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CONTRIBUTING FACTORS AND RESTRICTIONS TO THE PARTICIPATION OF RURAL WOMEN IN CASSAVA PROCESSING IN ISIUKWUATO AREA OF ABIA STATE, NIGERIA

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Abstract

Women play a crucial role in the Nigerian Agricultural sector ranging from production to processing and marketing. About 80% of small scale cassava clusters in the western part of Nigeria are owned and operated by women. The study sought to analyse the restrictions and factors that contribute to the participation of rural women in cassava processing in Isiukwuato area of Abia State, Nigeria. Multistage sampling technique was employed in the selection of eighty (80) respondents from whom data were elicited. Data were analysed using descriptive statistics and the probit regression model. The result showed that the respondents were young ($\bar{X}$ 44.19), with majority married (78.75%), had a mean household size of ($\bar{X}$ 5.16) persons, attained various levels of education but were small scale farmers with a mean farm size of (1.98) hectares. The probit regression estimate showed that the coefficients of age, education level, farm income, cooperative membership, household size and extension contact influenced the participation of the respondents in cassava processing at varied levels of significance. The model posted a pseudo R^2 of (0.6303). Like every other business, the respondents faced restrictions like poor storage facilities, low quality of cassava roots, discolouration and uncontrolled fermentation, inadequate supply of cassava roots all year round among others. Based on the findings, the study suggested the introduction of contract farming in the area, which will ensure a reliable supply of cassava roots for large scale processing and incorporating gender perspective into all agricultural interventions by the government to ensure equal impact.

Key words**:** *cassava processing, contributing factors, participation, women*

INTRODUCTION

Cassava, a starchy root crop and major source of food security in Africa has the ability to grow in low quality soil, is drought and disease resistant and has a flexible cycle of cultivation [18, 30]. Cassava alongside maize, rice, yam, sorghum and millet has been identified by [22] as the major staple food in Nigeria. It is one of the many crops promoted by the federal government of Nigeria through the Agricultural Transformation Agenda (ATA) initiated in 2011 to boost local food production and is cultivated by over 30 million farmers in the country [12]. According to [13], Nigeria is the world's leading cassava producer, contributing about 21% of the product in the global market. Fresh cassava roots is highly perishable and one of the ways of reducing loss is through processing, which helps to increase its shelf life. Cassava is consumed in processed form, [17] stated that in Nigeria the main traditional cassava products are *garri*, *fufu* and *lafun.* Recently, there has been an increase in *garri* processing because it is seen as convenient, quick and easy to cook and store. *Fufu* and *lafun*, also in their order of importance are gaining popularity because of their ease of preparation and compact packaging. According to [15], the operations involved in cassava processing include peeling and grating, fermentation, dewatering, roasting and frying, drying, cooking and milling. Apart from pressing or dewatering which involves the exerting a lot of energy done by men, other operations are done by women. Women play a crucial role in the Nigerian agricultural sector ranging from production to processing and marketing. [2] observed that about 80% of small scale

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cassava processing clusters in the western part of Nigeria were owned and operated by women. However, these clusters suffered from inefficiencies emanating from limited financial resources for both maintenance and business expansion, high land rent, low processing technology, poor access to improved cassava varieties and markets. [15] added other constraints faced by women in cassava processing to include lack of steady supply of roots, drudgery in the traditional operations involved in the process, inadequate storage facilities for both raw and finished products, long processing tie and low returns from product sales [11], ineffective linkages between processors, farmers, transporters and marketers [6]. Hence, to reach the targeted processing capacity and quality for Nigeria, the type of processing technology for small scale processors especially women would have to be improved upon significantly [2]. This background informed the basis for the study. The study was driven by the following objectives, to:

(i)determine the socio economic characteristics of cassava processing rural women;

(ii)analyse the factors affecting rural women participation in cassava processing;

(iii)identify the constraints faced by rural women involved in cassava processing in the study area.

MATERIALS AND METHODS

The study was conducted in Isuikwuato Local Government Area of Abia State in south eastern Nigeria. The Local Government is made up of several villages, with the headquarters at Mbalano Imenyi. The notable landmarks in the area include the Abia state University Uturu and the Uhuchukwu cave in Ahaba-Imenyi. As at the 2006 national census, the local government area had a population of 115, 794 people with a projection of 151, 700 people in 2016 [20].

