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Original Research Article

Examining the Adoption of Improved Cassava Processing Technologies among Women in Abaji Area Council, Abuja: Implications for Sustainable Farming Practices

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Abstract

The research study was carried out to investigate women's adoption of enhanced cassava processing technology in Abaji Area Council. 152 respondents were selected at random. Descriptive statistics, regression analysis, and the Z-test statistic were utilized as analytical tools. According to the findings, the respondents' average age was 35. Age, household size, processing experience, and association participation were significant predictors of the adoption of better cassava processing technology, in accordance to the regression analysis. The coefficient of determination (R2) turned out to be 0.47, indicating that the model's chosen parameters could account for 47% of the variability in the adoption of enhanced cassava processing technology. Indicating that the respondents' output and income increased following the adoption of enhanced cassava processing technologies, the Z-stat (20.04) for output was higher than the Z-critical (1.98) and the Z-stat (24.30) for income was higher than the Z-critical (1.98) respectively. Both of these differences were significant at p<0.05. The respondents' main challenges include poor financing, poor extension contacts, expensive cassava tubers, and expensive cassava processing machine rental fees. The study came to the conclusion that household size, age, processing experience, and association membership were significant and should be taken into account for assuring widespread adoption of enhanced cassava processing methods. Consequently, it is advised that the female cassava processors establish cooperatives so that they can pool their financial resources for future investment. By providing services, particularly in areas that exhibit low adoption in this study, such the mechanical sifter and fryer, the extension services on better cassava processing technologies should be emphasized in the study area. Governmental and non-governmental organizations should provide women who process cassava with improved technologies.

Keywords: Adoption, technologies, cassava, sustainable, farming, practices

INTRODUCTION

For many small-scale enterprises, including bakeries, quick food chains, restaurants, and gari processing businesses, cassava has evolved into a fundamental raw resource (Nyanda, 2015). Following the presidential cassava initiative of Nigeria, cassava maintains a key role in foreign exchange revenues. Through this project, cassava's potential was brought to public attention. The initiative was aimed at promoting cassava as a potential source of foreign exchange and to create a production system that could meet the nation's demand (Ajayi and Olutumise, 2018; Ayeni et al., 2023). It is impossible to overstate the position and capacity of women to meet the demands of agricultural growth (Aziz, Ren, Rong and Zhou, 2021).

According to Koyenikan and Obar (2015), women dominate agricultural production in Nigeria. It is also not new for them to actively participate in African agriculture in general. Similarly, Pattnaik and Lahiri-Dutt (2022), stated that women play important roles in the home economic life of society and their contributions to agricultural output should never be undervalued. All across the world, women have important roles in agriculture. Women make up about 80% of food producers, 70% of agricultural workers, 10% of people who process foods, and 60–90% of rural marketers, accounting for more than two thirds of the agricultural workforce (FAO, 2015; Uduji, Okolo-Obasi and Asongu, 2019; Sati, Sennuga, Bamidele, Alabuja, and Osho-Lagunju, 2023). They handle the bulk of the cassava processing, which gives them an additional source of income and improves their capacity to aid food security for each of their families. According to FAO (2015), women in Nigeria's central zones, southwest, and southeast regions each contribute around 58%, 67%, and 57% of the nation's total agricultural work.

Several policies supporting the cultivation, processing, and marketing of cassava have been developed as a result of government involvement and NGO activities. Through this initiative, processing technology development and rural infrastructure have advanced significantly. Many labor-intensive processing procedures, including grating, dewatering, and milling, have been automated (FAO, 2015; Achngwa, Sennuga, Osho-Lagunju and Alabuja, 2023). According to Uzochukwu, Mgbedike, and Chukwujekwu (2021), research in engineering in Nigeria as well as other African countries has effectively automated parts of the time-intensive and laborious cassava processing methods. As a result, it's crucial to use the right technology or equipment for both industrial and domestic usage. As a result, in order to understand the possibilities and limitations, it is necessary to evaluate the level of acquisitions of these applicable technologies. Numerous factors, including socioeconomic, institutional, and technological ones, affect the use of better agricultural technology (Borges, Foletto, and Xavier, 2015; Koyenikan and Obar,2015; Maisule Sennuga, Osho-Lagunju and Alabuja, 2023).

