NIGERIAN AGRICULTURAL JOURNAL
ISSN: 0300-368X
Volume 49 Number 2, October 2018. Pp. 101-105
Available online at: http://www.ajol.info/index.php/naj

DIFFERENTIALS IN MARKET PARTICIPATION AMONG COCOYAM FARMERS IN ENUGU STATE, NIGERIA

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ABSTRACT
The study was conducted to empirically investigate determinants of market participation among cocoyam farmers in Udenu, Enugu North Local Government Area of Enugu state. Structured questionnaires were used to obtain data from the respondents. The data collected were analysed using descriptive statistics and probit regression analytical procedure. The results of the descriptive statistics showed that majority of the respondents were females (65%) who had an average farm size of 4ha and 10 years farming experience. The coefficient of gender and household size had an indirect relationship with market participation at 10% level of significance respectively. The coefficient of farming experience and income had a direct relationship with market participation at 5% and 10% level of probability each. The study recommends policies targeted at the provision of storage facilities and processing machines to avoid post-harvest losses, access to micro credit facilities should be encouraged, access to farm input such as pesticides, fertilizers and improved planting materials at affordable rates, good infrastructure (road network), and training of farmers should go a long way in strengthening and promoting market participation for cocoyam in the study area.

Keywords: Cocoyam, Market and Participation

Introduction

Cocoyam varieties (*Xanthosoma sagittifolium*) called *tannia* and (*Colocasia esculenta*) taro are important staple food crop grown extensively in south-eastern Nigeria. Cocoyam is a member of *Araceae* family and in the group of monocot plant. Cocoyam is the third important staple tuber crop after yam and cassava in Nigeria (Food and Agricultural Organization, 2009). It is also an important food security crop in Nigeria and variously grown by resource poor farmers mostly women who intercrop cocoyam with yam, maize, plantain, vegetables and rice (Okoye *et al*., 2008). Nigeria is the largest producer in the world, producing about 5.39 million metric tonnes (Nwakor *et al*, 2016). The vital role and importance of marketing in agricultural and economic development have been emphasized by many development economists and policymakers. The key to increasing agricultural output in most developing countries is improving the productivity of farmers, which cannot be achieved without markets that would effectively bind the increasingly specialized activities of thousands of widely dispersed producers into an integrated national economy. Market participation among farmers has long been on agricultural economist research agenda in both developed and developing nations (Barret, 2007). Cocoyam farmers must have access to productive technologies and adequate private and public goods and improved technologies that can increase farmers' earnings, savings and investment. Other studies have shown that the return on investment by smallholder farmers' is quite low (Egbetokun and Omonona, 2012). There is therefore need to encourage farmers by integrating them into the markets, and this will only happen when smallholder farmers fully participate in the market. This study therefore aims at identifying the main socioeconomic factors influencing the farmer's decision on cocoyam sales, the determinants of farmers' market participation and to proffer solutions that can lead to an increase in market participation of cocoyam.

Methodology

The study was conducted in Enugu North Local Government Area of Enugu State. It is one of the

twenty seven Local Government Areas of the State. It was purposively selected based on the preponderance of cocoyam producing households in the area. Simple random sampling was used in selecting 100 cocoyam producing households and marketers. Data for the study were collected using well-structured questionnaire to elicit information from the selected respondents. The data collected were analysed using descriptive statistics and Probit regression model which is specified thus:

$$P_{(sy-1)} = f(z_1) = \frac{1}{\sqrt{2\pi}} \int_{\infty 2}^{U^2} du \quad (1)$$

Where the unobservable z_1 is a linear combination of observable explanatory variables

Where
Y = Market participation (dummy; yes = 1, no = 0)
X_1 = Age (years)
X_2 = Level of education (years)
X_3 = Gender (dummy; male = 1, female = 0)
X_4 = Household size (number)
X_5 = Farm size (ha)
X_6 = Farm experience (years)
X_7 = Income (Naira)
X_8 = Membership of cooperatives (dummy; yes = 1, no = 2)
X_9 = Market information (dummy; I =yes, 0=no)
e = error term

Results and Discussion

Socio-economic characteristics of the Respondents

Table 1 shows the distribution of respondents according to socio-economic characteristics. Majority (53%) of the farmers were of productive age, between 40 and 59 years. This shows that farmers within the age of 40-59 years constituted bulk of cocoyam farmers in the study area, it also shows that there was potential for high productivity in the area thus promoting increased market participation (Egbetokun and Omonona, 2012, Nwakor *et al*, 2016). The result revealed that many of the farmers (41%) had formal education. About 65% of female farmers participated more in market than their male counterparts (35%). This indicates that women were more involved in cocoyam farming in the study area. This result is in line with Key *et al* ., (2000); Olarinde and Kuponiyi (2005) and Omonona and Agoi, (2007). A greater percentage of the respondents were married (77%) with a mean household size of about 6 persons This is an indication of large household sizes implying relative high food demand. Therefore, participation in the food market is important, whereby a household would sell part of its produce to generate funds to procure what it could not produce to cater for the members. The result also shows that majority of the farmers had farm size of 4 ha and about 10years of farming experience. Farmers in the study area were members of cooperative group; hence this is an indication for receiving market information (74%).

