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Utilization of Modern Cassava Processing Techniques among Small Holder Rural Women Processor in Ondo state, Nigeria

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Abstract
This study examined the utilization of cassava processing techniques among rural women in Owo and Akoko South West Local Government Areas of Ondo State. A multistage sampling technique was used in selecting one hundred users of cassava processing techniques. Interview schedule was the main tool used for data collection while frequency counts, charts and percentages were used in analyzing the data. The results show that 58% of the respondents are within the age range of 31 – 50 years and that 71% of them were married. It was observed that majority of the respondents (95.0%) asserted that modern cassava processing techniques saves time while 84.0 percent opined that lack of operating skills do not prevent the adoption of modern cassava processing techniques. 71.0 percent of the respondents utilized some cassava processing techniques before and later abandoned it because these techniques are time wasted and energy sapping. Also, 98.0 percent of the respondents agreed that age has effect on the use of modern cassava processing techniques ($X^2 = 2.40$, $p < 0.05$), marital status ($X^2 = 1.03$, $p < 0.05$), household size ($X^2 = 8.81$, $p < 0.05$), Religion ($X^2 = 4.07$, $p < 0.05$) and level of education ($X^2 = 1.35$, $p < 0.05$). Technologies introduced through the extension agents must be relevant to the needs of rural women who are the users and the degree of their sophistication should not be beyond their comprehension.
Keywords*:* Utilization, Cassava processing, Rural women.

INTRODUCTION

Cassava is an important staple food crops grown in Nigeria. It plays has contributed significantly to alleviation of food crisis in Nigeria because of its efficient production of food energy all year-round, availability, tolerance to extreme stress conditions, and suitability to peasant farmers who are the mainstay of food systems in the country. Cassava is a major staple food widely cultivated in the lowland humid tropic and it is s capable of providing very high yields of energy per hectare for example about thirteen times more than maize or guinea corn (Oke, 1990).

Nigeria is the largest producer of cassava in the world with a total annual production of 40 MT (Adesina, 2013). The cassava production is mostly carried out by smallholder farmers in the rural areas using low-level production techniques which has left them with production of cassava tubers without much value addition. The resultant effect of the above is low farm output by the farmers and this will invariably affect their level of income. In view of the above governments at various levels have been trying in various ways to encourage rural farmers to adopt the modern cassava production technologies in order to increase the rural farmer's production and value addition through dissemination of information on improved technologies in rural farming communities However some of the farmers rejected the innovations because they found them not to be economically feasible , culturally and socially incompatible.

In Nigeria, women cassava utilizers constitute more than 60% of the adult population resident in the rural areas (Odebode, 1997). Women contribute significantly to nation-building economic growth through their roles in agricultural production, housekeeping and child welfare services. However, their traditional contribution to agricultural production has been rendered inefficient by the crude and inappropriate form of agricultural technologies frequently used (Olawoye, 1988), the result is a relatively low agricultural productivity, which is inversely proportional to the enormous labour intensive input. It is therefore important to note that the use of appropriate technologies by users [rural women] will improve their contribution to national development and that they will adopt improved technologies if it meets needs and it is culturally, socially and economically feasible. Such technologies must also be adaptable to the ecological, climatic and physical conditions in order to be functionally relevant.

In the area of cassava production, the recent Agricultural Transformation Programme of the Federal Government which has facilitated the establishment of Cassava processing plants, exportation of Cassava chips to countries like China has led to increase in the interest of the rural famers including women to increase their level of Cassava production and processing. In the domestic parlance the rural women process Cassava into various products such as cassava flour, chips, and starch among other products.

Objectives of the Study

The study examined utilization of cassava among rural women Ondo State, Nigeria. Specifically it: :

- Ascertain the socio-economics characteristics of the respondents
- Identify the types of modern cassava processing techniques that are available to the respondents.
- Determine the level of utilization of modern cassava processing techniques by the respondents
- Examine the factors affecting adoption of innovations introduced to the respondents.
- Determine the effect of information sources on utilization of Cassava processing techniques by the rural women.

Hypotheses of the Study

In order to achieve the objectives of the study, the following hypotheses were tested.

- $Ho_{1\,;}$ There is no significant relationship between the personal characteristics of respondents and use of improved cassava processing techniques.
- $Ho_{1\,:}$ There is no significant relationship between sources of information and utilization of modern cassava processing techniques by respondents.