FAO (2015) noted that farmers' use of research findings is generally relatively restricted in many emerging nations. This is partially because many farmers in emerging nations reside in rural areas with little informational resources. Due to the country's low levels of food production and processing, approximately 75% of Nigerians dwell in rural areas and depend on agriculture for their livelihood. Despite this, they spend a significant percentage of their money on food. Poor processing is a significant factor in post-harvest losses worldwide, with a focus on poor nations like Nigeria (FAO, 2015). According to Uzochukwu, Mgbedike, and Chukwujekwu (2021), about 41% of grown cassava produce in West Africa is processed into chips as well as flour. Cassava is a highly perishable root and tuber crop, degrading between two and three days afterwards harvest. As a result, it needs to be processed as quickly as possible after being harvested. Cassava also includes cyanogenic glucoside, an allergen that is normally removed after processing. As a result, cassava is often sold as a processed product instead of as a raw vegetable, as are other roots as well as tubers (Ekele, Sennuga, Osho-Lagunju and Alabuja, 2023).

Cassava processing requires much labour and is frequently marked by little productivity per hour, and a lot of tedium. Therefore, it is crucial to place a focus on the right technologies to boost food supply through better processing and preservation. The Abaji Area Council has enhanced cassava processing technology such as fryer (toaster), screw press, mechanical grater, and mechanical sifter. The inclusion of women farmers in processing cassava is the sole study that is currently accessible. Therefore, research needs to be started to analyzing the factors affecting women's adoption of better cassava processing strategies. This will give the women processors or farmers the tools they need to get past the obstacles in their way and adopt enhanced cassava processing technology for an improved and successful processing business. The following are the study's objectives:

- describe the socioeconomic characteristics and institutional characteristics of women processors in the research region using enhanced cassava processing technologies
- identify the socioeconomic, institutional, and technological variables impacting women cassava processors' adoption of better cassava processing technology in the research area
- assess the influence of enhanced cassava processing technologies on the income and output of women processors in the study region.
- highlight the barriers to the implementation of enhanced cassava processing technology.

LITERATURE REVIEW

Theoretical Framework

The theory of social change employing the diffusion and use of perspectives will serve as the theoretical basis for the present research. Rogers (1971) defines social change as the channel through which the framework and operations of a system of society change. Social change can also be defined as a shift in a society's social order. Modifications in nature, societal structures, social behaviors, or social relations are examples of social change. Cultural, religious, scientific, or technical causes can all drive social change. A social system could encompass a society, a community, an area, an entire nation, or a geographical area. According to Nzeh (2015),

