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Effectiveness of Cassava Women Processors in Value Addition Technologies in Abia State, Nigeria

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Abstract

This study analyzed the effectiveness of cassava women processors in value addition technologies in Abia State, Nigeria. Purposive and simple random sampling techniques were used to select ninety (90) women. Data for the study were collected through a structured questionnaire and analyzed with descriptive statistics such as: frequency, mean scores and percentages and inferential statistics (Tobit regression analysis). The socio-economic characteristics of the women revealed that a 63.33% of the women were married, with mean age of 49.5 years, mean processing experience of 4.5 years and mean annual processing ₦226,500 (4,190.25 USD). The result also revealed that the processors effectively utilized ($\bar{x}$ =2.65) cassava value added technologies in the study area. The Tobit regression estimates of the determinants of effectiveness of women in cassava value addition indicate that coefficients for processing experience, level of education and access to credit were positive and significant at 1%, 5% and 5% levels of probability respectively, while coefficients for marital status and age were negative and significant at different levels of probability. The study therefore recommends sustainability in training and re-training of women in cassava value addition technologies, group formation and access to credit by women in order to promote effectiveness in cassava value addition technologies in the study area.

1. Introduction

Cassava (*Manihot esculenta crantz)* is one of the most important crops grown in Nigeria and Africa as a whole (Nweke *et al*., 2002). It is generally regarded as the foremost food security and poverty alleviation crop for Nigeria and entire sub–Sahara Africa (SSA), because of its special attributes which include ability to make return on roots yield, high tolerance to unfavorable conditions, all year round availability, highly suitable to various farming and food systems in Africa as well as efficient production of food energy (Awa and Tumanteh, 2001).

Cassava bulk is substantially reduced when processed into processed forms such as gari, flour, flakes among others and thus increasing its shelf life. The cassava roots are peeled, chipped, soaked, fermented dried and sometimes grated. Peeling represents the most labor –intensive unit operation of the cassava value chain, non- mechanized and traditionally done by women and sometimes children. Cassava has been identified to promote agro-enterprises development in Nigeria and supports the national agricultural transformation agenda through market and value chain development and investment to unlock growth opportunities, food security, jobs and income creation, value addition and competitiveness (Gwera, 2009).

In Nigeria, women play important roles in all areas of agricultural production. They are involved in food production, processing and marketing (Rahmanad et *al*., 2014) and produce 60 -80 percent of food in Nigeria. The women equally contribute to the well-being of their households through income generating activities such as cassava value addition (Mgbada, 2000).

Alternative uses of cassava through value addition has resulted in emergence of wide food recipes from cassava through processing which involves conversion of edible food to another form more acceptable or convenient to the consumer

(Nwaobiala *et al*., 2009). National Root Crops Research institute (NRCRI), Umudike[1] developed technologies in cassava utilization aimed at diversifying the uses of cassava in Nigeria. The value additions technology in cassava possess enormous potential for increased cassavas consumption, diversifying its uses as well as using same to enhance livelihoods of farm families through providing opportunities for employment, micro–agro enterprises development income and boosting economy of rural households (Nwakor *et al*., 2007). Amamgbo *et al*., (2006) observed that diversification of cassava uses promises high potentiality for wedging hunger, alleviating poverty as well as enhancing the livelihoods of many rural farm households. This development and dissemination of cassava value adding technologies by national root crops research institute, Umudike is timely, appropriately and vital in the current effort to improve the livelihoods of rural households.

The essence of these technologies is to ensure that these crops can be put to wider uses in the home, for income generation and possibly for export purchases. However, ever since this massive dissemination of these technologies to farmer \women groups in the agro-ecological zones (Abia, Akwa Ibom, Anambra, Cross River, Enugu, Ebonyi and Imo States) especially in Abia state, there seem to be no proper documentation on the effectiveness of women trained in the technology in different states (Ironkwe *et al*., 2000).