The coordinates of Isuikwuato are Latitude: 05^0 32' N and 05^0 53' N, longitude: 07^0 29' E and 07^0 48' E of the Greenwich Meridian and a land mass of 375,000 square kilometres. The area falls within the forest belt region of Nigeria which accounts for rainfall which is heavy for about seven (7) months of the year (April to October with two weeks' dry spell in August (Break). The harmattan winds blows across the area between November and February. while the daily temperature ranges between 27^{o}C and 36^{o}C [1].

The major crops cultivated in the area are oil palm, cashew, yam, cassava, etc including rearing of livestock. The Local Government Area was purposively chosen because it is one of the major food producing areas in Abia State and majority of its Agribusiness ventures such as rearing of animals, processing of cassava, palm oil etc are actively done by women.

Multi – stage sampling technique was used in the selection of respondents for the study. In the first stage, five (5) communities were randomly selected, in the second stage, two (2) villages were randomly selected from each of the previously selected communities to give a total of ten (10) villages. In the final stage, from each of the chosen villages, eight (8) rural women were randomly selected, giving a total sample size of eighty (80) respondents.

Data collected were analysed using descriptive statistics and probit regression model which was employed by [23] in a similar study.

The probit model for the estimation of determinants of rural women participation in cassava processing in the study area is specified thus:

$$P\ (Y = 1/x) = F\ (XB) = 1/\sqrt{2\pi}\int_{-\infty}^{XB} e - \frac{(XB)^2}{2}\ dx \ \ldots\ldots (1)$$

where:

$X = (1, X_1i, X_{2i} \ldots\ldots X_ki)$

$B' = (\beta_0, \beta_1, \ldots\ldots \beta_k)$

Y = Vector of dependent variable (1 for participated and 0 for non-participated)

X = Vector of explanatory variables (predicators)

$\propto$ = probit coefficients

e_i = random error term

where:

X_1 = age (years)
X_2 = marital status (dummy; married = 1, otherwise = 0)
X_3 = level of education (years)
X_4 = distance of the women's farm from homestead (km)
X_5 = level of farm income (naira)
X_6 = cooperative membership (dummy; 1 = Yes, 0 = No)
X_7 = household size (number)
X_8 = year of experience in farming (years)
X_9 = Extension contact (dummy; 1 = yes, 0 = No)
X_{10} = major occupation (dummy; 1 = farming, 0 = non-farming)
X_{11} = access to credit facilities (dummy; 1 = Yes, 0 = No)
X_{12} = access to subsidiary inputs (dummy; 1 = yes, 0 = No).

RESULTS AND DISCUSSIONS

Socio-Economic Characteristics of Respondents

To determine the socio economic characteristics of the respondents, simple descriptive statistics were used and the results presented in Table 1.

The result shows that 23.75% of the rural women participating in cassava processing in the study area were less than 31 years old, 25.00%, between the ages of 31 and 40 years, 17.50% were between 41 to 50 years and 51 to 60 years respectively, while 16.25% were above 61 years. The mean age of the respondents was 44.19 years.

This implies that rural women involved in cassava processing were young and energetic and thus capable of withstanding the stress and rigours involved in the business. Age is a primary latent characteristic affecting the participation of rural women in agribusiness ventures such as crop production and processing [7].

Aged rural women participating in agricultural ventures had reduced risk bearing capabilities, are less innovative and may not withstand the strain and stress involved in such ventures as crop production and processing [21, 29]. The result is also consistent with the findings of [27] that women in their early 30s and 40s take active part in food crop production and processing.

Table 1. Socio economic characteristics of cassava processing rural women

Age (years)	Frequency	Percentage (%)	Mean & St. Dev.
Age			
>31	19	23.75	44.19 ± 14.09
31-40	20	25.00	
41-50	14	17.50	
51-60	14	17.50	
61 and above	13	16.25	
Total	80	100.00	
Marital Status			
Single	9	11.25	
Married	63	78.75	
Widowed	8	10.00	
Total	80	100.00	
Household Size			
<4	10	12.50	5.16 ± 1.64
4 – 6	60	75.00	
7 – 9	8	10.00	
10 – 12	2	2.50	
Total	80	100.00	
Education Level			
No formal education	4	5.00	
Primary education	20	25.00	
Secondary education	38	47.50	
Tertiary education	18	22.50	
Total	80	100.00	
Farm Size (Hectares)			
< 1.0	2	2.50	1.98 ± 1.54
- 2.0	66	82.50	
2.1 – 3.0	7	8.75	
> 3.0	5	6.25	
Total	80	100.00	
Farming Experience			
<10	31	38.75	13.11 ± 8.38
10-15	28	35.00	
16 – 20	7	8.75	
21 -25	7	8.75	
26 – 30	5	6.25	
>30	2	2.25	
Total	80	100.00	
Access to Extension Agents			
No	73	91.25	
Yes	7	8.75	
Total	80	100.00	
Membership of Cooperative Society			
Yes	35	43.75	
No	45	56.25	
Total	80	100.00	
Access to Credit			
Yes	11	13.75	
No	69	86.25	
Total	80	100.00	

