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FACTORS INFLUENCING CASSAVA VALUE ADDITION BY RURAL AGRIBUSINESS ENTREPRENEURS IN ABIA STATE, NIGERIA

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Abstract

The study analyzed the factors influencing cassava value addition by rural agribusiness entrepreneurs in Abia state, Nigeria. The specific objectives were to: ascertain the various forms of the value added cassava products produced by the respondents; estimate the factors that influence farmers' decision to add value to cassava; and make recommendations based on the findings. A multi-stage random sampling technique was used to select 70 respondents. Primary data were collected through the aid of a well structured questionnaire. Data collected were analyzed using descriptive statistical tools such as frequency, mean, tables, percentage as well as the binary logit model. The result of the binary logistic results indicated that the coefficients of gender, education, income, household size and output were statistically significant at different levels of probability. The study therefore recommended that encouragement should be given to females to go into cassava value addition as well as making high yielding varieties available to the entrepreneurs by the government and its agencies whose mandate is to do so.

Key words: *cassava, binary logit, entrepreneurs, value addition*

INTRODUCTION

Cassava (*Manihot esculenta*) has its origin in Latin America where it has been grown by the indigenous Indian population for at least 4000 years. After the discovery by the Americas, European traders took the crop to Africa as a potentially useful food crop; later it was also taken to Asia to be grown as a food security crop and for the extraction of starch [3]. In recent years cassava has gained global attention as an important root crop in Africa. This is because climate variability does not affect its productivity [1]; it has a flexible planting and harvest cycle; it can withstand drought and diseases as well as thrive on soil with low quality [13]. Also, every part of cassava crop is useful. Its leaves are relished as vegetables in countries like Congo and Tanzania [10]; its peel is used as animal feed; while its peeled roots can be processed into various value added by-products such as: garri, fufu, flour, starch, chip and ethanol.

Throughout the tropics, especially in Nigeria, the plant's root do not only serve as an essential source of calories but even more so as a major source of income for rural households. Cassava performs five main roles namely famine reserve crop, rural food staple, cash crop for urban consumption, industrial raw material, and foreign exchange earner [16]. This shows that cassava possesses the potential of eliminating food crisis and famine.

Nigeria is currently the largest producer of cassava in the world with an estimated annual output of 54 million metric tonnes [8] and its cassava transformation master plan the most advance in Africa. Cassava is also seen to have a high poverty-reduction potential for Nigeria due to its low production cost [17] hence cassava production is widespread across all regions of the country.

However, cassava just like other agricultural produce are highly perishable, hence most rural farmers do not get the desired reward for their work as most of their produce start deteriorating a day or two after harvest [4]. Consequent upon this, the National Root Crops Research Institute (NRCRI), Umudike which had the national mandate to research into root and tuber crops, developed some processing technologies of root and tuber

crops in order to curtail their perishability and add value to these crops.

The major processed forms of cassava roots fall into four general categories; meal, flour, chips and starch.

Meal forms include: *gari, fufu, lafun, tapioca, abacha,* cassava cock tail tit-bite, 30% cassava/wheat bread, cassava fritters, 10% cassava/wheat bread, cassava queen's cake, cassava croquette, grundi and other cassava based foods (non-confectionary) like cassava salad cream, cassava pizza, *ikpan iwa*, *megau* etc [4].

From 2005 till date training and workshops on the production of value added cassava products have been conducted for farmers in Abia state and its environs by staff of the institute [4].

The essence is to enable farmers to see how cassava can be put to wider uses in the home, for income generation and possibly for export purposes. However, the farmers have to decide on the form of value added products to produce.

Decision making is regarded as the cognitive process resulting in the selection of a belief or a course of action among several alternative possibilities based on the values and preferences of the decision maker [20].

Every decision making process produces a final choice that may or may not prompt action.

For the farmers, decision making regarding the addition of value to cassava products is based on the expected utility derivable which is also a function of the socioeconomic characteristics of the farmers.

Thus the study analyzed the determinants of farmers' decision making regarding addition of value to cassava products disseminated by the National Root Crops Research Institute (NRCRI), Umudike, Abia state, Nigeria.

The specific objectives are to: ascertain the various forms of value added cassava products produced; determine the factors that influence the respondents' decision to produce value added cassava products; and make recommendations based on findings of the study.

MATERIALS AND METHODS

Study Area

The study was carried out in Abia state, Nigeria. Abia state is one of the 36 states in Nigeria created in 1991 from part of Imo state. It is located in the south-east geopolitical zone of the country.

