

DOPTION OF CASSAVA PROCESSING TECHNOLOGIES BY FARMERS IN AFIKPO NORTH LGA, OF EBONYI STATE, NIGERIA

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ABSTRACT

The study examined the adoption of cassava processing technologies by farmers in Afikpo North L.G.A of Ebonyi State, Nigeria. A multistage random sampling technique was used in the selection of samples. Data were collected through a structured questionnaire. The sample size was 80 cassava processors. Data were analyzed using descriptive and inferential statistical methods to achieve the objectives. The findings suggested non-availability of some cassava processing technologies such as peeling machine, washing machine, fermentation tank and sifter. The most widely available cassava processing technologies were motorized graters, hydraulic press and garri fryer which were adopted. The determinants of adoption were age, gender, educational attainment and income. The study therefore recommends that, there is need for government to make available cassava processing technologies among farmers irrespective of gender so that the farmers will be more effective in Agricultural productivity and also females should always be considered in the design of these technologies so as to encourage their use of them.

Key words: Adoption, Cassava, Processing Technologies, Afikpo North L.G.A.

INTRODUCTION

Cassava (*Manihotesculenta*) is an efficient producer of calorie and protein and remains the most important crop in the humid zone occupying over 60% of the arable land (Nweke *et al.*, 1999). The estimated dietary calorie equivalent of the daily per capita consumption of cassava in Nigeria is 238kcal and accounts for about 80% of the calorie intake by the inhabitants in the producing area (Cock, 1985). The production of cassava has been estimated in Nigeria to be approximately 34 million tones and comparing the output of various crops in Nigeria, cassava production ranked first (FAO, 2004). Nigeria is presently the world's largest

producer of cassava (Phillips *et al.*, 2004).

The Federal Government of Nigeria has unequivocally lent credence to the need to develop the agricultural sector through commercialization of the sector rather than the present and prevailing subsistence nature (Okuneye *et al.*, 2014). The drive towards commercialization which is often in consonance with production of large quantities cannot be sustainable without the adoption of processing technologies. If complementing processing technologies are not developed and adopted, the development of high yielding and disease resistant cassava varieties will be a waste of human, physical and economic resources. This becomes imperative as value addition in form of processing is a virile means of preventing rapid deterioration which sets in within 24–48hours upon harvesting of cassava tubers (Okuneye *et al.*, 2014) The traditional technologies in processing of cassava are of low productivity and hygiene, tasking, time consuming and generally inefficient, with the problem worsened when the quantities to be produced are very large (Adekanye *et al.*, 2013). Therefore, cassava processing technologies ameliorate the above shortcomings in traditional technologies and have the potentials to improve the nation's economy as Nigeria has been consistently ranked as the world's largest producer of cassava (Adekanye *et al.*, 2013).

The National Agricultural Research Institutes (NARIs) have been consistently developing new cassava processing technologies to improve the processing of cassava and have the general belief that increased cassava processing technologies will depend primarily on the acceptance of the improved cultural and technological changes at the rural farm level and that the small scale cassava processors will achieve higher yields, if they adopt recommended scientific cassava processing technologies in place of their traditional practices. The improved technological packages include; peeling machine, washing machine,

motorized grater, fermentation tank, hydraulic press, garri fryer and sifter. This study was carried out to determine adoption of improved cassava processing technologies in Afikpo North L.G.A of Ebonyi State, Nigeria. The specific objectives of the study were to; (i) describe the socio-economic characteristics of the cassava processors in Afikpo North LGA; (ii) identify cassava processing technologies available to farmers in the area; (iii) ascertain level of adoption of cassava processing technologies by farmers in the study area and (iv) determine the factors influencing adoption of cassava processing technologies by farmers in Afikpo North L.G.A.

METHODOLOGY

The study was conducted in Afikpo North Local Government Area of Ebonyi state, Nigeria. This area was chosen for the study owing to the fact that farming is the predominant occupation of the people. Afikpo North is made up of three (3) towns namely Afikpo, Amasiri and Apkoha. These towns have many communities and villages. Based on the National population Census (NPC)(2006), Afikpo North had total population of 156,611 people. It has an annual rainfall range of 1,500mm to 1,800mm and temperature range of 22^oc to 30^oc during the year. It is bounded in the East by Ozziza in the South by Ekoli Edda LGA and the West by Ohafia Local Government Area and in the North by Ivo LGA. The main occupation of the people is arable crop farming (yam, cassava, rice among others) and rearing of livestock.