Source: Field Survey, 2019.

The distribution of respondents according to their marital status shows that majority (78.75%) of the rural women were married, 11.25% were single while 10.00% were widowed. This implies that married rural women have access to extra financial and physical supports from their spouse which positively influences participation in cassava processing. This corroborates the finding of [5], that the preponderance of the married people could create potential for increased labour supply which would positively contribute to rural women participation in agricultural activities.

The distribution of respondents according to household size shows that 12.50% of the respondents had a household size of less than 4 persons, majority (75.00%) of the rural women had household size of between 4 to 6 persons, 10% had a family size of between 7 to 9 persons, while 2.50% had a household size of between 10 to 12 persons. The mean household size of rural women was 5.16 persons. This implies that the rural women had moderate family size which means availability of household labour (if up to labour age) for farming activities. Also, the element of household labour plays an important role in rural women participation in agriculture especially when hired labour or mechanization is inadequate in supply or unavailable. The result is in line with [3], that household size influenced participation in agriculture related activities.

The distribution of respondents according to their educational level shows that 5% of the women in cassava processing in the study area had no formal education, 25% had primary education, 47.50% had secondary school education while 22.5% had tertiary education. In summary, 95.00% of the rural women in cassava processing in the study area were educated at various levels. This indicates that the respondents were literate. Educational level affects the level of participation of rural women in agri-business as education increases the ability of these rural women to obtain, process, and use information relevant to the various agricultural ventures. This agrees with [24] that high level of education had the capacity of influencing farmers and processors to accept new innovations and change their attitude to the desired technology. [9] opined that farmers with high level of education stood to be better informed in production and processing activities.

Distribution of the respondents according to farm size shows that 2.50% of them have farm sizes less than 1 hectare, majority (82.50%) have farm sizes of between 1.0 and 2.0 hectares, 8.75% cultivate between 2.0 and 3.0 hectares , while 6.25% have more than 3 hectares of land. The mean farm size of the rural women is 1.98 hectares . This implies that rural women in the study area are involved in small scale farming (producing at subsistence level) ,which also influenced the quantity processed. This finding is expected. The result also agrees with [9] that agricultural production in South-East Nigeria is generally done by small holder farmers with land holdings of less than 3 hectares.

The distribution of respondents according to their years of processing experience shows that 38.75% of the rural women has processed cassava for less than 10 years, 35.00% had experience of between 10 and 15 years, 8.75% had experience of between 16 to 20 years and 21 to 25 years respectively, 6.25% had 26 to 30 years experience, while 2.25% has been in the cassava processing business for over 30years. Their mean years of experience is 13.11 years. This implies that rural women involved in cassava processing in the study area have acquired enough experience, hence farm resources could be efficiently utilized. [31] recorded that more than 10 years farming experience shows that farmers have garnered ample farming knowledge through experience which could have an influence on their attitude.

The distribution of the respondents according to their access to extension agents shows that 91.25% of rural women had no extension contact, while 8.75% of the rural women had access to extension agent. This implies that the impact of extension agents have not been felt in the study area. Extension agents inform and build the capacity of farmers, increase their knowledge bank and reduce uncertainty

in decision-making. Extension provides information on availability of new technologies and technical skills in farming generally. [32] noted that extension contact enhances farmers' access to information regarding agricultural activities and subsequently impacts positively on farmer's participation in agro related businesses.

The distribution of respondents according to their membership of cooperative societies shows that 56.25% of the rural women in agribusiness do not belong to cooperative societies. However, an appreciable number belonged, meaning that the cassava processors in the study area have begun to see the benefits accrued from joining such associations. The reason for not being members could be due to low perception of the benefits of belonging to such economic groups. The result compared favourably with [27] who observed that 71.67% of women cassava producers do not belong to cooperative societies. Collective endeavour makes necessary arrangements for better inputs supply, adoption of innovations, extension support, credit access, collection of produce, processing and marketing facilities [19].