The bulkiness of cassava roots, high cynogenic glucosides contents (inherent toxicity) and perishability were the problems confronting women farmers, thus processing cassava roots become very essential in diversifying it into different forms. In view of the above this study was designed to analyze the effectiveness of women cassava processors in value addition technologies in Abia State, Nigeria. The specific objectives of the study were to;

i. Describe socio-economic characteristics of cassava women processors in Abia state, Nigeria.

ii. Assess the levels of effectiveness of cassava women processors in different value-addition technologies in study area.

iii. Determine the factors that influence effectiveness of cassava women processors in utilizing value addition technologies in the study area.

[1] Umudike is a community in Abia State, Nigeria, about 10 kilometers southeast of Umuahia, the state capital. It is home to the Michael Okpara University of Agriculture and to the National Root Crops Research Institute

2. Materials and Methods

This study was conducted in Abia State, Nigeria. Abia State lies between longitudes 7^{o} 23^{1} and 8^{o} 2^{1} East of the equator and latitudes 4^{o} 47^{1} and 6^{o} 12^{1} North of the Greenwich Meridian. The State is located East of Imo State and shares common boundaries with Anambra to the North, Enugu and Ebonyi states to the West and East respectively. On the East and South East, it is bounded by Cross River and Akwa Ibom States and by Rivers State on the South. Abia State is made up of 17 local government areas and most of the people especially, the rural dwellers are engaged mainly in subsistence farming. They engage in arable crop production such as cassava, yam, rice, maize and sweet potatoes.

A list of trained cassava women processors trained in the state in value addition technologies were obtained from the Ministry of Agriculture/Abia State Agricultural Development Programme (ADP). Purposive and simple random sampling techniques were adopted in this research. Purposively, cassava women processors were selected because they participated in value addition trainings organized by National Root Crops Research Institute (NRCRI) Umudike Abia state, through the ministry of agriculture and ADP. From the list simple random sampling technique was used to select ninety (90) cassava processors across the seventeen (17) Local Government Areas of the state. Objectives i and ii were captured with descriptive statistics such as frequency counts, percentages and mean score while objective iii was achieved with tobit regression analysis. The levels of effectiveness of women processors in cassava value addition technologies were measured using different types of value addition technologies available to the women and rated on a 4-point Likert-type scale. Based on the mid score decision rule, any mean score greater than or equal to 2.50 implied that the technology was effective and mean score less than 2.50 denotes non effective.

3. Results and discussion

3.1 Distribution of Socio economic Characteristics of Respondents

The socio-economic characteristics of respondents are shown in Table 1. The result reveals that 63.33% of the women were married, 15.56% of them widowed, 14.4% were single, while 6.67% were divorced. This implies that cassava processing was dominated by married women in the study area. The mean age of the respondents was 49.5 years .The implication of this finding show that the women were still strong and capable being in their productive age. Asogwa *et al.*, (2013) noted that cassava processing requires a lot of energy as it is labour intensive in assembling products for processing and marketing.

This result indicates that a fairly good proportion (48.89%) of the women acquired secondary education. The results suggest that the respondents were literate enough to understand and put to practice technologies transferred in cassava value addition. This result is in support of this finding, Nwaobiala *et al*., (2008) were of the view that education enhances farmers' ability to seek innovation and make good use of information about production technologies disseminated by extension. This table also reveals that the respondents had a mean processing experience of 4.5 years. This implies that most women involved in the activity were not full time processors, but had other means of livelihood. The mean annual processing income of the women was ₦226, 500.00 (4,190.25 USD), while a good proportion (55.56%) of the respondents belonged to different cooperative societies and 54.44% had access to credit. Sofranko (1984) and Nwawuisi *et al*. (2007) noted that adoption of innovation by groups of or associations was due to their group dynamics and benefits derived from the group such as inputs supply, credit, marketing information and trainings.