A Multistage Random Sampling Technique was used to select towns, villages and cassava processors. Two towns namely Amasiri and Afikpo were randomly selected. From each of the towns selected, four (4) villages were randomly selected giving a total of 8 villages. From the selected villages, ten (10) farmers were randomly selected to give a total of eighty (80) farmers. The data used for the study were obtained by means of a structured questionnaire and interview schedule. Data were analyzed using descriptive and inferential statistical methods to achieve the objectives. Objective i. and ii. were analyzed using descriptive statistics such as means percentages and frequency distribution. Adoption scale analysis were used to determine objective iii. and objective iv. that dealt with determining factors influencing adoption of cassava processing technologies in the study area was realized using Probit

Regression Model. The implicit form of the model is specified as;

$$Y = f(X_1, X_2, X_3, X_4)$$

Y = number of cassava processing technologies adopted

X₁ = gender (a dummy: 1 = male, 0 = female).

X₂ = age (years)

X₃ = years of formal education

X₄ = income (naira).

RESULT AND DISCUSSION

Table 1 shows the socio-economic characteristics of the cassava processors. The result indicates that majority(62.5%) of the farmers were males. This is in line with Nwaneri (2015), who opined that training services should primarily be directed towards men because they are more likely to adopt technologies faster than the females. The table further shows that farmers within the age bracket ranged between 40-49 years were in majority(45%) while the least (6.2%) fell within age bracket ranged between 20-29. 31.3% of the respondents fell within the age bracket ranged between 30-39. Age is vital in Agricultural production especially labour which is intensive and could be better accomplished by able bodied and energetic individuals, (Asiabaka, 2003). This finding is in line with Nwaneri *et al.*,(2013). Majority(90%) of the respondents were educated attaining various levels of education, primary (30%),secondary(36.3%) and tertiary education (23.7%), while 10% of the respondents had no formal education. Okoronkwo and Ume (2013), observed that the more educated a farmer is the better he can adopt innovations. The level of education attained by a farmer not only increases his farm activity, but also enhances his ability to understand and evaluate new production technologies (Nwaneri T.C and Nwaneri J.A, 2015). The table also shows that farmers with household size ranged between 7-9 were in majority (47.5%) while the least (3.7%) fell between household size ranged between 1-3. According to Iwueke (1987), household size ranging from 7 is large. Large household size has shown to provide cheap labour, especially where labour costs or wage are costly. It is therefore expected that the family embarks on technologies that will increase their farm output. Majority (62.5%) of respondents were married while 37.5% were single. Farmers with farming experience between 11-20 years were in majority (51.3%), while the least (3.7%) had

farming experience ranged between 41-50. Years of farming experience gives an indication of practical knowledge acquired on how the individual can overcome certain inherent problems associated with farming (Ume, et al.,2013) Source: *Field survey data, 2015*

Table 1 Distribution of Farmers Based on Socio-economic Characteristics In Afikpo North LGA of Ebonyi state, Nigeria.(n=80).

Characteristics	Frequency	Percentage(%)
Gender		
Male	50	62.5
Female	30	37.5
Age		
20 – 29	5	6.2
30 – 39	25	31.3
40 – 49	36	45.0
50 – 50	8	10.0
60 – Above	6	7.5
Educational level		
No formal education	8	10.0
Primary education	24	30.0
Secondary level	29	36.3
Tertiary education	19	23.7
Household		
1 – 3	3	3.7
4 – 6	22	27.5
7 – 9	38	47.5
10 – 12	12	15.0
13 – 15	5	6.3
Marital status		
Single	30	37.5
Married	50	62.5
Farming experience (yrs)		
1 – 10	12	15.0
11 – 20	41	51.3
21 – 30	20	25.0
31 – 40	4	5.0
41 – 50	3	3.7

Source: *Field survey data, 2015*

The frequency and percentages of cassava processing technologies available to the farmers and the mean scores for level of adoption of the available cassava processing technology packages in the study area are shown in table 2. Motorized grater, Hydraulic press and Garri Fryer with percentage ratings of 70%, 81% and 81% respectively are the cassava processing technologies accepted by the farmers as

being available in the area. By low percentage scores of other items, they were considered as not being available by the farmers. This is corroborated by Nwaneri *et al.*, (2013) who stated that agricultural development in Nigeria and other developing countries has been hampered by low level of information exchange. It is one thing for an innovation to be available and a different thing for the technology to be propagated by extension services.

