Centre for Research and Development (CERAD)
The Federal University of Technology, Akure, Nigeria (www.jost.futa.edu.ng)
JoST 2014

Adoption of Improved Cassava Processing Technologies Among Rural Women in Lapai Local Government Area, Niger State, Nigeria

MUHAMMAD, H. U.; TYABO, I.S.; TSADO, J.H.; ADEBAYO, C.O. and MOHAMMED, U.
Department of Agricultural Economics and Extension Technology,
Federal University of Technology, Minna, Nigeria.

ABSTRACT: This study was carried out to assess the adoption level of improved cassava processing technologies among rural Women in Lapai Local Government Area, Niger State. Eighty (80) women were randomly selected for interview. The data collected were analyzed using descriptive statistics and Logit regression model. The results revealed that majority (62.5%) of the women were within 26-40 years of age, 60.0% were married, 50.0% had 6-10 people in their household and majority (55.0%) of the women had no formal education. Results also revealed high proportion (52.0%) of the Women had adopted the improved processing technologies. They attributed the reasons for the adoption to; it is less time consuming (97.5%), it is less labour demanding, it increases output (95.0%) and increases income (92.5%). The Logit regression analysis revealed that education, access to credit, cooperative membership and extension contact significantly influenced adoption of cassava processing technologies. Based on the findings of this study, it was recommended that the women cassava processors should be sensitized and encouraged to adopt mechanized and modern cassava drier for increased outputs.

Keywords: Adoption level, Cassava, Women, Processing, Improved technologies

JoST. 2014. 5(2): 100-105.
Accepted for Publication, November 20, 2014

INTRODUCTION

Agriculture is one of the most important sub-sectors of Nigeria economy, given its role as source of food supply for the ever increasing human population. It is the leading employer of labour, provide raw materials for the agro-allied industries and foreign exchange earner for funding other sectors of the economy (RMU, 2003). Cassava (Manihot esculenta) is one of the most important food crop cultivated in Nigeria and the whole of sub-saharan Africa.

Cassava was first introduced into central Africa during the last part of the 16th century, into West Africa in the early 18th century and into east Africa in the early 19th century (Mafimisebi, 2008). It was probably the incapacited slaves who introduced cassava into southern Nigeria as they were returning to the country from South America through the Island of Sao Tome and Fernando Po. However, cassava gained its prominence at the end of 19th century when processing techniques were introduced as many slaves returned home.

According to Odoemenem and Otanwa (2011), cassava is grown in all the ecological zones in Nigeria, the crop has advantage over other crops as it is easy to cultivate. Production of the crop is generally adjudged to be less labour intensive per unit of output; it can be planted all the year round depending on the availability of moisture. The peak of planting period is April to May. Cassava is adaptable to wide variety of soils even marginal soils where other crops cannot

*Correspondence to: Muhammad, H.U.; usmanhmuhd@yahoo.com

thrive well and mixed cropping system is most practiced method of production (Muhammad *et al.,* 2012).

Cassava is essential not only as food crop but even as major source of income for many poor households. However, owing to the importance of the crop, between 2002 and 2010 International Institute of Tropical Agriculture (IITA) implemented the integrated cassava project (ICP) to support the presidential initiative on cassava. Under the ICP, IITA and its partners successfully promoted and introduced more than 40 cassava varieties to Nigerian farmers and also assisted in the establishment of many fabricating and processing centers. The presidential initiative launched in July 2002 was aimed at using cassava production as the engine of growth in the country through creating awareness among farmers on the opportunities in the cassava markets worldwide, increase the area of cultivation with cassava to 5 million hectares, targeting a harvest of 150 million tonnes annually and to earn Nigeria about $5 billion every year from export by the end of 2010. By and large this initiative actually produced positive result. As at 2004, Nigeria was ranked the largest cassava producer in the world, with the estimated output of about 34 million tonnes (FAO, 2005).

According to Nonyelu (1991), participation of Women farmers in agricultural activities differ according to geographical location, cultural and religious beliefs. Nonetheless, rural women play very vital role in Nigeria agriculture; they are involved in post harvest activities such as processing, utilization, storage and marketing (Idu *et al.,* 2010). Rural women also, are mostly involved in land preparation, planting and harvesting. The transfer of improved farm technologies to Nigerian small holder farmers is vital towards increasing their productivity and improved standard of living. In other words improved farm technologies are of little value until they are put to practical use. Idu *et al.* (2010) reported that, most cassava roots are lost to deterioration due to poor or inefficient processing method to handle the large volume of roots produced annually and this could discourage increased production. In order to sustainably promote cassava production and utilization, it is essential that a more efficient (improved) processing method be identified and the results made available to the end users for adoption. The objective of this study was therefore to examine the level of adoption of improved cassava processing technologies among rural women in Lapai Local Government Area, Niger State. The specific objectives are to; describe the socio-economic characteristics of the women cassava processors, assess the level of adoption of improved cassava processing technologies, ascertain the reasons for adoption of the improved processing technologies and determine the factors that influence the adoption of the technologies among the women in the study area.