Determinants of Market Participation among Cocoyam Farmers

The empirical results of the determinants of market participation by the farmers in the study area are shown in Table 2. The χ^2 was significant at 5% level of probability indicating goodness of fit of the probit regression line. Results show that the coefficient of gender was negatively signed and significant at 10% level of probability. This implies that the probability of female farmers involved in cocoyam production is more than their male counterparts in Enugu state. The result also shows that farmer's household size was negative and significant at 5% level of probability. This implies that any increase in household size will lead to a corresponding decrease in probability of participating in the market. Okoye *et* al (2008) posited that Farmers with large household size tend to dissipate most of their resources on upbringing and education of their children in contrast to provision of labour. The years of experience was positive and significant at 5% level of probability. The implication is that increase in farming experience will lead to a corresponding increase in probability of participating in the market. Income was significant and positive at 10% level of probability. This implies that increase in the income of farmers will increase the probability of participating in cocoyam marketing. This finding is in line with a priori expectation as increase in income will enable the respondents to produce more crop.

Constraining factors of Market Participation among Cocoyam Famers

Table 3 presents the varimax-rotated factors militating against market participation among the cocoyam farmers in the area. Three (3) factors were extracted based on the response of the respondents. Only variables with factor loading of 0.30 and above at 10% overlapping variance (Ukeje, 2017) were used in naming the factors. Variables that loaded in more than one factors as in the case of variable 2 (lack of quality planting material) were discarded while variables that have factor loadings of less than 0.30 were not used (Enete and Amusa, 2010). For factor 1 (Economic/institutional factor), the specific variables militating against market participation among cocoyam farmers in the area include: Prevalence of pest and diseases (0.5756), low access to farm input (0.4262), poor soil fertility (-4.4794) and illiteracy (-0.4040). Variables that loaded in factor 2 (Techno-infrastructural problem) were: Poor storage (0.4354), poor road network (0.3092) and distance to the market (0.3468). For factor 3 (Socio-financial problem)

include: Low credit accessibility (0.3947), high cost of labour (0.3871) and insufficient capital (0.3883).

Conclusion

The findings of this study show factors influencing and constraining market participation among cocoyam farmers in Enugu state, Nigeria.The results call for policies aimed at the provision of storage facilities and processing machines to avoid post-harvest losses, access to micro credit facilities should be encouraged, access to farm input such as pesticides, fertilizers and improved planting materials at affordable rates, quality infrastructure like road network, and training of farmers should go a long way in strengthening and promoting cocoyam market participation in the study area.

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Table 1: Socio-economic characteristics of the Respondents

Variable	Frequency	Percentage	Mean
Age			
20 – 39	25	25	
40 – 59	36	36	53.96
60 – 79	32	32	
80 and above	7	7	
Educational level			
Non Formal Education	23	23	
Primary Education	41	41	6
Secondary Education	29	29	
Tertiary Education	7	7	
Gender			
Male	35	35	
Female	66	66	0.34
Household size			
0 – 4	15	15	
5 – 8	78	78	5.96
9 – 12	7	7	
Farm size			
1 – 2	8	8	
3 – 4	48	48	4.26
5 – 6	50	50	
Farming Experience			
0 – 9	29	29	
10 – 19	61	61	
20 – 29	10	10	
Cooperative membership			
No	5	5	
Yes	95	95	
Market information			
No			
Yes	26	26	
	74	74	

*Multiple responses. Source: Field Survey data, 2018

Table 2: Probit Regression Analysis of Determinants of market participation among cocoyam farmers in the study area

Variables	Parameters	Coefficient	Standard Error	z-value
Age (years)	X_1	0.0030837	0.0079027	0.39
Educational level (years)	X_2	0.0240112	0.0276685	0.87
Gender	X_3	-0.547154	0.3110906	-1.76*
Household size	X_4	-0.1150174	0.0677777	-1.70*
Farm size	X_5	-0.1259519	0.1383064	-0.91
Farming Experience	X_6	0.01053275	0.0396352	2.66**
Income	X_7	0.0000127	7.63e-06	1.67*
Cooperative membership	X_8	0.1398724	0.6115314	0.23
Market Information	X_9	0.0037514	0.3445207	0.01
Constant	β_0	2.579402	1.085025	2.38*
Log likelihood		-57.603664		
χ^2		21.98**		
Pseudo R^2		0.1602		
Number of Observation		100		

Source: Field Survey Data, 2018. Note: ***, ** and * implies statistically significant at 1%, 5% and 10% levels respectively

Table 3: Constraining factors of Market Participation among Cocoyam Famers

Constraining Variables	**Factor 1 Economic/Institutional factor**	**Factor 2 Techno-infrastructural factor**	**Factor Socio-financial factor**
Land tenure or ownership problem	0.0164	-0.0079	-0.2709
Lack of quality planting materials	0.4524**	-0.3143**	0.2547
Prevalence of pest and disease problem	**0.5756**	-0.1928	0.1049
Extension Contact with farmers	-0.0750	0.1147	0.2227
Poor storage facilities	-0.0814	**-0.4354**	-0.1634
Low credit accessibility	0.2449	-0.0644	**0.3947**
Low access to farm inputs	**0.4262**	-0.0431	0.2405
Poor road network	0.1669	**0.3092**	-0.1542
Distance to the market	0.0062	**0.3468**	0.0725
Poor Soil fertility	**-0.4794**	-0.2215	-0.0772
Age of the Farmers	0.2089	-0.2080	0.0346
Illiteracy	**-0.4040**	-0.0648	0.2933
High cost of labour	-0.2254	0.0635	**0.3871**
Insufficient Capital	-0.2324	0.2677	**0.3883**
Post-harvest losses	0.0950	**0.4568**	0.0028

Source: Field Survey Data, 2018. Note: Factor loading of 0.30 is used at 10% overlapping variance. Variables with factor loadings of less than 0.30 were not used. **Variables that load in more than one factor were discarded