3.2 Effectiveness of Women Cassava Processors in Value Addition Technologies

The distribution of respondents according to their effectiveness in cassava value technologies is shown in Table 2. The result in the result shows that the women indicated cassava odourless fufu, cassava chin-chin and cassava cake with mean rating of 3.10, 2.97 and 2.92 were the technologies found to be effective.

Table 1. Distribution of Selected Socio-economic Characteristics of Cassava Women Processors in in Abia State, Nigeria

Variables	Frequency	Percentage	Mean
Marital Status			
Married	13	14.14	
Single	57	63.33	
Divorced	6	6.67	
Widowed	14	15.56	
Age (years)			
20 – 29	20	22.22	
30 – 39	31	34.44	
40 – 49	17	18.89	
50 – 59	16	17.78	49.50 years
60 – 69	3	3.33	
70 - 79	3	3.33	
Education	5		
No Formal Education	9	10.00	
Primary School Education	12	13.33	
Secondary School Education	44	48.89	
Tertiary School Education	25	27.78	
Processing Experience			
1– 2	7	7.78	
3 – 4	26	28.89	
5 – 6	35	38.89	4.5 years
7 – 8	22	24.44	
Annual Processing income (₦)			
10,000 – 50,000	27	30.00	
51,000 – 100,000	40	44.44	
101,000 – 150,000	7	7.78	₦226.500
151,000 – 200,000	10	11.11	
201,000 – 250,000	6	6.67	
Cooperative Membership			
Member	50	55.56	
Non Member	40	44.44	
Credit Access			
Yes	49	54.44	
No	41	45.56	

Table 2. Distribution of Respondents According to their Effectiveness in Cassava Value Addition Technologies (N = 90)

Cassava Value Addition technologies	Very Effective	Fairly Effective	Effective	Not Effective	Total	Mean
Cassava odourless fufu	41(164)	22(66)	22(44)	5(5)	279	3.10*
Cassava flour	25(100)	34(102)	20(40)	11(11)	233	2.58*
Cassava cake	35(140)	20(60)	28(56)	7(7)	263	2.92*
Cassava chin-chin	33(132)	30(90)	18(36)	9(9)	267	2.97*
Cassava chips	24(96)	30(90)	17(34)	19(19)	239	2.65*
Cassava flakes	27(108)	36(108)	15(30)	12(12)	258	2.86*
Cassava doughnut	15(60)	14(42)	23(46)	38(38)	186	2.06
Cassava biscuit	17(68)	16(48)	28(56)	29(29)	201	2.23
Cassava starch	31(124)	26(78)	20(40)	13(13)	255	2.83*
Cassava pellet	14(56)	22(66)	21(42)	33(33)	197	2.18
Grand mean = 26.38						
Total mean = 2.64						

Decision Rule: 2.50 and above is effective, below 2.50 is not effective, *effective

Figures in parenthesis are frequencies multiplied by nominal Likert values

This is followed by cassava flakes ($\bar{x}$=2.86), cassava starch ($\bar{x}$=2.83), cassava chips ($\bar{x}$=2.65) and cassava flour ($\bar{x}$=2.58). The total mean effectiveness of these technologies was 2.64, indicating that the women effectively used these cassava technologies. The effectiveness in utilization of selected packages or products by women in the study area may be for diversified domestic uses, marketing and increased income. Okunade *et al*., (2005) opined that women effectiveness in utilization of cassava value added technologies were meant to satisfy family and economic needs

3.3 Determination of Factors Influencing Effectiveness of Women Cassava Processors in Value Addition Technologies in Abia State, Nigeria