Methodology

The study was carried out in Ondo state of Nigeria. The state lies between latitudes 5 45' and 7 52' N and longitudes 40 20' and 6 5' E. its land area is about 15,500 square kilometers. Annual rainfall varies from 2000 mm in the Southern part to 1150 mm in the northern extremes. Agriculture is the dominant occupation of the people of Ondo state providing income and employment opportunities for over 70% of the population. Arable crops cultivated are rice, cassava, maize, yam, beans and host of other vegetables. Tress crops grown are Oil palm, cocoa, kolanut, forest trees of Mahogany, Iroko and teak among others.

Sampling Technique and Sample Size

A multi-stage sampling technique was used. The first stage was the purposive selection of two (2) out of the eighteen Local Government Areas (L.G.As.) in Ondo state that is prominent in cassava production. The Local Government Areas are Owo and Akoko south. This was followed by random selection of five (5) communities from each of the two Local Government Areas to make a total of ten (10) communities that were used for this study. In the third stage each community was divided into five wards out of which two (2) was randomly selected. From each selected ward, five (5) respondents were interviewed, making a total of ten (10) respondents per community and hundred total sample size of One hundred.

Results and Discussion

Socio-economic characteristics.

Table 1 shows that majority of the respondents (58 percent) are within the age range of 31 – 50 years while 10% were 61 years and above. The mean age of the respondents was 23 years. This indicates that majority of the respondents are still in their active years and as such could undergo the rigors of cassava processing. About 53percent of the respondents had one form of education or another with 31percent having primary education, 14percent secondary education while 47percenthad no formal education. The result further shows that 71percentof the married, and 24percent were divorced. Christianity and Islam religion were practiced by the respondents (43percentand 44percentrespectively) while only 13perecent of the respondents were traditionalist. This confirms that there is no taboo against cassava processing in the study area. The findings also shows that majority (73.0 percent) of the respondents have been into cassava processing for over 5 years, this revealed that most of the respondents were experienced in cassava processing.

Table 1: Socio-economic Characteristics of the respondents

Characteristics	Frequency	Percentage (%)
Age (years)		
21-30	14	14.0
31-40	28	28.0
41-50	30	30.0
51-60	18	18.0
61 and above	10	10.0
$\overline{X}$ = 23		
Educational Level		
Primary	31	31.0
Secondary	14	14.0
Adult Education	3	3.0
Post secondary	5	5.0
No Formal	47	47.0
Marital Status		
Single	2	2.0
Married	71	71.0
Divorced	3	3.0
Widowed	24	24.0
Religion		
Christianity	43	43.0
Islam	44	44.0
Traditional	13	13.0
Years of experience in cassava processing.		
1 – 5	21	21.0
5 – 10	37	37.0
10 – 15	21	21.0
15 – 20	15	15.0
20 – 25	6	6. 0
$\overline{X}$ = 25		

Type of Cassava processing techniques by respondents.

From the study 29.0 percent of the respondents used traditional techniques, 30.0 percent used modern techniques while 41.0 percent combined both traditional and modern techniques. However, none of the respondents used only modern processing techniques .The table also reveals that 48 percent of the respondents did not adopt the use of modern techniques because they asserted that it was cheaper to acquire, and 43.0 percent of respondent in this category claimed that they lack fund to acquire modern processing equipment. Hence, they held on to the use of traditional processing techniques. It is also to be noted that 3 percent asserted that they do not have the skill to operate the machine for modern production while 6 percent of the respondents stated that the spare parts of the processing machine are not available.

Table 2: Type of cassava processing techniques used and reasons for using traditional techniques.

Variable categories	Frequency	Percentage (%)
i) Type of cassava processing techniques used		
Traditional techniques	29	29.0
Modern techniques	30	30.0
Traditional and modern techniques	41	41.0
(ii) Reasons for using traditional technique.		
Cheap	48	48.0
Lack of fund to acquire it	43	43.0
Low of operating skills	3	3.0
Non-availability of machine spare parts	6	6.0

Methods used before, current method used and the period for which it was used by the respondents.
Table 3 revealed that 71.0 percent of the respondents utilized some cassava processing techniques before and later abandoned it; this is because the techniques were found to be time wasting and energy sapping. Findings also show that 40.0 percent of the respondents abandoned hand grating techniques, while 11.0 percent abandoned stone pressing technique. The study also revealed that 40.0 percent of the respondents that abandoned hand grating method now use mechanical grating technique, while 20.0 percent of the respondents that abandoned both local stone and wood pressing traditional method now use improved hydraulic pressing technique.

Table 3: Respondents adoption of improved Methods for processing..