The state lies between Longitude 04^0 45' and 06^0 07' North and Latitude 07^0 00' and 08^0 10' East. It is bounded by Imo State on the West, Ebonyi and Enugu states on the North, Cross Rivers and Akwa Ibom states on the East and Rivers state on the South.

The state covers an area of about 5,243.7 square kilometer which is approximately 5.8 percent of the total land area of Nigeria. [11]. It has a population density of 580 persons per square kilometer and a population of 2,833,999 persons [14].

Administratively, it has 17 Local Government Areas (L.G.As), 3 Senatorial zones and 3 Agricultural zones with Umuahia as the state capital. The climate of the state is tropical with 2 distinct seasons namely rainy season which starts from March to October; and dry season which commences from November and ends in February. Agriculture is the major occupation of the people and subsistent agriculture is prevalent and about 70 percent of the population engage in it [2]. They produce crops like cassava, yam, cocoyam, sweet potato, ginger, rice and maize, while the cash crops include; oil palm, rubber, cocoa, banana, and various types of fruits. They also rear animals like pig, goat, sheep, several of types of domesticated birds, etc. Cassava however, is a major tuber crop produced by almost every household in the study area and hence the choice of the crop.

The inhabitants are predominantly Igbos, and practice Christianity and African Traditional Religions. Aba is regarded as the commercial centre of the state. The state is blessed with mineral resources such as lead, zinc, limestone, fine sand and petroleum. As regards tourism there are many tourist centers but the most outstanding are the: national war museum in Umuahia, the Azumini blue river at Ukwa east, and the long juju of Arochukwu [2].

Sampling technique

A multi-stage random sampling technique was used to select a sample size of 70 cassava farmers/processors from the study area. Firstly, three local government areas were randomly selected from the seventeen local government areas of Abia state. Thereafter, two autonomous communities were randomly selected from the each of the three local government areas to give a total of 6 communities. Finally, 11 cassava farmers/processors each were selected from 5 of the 6 selected communities, while 15 farmers/processors were selected from the remaining 1 community to give a total of 70 respondents that were used for the study.

Method of Data Collection

Primary data were generated through interview and well structured questionnaire administered to the respondents.

Method of Data Analysis

Objective (i) realized using descriptive statistics such as percentages, frequencies and mean. While, objective (ii) was analyzed using binary logit model.

Model Specification

Logistic regression analysis is part of a category of statistical model known as generalised linear models which consist of fitting a logistic regression model to an observed proportion in order to measure the relationship between the response variable and set of explanatory variables [13, 5].

The binary logistic model falls in the group of qualitative response models which have the dependent variable as an indicator of a discrete choice. The logistic regression model has been used in many applications due to its mathematical convenience. The Y = binary dependent variable, which represents the decision making index that takes the values of between 0 and 1[9].

The logistic regression model [10] is given by:

$$\pi(X) = \frac{1}{1+e^{X\beta}} \quad (1)$$

$\pi(X)$ = The success probability of value X.

$X\beta$ = Stands for

$$\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots\ldots + \beta_n X_n \quad (2)$$

e = exponent or the base of the system of natural logarithms.

Its transformation generates:

$$\text{Odd} = \frac{1}{1-\pi} \quad (3)$$

The logistic regression model has a linear form for the logit of this probability.

$$\text{Logit}\ \{(X)\} = \log\{\frac{\pi(X)}{1-\pi(X)}\} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots\ldots + \beta_n X_n \quad (4)$$

In this study, six components or products were identified. The total score per respondent for the number of products identified divided by the six and were expressed as an index of the overall score for the six products thus:

$$Y = \frac{x}{n}$$

Where: Y = index score

x = number of components or products produced by each respondent

n = total number of components identified

RESULTS AND DISCUSSIONS

Forms of Value Added Cassava Products Produced by the Respondents.

Table 1 shows the various forms of value added cassava products produced by cassava farmers/processors in the study area. The result is presented in order of their magnitude: Cassava root to *Fufu* (88.6%), Cassava root to Garri (82.9%), Cassava root to cassava tapioca (82.9%), Cassava root to cassava flour (48.6%), cassava root to cassava fritters (32.9%) and cassava bread (2.86%).

Table 1. Distribution of Respondents based on Forms of Value added Cassava Products Produced.