The distribution of the respondents according to access to credit shows that 86.25% the respondents had no access to credit facilities while 13.75% of them had access to credit facilities. Poor access to credit could be due to the fact that women are rarely considered credit worthy because they have no collateral [33]. Lack of access to credit facilities constitutes a constraint in purchasing raw materials, processing equipment, implements and other farm inputs. Access to credit is regarded as one of the key elements in raising participation in agribusiness. Rural women without cash and had no access to credit will find it very difficult to engage in agriculture [25].

Determinants of participation of Rural Women in Processing of Cassava

To determine the major contributing factors to the participation of the respondent in cassava processing in the study area, the probit regression model was employed and the results shown in Table 2.

Table 2. Probit Regression Estimates of Factors Influencing participation of rural women in cassava processing in Isuikwuato, Abia State

Variables	Coefficient	Std.Err	z-value	P>|z|
Constant	-3.7390*	1.7533	-1.82	0.068
Age	-0.0461**	0.0193	-2.48	0.013
Marital Status	-0.0678	0.3888	-1.06	0.290
Level of Education	0.0342**	0.0745	2.41	0.016
Distance of the farm from homestead	-0.7063	0.2472	-1.32	0.188
Farm Income	5.91e-07**	1.46e-06	2.16	0.031
Membership of Cooperative	0.0927**	0.0792	2.24	0.025
Household Size	0.1004**	0.0187	2.52	0.012
Years of Farming Experience	-0.1072	0.3867	-1.26	0.208
Extension contact	0.0013*	0.0004	1.91	0.056
Major occupation	0.1024	0.0731	0.61	0.544
Access to credit	-0.0788	0.1426	-2.13	0.033
Access to subsidiary inputs	0.1113	0.0183	1.05	0.253
Log likelihood	-41.55389			
LR Chi^2	17.90			
Pseudo R2	0.6303			

Source: Field Survey, 2019.

**, * Significant at 5.0% and 10.0% levels respectively.

The model posted a log likelihood value of -41.55389, *pseudo* R^2 value of 0.6303 and goodness of fit chi square value of 17.90 which was statistically significant at 1.0% alpha level. seven out of the twelve variables fitted into the probit model were significant.

Specifically, the coefficient of age (-0.0461) was negatively signed and significant at 5.0% level of probability. This implies that younger rural women had higher probability of participating in processing of cassava than their older counterparts. The reason is that older rural women are likely to be less energetic and therefore find it difficult to engage in the rigorous activities that characterize cassava processing.`Similar result was observed by [10] that the women participating in agriculture were mostly young.

The coefficient (0.0342) of the educational level of the respondents was significant at 5.0% and positively signed. This means that increase in literacy level will most likely result in an increase in the rural women participation in cassava processing as education is an investment in human capital which is able to raise the skills and qualities of man, narrows his information gap and increase his allocative abilities thereby leading to more productive performance in agribusiness. This is expected and according to [8], formal education helps one to grasp issues better, anticipate and respond to market needs. [26] added that postharvest processors with higher education have better access to information and knowledge that are beneficial to processing operations. Education enhances the potential of rural women to process information and make the best out of any situation hence enable them to minimize risk and face uncertainties in any agribusiness venture [30].

The coefficient of extension contact (0.0013) was sparingly significant at 10.0% alpha level and positively signed indicating that the more the extension contact with the rural women, the higher will be the likelihood of their participation in processing of cassava. This is expected because regular contact with extension agents create favourable environment for information dissemination. The result is in line with [3] who observed that as women get more contact with extension agents, they are likely to learn modern techniques of cassava processing and thus their involvement in them will increase.

The coefficient (-0.0788) of access to credit facilities was significant at 5.0% probability level and negatively signed. This implies that with more credit available to the rural women there is a less tendency to involve in cassava production and processing in the study area. This could be possible where the resources are not used efficiently. Also, with available credit the women may venture into less risky non-farm activities with faster returns on investment [28]. The result negates the findings of [4] that rural women cassava processors who had access to credit may overcome their financial constraints and as such as purchase of cassava processing implements will be feasible.