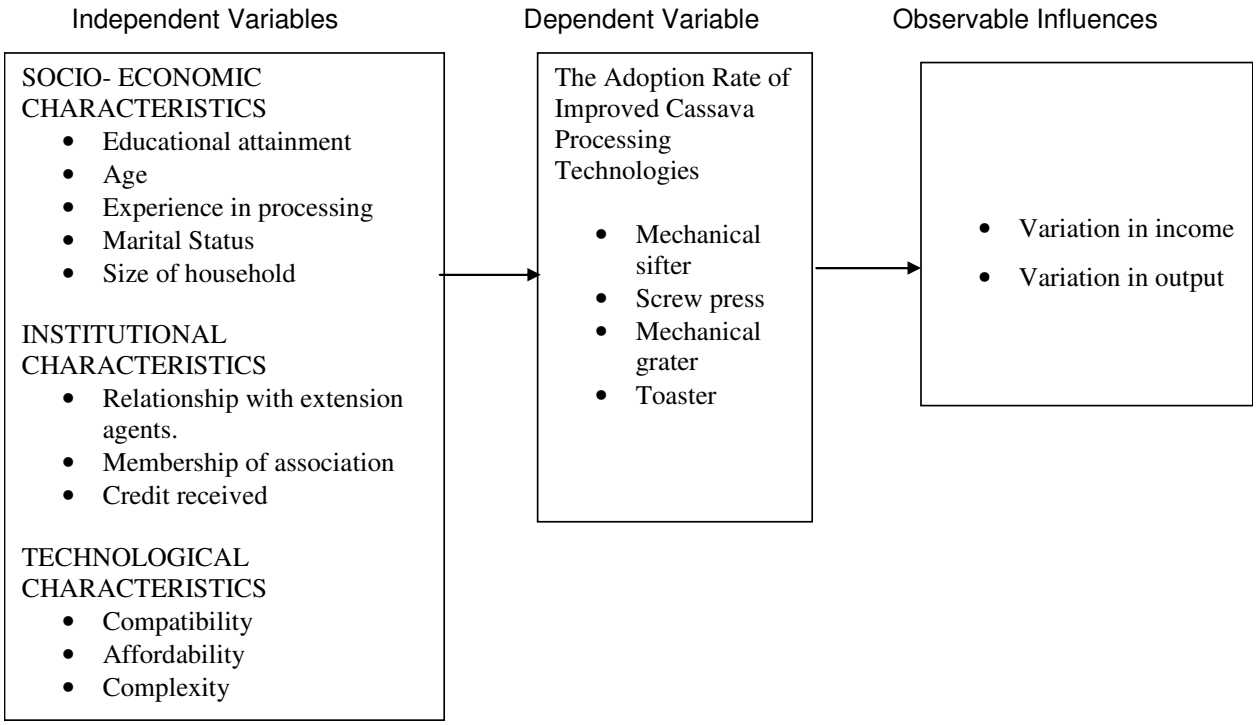

Figure 1. Conceptual Framework

social changes are primarily brought about by invention, dissemination, and discovery and may relate to changes through time in behavioral patterns, norms, and values.

Theories of social change are usually focused on explaining the root causes of social change, the time span of change, and the influence of change on an evolving unit (Ani, Ojila, and Abu,2019; Ayeni, Sennuga, Osho-Lagunju and Alabuja, 2023).There are two sources of change: the first source is the occurrence of unusual or random elements, such as the environment, the weather, or particular racial or ethnic groupings. System factors are still another factor. For instance, an adaptable administration, adequate access to free resources, and a broad social structure are all important for effective development. Social change can be either intentional or spontaneous. Intentional change is a conscious, planned, and purposeful attempt by a number of agents to effect change (Rogers, 1995). The ADP purposefully established the technology in the region to increase output and, as a result, revenue from cassava processing, therefore the incorporation of enhanced cassava processing technologies by women farmers or processors in Abaji Area Council is an intentional development.

Conceptual Framework

Figure 1 shows a representation of the framework that highlights the variables influencing women who are processors in the study area's adoption of better cassava processing technologies. The independent variable in the study's model is:

i. Socioeconomic factors which includes educational level, age, size of household, processing experience as well as marital status.

ii. Institutional variables, which include credit received, relationships with extension agents as well as membership of association.

iii. Technological factors such as compatibility, affordability and complexity. The adoption rate of improved cassava processing methods is the dependent variable. Mechanical sifter, screw press, fryer (toaster) and mechanical grater were among the technologies proposed. Figure 1 depicts how the independent variables (X) influence the dependent variable (Y), that determines the rate of adoption of improved cassava processing methods. The observable benefits of adopting enhanced cassava processing technology are changes in cassava processing output and changes in processor income.

