Comparative Factors Influencing Patterns of Participation in Cassava Value Chain Activities Amongst Smallholder Processors in Kwara and Kogi State, Nigeria

Eliza Aderonke Adedoyin*, David Ahmed Adamu**, Isaac Tunde Oyebamiji***, Deborah Adedoyin Olabode****, Olugbenga Agbana*****, Chiwendu Vivian Ohaeri******

A R T I C L E I N F O	A B S T R A C T
	Despite the high production of cassava in the two States, studies on processors value chain activities of cassava remain inadequate. This study ascertains comparative factors influencing patterns of participation in cassava value chain activities amongst smallholder processors in Kwara and Kogi States, Nigeria. A Multistage sampling technique was used in selecting a total of 179 and 200 respondents. The study describes the participation patterns in cassava processing of the respondents and to analyze the factor influencing the participation patterns amongst cassava processing in the study area. Results showed the mean age of respondents to be 43 and 42 for both States respectively. The result revealed that 34.1% and 38.0% of the respondents falls within age range of 21-30 years. Out of which 84% and 90% participated frequently in cassava processing in Kwara and Kogi States respectively. Factors influencing pattern of participation were age of respondents, years of experience in processing, frequency of extension visit/training and availability of raw cassava were all statically significant and have direct influence on the patterns of participation in processing activities in the Study areas. The study conclude that socio-economic factors play a key role in participation in cassava processing. The study therefore recommended that more training on best processing practices and ready access to raw cassava is required. Government and stakeholder should create policies that bridge the rareness in participation pattern through supply of processing facilities, ready market and increase in cassava supply, enhance frequent participation is assured and processors' livelihood were improved.

1. Introduction

Cassava (*Manihot esculenta*) is a staple food crop in Nigeria, contributing significantly to food security and economic stability in the region (Adebayo & Adeyemo, 2021). It serves as a major source of carbohydrates for millions of people and supports various processing industries. The processing of cassava into products such as garri, fufu, and flour has gained prominence as it enhances the crop's value. The processing of cassava into various products enhances its value and provides livelihood opportunities for numerous rural households (Ogunniyi *et al.,* 2019). Although cassava plays critical roles food available but many processors face challenges such as inadequate access to technology and financial constraints, which adversely affect their participation levels (Olajide & Baba, 2020). Research

*, **, ***, ****, *****, ****** Research Outreach Department, Nigerian Stored Products Research Institute Ilorin, Kwara State, Nigeria. Email addresses: adedoyinaderonke@gmail.com (E. A. Adedoyin), adamu.davida@gmail.com (Corresponding author D. A. Adamu), oyebamijiisaac@gmail.com (I. T. Oyebamiji), olabodedeb@gmail.com (D. A. Olabode), gbengamemories@gmail.com (O. Agbana), ohaerivivian92@gmail.com (C. V. Ohaeri).

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on the socio-demographic profiles of processors and participation patterns is limited, hindering tailored interventions (Davis et al., 2022). The underlying principle for value addition is premised on the prerequisite to increase rural processors incomes, create employment and investment opportunities for value chain actors and decrease postharvest loss thereby shelf life of products is extended. Focusing on value addition by small scale operator is important especially in developing countries like Nigeria. Value addition can aid farmers to claim part of the untapped profit going unclaimed in the production of food, fiber and industrial or other product from agricultural produce. Value addition is important for the agricultural sector which in turn translate to development through increased in per capital income (Kehinde and Aboaba, 2016).

Despite the significant benefits that cassava processing made possible in rural economies, processors in Kwara and Kogi states face various challenges that affect their participation levels and efficiency in the sector. These challenges include inadequate access to processing technologies, financial constraints, limited market access, and variable participation due to socio-economic factors. Furthermore, there is insufficient research on the socio-demographic profiles of cassava processors and the patterns of participation that could help in tailoring interventions to improve their productivity. This lack of understanding hinders efforts to optimize cassava processing and consequently affects the livelihoods of many households in these states. To effectively improve participation in cassava processing, it is imperative to assess socioeconomic characteristics of cassava processors, describe the participation patterns in cassava processing of the respondents, and to analyze the factor influencing the participation patterns amongst cassava processing in the study area.

