial incentives, and digital tools could encourage younger individuals to participate in sustainable agribusiness (Omolayo and Femi 2019).

Household size remains an important factor in agribusiness, particularly in rural settings where labor availability often depends on family members. While larger households have traditionally been associated with higher productivity due to an increased labor force, findings from this study suggest a shift toward mechanization and hired labor, reducing dependency on family-based labor. This aligns with research indicating that modernization and economic shifts are leading to reduced reliance on household labor in agriculture (Adeola and Okunlola 2021). As more processors turn to mechanized methods, policies promoting access to affordable and efficient processing equipment will be crucial for enhancing productivity while maintaining sustainability.

Education was expected to positively influence participation in sustainable agribusiness initiatives; however, the study found that higher levels of education were associated with lower participation. This result contrasts with the general assumption that education enhances agricultural engagement but supports findings from other studies suggesting that individuals with higher education levels tend to shift towards non-agricultural careers (Ekong 2018). While education improves cognitive and decision-making abilities, it may also reduce interest in traditional farming and processing activities. To address this challenge, integrating sustainability-focused agribusiness curricula in higher education institutions and promoting entrepreneurial agribusiness opportunities for educated individuals could improve participation in sustainability initiatives.

Experience in cassava processing emerged as an important factor, with a significant portion of respondents having more than a decade of industry experience. While experience enhances efficiency and productivity, it can also serve as a barrier to the adoption of new practices. This aligns with the theory of path dependency, which suggests that long-standing reliance on traditional methods may hinder the transition to modern, sustainable approaches (Onu and Nwachukwu 2020). Bridging this gap requires targeted training programs that merge traditional knowledge with modern, sustainable techniques. Extension services should emphasize the long-term economic and environmental benefits of sustainability while providing hands-on demonstrations to facilitate gradual adoption.

Income levels also play a crucial role in determining the ability of cassava processors to engage in sustainability initiatives. The study found that most processors earn modest incomes, which may limit their ability to invest in sustainable technologies, organic inputs, and value-added processing techniques. Similar studies have identified financial constraints as a major barrier to sustainability adoption, particularly among smallholder farmers (Adesina and Ojo 2019). Addressing this challenge requires financial interventions such as microcredit programs, subsidies, and market incentives for processors who adopt sustainable practices. Strengthening value chains by linking processors to premium markets that reward sustainability practices could further enhance their financial capacity to invest in eco-friendly innovations (Ogunniyi et al. 2017).

Awareness of sustainable agribusiness initiatives was found to be the strongest determinant of participation. This finding reinforces the importance of education and outreach programs in driving sustainability adoption. Research has consistently shown that individuals who are well-informed about sustainability benefits are more likely to engage in environmentally responsible practices (Aina and Adeyemo 2022). However, the study also revealed that multiple or conflicting sources of information negatively impacted participation. This suggests that inconsistencies in sustainability messaging may create confusion and hesitation among processors. To address this, policymakers and extension services must develop clear, harmonized communication strategies that provide reliable, actionable information through trusted sources such as cooperatives, agricultural extension officers, and digital platforms (Omolayo and Femi 2019).

Despite the presence of significant constraints such as financial limitations, lack of technical know-how, and inadequate infrastructure, these factors did not significantly deter participation. This finding suggests that strong motivation, coupled with perceived long-term benefits, may enable processors to overcome challenges and engage in sustainable practices. However, this does not imply that constraints should be ignored. Research has emphasized that overcoming financial and technical barriers remains critical to scaling up sustainability adoption in agribusiness (Njoku and Okafor 2020). Public-private partnerships should be leveraged to provide infrastructure development, financial assistance, and training programs tailored to the needs of cassava processors.

Gender disparities in participation were evident, with men being more likely to engage in sustainable agribusiness initiatives than women. This finding aligns with studies highlighting systemic socio-cultural barriers that limit women's access to land, finance, and training opportunities (Ogunlana 2011). Addressing these disparities requires gender-inclusive policies that promote equal access to agribusiness resources (Ifejika and Ayinde 2021). Providing women with targeted financial support, specialized training, and leadership roles in cooperative organizations could enhance their participation and contribution to sustainable agribusiness development.