MATERIALS AND METHODS

Study Area

This study was conducted in Abaji Area Council, situated in the Federal Capital Territory (FCT) of Nigeria. Abaji Area Council is bordered by neighbouring area councils,

including Kuje to the north, Gwagwalada to the east, Kwali to the west, and Kogi state to the south. Abaji area council encompasses various rural and semi-urban settlements, including agricultural and natural landscapes. The populace of Abaji Area Council engages in diverse occupations. The area's economy is predominantly agrarian, with a significant portion of the population involved in subsistence farming, crop cultivation, and animal husbandry.

Sampling Procedure and Sample Size

The study's intended audience is the female residents of Abuja's Abaji Area Council. 152 women from the survey area were needed which was the total sample size for the study. Simple random sampling was utilized. The decision was made in light of the region's significant participation of women farmers involved in cassava processing.

Method of Data Collection and data analysis

Primary sources of data were utilized in the conduct of this investigation. The information was gathered via a structured questionnaire that enumerators gave to the female cassava processors. Respondents' socio-economic factors, such as education level, size of household, age, marital status and processing experience, were the main subjects of the data collection. Additionally, data on institutional traits such association membership, credit received, and interactions with extension agents were gathered. Additionally, data regarding technological traits like complexity, affordability, compatibility was gathered.
The analytical tools used were:
i. Regression analysis
ii. Descriptive statistics iii. Statistics from the Z-test.

To accomplish objectives i and iv, descriptive statistics that use measures of central tendency including mean, frequency distribution, tables, and percentages were used.

Regression was employed to meet objective (ii), which was to discover the factors influencing women's adoption of more effective cassava processing technology in the study area. The model's function is specified as follows:

$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + \ldots\ldots\ldots\ldots\ldots\ldots + b_{11} X_{11} + e$ …(1)

Where
Y = Use of enhanced cassava processing technology.
X1 = Age
X2 = Marital status
X3 = Educational attainment (number of years in school)
X4 = Number of people in the household
X5 = Number of years processing
X6 = Contact with extension agents (number of visits)
X7 = Received credit (amount in N)
X8 = Association membership (number of years)
X9 = Technology affordability
X10 = Technology compatibility
X11 = Technological Complexity
b1-b11 are the coefficients.
e = error term
a = constant

The Z-test statistic was employed for achieving objective (iii). That is, to investigate the influence of enhanced cassava processing technology adoption on output as well as income prior to and following adoption. The Z - test statistic was used to compare the production and income of women processors prior to and following adoption during 2010 and 2023. The Z - test is illustrated below:

$$Z = \frac{\overline{X1} - \overline{X2}}{\sqrt{\frac{S_1^2}{n1} + \frac{S_2^2}{n2}}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Where:
Z = The Z value
$(\overline{X1})$ = Mean output/income of women following implementation of enhanced cassava processing technologies
$(\overline{X2})$ = Mean output/income of women prior to adoption of better cassava processing technologies
S_1^2 denotes the standard deviation of women's output/income following the introduction of enhanced cassava processing methods
S_2^2 denotes the standard deviation of women's output/income prior to the deployment of better cassava processing methods.
n1 = number of women cassava processors following the deployment of better cassava processing technologies;
n2 = number of women cassava processors prior to the adoption of improved cassava processing technologies

RESULTS AND DISCUSSION

Socio-Economic, Institutional and Technological Characteristics of the Respondents

Table 1 shows that 41% of respondents were within the ages of 21 and 30, 26% were between the ages of 31 and 40, 24% were between the ages of 41 and 50, and 7% and 1% were between the ages of 51 and 60 and 61 and 70, respectively. The average age of the respondents is 35. In accordance to the findings, 68% of respondents were between the ages of 21 and 40. This indicates that the responders are in their prime, active, and productive years. This supports Lee, Kim, Shin and Hwang (2018) observation that farmers' younger and more active ages are mostly related to how they perceive and implement innovation. Women can nowadays make important decisions and have an impact on agricultural

Table 1. Summary of Socio-economic and institutional characteristics of respondents (n = 152)

