

Analysis of Market Participation by Rice Farmers in Southern Nigeria.

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ABSTRACT

The study analyzed the factors affecting market participation by smallholder rice farmers in the study area. A random sampling procedure was employed in selecting the respondents. The data collected were analysed using descriptive statistics and the probit regression model. The results showed the demographic and socioeconomic characteristics of the small holder rice farmers varied greatly. The probit regression result showed that the level of crop produced, total land size, use of improved seeds, group participation, market information and contractual agreement has positive and significant impact on the ability of household to participate in output market. Lack of timely market information, transport and restricted access to extension agents are some of the problems associated with smallholder farmers in the study area. Based on the findings of the study some policy implications are discussed.

KEYWORDS:Market participation, Small holder rice farmers, Market information, Output market

1. INTRODUCTION

Markets and improved market access are critical and important to rural poor households as a pre-requisite for enhancing agriculture based economic growth by improving the competitiveness of farming enterprise and improving rural incomes. Despite these, participation of smallholder farmers in rice market remains low due to a range of constraints (Makhura, 2001).

Inherently, majority of the smallholder farmers are located in remote areas with poor transport and market infrastructures, contributing to high transaction cost. In addition they lack reliable market information as well as information on potential exchange partners (Key et al, 2000). Although smallholder farmers market their produce, their survival in the market is questionable. These doubts have been raised due to limited produce market, difficulty in enforcing contract, reliability on middle men, and inability to meet stringent safety norms. They also lack institution and instrument to manage price and other risk. Rice markets are increasingly being integrated due to globalization and liberalization. This implies that farmers in developing world are linked to consumers and corporations of the rich nations. Consequently, local rice farmers are facing increasing market competition, not only in international markets but also in local ones as well.

Over the years, deliberate though ineffective efforts have been made by donors and African countries to bring about agricultural development without much to show for it. Much of the failure can be attributed to the adapted transformation approach to agriculture which is characterized by the introduction of wide variety of large scale farming and processing technologies. It is however gratifying to note that there is now a shift in emphasis from the large scale transformation approach to small scale improvement strategy approach which is attuned to African age long farm practice.

The involvement of the smallholder farmers in the use of formal markets will result in proper co-ordination and allocation of resources, goods and services thereby reducing poverty and improving livelihoods of households (Jari and Fraser, 2009). It follows therefore that market participation is important amongst smallholder farmers as it offers benefit such as income and open opportunities for rural employment (Dorward, 2003; Machethe, 2004). Smallholder farmers contribute towards food security, equitable distribution of income and linkage creation for economic growth (Dorosh and Haggblade, 2003). However, smallholder farmers are resource poor and are unable to produce a stable amount of output each year. Inconsistent production (surplus) makes it difficult for them to acquire contracts with traders in the market (Makhura, 2001). Inability to get contracts becomes a problem when they produce marketable surpluses because they will be stuck with these surpluses. Moreover, the majority of smallholder farmers are scattered and operate individually and this exposes them to high transaction costs when they have the opportunity to enter formal markets (Kherallah and Kirsten, 2001). Therefore, it is important to identify the factors influencing small holders market participation. The identification of technical, social and institutional factors and the extent to which they

influence decisions to market through different channels could assist in the formulation of policy interventions and institutional innovations. The policies may enhance future market participation amongst smallholder farmers.

In Nigeria, agricultural produce from smallholder farmers is often lost after production due to spoilage and inability to access the markets. This is mainly because most smallholder farmers are faced with a range of technical, socio-economic and institutional factors influencing marketing. Whereas the marketing infrastructure is poorly developed, smallholder farmers lack supportive organizations that represent and serve them. These factors reduce smallholder farmers' incentives to participate in formal markets. A reduction in formal market participation, in turn, makes it difficult for these farmers to shift into commercial farming and thus, a reduction in economic development.

Although several studies have been conducted on production and marketing of rice and other crops in Nigeria, most of the studies focused on efficiency of farmers in terms of resources use, structure, conduct and performance of market (Odok, 2000; Ohen, 2008). Specifically Information on the extent to which institutional, socio-economic, and technical factors influence the marketing channel decisions among smallholder farmers in Cross River State, Nigeria are lacking. Yet these types of studies are very essential for reliable assessment and formulation of appropriate rice production and marketing policies.

The main objective of this study is to analyse the factors influencing smallholder farmers' decision on marketing channels choices.

2 METHODOLOGY

The study was carried out in Cross River State. Cross River State is located within the tropical rainforest belt of Southern Nigeria. It lies between latitude $4^{\circ} 28'$ and $6^{\circ} 55'$ north of the equator and longitude $7^{\circ} 50'$ and $9^{\circ} 28'$ east of Greenwich meridian. It occupies a land area of 21,787 square Km with a population of 2,892,988 with a gender distribution of 1,471,967(50.9%) males and 1,421,021 (49.1%) females in 2006 (NPC, 2006). It shares common boundaries with the Republic of Cameroon in the east, Benue State in the north, Ebonyi and Abia in the west. Akwa Ibom State in South West and Atlantic Ocean in the South. The favourable climate of tropical, humid, dry and wet seasons gives rise to rich agricultural lands, thus encouraging both perennial and annual crop cultivation. Some varieties of crops cultivated include; rice, rubber, cocoa, cashew, yam, cocoyam, plantain, banana, oil palm, groundnut and assorted vegetables.

The study made use of multistage random sampling method. Cross River State is an intensive rice production zone in Nigeria, the state was chosen purposively for the study. In Cross River State, there are 3 Agricultural Development Project (ADP) zones which are Calabar zone, Ikom zone and Ogoja zone. The sample frame which comprised all registered member of the different rice associations in the zones were obtained from ADP.