The coefficient (0.0927) of membership of cooperative societies was positively related to participation in processing of cassava and statistically significant at 5.0% alpha level. This indicates that the more the women belong to cooperative societies, the more their participation in cassava processing because most institutions both extension and research interact more with farmers in groups with the aim of reaching out to many farmers within the shortest time frame with improved innovations, loans etc. women who belong to such associations or groups are likely to access these provisions. This result is consistent with the findings of [14]. that cooperative societies ensure collective production, marketing, enables farmers to access loans, training, ensuring pooling of resources together and reduction of information asymmetry thus reducing transaction costs and ensuring economies of scale.

The coefficient (0.1004) of household size was positive and statistically significant at 5.0% alpha level. The positive sign of the variable implies that rural women with larger the household size, participate more in cassava processing . Large household size is

expected to provide cheap family labour needed for processing of cassava. The availability of substantial family labour may reduce the number of hired farm labours and cost associated with it, thereby increasing the chances of participation in cassava processing by the rural women [16].

The coefficient (5.91e-07) of income was significant at 5.0% alpha level and positively influenced rural women participation in cassava processing. The positive sign of the variable implies that rural women with large income, participate more in the processing of cassava because they will be able to afford the expenditures the process requires. Production and processing activities require money and so an increase in farm income will increase the tendency of the women to be involved in these activities [28].

Restrictions faced by rural women involved in cassava processing

In the bid to analyse the constraints faced by the respondents in the cause of cassava processing, simple descriptive statistics was employed and the results shown in Table 3.

The result shows that the rural women participating in cassava processing ventures were restrained by inadequate supply of cassava roots all year round (62.50%), irregular root size (85.00%), domestic chores (60.00%), tediousness of traditional processing method (92.50%), Inadequate access to productive resources (land and labour) (93.75%), distance from home to farmland (57.50%), poor infrastructural facilities (68.75%), time involved in processing (86.25%), low quality of cassava roots (96.25%), discolouration and uncontrolled fermentation (91.25%), high cost of processing (92.50%), Inadequate access to credit facilities (88.75%), poor storage facilities (91.25%), low output due to weather conditions (86.25%) and Poor extension services (80.00%). [3] enumerated the constraints in cassava processing to include inadequate capital, inadequate land, pre- occupation, cost of transportation, inadequate storage and high cost of materials. [15] identified the following as constraints faced by cassava processors in their study area; ineffective linkages between processors, farmers, transporters and marketers, low processing time, low returns from sales and irregular cassava shape. Summarily, [17] stated the constraints in cassava value chain to include production constraints, fresh cassava value chain constraints and general market constraints.

Table 3. Constraints faced by rural women in cassava processing

Constraints	Frequency*	(%)
Inadequate supply of cassava roots all year round	50	62.50
Irregular root size	68	85.00
Domestic chores (cooking, fetching water and firewood)	48	60.00
Tediousness of traditional processing method	74	92.50
Inadequate access to productive resources (land and labour)	75	93.75
Distance from home to farm land	46	57.50
Time involved in processing	69	86.25
Poor infrastructural facilities	55	68.75
Low quality of cassava roots	77	96.25
Discolouration and uncontrolled fermentation	73	91.25
High cost of processing	74	92.50
Inadequate access to credit facilities	71	88.75
Poor storage facilities	73	91.25
Low output due to weather condition	69	86.25
Poor extension services	64	80.00

Source: Field survey, 2019.
* Multiple Responses Recorded

CONCLUSIONS

Empowering women can cause a tremendous contribution to the food security of their families and the society at large. The study revealed the factors that contributed to the participation of rural women in cassava processing to include; age, level of education, farm income, cooperative membership, household size and extension contact. Like any other business, the women involved in cassava processing encounter some problems

which if not properly handled, the state and country may not reach the targeted processing quantity and quality to achieve the desired food security. In the light of the foregoing, the following recommendations were made.

Introducing contract farming in the area, which will ensure a reliable supply of cassava roots for large scale processing. Contract farming can encourage the formation of associations by farmers which can improve market information and increase in bargaining power. It can also solve the problem of extension services and returns to scale.

Provision of funds through credit programmes that can serve as incentives to encourage women who are into cassava processing, this will enable them procure modern machines to reduce the drudgery that characterizes the business.

Incorporating gender perspective into all agricultural interventions by the government to ensure equal impact.

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