Characteristics	Frequency	Percentage (%)	Mean
Respondents' age (years)			
21-30	63	41.45	
31-40	40	26.32	35
41-50	37	24.34	
51-60	11	7.23	
61-70	1	0.66	
Marital status			
Single	22	14.47	
Married	104	68.42	
Divorced	10	6.58	
Widowed	16	10.54	
Level of Education			
No formal schooling	25	16.44	
Primary schooling	67	44.07	
Secondary schooling	47	30.92	
Tertiary schooling	13	8.95	
Household size			
1-5	35	23.03	
6-10	72	47.37	
11-15	37	24.34	
16-20	8	5.26	
Processing experience			
1-5	32	21.05	
6-10	38	25.00	
11-15	46	30.26	
16-20	25	16.45	
21-25	11	7.24	
Extension contact			
No access to extension contact	111	73.03	
Have access to extension contact	41	26.97	
Credit accessibility			
Accessible	31	20.39	
Not accessible	121	79.60	
Membership of association			
Possessed membership	31	22.39	
Do not possess membership	121	77.61	

Source: *Field survey, 2023*

processing and technological growth in general during this energetic and prime age range from (21-40).

According to Table 1, 14% of respondents are single, 68% are married, and 7% and 11%, respectively, have been divorced or widowed. 68 percent of those surveyed were married. This is in line with Nzeh (2015) asserting that the vast majority of married women in rural areas work in agriculture. This is consistent with the results of Oyemma, Tokula, Tertsea, and Chimla (2019), who discovered that married people have more family responsibilities than single people, such as paying for the needs of the entire household and expanding family labour.

Table 1 also shows the distribution of responders by educational attainment. 16% of those surveyed had no formal schooling. Approximately 44% of persons had completed primary school, 30% had completed secondary school, and 9% had completed postsecondary education. The average amount of time spent in formal schooling is five years. This implies that they demand more instruction from extension agents about the importance and deployment of improved technologies. Education influences how people embrace innovations, according to Tesfaye and Seifu (2016).

The study depicts that respondents with household size of six to ten members had the largest percentage (47%), followed by those with eleven to fifteen members (24%), and those with one to five members (23%). Only 5% of respondents lived in households size involving 16 to 20 people. Nine people make up the respondents' average household size. This is comparable to the findings of Odediran, Ashimolowo, Sodiya, Sanni, Adebayo, Ojebiyi, and Adeoye (2015) who stated that when size of household increases, labor availability increases and household income requirements increase.

Based on the study's findings (Table 1), 21% of

Table 2. Average scores of technological characteristics

Characteristics of technology	Mechanical grater	Screw press	Mechanical sifter	Fryer (Toaster)	Mean score	Overall perception
Affordability	56.0	61.4	48.8	63.2	1.5	Not affordable
Compatibility	119.2	122	100.8	113.2	3.0	Compatible
Complexity	48.5	44.8	56.2	49.41	2.3	Not complex

Source: *Field survey, 2023*

respondents had 1 to 5 years of processing experience, 25% had 6 to 10 years of processing experience, 30.3% had 11 to 15 years of processing experience, and 16% and 7% had 16 to 20 years and 21 to 25 years of processing experience, respectively. The average period of processing experience was ten years. According to the findings, 72% of respondents had 6 to 20 years of processing experience. This backs up Vihi, Chomini, Tor, Jesse, Dalla, Bassey and Owa (2022) claim that farmers with significant agricultural experience are more satisfied with the restrictions, boosting their acceptance of creative solutions to production restrictions.

According to Table 1, 73% of respondents have never had a contact from or been to an extension agent during the years of their processing. In the past two years, extension agents have only visited 27% of the respondents. This implies that the extension visit rate is insufficient. This supports the research of Odediran *et al.* (2015), who discovered that extension personnel had little with women processors. Nwaobiala (2018) noted that half of the people surveyed had no extension contact when conducting a review of the implementation of extension services on enhanced cassava technologies among cassava farmers in Osun State. As a result of greater contact with extension personnel, women are likely to learn modern methods of cassava farming and processing (Nyanda, 2015).