The results in Table 3 shows the Tobit regression estimates of the determinants effectiveness of women in cassava value addition technologies of the respondents in the study area**.** The coefficient for marital status was negatively signed and significant at 5% level of probability. This implies that the respondents whom were single were more effective than their married counterparts. This is against *a priori expectations* probably because those who are married do not get overwhelmed with the consumption needs from large sized household. The coefficient for age was negatively signed and significant at 10% level of probability. This implies that any increase in age will lead to increase in probability and intensity of effectiveness in cassava value addition among the respondents in the study area. This is expected because the younger respondents tend to be stronger, agile and highly innovative because they are risk takers, and hence increase effectiveness of the women (Hussain *et al.*, 1984). The coefficient for education was positively signed and significant at 5% level of probability. This implies that any increase in level of education is expected to lead to increase in probability and intensity of effectiveness among processors in the study area. This is true because with more education, they are expected to access and process information on technologies than their illiterate counterparts. Education is a variable that is expected to sharpen managerial input and lead to a better assessment of the importance, complexities of good decisions (Biafarin *et al.*, 2010). Generally, education is thought to create a favorable mental attitude for the acceptance of new practices especially of information intensive and management intensive practices (Caswell *et al*., 2001; Onyenweaku *et al.*, 2010).

The coefficient for credit status is also positively signed and significant at 5% level of probability .This implies that any increase in credit volume will lead to increase in probability and intensity of effectiveness in cassava value addition among the respondents in the study area. UN (2009) affirmed that women access to credit and control over economic and financial resources have direct implication for both women's economic empowerment and broader process of development. The coefficient of processing experience is positively signed and significant at 1% level of probability. This implies an increase in increase in experience will lead to a corresponding increase in processing in experience. Experience has shown to increase efficiency in production and processing of cassava value addition technologies. The chi (x^2) value of 12.15 was significant at 5% level indicating that the tobit regression was a good fit. The pseudo R^2 of 0.5203 indicate 53.03% variability in effectiveness explained by the independent factors.

Table 3. Tobit Regression Estimates the Determinants of Effectiveness of Women In Cassava Value Addition Technologies in the Study Area

Variables	Coefficient	Standard error	t- value
Constant	26.5098	3.6531	7.26***
Marital status	-3.3737	1.5145	-2.23**
Age	-0.1135	0.0667	-1.70*
Education	0.3651	0.1547	2.36**
Processing experience	1.1225	0.2003	5.60***
Occupation	0.6663	0.6463	1.03
Processing Income	$-8.83x10^{-7}$	$3.59x10^{-6}$	-0.25
Non Processing Income	0.000017	0.000013	1.35
Membership of Cooperative Society	-0.4060	1.5598	-0.58
Access to Credit	1.1762	0.4645	2.54**
Chi^2 (χ^2)	12.51***		
Pseudo R^2	0.5203		
Log likelihood	-293.3909		

Source: STATA 8A, Results 2014

*,** and *** significant at 10%,5% and1% level of probability.

4. Conclusion and recommendations

This study has shown that cassava women processors effectively utilized the value addition technologies disseminated to them through the trainings organized by relevant government agencies. Factors such as processing experience, level of education and access to credit marital status and age influenced the effectiveness of women processors in cassava value addition technologies in the study area. The study therefore recommends sustenance in training and re-training of women in cassava value addition technologies through establishment of more training centers, cooperative membership and reduction in interest rates to enable women have access to credit and in turn procure machines for processing.

References:

1) Asogwa, B. C., Ezihe J.A.C., and Ater, P.I. (2013). Socio Economic Analysis of Cassava Marketing in Benue State, Nigeria. International Journal of Innovation and Applied Studies, 2(4): 384-391.

2) Awa, E. H. and Tumanteh, A. (2001). Cassava Based Cropping Systems and Use of Inputs in Different Ecological Zones of Central Africa. African Journal of Root and Tuber Crops 4(2):45 -49.

3) Biafarin, J., Alimi, T., Baruwo, O. I and Ajewole, O. C. (2010). Determinants Technical, Allocation to Economic Efficient in the Plantain Industry, Ondo State Nigeria Proc. IC on Banana and Plantain in Africa Acta Hort P_P.870.

4) Caswell, M. I., Fuolie, K., Inpram, C., Jans, S. and Kascalc, C. (2001). Adoption of Agricultural Production Practices: Lesson Learned from the US. Department of Agriculture Area Studies Project. Washington DC. United States Department of Agriculture. Resume Economics Division, *Economic Research Series.* Agriculture Economic Report No 782. January (2001).

