Journal of Community & Communication Research
ISSN: 2635-3318
Volume 4, No. 2 December 2019
Pp. 127-133

Awareness and Utilization of Cocoyam Value Addition Technologies by Farmers in South-East, Nigeria

Accessible at: https://jccr.sccdr.org.ng/index.php/jccr/issue/view/1

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Review Process: Received: 03/09/19 Reviewed: 21/09/19 Accepted: 25/12/19

ABSTRACT
The study examined the level of awareness and utilization of cocoyam value addition technologies among farmers in South-East Nigeria. The specific objectives of the study were to examine some selected socio-economic characteristics of the respondents, ascertain level of awareness of cocoyam value addition technologies among the respondents and determine the extent of use of cocoyam value addition technologies among the farmers in the study area. Multi-stage sampling procedure was used in the selection of 480 respondents. Data were collected with the use of questionnaire and focus group discussion and later analyzed with descriptive and inferential statistics like frequency distribution and ordinary least square regression model. Major findings revealed that majority of the respondents (97.7%) had low awareness on the cocoyam value addition technologies. The result also indicated that out of the 7 technologies disseminated to the farmers, only one, preparing of cocoyam as soup thickener ($\bar{x}$=3.62) had a high mean score. Therefore the study concluded that awareness and utilization level of the respondents were poor and recommends massive campaign and re-training of the farmers in the study area.

Keywords: Awareness, Utilization, Cocoyam, Value Addition, Technologies

INTRODUCTION

Agricultural produce are known to be highly perishable, hence most rural farmers do not get the desired reward for the work as most of their produce are lost a day or two after harvest. (Onuekwusi, Odoemelam, and Kanu, 2017). Consequent upon that the National Root Crops Research Institute (NRCRI), Umudike which had the 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 essence is to ensure that these crops can be put to wider uses in the home for income generation.

Several studies have been documented on cocoyam production output in Nigeria (FAO, 2006; Chukwu, 2015). In view of the numerous challenges associated with cocoyam production and utilization in Nigeria, the National Root Crops Research Institute disseminated these technologies aimed at boosting cocoyam production and utilization especially in South-East, Nigeria.

In order to achieve agricultural transformation, these improved technologies were made available to the farmers. Akwaji, (2016) in his findings stated that the appropriateness of any technology depends on its acceptability by the people. Hence, if the innovation was not accepted by the people, the money, time and effort spent are wasted.

The utilization (adoption) of innovation is the last step in decision process. To make full use of an innovation having considered that such makes impact positively on the livelihood of the adopter. Against this background, it was pertinent-to assess the awareness and utilization of the cocoyam value addition technologies disseminated by the Institute to the farmers, with the following specific objectives to; examine some selected socio-economic characteristics of the respondents, ascertain level of awareness of cocoyam value addition technologies among the respondents and determine the extent of use of cocoyam value addition technologies among the farmers in the study area. It was hypothesized that there was no significant relationship between the socio-economic characteristics of the respondents and their use of cocoyam value addition technologies.

METHODOLOGY

The study was carried out in South-east agro-ecological zone of Nigeria. Population of the study consisted of all cocoyam farmers in South-east Nigeria. Multi-stage sampling procedure was used in the selection of the sample size. In the first stage, 3 States out of the five States were randomly selected, followed by a selection of 2 agricultural zones from each State, 2 blocks, 2 circles and 10 cocoyam farmers were randomly selected from each circle bringing the total to 480 respondents. Data were collected with the use of questionnaire and focus group discussion. The data collected were analyzed using descriptive and inferential statistics. Objectives 1 and 2 were analyzed using descriptive statistics like frequency distribution, while objective 3 was analyzed using mean scores.

The hypothesis was realized using Ordinary Least Square regression Model, the model is specified below:

$$y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}+e \quad (1)$$

Where,

Y = cocoyam value addition technologies used (total mean score).