According to Table 1, 80% of respondents were not given credit, while just 20% of respondents did. This indicates that a large percentage of respondents lacked credit. Ani, Ojila and Abu (2019) emphasized the need of loan access in their study of women's engagement in crop production. They revealed that 63% of the surveyed respondents did not have access to farm loans since women are seldom considered as creditworthy due to a lack of collateral. According to Table 1, 78% respondents are not related to any associations, while only 22% do. This implies that the most of the respondents do not participate in any associations. This is congruent with the findings of Maisule, Sennuga, Bamidele, Alabuja and Osho-Lagunju (2023), who discovered that 81% of respondents in their study were not associated or related to any associations.

Table 2 displays the respondents' average weighted scores for the technological characteristics. With a mean score of 1.4, affordability suggests that respondents do not find the technologies not affordable. The respondents are unable to purchase the technologies because of their high expense. The technologies are thought to be compatible with the respondents' typical methods of processing cassava based on compatibility's mean score of 3.0. Finally, complexity has an average score of 1.3, indicating that the technologies are neither difficult or tough for those who responded to use.

Technological characteristics of respondents

The respondents' mean scores for technological characteristics are displayed in Table 2 below. The respondents find the technologies not affordable, as indicated by the average score of 1.5 for affordability. The cost of the technologies prevents the respondents from purchasing them. The technologies agree with the respondents' customary techniques of processing cassava, according to compatibility, which had an average score of 4.0. Finally, complexity had a mean score of 2.3, suggesting that the respondents find the technologies to be simple and easy to use.

Socio-Economic, Institutional and Technological Factors Affecting the Adoption of Enhanced Cassava processing Technologies by Women

The adoption and use of novel methods for processing cassava does not much depend on the socioeconomic characteristics of the women who process the crop. The socioeconomic characteristics taken into account included marital status, age, level of education, household size, and years of processing. The finding, which is shown in Table 3, indicated that three of the five socio-economic factors taken into account had a significant impact on the adoption of enhanced cassava processing technology. Age significantly influenced the adoption of better cassava processing technology at the 1% level of probability and had a negative regression of 0.048. This suggests that as people get older, they adopt less of the newer technology for processing cassava. This concurs with Maliumo and Onuwa (2022) finding that the use of advised onion producing practices was significantly influenced by age. At a 10% probability level,

Table 3: Effects of socio-economic, institutional and technological variables on adoption

Variable	Co-efficient	S. error (%)	t-value
Socio-economic variables			
Age	-0.048	0.017	-2.84***
Marital status	-0.070	0.081	-0.86NS
Educational status	0.019	0.017	1.14NS
Household size	0.118	0.064	1.83*
Processing experience	0.086	0.029	2.98***
Institutional variables			
Credit received	$1.42e^{-06}$	$1.42e^{-06}$	0.97NS
Membership of association	0.036	0.017	2.02**
Extension contact	0.131	0.083	1.57NS
Technological variables			
Affordability	0.049	0.017	2.76***
Compatibility	0.017	0.018	0.96NS
Complexity	-0.051	0.023	-2.17**