5) Onyenweaku, C.E, Okoye, B.C and Okorie K.C (2010). Determinants of Fertilizer Adoption by Rice Farmers in Bende Local Government Area of Abia State, Nigeria. The Nigeria Agricultural Journal 41(2) 1-5.

6) Gwera, M. (2009). Food Centre to Improve Cassava Production. Daily News.

7) Hussain, M., Norton, G and Neale, R.J. (1984) Composition and nutritive value of cormels of Colocasia esculenta (L) schott. Journal of the Science of Food and Agriculture, 35, 1112-1119.

8) Ironkwe, A. G. (2000). Gender Involvement in Yam Minisett Technology Development, Transfer and Utilization in South East, Agro ecological Zone of Nigeria. Department of Rural Sociology and Extension, Michael Okpara University of Agriculture, Umudike,. Pp 13-15.

9) Mgbada, J. U. (2000). Production of Staple Crops by Rural Women in Enugu and Ebonyi States. Int. Olowu (ed) Extension and Poverty Alleviation in Nigeria. Proceedings of 6th Annual National Conference of the Agricultural Society of Nigeria. Pp 1-10.

10) Nwakor F. N., Ekwe K. C. and Okoro, B. O. (2007). Adoption of Cassava Value Added Technologies among Women farmers in Ohafia Agricultural Zone of Abia State Nigeria. Proceeding of the Sixth Annual Congress of the Nigeria Rural Sociological Association, held at Bowen University in Osun State, 13th-17th August, 2007 Pp. 37-40.

11) Nwaobiala, C. U., Isiocha C. U. and Nwachukwu, K. (2009). Adoption of Cassava Post Harvest Technologies by Women in Ivo L.G.A of Ebonyi state, Nigeria. Proceedings of the 43rd Annual Conference of the Agricultural Society of Nigeria held at Abuja 20th -23rd October. Pp.670 - 672.

12) Nwaobiala, C. U., Ekwe, K. C and Onumadu, F. N. (2008).Comparative Analysis of Effect of Green River Project on farmers productivity in ogba/egbema/Ndoni LGA of River State, Nigeria. Processing of 42nd conference of Agricultural Society of Nigeria (ASN) held at Ebonyi State University, Abakaliki 10th - 23rd October, Pp 549-551.

13) Nwawuisi, J. U., Okoye, B. C. and Odaji, C. O. (2007). Adoption of Improved Cassava Varieties (TMS 30211 and TMS 3001) in Ivo LGA Ebonyi State. Proceedings of the 41st Conference of Agricultural Society of Nigeria, Samar. Pp 527-530.

14) Nweke, F. I. Spencer, D. S. C and Lyman, J. K. (2002). *The Cassava Transformation Africa Best Kept Secret*. Michigan State University Press. East Lansing U.S.A. 273P.

15) Okunade, E. O, Olaniyi O. A and Ogunleye, K. Y. (2005). Adoption of Improved Cassava Production Technologies Among Farmers in Sulurere LGA of Oyo State, Nigeria. Proceedings 39th Agricultural Society of Nigeria (ASN) Conference. Pp:1-8.

16) Rahmanad, S.A., Gabriel, A.J. and Amarcus, N. D. (2004).Gender Differentials in Labour Contributions and Productivity in Farm Production. Empirical Evidence from Kaduna State of Nigeria. Paper Presented at the National Conference of Family held at New Theatre Complex Benue State, University of Makurdi, Nigeria.

17) Sofranko, A. J. (1984). Introducing Technological Change: The Social Setting. In Swanson, B. E (ed) Agricultural Extension: a reference manual 2nd edition FAO of United Nations Rome. Pp 65-7

18) United Nations. (2009). Women's Control over Economic Resource and Access to Financial Resources Including Microfinance World Survey on the Role of Women in Development. UN Publication, New York.