METHODOLOGY

The study was conducted in Lapia Local Government Area of Niger State. The Local Government Area (LGA) is one of the 25 LGAs, in Niger State. It covers an estimated land area of 3,051sq.km and fall within the guinea Savanna vegetation. The LGA has annual rainfall of 1400mm-1600mm and minimum and maximum temperature is between 28^0C and 35^0C (NSADP, 2003). The human population is about 110, 127 (NPC, 2007). The people are predominantly farmers; cultivate crops like cassava, rice, melon, yam, millet and groundnut. Livestock reared include cattle, sheep, goat and poultry (NSG, 2005).

Multi-stage sampling technique was employed in this study. The first stage involved purposive selection of Lapai LGA due to its prominence in cassava production and processing, second

stage was random selection of four districts out of ten (10), the third stage involved random selection of four (4) villages from each district while the fourth stage was random sampling of five women cassava processors from each village. The total respondents used for the study was 80.

Data used were from primary source, collected through the use of structured questionnaire. The respondents were grouped into two, adopter and non-adopter. Descriptive and Logit regression model were used to analyze the data collected. The adoption level was assessed by categorization of women adopters into full adoption, partial adoption and not adopted. The logit model is based on the cumulative distribution functions and yields results that are not sensitive to the distribution of the sample attributes when estimated by maximum likelihood. The Logit regression model is explicitly expressed as; logit (P) = ln (P/1-P) $= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + ...\beta_7 X_7 + U$

Where;

The ratio P/1-P is the odds ratio

P = Probability that a farmer will adopt

1-P = Probability that a farmer did not adopt

X_1 = age (yrs)

X_2 = educational level (number of yrs school)

X_3 = cooperative membership (member = 1, otherwise 0)

X_4 = processing experience (yrs)

X_5 =cooperative membership

X_6 = access to credit

X_7 = extension contact (number)

$\beta_1 - \beta_7$ = regression coefficient

β_0 = constant

U = error term

RESULTS AND DISCUSSION

Table 1 present the socio economic characteristics of the respondents. The results revealed that, majority (75.0%) of the women cassava processors were between 30 and 40 years of age and this implies, the women were in their active productive age. The results further revealed that large proportion (60.0%) of the women were married, hence, their involvement in cassava processing may be attributed to their desire to contribute to their family up keep. Half (50.0%) of the women has within 10-15 people in their households while just (12.5%) has 1-5 people in their households. The large family size could serve as source of cheap labour to many farm families in rural communities. This finding substantiate the views of Okoye *et al.* (2007) who reported that a relatively large household size provides cheap/free labour for agricultural production particularly in rural areas. On processing experience, majority (75.0%) of the women processors has 10-20 years of processing experience. This implies that cassava processing is a popular occupation in the study area. Also majority (55.0%) of the women processors had attended primary school and was likely to positively affect their decision to adopt improved processing technologies. Education assists people to understand the importance of improved technologies and adopt.

Result in Table 2 revealed that mechanized cassava peeler was yet to be adopted in the study area. The results also indicate that large proportion (40.2%) of the women processors has fully adopted mechanized grater, 28.7% of the women processors has partially adopted while 4.3% of the women processors has not adopted the technology. Table 2 further revealed that 39.2% of women processors have fully adopted cassava screw presser, 30.4% of the women processors has partially adopted cassava screw presser and 3.7% of the women processors were yet to adopt the technology. None of the women processors has adopted modern cassava drier in the study area.

Also 20.6% of the women processors has fully adopted mechanized grinder, large proportion (40.9%) of women processors has partially adopted mechanized grinder, meanwhile 6.9% of

Table 1: Distribution of respondents according to socio-economic characteristics

Variables	Frequency	%
Age (yrs):		
<25	12	15.0
26-30	38	47.5
31-40	12	15.0
41-50	10	12.5
51 and above	8	10.0
Marital status:		
Single	6	7.5
Married	48	60.0
Divorced	20	25.0
Widowed	6	7.5
Household size (no of persons):		
1-5	10	12.5
6-10	40	50.0
11-15	10	12.5
16-20	8	10.0
21 and above	12	15.0
Experience (yrs):		
1-5	8	10.0
6-10	10	12.5
11-15	30	37.5
16-20	20	25.0
21 and above	12	15.0
Educational Level:		
Non- formal	20	25.0
Primary	44	55.0
Secondary	16	20.0

Source: Field survey, 2012

the women processors has not adopted the technology. The result generally implies that mechanized peeler and modern cassava drier were yet to be embraced in the study area and this is likely to affect their productivity.

Table 3 revealed the reasons for the adoption of the improved technologies. The women processors attributed their high rate of adoption of the improved technologies to include; it is less time consuming (97.5%), It is less labour demanding, it increases outputs (95.0%), increases income (92.5%) and simple to operate (66.3%).