2. Literature review

Westby (1991); Eforuoku and Oyewole (2019) affirmed that most of the cassava grown in Africa (88%) were utilized for staple food for human consumption, with more than half going into processed goods. Other were converted as feed applications for animal and industry uses (ethanol, starch) are still rather small. In some Nations, cassava is becoming an industrial and cash crop, despite the fact that it is still regarded as a staple in many others (Reincke et al., 2018). Although, cassava is produced largely by small-scale farmers using rudimentary implements. The average landholding is less than two hectares and for most farmers, land and family labor remain the essential inputs. Land is held on a communal basis, inherited or rented; cases of outright purchase of land are rare. Capital is a major limitation in cassava production in the southwest Nigeria; only few farmers have access to rural credit (Oguntuase et al., 2015). Cassava is usually consumed in processed forms. Cassava processing by traditional methods is labor-intensive but the increasing application of improved processing technology has reduced processing time and labor and encouraged increased production. Industrial utilization of cassava products is increasing but still accounts for less than 5% of the total production (Shittu et al., 2016).

3. Research Methodology

The study areas

The study was conducted in Kwara and Kogi States of Nigeria. The States are reported to be among the major producers of cassava in North central Nigeria. Descriptive and inferential Statistics were used to analyze the data. The Descriptive statistics include mean, frequency and percentage while multinomial

logistic regression analysis were used to make inference for the dependent variables. The assumption of linearity make the logistic curve to be interpreted as probability associated with each outcome across independent variable values. More so, no multicollinearity entails independent variables does not correlated amongst each other. Hence on this basis the model fit. Primary data was obtained through the administration of structured questionnaire. A multistage sampling techniques were used for this study. first stage include purposive selection of Kwara and Kogi state because of predominance in cassava processing, the second stage involved random selection of 5 communities each from the two states, while the third stage involve the use of Taro Yamane's at 0.05 confident interval because of it unbiased nature to select a representative sample size of 179 and 200 respondents from Kwara State and Kogi State respectively for this study out of the Agricultural development projects (ADPs) registered cassava processors.

4. Result and Discussions

Distribution of the socioeconomic characteristics of the respondents

The result in Table 1 shows the findings on socioeconomic characteristics of the respondents which revealed that 34.1% and 38.0% were between the ages of 21 to 30 years of age in both kwara and kogi states respectively. The mean age is 43 and 42 years respectively. The result indicated that the cassava processors in both states were youths and in their active age indicating that they are energetic to take up cassava processing activities. This finding is in tandem with the earlier study of Akomolafe, et al., (2023) who stated that individuals who are in active age group are highly productive in their undertakings. Furthermore, the distribution of marital status showed that majority (96.1%) and 42.5% were married in kwara and kogi states respectively. The result indicated that majority of the respondents in both states were married. Meaning that there is increase in labor supply as marriage confers responsibility. This is consistent with the studies of Ikwu-Oche et al (2024) who reported that cassava processing industry is dominated by married women. The distribution of educational qualification among women cassava processors revealed that 49.2% had secondary education in kwara state while, 47.0% had quranic education in Kogi states respectively.