Variable categories	Frequency	Percentage (%)
Adopt improved processing method		
No	29	29.0
Yes	71	71.0
Abandoned traditional cassava processing techniques.		
Hand grating	50	50.0
Stone pressing	22	22.0
Wood pressing	9	9.0
Hand grating and stone pressing	6	6.0
Hand grating and wood pressing	13	13.0
Improved cassava processing techniques adopted..		
Mechanical grating	69	69.0
Hydraulic pressing	22	22.0
Mechanical grating and hydraulic pressing	19	19.0

Social economic factors affecting the use of modern cassava processing techniques.
From the study, 98.0 percent of the respondents agreed that age has effect on their use of modern cassava processing techniques. This supports Okunlola (2010) assertion that age is one of the factors adoption of improved technologies in Nigeria. Ninety eight percent of the respondents believed that income is a strong determinant on the use of modern cassava processing techniques as the level of income determines the ability of the respondents to procure required inputs to back up the adoption of new technologies introduced to them. The result also indicated that majority of the respondents (88.0percent) believed that farming experience has effect on the use of modern cassava processing techniques as some of the older farmers are reluctant to change their old practice while farm size also affect utilization of modern processing techniques as farmers with large farm size are eager to save time on their processing and reduce cost of labour The result confirms Okunlola's (2010) findings that farming experience is a strong factor that influences adoption of new technology by farmers.

Table 4: Social economic factors affecting attitude of respondents towards the use of modern cassava processing techniques.

Effect on utilization of modern cassava processing techniques	SA		A		UD		D		SD	
	F	%	F	%	F	%	F	%	F	%
(i) Age	-	-	2	2.0	-	-	51	51.0	47	47.0
(ii) Level of income			1	1.0	1	1.0	26	26.0	72	72.0
(iii)Educational level	10	10.0	22	22.0	26	26.0	38	38.0	4	4.0
(iv)Social status	1	1.0	12	12.0	36	36.0	49	49.0	2	2.0
(v)Household size	1	1	8	8	5	5	39	39	47	47
(vi)Years of farming	-	-	2	2	10	10	62	62	26	26
(vii)farm size			3	3	-	-	25	25	72	72

SA- strongly agreed, A- agreed, UD- undecided, D- disagreed, SD- strongly disagreed.

Attitudes of rural women towards modern cassava processing techniques.
Ninety six percent of the rural women believed that modern cassava processing techniques saves time, energy, quality of products and it also increases level of production. From the study, 96.0 percent of the respondents claimed that they could not use modern techniques for cassava processing due to lack of fund to acquire modern processing equipment. The result confirms Agbamu (1993) assertion that credit facility is one of the factors affecting acceptance of innovation by farmers in Nigeria. This is in agreement with Jimson (2009) who stated that lack of fund and poor information hindered the awareness of the respondents on how to improve cassava processing by rural farmers.

The use of modern cassava processing techniques reduces the number of hired labour in use as claimed by 96.0 percent of the respondents in table 5. The study also revealed that modern cassava processing is simple

to use as it also reduces stress.

Table 5 Attitudes of Rural Women Towards Modern Cassava Processing Techniques.

Variable Category	SA		A		UD		D		SD		Mean
	F	%	F	%	F	%	F	%	F	%	
Modern cassava Processing method saves time	23	23.0	73	73.0	1	1.0	-	-	3	3.0	4.13
. Modern cassava processing method increase production	27	27.0	69	69.0	1	1.0	3	3.0	27	27.0	4.2
. Spare parts of improved methods are not readily available	1	1.0	5	5.0	22	22.0	71	71.0	1	1.0	2.34
Lack of operating skill prevents the use of modern techniques	4	4.0	2	2.0	10	10.0	73	73.0	11	11.0	2.15
Lack of fund to acquire the improved techniques	69	69.0	23	23.0	1	1.0	5	5.0	2	2.0	4.52
. Instability of electricity prevents the use of improved methods	7	7.0	30	30.0	25	25.0	36	36.0	2	2.0	3.04
.I Feel comfortable using the method	24	24.0	70	70.0	4	4.0	1	1.0	1	1.0	4.15
. Use of modern method reduces the use of hired labour	33	33.0	63	63.0	2	2.0	-	-	2	2.0	4.27
.I will recommend modern methods of cassava processing to any friend	32	32.0	61	61.0	4	4.0	3	3.0	-	-	4.22

Test of Hypothesis

Ho_1: There is no significant relationship between personal characteristics of the respondents and utilization of modern cassava processing techniques

Multiple Regressions presented in Table 6, shows that the coefficient of determination (R^2) is 0.797. The implication is that about 79.7 percent of the variations observed in the adoption of modern cassava processing techniques are jointly explained by the independent variables in the model. The F- ratio (F & 0.05, 18.206) is significant at 0.05 level. This shows that the estimated equation presents a reliable goodness of fit at 0.05 levels. The standard errors of the estimate were generally low, ranging from 0.133 to 2.211. This suggests that the sample size was reasonable and was taken from a normally distributed population. The empirical result of the model rejects the null hypothesis which states that there is no significant relationship between personal characteristics of respondent and adoption of modern cassava processing techniques. Hence, we infer that personal characteristics of respondent influence knowledge and utilization of modern cassava processing techniques.