X_1 = Sex (male 1, female 0)

X_2 = Age measured in years

X_3 = Marital status (dummy; married 1, otherwise 0)

X_4 = Educational level (measured in years)

X_5 = Occupational status (full time 1, otherwise 0)

X_6 = Farming experience (measured in years)

X_7 = Farm size (measured in hectares

X_8 = Household size (number of people living together)

X_9 = Income (measured in Naira)

X_{10} = Membership of organization (member 1, non-member 0)

X_{11} = Access to credit (dummy; access 1, non 0)
X_{12} = Extension contact
e = Error term

RESULT AND DISCUSSION

Socioeconomic Characteristics of the Respondents

The Table revealed the mean age of the respondents as 48.81. Age is a critical factor in agricultural activities, essentially due to the labour intensive nature and the drudgery associated with agriculture production. The table also revealed the marital status of the respondents, about 82.3% were married, and 13.13% were single while 4.43 were widowed.

Table 1: Socio-economic characteristics of the respondents

Variables	Percentage
Age	
0-30	3.87
31-40	18.87
41-50	37.13
51-60	29.13
≥ 60	11
Mean	48.81
Marital status	
Single	4.43
Married	82.27
Widow	13.3
Level of education	
Non formal	11.2
Primary school	21.96
Secondary	39.27
Tertiary	27.57

Source: Field survey, 2017

The result implied that cocoyam farmers in the study area were largely married and were actively engaged in their business in order to adequately cater for their family members (Ekwe, Ebere, and Kalu, 2016). On educational level, the result indicated that about 39.3% of the respondent's attained secondary education, 27.6% had tertiary education while a small proportion of 11.2% had no formal education. It is assumed that their level of adoption of improved technologies will be very high because Apu and Nwachukwu (2008) observed that farmers educational level positively influence their adoption of improved technologies.

Awareness of cocoyam value Addition technologies

Result on Table 2 shows the awareness of the respondents on cocoyam value addition technologies. The study revealed that 61.3% of the respondents were not aware of value addition technology on processing of cocoyam into flour while only 49.7% were aware of the technology. For bread-making from the flour only 17.1% were aware. For conversion of flour to chin-chin, 23.3% were aware. About 31.8% were aware of flakes. For cake-making from cocoyam flour, 17.5% were aware of the technology. For use of cocoyam leaves for soup, about 72.5% were aware. Awareness creation is key to enlightenment of individuals on technological innovations, and until a proper awareness is created among the respondents, the uptake of these value addition technologies is most likely to remain low

Table 2: Distribution of Respondents based on their of Awareness of cocoyam value Addition technologies

Variables	Yes	No
Processing cocoyam into flour	49.7	61.3
Converting flour bread	17.1	82.9
Chin-chin	23.3	76.7
Cocoyam flakes	31.8	68.2
Cocoyam cakes	17.5	82.5
Use of cocoyam leaf for Soup	72.5	27.5

Source: Field data, 2017.

Extent of utilization of cocoyam value addition technologies

Result on T able 3, shows mean distribution of respondents on utilization of cocoyam value addition technologies in the study area. The result revealed that all the cocoyam value addition technologies had low utilization, except one (preparation of cocoyam soup thickener ($\bar{X}$ =3.62). The result is an indication of poor awareness of the respondents on these technologies.

Table 3: Mean distribution of extent of utilization of cocoyam value addition technologies

Utilization of technologies	**Mean**
Processing corms into flour	1.91
Converting cocoyam flour into bread	1.35
Converting cocoyam flour into chin-chin	1.40
Making of cocoyam flakes	1.76
Making of cocoyam cakes	1.37
Using cocoyam leaves for soup	2.48
Preparing of cocoyam soup thickener	3.62
Grand mean	1.98

Source: Field data, 2017.

Relationship between farmers' socio-economic characteristics and the use of cocoyam value addition (processing) technologies

The result in table 4 shows the Ordinary Least Square Regression result of the relationship between socio-economic characteristics of the respondents and their use of cocoyam value addition (processing) technologies in the study area. Four functional forms of multiple regression were tried and Double-log functional form was selected based on the magnitude of the R2 value, number of significant variable and F-ratio. The R2 (coefficient of multiple determination) value was 0.86 which implies that 86.0% of the total observed variations in the dependent variable (Y) were accounted for, while 14% of the variation were due to error. F-statistics was significant at 1% indicating the fitness of the model used for the analysis.