Table 1. Distribution of socioeconomic characteristics of the respondents

	Kwara State		Kogi State	
Parameters	Frequency/Percentage	Mean	Frequency/Percentage	Mean
Age of respondents		43	42	42
≤ 20	3(1.7)		38(19.0)	
21 - 30	61(34.1)		76(38.0)	
31 – 40	56(31.3)		45(22.5)	
41 ≥	4(33.3)		41(20.5)	
Marital Status				
Single	7(3.9)		115(57.5)	
Married	172(96.1)		85(42.5)	
Educational Qualification				
Quaranic	35(19.6)		94(47.0)	

	Kwara State			Kogi State	
Parameters	Frequency/Percentage	Mean	Frequency/Percentage	Mean	
PGD	5(2.8)		43(21.5)		
HND/BSc	48(26.8)		41(20.5)		
Secondary	88(49.2)		2(1.0)		
Primary	3(1.7)		20(10.0)		
Household Size		6	7	7	
1 − 5	126(71.0)		187(93.5)		
6 − 10	44(24.6)		5(2.5)		
11 ≥	8(4.5)		8(4.0)		
Membership Association					
Yes	139(77.7)		188(94.0)		
No	40(22.4)		12(6.0)		
Frequency of Products Processed					
Starch	7(4.1)		15(7.5)		
Garri	128(71.5)		127(63.5)		
Cassava Flour	29(16.2)		27(13.5)		
Fufu	9(5.0)		8(4.0)		
Tapioca	5(2.8)		12(6.0)		
Ethanol/Spirit	1(0.6)		11(5.5)		
Reason(s) for Cassava Processing					
Commercial	123(68.7)		128(64.0)		
Personal use	56(32.3)		72(36.0)		

Source: Field Survey 2025

The findings of this study indicate that majority of women processors in the study area had either formal or non-formal education, level of education would influence their participation pattern in cassava processing. This is in tandem with the submission of Eze, et al., 2019 that level of education increases productivity and capacity. The distribution of respondents by household size in the table shows that majority (71.0%) and (93.5%) had 1 to 5 members in their household in kwara and Kogi states respectively. This result indicates a moderate family size and that the family members would constitute family labor for cassava processing activities. This is in line with the submissions of Adeniyi et al (2023) who reported that having large to medium household size is favorable as members would be used as source of labor thus reducing labor cost and increasing processing capacity of the household. Also, the distribution according to membership of association in the table shows that majority (77.7%) and (94.0%) were members of association in kwara and kogi states respectively. Membership of association facilitates access to resources, information and training on processing, this result is in tandem with the findings of (Adeyemo and Kehinde 2020) that females belong to agricultural related associations. Distribution of respondents by frequency of products processed revealed that garri majority (71.5%) and (63.5%) has the highest frequency of production in both Kwara and Kogi states respectively.

This is in line with the submission of Apeh et al 2023 that garri is the most widely consumed cassava food product by both rural and urban dwellers. Distribution of respondents by reasons for cassava processing reveals that majority (68.7%) and (64.0%) process cassava for commercial purposes in kwara and kogi states respectively. As cassava products has a high market demand and widely consumed by many this is congruent with the reports of Nwokugha, et al (2023) that growth in cassava production and processing is due to rapid growth of population, and large market demand. This could also drive many into cassava processing activities.

Patterns of Participation in Cassava Activities in the Study Area

The result in table 2 shows the various patterns of participation in cassava processing activities in the study area, the distribution of respondents that participated frequently were majority (84%) and (90%) in kwara and Kogi states respectively, this reveals that majority of the respondents habitually participated in cassava processing activities, and it is ranked first this could be due to the fact that cassava processing is their primary occupation and proceed would be instrumental in meeting immediate family needs.

Kogi state had high percentage of frequent processors than the result for Kwara state due to high production of cassava as Kogi State is rated as the second largest producer of cassava in Nigeria. This is consistent with the report of Kogi ADP (2022) in Ikwu-Oche et al (2024). That Kogi state is one of the leading cassavas producing state in Nigeria.