Marital status was another factor negatively associated with participation, as married individuals were less likely to engage in sustainability initiatives. This is consistent with previous findings suggesting that family responsibilities, economic constraints, and time limitations often restrict married individuals' ability to participate in new ventures (Agboola et al. 2020). To enhance participation among married processors, sustainability initiatives should incorporate flexible models that accommodate family commitments. Community-based sustainability programs, shared processing facilities, and financial incentives tailored for married individuals could help address this challenge.

The study also found that household size did not significantly influence participation, contradicting previous research that suggested larger households contribute more labor to agribusiness activities (Bamisile

et al. 2017; Ojo and Adebayo 2019). This may be attributed to increasing reliance on mechanized and semi-mechanized processing methods, reducing the direct impact of household labor availability. Future research should explore how technological advancements in cassava processing are shaping labor dynamics in agribusiness.

Overall, this study give emphasis to the complex interplay of socio-economic, informational, and institutional factors influencing participation in sustainable agribusiness initiatives (. Moving forward, policies should focus on expanding awareness campaigns, improving access to financing, promoting gender inclusivity, and strengthening infrastructure to facilitate sustainability adoption. Future research should investigate the long-term impact of sustainability interventions on cassava processors' productivity, profitability, and environmental outcomes. Additionally, exploring the role of digital tools in enhancing sustainability adoption could provide new insights into the future of agribusiness transformation in Nigeria.

Limitations

This study is contextually limited by its focus on cassava processors within Ido Local Government Area of Oyo State. While the choice of study area was purposive and justified by the prominence of cassava production and processing activities in the locality, the findings may not fully capture the experiences of cassava processors in other regions of Nigeria where socio-economic, cultural, and institutional conditions differ. Consequently, the results should be interpreted with caution, as they are most directly generalizable to contexts with similar demographic and agribusiness characteristics. Broader generalization to other LGAs, states, or countries should therefore be made with careful consideration of local variations in market structures, gender roles, financial systems, and extension service delivery. Future studies covering multiple regions and comparative settings would help to enhance the external validity of the findings.

5. Conclusions

This study examined the socio-economic characteristics of cassava processors in Ido Local Government Area, South-West Nigeria, and their participation in sustainable agribusiness initiatives. The findings revealed that middle-aged and older individuals dominate cassava processing, indicating a potential challenge for long-term sustainability as younger generations shift towards non-agricultural sectors. Education played an unexpected role, with higher levels associated with lower participation, suggesting that educated individuals may be drawn to non-agricultural careers. Financial constraints, while significant, did not strongly impact participation, implying that awareness and perceived benefits may be more influential. Awareness of sustainable agribusiness initiatives emerged as the most significant factor driving participation, while inconsistent sources of information negatively affected engagement. Gender disparities were also evident, with men participating more than women, reinforcing the need for policies that promote gender inclusivity in sustainable agribusiness.

The study contributes to the growing body of research on sustainable agribusiness by providing empirical evidence on the factors influencing participation among cassava processors. It highlights the importance of targeted interventions that address financial, technical, and informational barriers to sustainability adoption. The findings emphasize the need for structured training programs that integrate traditional knowledge with modern sustainable practices. Additionally, the study underscores the necessity of harmonized communication strategies to ensure clear and consistent dissemination of sustainability-related information. Policymakers, extension officers, and agribusiness stakeholders can use these insights to design initiatives that enhance engagement, particularly among women and younger individuals, to ensure long-term sustainability in the sector.

In conclusion, the research objectives were successfully addressed by identifying the key determinants of cassava processors' participation in sustainable agribusiness initiatives. The study reaffirms the importance of increasing awareness, improving access to financial support, and providing targeted training programs to enhance sustainability adoption. Future policies should focus on fostering youth involvement, bridging gender gaps, and improving market linkages for sustainably processed cassava products. Further research

should explore the long-term economic and environmental impacts of sustainable agribusiness initiatives, as well as the effectiveness of different policy interventions in enhancing participation in sustainability programs.

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