Results of the Logit regression in Table 4 revealed

Table 2: Level of adoption of improved cassava processing technologies

Improved Technologies	Adoption Full	%	Level** Partial	%	*NA	%
Mechanized peeler	-	-	-	-	80	42.6
Mechanized grater	39	40.2	33	28.7	8	4.3
Screw presser	38	39.2	35	30.4	7	3.7
Modern drier	-	-	-	-	80	42.6
Mechanized grinder	20	20.6	47	40.9	13	6.9
Total	97		115		188	

Source: Field survey, 2012

*No adoption, ** Multiple response

Table 3: Reasons for adoption of the improved technologies

Variables	Frequency*	%
It is less time consuming	78	97.5
It is less labour demanding	76	95.0
It increases output	76	95.0
Increases income	74	92.5
Simple to use	53	66.3

Source: Field survey, 2012
*Multiple response

that, educational level (x_2) has significant positive coefficient (P<0.01). This implies that increase in level of education would increase the rate of adoption of the improved cassava processing technologies. This affirms the finding of Nsoanya and Nenna (2011) who stated that educational level has advantage for innovation adoption and transfer. Extension contact (x_7) has significant positive coefficient (P<0.05). It implies that, the, more contact the women processors has with the extension agents the high their rate of adoption of the improved technologies also cooperative membership (x_5) has significant positive coefficient (P<0.10), membership of cooperative increase people's awareness of availability and benefits of improved technologies and decision to adopt. On the other hand, access to credit (X_6) has significant negative coefficient (P<0.10). The negative coefficient indicates inverse relationship, which implies that, less credit is available to the women processors the less they adopt the improved technologies and vice versa.

Table 4: Logit regression analysis of factors affecting adoption of improved cassava processing technologies

Variables	Coefficients	Standard error	Probability level
Constant	54.825^{NS}	27.862	0.451
Age (X_1)	-0.085^{NS}	0.109	0.435
Educational level(X_2)	0.754*	0.237	0.001
House hold size(X_3)	0.042^{NS}	0.107	0.689
Processing experience(X_4)	0.123^{NS}	0.211	0.560
Cooperative membership (X_5)	2.056***	1.053	0.051
Access to credit (X_6)	0.000***	0.000	0.052
Extension contact (X_7)	2.277**	1.084	0.036
No. of Observation	80		
1log likelihood	-23.409		
LRchi^2(8)	62.83*		
Pseudo R^2	0.573		

Source: field survey 2012
*Significant at 1% level
**Significant at 5% level
***Significant at 10% level
NS=Not significant

CONCLUSION AND RECOMMENDATIONS

The results showed that young rural women in the study area adopted improved cassava processing technologies due to their time saving advantages. Education, access to credit, membership of cooperatives and extension contact influences adoption of the technologies. Based on these findings it was recommended that women cassava farmers need to be sensitized and encouraged to adopt mechanized cassava peeler and modern cassava drier for increased outputs.

REFERENCES

FAO (2005). Food and Agriculture Organization; Food security outlook P. 36

IDU, R.I; C. P.O. OBINNE and E.E. IDU (2010). Adoption of Cassava Post-harvest Technologies among Rural Women Famers in Benue State, Nigeria. *International journal of Agriculture and Rural Development* 1 (2): 170 – 172

MAFIMISEBI, T.E (2008). Determinant and Use of farm Income from the Cassava Enterprise in Ondo State, Nigeria. *Journal of Human Ecology* 24 (2): 125 – 127.

MUHAMMAD, H.U.; MOHAMMED, U.S. and MAYOWA, O.O. (2012). Economic Analysis of Cassava Production in Lagelu Local Government Area of Oyo State. *International Journal of Agricultural Economics, Management and Development*, 2: 36-37

NATIONAL POPULATION COMMISSION (2007). Federal Republic of Nigeria Official Gazette 94 (24)

NIGER STATE AGRICULTURAL PROJECT (NSADP) (2003). Niger State Agricultural Development Project Annual Report.

NIGER STATE GOVERNMENT (2005). NYSC Bida: Agriculture in Niger State. www.nyscbida.5u.com/agric -dev.htm

NIGER STATE GOVERNMENT (2009). Niger State Diary pp.5-8

NONYELU, C. (1991). Women in Nigeria Agriculture; Field notes Port Harcourt NAFCON 17(2):5

NSOANYA, L.N. and M.G. NENNA (2011). Adoption of improved cassava production technologies in Anambra-East Local Government Area, Anambra State, Nigeria. *JORIND 9(2):37-39.*

ODOEEMENEM, I.U. and OTANWA, L.B. (2011). Economic Analysis of production in Benue State, *Nigeria Journal of Social Sciences* 3(5): 406 – 410.

OKOYE, B.C.; OKOYE, A.C.; DIMELU, M.U.; AGBAEZE, C.C.; OKOROAFOR, O.N. and AMAEFULA, A.B. (2009). Adoption Scale Analysis of Improved cocoyam production, production and storage Technologies across Gender in Enugu North Agricultural Zone of Enugu State Nigeria. http://mpra.ub.uni-muenchen.de/17432.

RAW MATERIAL UPDATE (RMU) (2003). Cassava an important food and industrial Crop. A Biannual publication of the Raw Material Research Development Council Abuja 4(1):10-23