Table 2. Patterns of participation in Cassava processing Activities by the respondents

| Parameters | Kwara State | | Kogi State | | |
	Frequency	Percentage	Frequency	Percentage	Remark
Frequently	150	84	179	90	1st
Occasionally	24	13	18	9	2nd
Rarely	5	3	3	2	3rd

Source Authors Computation (2025)

The distribution of respondents that participated in cassava processing activities occasionally were 13% and 9% for kwara and kogi states respectively this finding implies that only a small portion of the respondents participated occasionally in cassava processing activities, this could be as a result of engagement in other income generating activities such as trading. The distribution of respondents that participated in cassava processing activities rarely were 3% and 2% in kwara and kogi states respectively, this finding implies that a very minute portion of the respondents participated rarely in cassava processing activities, this could be the part of the population who have the skills of cassava processing but engage in cassava processing for home use only.

Estimation of factor influencing the participation patterns amongst cassava processors

Table 3 show the results of the multinomial Logit analysis that showed the factors that influence the level of participation in cassava processing activities among processors in Kwara and Kogi State, Nigeria. The multinomial logistic for level of participation in processing activities were in 3 levels (1= rarely participating, 2= sometimes participating and 3= frequently participating).

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The coefficients were estimated for the two states using (Sometime participating= 2) as the reference group. Therefore, the inference from the estimated coefficients for each choice category was made with reference to group 2. The result shows that, the log likelihood value for Kwara was -134.54341 while Kogi was -135.0712.

The result for Kwara State shows the log likelihood value to be -134.54341, pseudo R^2 value of 0.1483 and the Prob.> Chi^2 0.0035 indicating a good fit and the correctness of the estimated model also confirmed that all the slope coefficients are not equal to zero. In other words, the explanatory variables are collectively significant in explaining the level of participation in cassava processing activities in the study area.

The result in the table shows estimated coefficient values, standard errors and p values of the independent variables in the model. The coefficient of the variables measures the expected change in the logit for a unit change in each independent variable, leaving all others constant. The sign of the coefficient shows the direction of influence of the variable.

The significant values show whether a change in the independent variable significantly influence the logit at a given level. In other word the degree to which choosing a level of participation 1, 2, or 3 can be explained by personal characteristic.

Table 3. Result of Multinomial Logistic Regression Model of pattern of participation in cassava value addition activities

Variables	Kwara State		Kogi State	
	Rarely participate 1	Frequently participate 3	Rarely participate 1	Frequently participate 3
Age of respondents	-0.1484828 (0.0786498)*	0.0159855 (0.0308153)	-0.0254101 (0.0410326)	-0.0077904 (.0318249)
Marital status	0.5496884 (1.502265)	0.0912473 (1.016005)	0.1763143 (0.7162682)	0.5168712 (.5889508)
Years of experience	0.155947 (0.0765748)**	0.0009716 (0.0438284)	0.0905316 (0.0751357)	0.1511361 (.0578927)***
Major occupation	0.8854775 (0.9249114)	0.8937742 (0.5206181)*	-0.2384086 (0.5950741)	-0.3007324 (.4813304)
Number of year in schooling	0.2151178 (0.1085814)**	-0.0319153 (0.0626642)	0.0341535 (0.0719405)	0.0509243 (.0565754)
Member of cooperative	-0.46067 (1.562754)	0.936647 (0.6450279)	-2.29698 (0.7291843)***	-1.420781 (.7165525)**
Income from cassava	1.70e-06 (6.54e-06)	4.57e-07 (3.99e-06)	0.0000154 (0.0000104)	0.0000136 (.0000102)
Frequency of visit	14.06511 (0.4217106)***	0.1845083 (0.1994643)	-0.1535635 (0.3432695)	-0.5318304 (.2295201)**
Household size	0.2058991 (0.2204214)	0.103075 (0.1050161)	-0.0946308 (0.1038247)	-0.266694 (.0822067)***