Forms of value addition	Frequency	Percentage
Fufu	62	88.6
Garri	58	82.9
Tapioca	58	82.9
Cassava Flour	34	48.6
Cassava Fritters	23	32.9
Cassava Bread	3	2.86

Source: Field Survey Data, 2014

From the result, it could be observed that cassava flour; cassava bread and cassava fritters recorded less than 50% production

against those of fufu, garri and tapioca. Due to the high cost of procuring processing equipment for the production of flour, bread and fritters, their production seems low compared to fufu, garri and tapioca which require less expensive equipments and are therefore within the reach of farmers.

Factors influencing cassava value addition by rural agribusiness entrepreneurs in Abia state, Nigeria

The result of the estimates of the factors influencing cassava value addition by rural agribusiness entrepreneurs in Abia state, Nigeria is presented in Table 2 below.

Table 2. Estimates of the factors influencing cassava value addition by rural agribusiness entrepreneurs

Variables	Coefficients (B)	S.E	Wald	Exp (B)
Age (X_1)	-0.014	0.021	0.428	0.987
Marital status(X_2)	0.131	0.410	0.103	1.140
Gender (X_3)	-0.110	0.071	2.385	0.896 **
Education (X_4)	0.686	0.205	11.198	1.089 ***
Income (X_5)	4.628	2.375	3.800	0.008 ***
Household size (X_6)	-0.006	0.004	2.337	0.994 **
Experience (X_7)	-0.493	0.397	1.538	0.611
Output (X_8)	0.001	0.001	3.120	1.001***
Constant	5.608	2.958	3.594	272.683***

Chi^2
Cox and Snell R^2
Nagelkereke R^2
Loglikelihood
Source: Field Survey Data, 2014
Note: ***, ** denotes 1% and 5% levels of significance respectively

The result of the binary logistic regression on the factors influencing cassava value addition by rural agribusiness entrepreneurs in Abia state, Nigeria, as presented in Table 2 above indicated that the coefficients of gender, education, income, household size and output were statistically significant. The coefficient of sex was significant at 5 percent level of probability but with a negative sign. This indicated that female gender were more involved in cassava value addition than their male counterparts. [7] had opined that overall; women tend to be less integrated in value chains than men. Their lack of mobility and thus lack of access to markets, as well as social norms, impede their interaction with value chain actors. However, the reason for the negative sign of sex being that men were not directly involved in processing and as such had low level of awareness of cassava value addition. This corroborate the findings of [18] who observed that the negative sign of sex implies that men were not directly involved in processing and as such had low level of awareness of sweet potato value addition.

Education of the respondents was statistically significant at 1 percent of probability level with a positive sign. This implied that as the education of the respondents increases, the probability of their decision to undertake value addition in cassava increases. Education is important and it has been found to influence other factors like management [15]. Similarly, formal education helps one to grasp issues better, anticipate, appreciate and respond to market needs. Given this, the result of the findings is plausible.

The coefficient of income was also positive and significant at 5 percent probability level. This meant that as the entrepreneurs' income increases, their likelihood of adding value to cassava products will increase. The economic status of an individual often times plays a significant role in decision making processes. This is especially true when it involves the purchase of new implements which will usually be dictated by individual financial capability.

The coefficient of household size posted a negative but statistically significant at 5 percent probability level. This meant that as household size increases, the decision to add value to cassava by the entrepreneurs reduces. Large family sizes have been associated with increased responsibilities, including consumption of food. Furthermore, cassava is one of the major staples in the area and therefore, the tendency for high self consumption for the large families is high. This result is expected and corroborates with [12].

The coefficient of output was positive and significant at 99 percent confidence level. This meant that with larger outputs, the probability of the entrepreneurs engaging in cassava value addition increases. It has been known that harvested cassava if not processed

after about two days will start deteriorating. Given this fact, entrepreneurs with large output will opt for adding value by processing into various other forms to at least extend shelf life of the harvested cassava.

The LR chi^2 was 98.73 which is significant at one percent probability level, while the pseudo R^2 was 0.6332 meaning the 63.32 percent of the variability has been explained in the equation.

CONCLUSIONS

The study has shown that the major value added cassava products produced in the study area are: Fufu, Garri and Tapioca; the major factors influencing entrepreneurs' decision to add value to cassava are: gender, educational attainment of the entrepreneurs, income, household size and output. The study therefore recommends that encouragement should be given to females to go into cassava value addition. This could be in the form of credits which will enable the female entrepreneurs acquire the necessary equipments required for their operations. High yielding varieties should also be made available to the entrepreneurs by the government and its agencies whose mandate is to do that. This will help boast their output thus, making way for value addition. This is especially important now that the market for these products is on the increase.

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