R^2 = 0.47, F value = 4.778*** NS=Not significant
Source: *Field survey, 2023*

the adoption of enhanced cassava processing technology was significantly influenced by household size, which had a positive regression of 0.118. This suggests that as numbers of households' size rise, so does the adoption of better cassava processing methods. This is because of the fact that larger households result in higher family labour being available and more demand for revenue. At a 1% probability level, the respondents' processing experience significantly influenced the adoption of enhanced cassava processing experience with a positive regression of 0.086. This shows that more enhanced cassava processing experience were adopted due to the respondents' increasing processing experience. Adoption was unaffected by marital status either being married or unmarried, and had a negative regression coefficient of 0.070. This suggests that adoption or non-adoption of more advanced cassava processing methods is unaffected by marital status. The adoption of more advanced cassava processing methods was not significantly influenced by educational status, which had a positive regression coefficient of 0.019. This suggests that a formal education is not necessary for cassava processing. Because the machines are frequently managed by men and with no clarification from extension agents, even people with little to no educational background can adopt the improved cassava processing technology. Thus, the null hypothesis, claims that female cassava processors' socioeconomic position had no apparent effect on their adoption of improved cassava processing methods, is debunked. Table 3

The adoption and use of more advanced cassava processing technologies is not significantly influenced by the institutional characteristics of the women processors of cassava. Credit received, association membership, and extension visits were taken into consideration as institutional considerations. At a 5% level of likelihood, association membership had a substantial influence on the adoption of better cassava processing methods, with a positive regression of 0.036. This suggests that association membership improves the adoption of enhanced cassava processing methods. This concurs with Wang, Sarkar, and Qian (2021) finding that association membership has a major impact on farmers' adoption behavior. Credits received has no discernible impact on the adoption of new technology for processing cassava. This contradicts Lee, Kim, Shin and Hwang (2018) assertion that credit is crucial for the effective application of cassava processing technologies. Additionally, extension contact has little impact on adoption. The null hypothesis, which claims that female cassava processors' institutional characteristics have no detectable influence on the adoption of superior cassava processing technologies, has been accepted.

The adoption of newer technology for processing cassava is unaffected by the technological characteristics of the women processors. The study took affordability, compatibility, and complexity of technology characteristics into account. At a 1% likelihood, affordability had a substantial impact on the affordability of enhanced cassava processing technology with a positive regression coefficient of 0.049. This implies that adoption rises in direct proportion to respondents' capacity to purchase new technologies. Compatibility did not significantly affect the adoption of better cassava processing technology, with a positive regression coefficient of 0.017. At a 5% likelihood, complexity had a substantial impact on adoption with a negative regression coefficient of 0.051. This suggests that as complexity rises, adoption declines. Complexity and affordability were the two that were significant.

Table 4. Impact of adoption of enhanced cassava processing technologies on the output

	Output Before Adoption (kg)	Output After Adoption (kg)
Mean	81.052	173.158
Standard deviation	50.868	72.703
Observations	152	152
Pearson Correlation	0.585	
Hypothesized Mean Difference	0	
Df351		
z Stat	-44.045	
P(Z<=z) one-tail	9.511E-54	
z Critical one-tail	1.655	
P(T<=z) two-tail	2.702E-53	
z Critical two-tail	1.88*	

*P<0.05
Source: *Field survey, 2023*

Table 5. Effect of adoption of improved cassava processing technologies on the income

	Income Before Adoption (₦)	Income After Adoption (₦)
Mean	398315.789	778736.842
Standard deviation	224204.1	260845.1
Observations	152	152
Pearson Correlation	0.713	
Hypothesized Mean Difference	0	
Df	151	
z Stat	-34.296	
P(Z<=z) one-tail	3.431E-54	
z Critical one-tail	0.6550	
P(T<=z) two-tail	5.861E-54	
z Critical two-tail	1.78*	

*P<0.05
Source: *Field survey, 2023*

According to Ehinmowo and Fatuase (2016), adoption of more advanced cassava processing technology was influenced by affordability and complexity. The null hypothesis, according to which the adoption of better cassava processing technology was not significantly influenced by the technological traits of the female cassava processors, is thus disproved.

Influence of Adoption of Improved Cassava processing Technologies on Output and Income of Women Processors

Table 4 depicts the influence of enhanced cassava processing technologies on the productivity of female cassava processors.