Table 6: Empirical Results of Multiple Regression.

Variable	Regression coefficient	Standard error	T-value
Constant	-6.936	2.211	-3.137*
Age	0.430	0.179	2.399*
Marital Status	0.230	0.223	1.031*
Household Size	1.460	0.166	8.809*
Religion	1.198	0.294	4.071*
Level of Education	0.180	0.133	1.351*

*= Significant at 5% $R^2 = 0.797$ F Ratio = 18.206

Chi-square analysis of the association between sources of information and utilization of modern cassava processing techniques by respondents.

Chi- square was used to test association between sources of information and utilization of modern cassava processing techniques. There is a significant relationship between utilization of modern processing techniques

and sources of information such as radio programmes, television programmes, newspapers, Agric Bulletins and others.

Table 7: Chi-square analysis of the association between sources of information and utilization of modern cassava processing techniques by respondents

Variable	χ^2 cal	χ^2 tab	Df	Remarks
Radio	53.06	24.99	15	S
Television	48.19	24.99	15	S
Newspaper	22.15	18.31	10	S
Agric Bulletins	27.49	18.31	10	S
Cooperative Society meetings	77.28	24.99	15	S
Relations and Friends	28.81	24.99	15	S
Extension Agents	44.76	18.31	10	S
Other Cassava Processors	22.24	18.31	10	S

Df = Degree of freedom

CONCLUSION AND RECOMMENDATIONS

The study indicated that over 41.0 percent of the cassava processors in Ondo state had been engaged in processing activities for the past ten years. Forty one percent of the respondents had used one or two traditional techniques before adopting the improved technique. From the study 95.0 percent of the respondents were aware of modern cassava processing techniques through radio programmes while 98.0 percent became aware through other cassava processors. Majority of the respondents (96.0 %) believed that modern cassava processing techniques saves time and increases production. A major constraint to adoption of some of the innovations is lack of fund to acquire modern processing facilities.

It is therefore recommended that improved cassava processing technologies should be introduced through the extension agents and other bodies to the rural women who are the users. The technologies should be made simple so that the rural women will find it difficult to operate. And the degree of their sophistication should not be beyond their comprehension. Government and agricultural machinery companies should give the requisite assistance towards the commercialization of viable cassava processing machinery emanating from research institutions, which if mass produced will be available to the processors at a subsidized rate.

REFERENCES

Agbamu J.J (1993); Analysis of farmers characteristics associated with adoption of soil management innovations in Ikorodu Local Government area of Lagos state. Nigerian Journal of Rural Extension and Development1 (2) 57-67

Hahn, S.K. (1993): An overview of African traditional cassava and utilization. Page 110-118.

Iwala, O.S, Okunlola J.O and Imoudu, P.B (2008): Determinants of the Adoption of Improved Technologies and Practices among Nigerian Small holder Oil Palm Farmers. *Journal of Applied Tropical Agriculture* 13(1&2) pp 79- 86.

Jimson, O.D. (2009). : "Effect of Indigenous Cassava Processing Techniques by Rural Women on the Environment in Ondo State". An Unpublished M.Tech project submitted to the Department of Agricultural Economics and Extension Federal University of Technology Akure, Ondo State. Pp 33-40.

Nweke FI, Spencer DSC, Lyman JK (2002): The Cassava Transformation Africa's Best-Keep Secret, East Lansing: Michigan State University Press.

Odebode, S.O. (1997):"Appropriate Technology for Rural Women in the processing of Soyabean and Cassava in Oyo State, Nigeria. Unpublished PhD thesis. Department of Agricultural Extension and Rural Development University of Ibadan Nigeria".

Oke, O.L. (1990): "Problems in the Use of Cassava as Animal Feed". *Animal Feed Science and Technology*. page 345-380. Pp 269.

Okunlola J.O (2010) :Factors influencing adoption of rubber based technologies among small holderfarmers in Delta State. Journal of Food and Agriculture& Environment 8(2).

Omonona BT (2009): Efficiency of resource - use in cassava production in Kogi State, Nigeria: implications for food security and environmental degradation. Retrieved on 27th April, 2009 from http://www.cababstractsplus.org/abstracts/SearchResults.

Olawoye, J.E. (1988) "Rural Women's Role in Agricultural Production: An Occupational Survey of Women from six selected rural communities in Oyo State Nigeria". Journal of Rural Sociology". Vol.2, No.1, (1988).

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