The mean scores on the level of adoption of cassava processing technologies in table 2. shows that hydraulic press and garri fryer

recorded the highest level of adoption with mean score of 3.5. Motorized grater had mean score of 3.2. Since the mean adoption scores of these packages were above the threshold mean of 3.0, it shows that these technologies were fully adopted by the cassava processors. However, peeling machine, washing machine, fermentation tank and sifter scored below the adoption mean score and therefore shows that these technologies were least adopted which could be attributed to the unavailability.

Table 2 Response on Availability of Cassava Processing Technologies to Farmers and the Level of Adoption in the Study Area

Technology	Yes	No	Adoption level (Threshold mean=3.0)	
	Frequency(%)	Frequency(%)	Mean	Adoption
Peeling machine	19 (24)	61 (76)	1.7	Awareness
Washing machine	19 (24)	61 (76)	1.7	Awareness
Motorized grater	56 (70)	24 (30)	3.2	Adoption
Fermentation tank	35 (44)	45 (56)	2.7	Trial
Hydraulic press	65 (81)	15 (19)	3.5	Adoption
Garri Fryer	65 (81)	15 (19)	3.5	Adoption
Sifter	35 (44)	45 (56)	2.7	Trial

Source: Field survey data, 2015

The probit estimates of the factors influencing adoption of cassava processing technologies in Afikpo North LGA is presented in table 3. The likelihood ratio chi-square is significant at 1% indicating the goodness of fit of the model. The coefficient of determination is 0.7920 indicating that 79.20% of variation in access to ICT facilities is explained by the factors included in the model. The significant factors influencing adoption of cassava technological packages are gender of the respondents, years of formal education and income.

The coefficient of gender is significant at 1% level of probability and negatively related to access to adoption of cassava processing technologies. This implies that men adopt technological packages than women because of the general held view and a common practice in the developing countries to direct extension and training services primarily towards men with the belief that information passed to men will always trickle down to other family members. The coefficient of years of education is

significant at 1% probability level and positively related to adoption of cassava processing packages, this implies that the higher the educational attainment, the greater the level of adoption since level of education attained by a farmer not only increases his farm activity, but also enhances his ability to understand, evaluate and use the new improved technologies resulting in higher adoption rate. The coefficient of income is significant at 5% probability level and positively related to adoption of cassava processing technologies. This implies that the higher the income of the respondents the higher the adoption of improved technological packages. This is in line with the observations of Nwogu, (2006) and Nwaneri *et al.*, (2013) were they stated that Technological packages anywhere are capital intensive. When technological packages are priced out of the reach of the rural dwellers, there is no way they can access or adopt them unless government comes to their aid.

Table 3: Probit Regression Estimates of Factors Influencing Adoption of Cassava Processing Technologies in Afikpo North LGA.

Variable	Coefficient	Std.Err.	-Z-
Intercept	0.462	0.126	3.68***
X1 (gender)	-0.456	0.104	-4.37***
X2 (age)	-0.015	0.017	-0.91
X3 (education)	0.130	0.035	3.74***
X4 (income)	1.73e-06	7.43e-07	2.32**
Likelihood ratio chi square	18.10***		
Pseudo R ₂	0.7920		

Source: *Field survey data*, 2015.

*** = significant at 1%

** = significant at 5%

CONCLUSION AND RECOMMENDATION.

The study examined the adoption of cassava processing technologies in Nigeria. Findings suggested non-availability of some cassava processing technologies such as peeling machine, washing machine, fermentation tank, and sifter. The most widely available cassava processing technologies are motorized grater, hydraulic press and garri fryer which were adopted. The determinants of adoption were age, gender, educational attainment and income. The study therefore recommends that, farmers should be encouraged to process more cassava tubers so as to facilitate the use of cassava processing technologies. There is need for Government to make available cassava processing technologies among farmers irrespective of gender so that the farmers will be more effective in Agricultural Productivity. Also, females should always be considered in the design of these technologies so as to encourage their use of them.

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