According to Table 4, the average production prior adoption was 81.05 and the mean quantity produced after adoption was 173.16. The standard deviation before adoption was 50.87 as well as 72.70, respectively. The computed Z - value was 24.04, which is greater than the critical value (Z - critical) of 1.88 at 5% probability.

According to table 5, the average pre-adoption income was $398,315.79, and the average post-adoption income was $778,736.44. The standard deviation for income prior to adoption was 224204.1, while after adoption it was 2608451. The calculated Z was 34.30, which was greater than the 1.78 Z-critical value. The calculated Z-values for output and income were both higher than the Z-critical value. The null hypothesis claims that introduction of better technologies for cassava processing has no discernible influence on the income and output of women cassava processors, is thus refuted. The analysis's findings show that the output and revenue in the research area varies significantly before and after the implementation of better cassava processing technologies. In other words, the women cassava processors in the research area saw a spike in revenue due of the adoption of better cassava processing methods, which led to greater output. The outcome is congruent with the results of Vihi, *et al.* (2022), who examined the factors affecting the enactment of suggested cassava production practices in Vandeikyain Benue State and found that doing so increased overall

Table 6. Distribution according to constraints to adoption of improved cassava processing technologies

Constraints	*Frequency	Percentage	Rank
Insufficient credit facilities	121	79.6	1
Insufficient extension contact	111	74.0	2
Exorbitant cost of transportation	107	70.4	3
Exorbitant cost of machines	96	63.2	4
High cost of cassava tubers	84	55.3	5
Cassava tubers bulkiness	72	47.4	6
Poor access roads	12	7.89	7
Long-distance processing facility	9	5.92	8

*Multiple responses
Source: *Field survey, 2023*

production by raising farmer income and yield.

Constraints to Adoption of Improved Cassava Processing Technologies

According to Table 6, which 80% of respondents provided, insufficient finance facilities were the top limitation. Insufficient credit facilities are a serious issue, especially for women, as they are less able to completely adopt new technology and as a result, are less productive. Insufficient extension contact came in second as 74% of respondents complained that extension agents had never visited them and that the visits were infrequent.

High transportation costs and high machine costs came in third (70.4%) and fourth (63%) place, respectively. Transporting cassava tubers from the field or market to the processing plant cost the women respondents a lot of money. Additionally, the cost of transporting cassava to markets is significant. Additionally, because most people cannot buy the upgraded cassava processing equipment, they must spend a lot of money carrying their products to and from the processing facilities where they look for rental equipment. Cassava tubers' high price came in at number five (55%) and their heaviness at number six (47.4%). The cassava tubers are very heavy in that, it is exceedingly challenging to transport them. Poor access roads (7.89%) and a significant distance to processing locations (5.93%) are two other restrictions, which were placed 7th and 8th, respectively.

CONCLUSION

It is clear from the results that most of the women who process cassava in the research region are young and married. Low extension visits were also found by the studies. Only a small percentage of respondents received visits from extension agents. This suggests that the minority of people who obtained information from extension agents are the only ones. Age, family size, processing expertise, association membership, affordability, as well as complexity were shown to be relevant and significant elements when adopting enhanced cassava processing technology in the research area. The R^2 of 0.47 suggests that any plan intended to ensure widespread use of better cassava processing technology should insist on taking these aspects into account. The z-test statistics show that respondents' output and revenue rose after adopting better cassava processing methods. This suggests that the respondents' output and revenue surged due to the use of enhanced cassava processing methods.

The following recommendations are based on the findings of the study:

i. The respondents' main challenge was having access to suitable financing facilities. The women who process cassava should establish cooperative organizations so that they can pool their financial resources and make loans to one another for future investments.

ii. Extension services on better cassava processing technologies ought to be increased by providing services, especially in areas where the mechanical sifter exhibit low acceptance.

iii. Government alas well as non-governmental organizations should work together to provide and fairly distribute enhanced cassava processing technologies in the research area in a bid to close this gap. The female cassava processors ought to organize as well into groups so they may independently buy these technologies.

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