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	Kwara State		Kogi State	
Variables	Rarely participate 1	Frequently participate 3	Rarely participate 1	Frequently participate 3
Availability of raw Cassava	-3.276556 (1.507783)**	-1.238701 (1.281356)	0.0605937 (0.4578773)	0.2302201 (.3355239)
Cost of purchase	0.0000199 (0.0000817)	-0.0000862 (0.0000461)*	7.18e-06 (7.03e-06)	1.51e-06 (6.04e-06)
Profit from cassava	-8.24e-07 (6.48e-06)	-2.92e-06 (4.24e-06)	4.11e-06 (3.76e-06)	7.47e-06 (2.85e-06)***
Constant	-97.29847	-0.622203	0.2127995	1.798251
Pseudo R^2=	0.1483		0.2552	
Chi^2 =	46.86		92.56	
Prob.> Chi^2 =	0.0035		0.0000	
Log likelihood=	-134.54341		-135.0712	
No. of observation	178		200	
Note:	Sometimes participate 2, as the reference group		Sometimes participate 2, as the reference group	

*Source: Field Survey 2025. ***, ** and * denote significant level P< 0.01, P< 0.05 and P< 0.10*

The result indicates a predictor variable such as age of respondent and years of experience to be negatively significant at 0.01% and 0.05% level of probability respectively while Numbers of years spent in school, availability of raw cassava and frequency of extension visit are positively significant at 0.05% and 1% respectively as they influence level of participating in cassava processing activities among processors in Kwara State. These implies that there is probability that respondent's age and years of experience to change from (rarely level of participation) in processing activities to (sometime level of participation, reference group) will have negative affect on their livelihood.

On the other hand, Numbers of years spend in school, availability of cassava and frequency of extension visit support a claim of a change in level of participation from (rarely participating) to (Sometimes participating, reference group) as it will help improve respondents' livelihood positively. Furthermore, cassava processing as a major occupation was significant at 1.0% level of probability and it have a significant relationship with livelihood as a change from (sometime participating, reference group) to (frequently participating) have positive effect on the livelihood of respondents involve cassava processing activities.

On the other hand, the result for Kogi State shows the log likelihood value to be -135.0712, pseudo R^2 value of 0.2552 and the Prob.> Chi^2 0.0000 indicating a good fit and the correctness of the estimated model also confirmed that all the slope coefficients are not equal to zero. The result indicates a predictor variable of membership of cooperative which was negatively significant at 0.1% level of probability as it influences the level of participating in cassava processing activities among processors in Kogi State.

These implies that there is probability that an attempt to change from (rarely level of participation) in processing activities to (sometime level of participation, reference group) is being affected by membership in a cooperative and it will have negative affect on their livelihood of Kogi processors. However, years of experience and profit from processing activities were both positively significant at

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0.1% level of probability and they claim that a change in level of participation from Sometimes participating, (reference group) to frequently participating will help improve respondents' livelihood positively. This mean that the years processor have engaged in cassava activities and profit obtained is a motivating factor to frequency engage in cassava processing activities. Meanwhile both membership in cooperative and frequency of extension visit, and household size were negatively significant at 0.05% and 0.1% level of probability.

These implies that a change from (sometime participating, reference group) to (frequently participating) have negative effect on the livelihood of respondents involve cassava processing activities.

5. Conclusion and Recommendations

The study underscores the patterns of participation of cassava processors in Kwara and Kogi States Nigeria, revealing the patterns of participation and factors influencing patterns of participation in cassava processing activities. Majority of cassava processors in the study area were young, married, and both formally and informally educated women with medium household size, their considerable level of education informed their membership of agricultural related association in order to meet the high market demand as a result of rapid population growth. The pattern of participation revealed that majority of the respondents participated frequently in cassava processing activities in both states, however, high percentage of processors was recorded in Kogi State than in Kwara State, because of interventions on cassava production and prevalence of high production of cassava in kogi state. The study concludes by affirming that socio-economic factors play a key role in participation in cassava processing. The study therefore recommended that processors can be better if more training on best processing practices and ready access to raw cassava in ensured. Government, donor- agencies and stakeholder should create policies that bridge the rareness in participation pattern through supply of processing facilities, ready market and increase in cassava supply, enhance frequent participation is assured and processors' livelihood were improved.

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