Table 4. OLS Regression estimates of the relationship between farmers' socio-economic characteristics and the use of cocoyam value addition (processing) technologies

Variables	Linear	Exponential	Semi-log	Double-log+
Constant	3324.578 (4.238)**	8.150 (6.913)***	6151.804 (10.334)***	1.324 (10.545)***
Sex	-447.6 (-1.310)	-0.511 (-0.44)	-891.993 (0.900)	0.743 (0.551)
Age	-4.123 (-4.090)***	-0.009 (-2.907)***	-648.511 (-2.348)**	-0.370 (-1.972)**
Marital status	18.923 (0.950)	0.004 (1.132)	309.629 (1.050)	0.071 (0.830)
Level of education	-82.300 (-0.596)	-0.077 (-0.907)	-35.354 (-0.101)	-0.117 (-0.685)
Occupation	9.592 (0.690)	0.002 (1.570)	420.526 (1.062)	0.003 (0.033)
Farming experience	-33.500 (-0.743)	-0.014 (-0.390)	320.904 (0.613)	0.045 (0.255)
Farm size	0.001 (0.860)	2.301E-7 (6.988)***	52.349 (7.330)***	0.107 (3.716)***
Household size	170.124 (0.587)	0.008 (0.044)	69.215 (0.131)	0.006 (2.505)**
Monthly income	5.313E-5 (5.596)	3.083E-8 (0.564)	267.550 (2.079)	0.143 (2.282)**
Membership of social organization	.781 (14.544)***	1.614E-5 (8.871)***	22143.785 (11.343)***	.290 (11.343)***
Access to credit	0.054 (0.247)	1.766E-6 (0.633)	8394.982 (0.767)	.048 (3.390)***
Extension contact	0.002 (2.875)**	1.476E-6 (1.706)*	-908.842 (-2.260)**	-0.280 (-1.430)
R^2	0.67	0.78	0.85	0.86
R Adjusted	0.65	0.76	0.83	0.84
F-Ratio	34.909***	22.813***	11.942***	30.419***

Field survey, 2017.Key: * Significance at 10%, ** Significance at 5%, *** Significance at 1% ***, + = Lead Equation and the values in bracket are the t-value

The coefficient of age was statistically significant at 5% and negatively related to the use of cocoyam value addition (processing) technologies in the study area. This inverse relationship implies that increase in the age of the farmers decreases use of cocoyam value addition (processing) technologies.

The coefficient of farm size was statistically significant at 5% and positively related to the use of cocoyam value addition technologies in the study area. This implies that any increase in the farm size will lead to a corresponding of farmers increase will increase the use of cocoyam value addition (processing) technologies in the study area.

The coefficient to household size was positively related and statistically significant at 5% level of probability. This result implies that an increase in household size will result to corresponding increase in the use of cocoyam value addition (processing) technologies in the study area. The increase of household sizes suggests that more family labour would be readily available since relatively large household size is an obvious advantage in terms of labour supply, where wage rate is relatively costly.

The coefficient of income was statistically significant at 1% and it is positively related to use of cocoyam value addition (processing) technologies. This implies that a unit increase in income will lead to an increase in use of cocoyam value addition (processing) technologies. This may be attributed to the fact that an increase in income will enable the farmers to adopt new production strategies.

The coefficient of membership to social organizations was statistically significant at 1% and positively related to use of cocoyam value addition (processing) technologies. This result implies that any increase in the membership to social organizations by farmers will lead to a corresponding increase in use of cocoyam value addition (processing) technologies.

The coefficient of access to credit was statistically significant at 1% and positively related to use of cocoyam value addition (processing) technologies. This result implies that a unit increase in the access to credit by the farmers will lead to a corresponding increase in use of cocoyam value addition (processing) technologies.

The study therefore rejected the null hypothesis which stated that there was no significant relationship between the socio-economic characteristics of the respondents and their use of value addition technologies and concluded otherwise at 5% alpha level.

CONCLUSION

There was a relatively high level of awareness of the production technologies, most of the respondents were not aware of the value addition technologies as well as a relatively high level of use of cocoyam production technologies than value addition technologies in the study area. In fact, most of the value addition technologies were relatively in low level of use.

RECOMMENDATIONS

1. Since most of the farmers were not aware of the value addition technologies, creating more awareness and training farmers on these technologies is recommended for the ADP and other government and private organizations involved in extension and advisory services delivery in the area.
2. Creating awareness and linkages/networks for up takers is also necessary.

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