Using the simple random technique, 150 farmers were selected for the study with fifty farmers from each zone. The respondents were further classified into male and female. Thus a total number of 116 were male while 34 were female respectively. Questionnaires were used in collecting both qualitative and quantitative data.

To identify the factors affecting small holder rice farmer market participation, the binary Probit Regression model (normits) for individual or ungrouped data was used. Drawing from Gujarati (2006), the following explicit function was used for estimation:

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7 + B_8X_8 + U_i$$

Where :

Y is a binary response variable defined as $Y = 1$ if the farmer participate given a threshold or critical value (Y^*) of above 75% and $Y = 0$ if $Y \leq Y^*$

X_1 = Market information (MKTINFO)

X_2 = Extension contact (EXT)

X_3 = Organizational of support (ORGMEM)

X_4 = Road infrastructure (RDINFR)

X_5 = Transportation (TRANS)

X_6 = Market infrastructure (MKTINFR)

X_7 = Contractual Agreement (CONTRCT)

X_8 = Group participation (PART)

B_0 = Intercept,

$B_1 \dots B_8$ = parameter estimate

U_i = Stochastic error term.

3 RESULTS AND DISCUSSION

3.1 Demographic and socio-economic characteristics of household

The result in Table 1 revealed that the proportion of male farmers (77.3%) involved in rice marketing is more than that of women (22.7%) in the study area. This is in line with World Bank, 1999 which states that most women find it very difficult to cope with labour intensive works as compared to men counterpart.

The result also revealed that 53.3% of the respondent falls between the age range of 20 – 40 years, while 43.3% falls between the age range of 41 – 60 years and 3.3% falls between the ages of 61 – 80. It further revealed that 45.3% of the farmers attended primary education while those with no formal education is 6% and those with secondary education is 38.7% and those with tertiary education (10.0%). These indicate that about (90%) of the farmers are illiterate because the highest qualification is secondary school.

More so, the result revealed that 8.0% of the respondents were single, 72.7% were married, 9.3% were widowed and 10.0% were separated. These implies that married people are majority of farmers as a result leads to increased productivity since farm labour supported by their children could reduce cost of labour and increase production and therefore will enable farmers access wider markets.

Furthermore, the result revealed that 66% of the household has between 1 – 4 family size, while 16.7% has between 5 – 8 family size and 17.3% comprises of 9 – 12 people. These means that the household size of 1 – 4 is greater and these size farmers may not be able to meet the demand of consumers hence require technical support to boost productivity.

3.2 Determinants of market participation for the smallholder farmer

From the Probit Regression Result, the level of crop production was found to have a positive impact on the decision of smallholder farmers to engage in output selling. It is statistically significant at 1% level indicating that households with high level of production tend to participate in the output market than those with lower production level.

The result also revealed that total land size was statistically significant (at 10% level) and had a positive influence on market participation of households. This could be due to the role of land size in boosting total production level and thus sales of surplus produce. Moreover, farm households with large land size could allocate their land partly for food crop production giving them better position to participate in the output market.

Furthermore, the use of improved seeds is found to be statistically significant (at 5%) and has a positive influence on the decision of households to participate in the output market. Use of improved seeds enhances the agricultural productivity of smallholder farmers. With enhanced productivity, farmers have a better chance of achieving surplus production for sale. The availability of good market infrastructure have a positive influence on alternative market participation choices, away from not participating in marketing and is significant at 10% level.

Group participation in market also had a positive influence on the dependent variable and is statistically significant at 10% level. There is enough evidence to support that when households market their produce in groups, there is a higher chance of participating in the market. Thus, group participation encourages market penetration among smallholder farmers who find it difficult individually to gain market access.

It can be concluded that the variable that have a higher probability are: access to market information, availability of good market infrastructure, and group participation. All of these three variables positively influence market participation, implying that households are likely to shift from non-participant to market participant with an increase in any one of the variables.

Based on the results, marketing channel choices among smallholder farmers are influenced by both institutional technical and socio economic factors. Where the institutional and technical factors are poorly developed, farmers have difficulties in marketing their produce.

Table 3 provides the probability estimation for the likelihood of market participation of a farm household given the statistically significant variables: value of total crop produced, total land size, use of improved seeds, market information, contractual agreement and group participation.

The probit estimate of the coefficient of total value of crop produced was positive and is significant at 1% level of probability in predicting the marginal effect of smallholder farmers for market participation. Its value of .0000498 means that with other variables held constant, if total value of crop produced increases by one unit on average, the estimated probit will increase by .0000498 indicating a direct and positive relationship between the two. These means that as the total crop produced increases by one unit, the marginal effect for market participation increases by .0000498 per cent.

The probit estimate of the coefficient of total land size was positive and is significant at the 10% level of probability in predicting the marginal effect of smallholder farmers for market participation. Its value .0299465 means that with other variables held constant, if total land size increases by one unit on average, the estimated probit will increase by .0299465 indicating a direct and positive relationship between the two. This means that as

the land size increases by one unit, the marginal effect for market participation increases by .0299465%.

The probit estimate of the coefficient of used of improved seed was positive and is significant at 5% level of probability in predicting the marginal effect of smallholder farmers for market participation. Its value .134442 means that with other variables held constant, if use of improved seed increases by one unit on average, the estimated probit will increase by .134442 indicating a direct and positive relationship between the two. This means that as the use of improved seed increases by one unit, the marginal effect for market participation increases by .134442%.

The probit estimate of the coefficient of market information was positive and is significant at 5% level of probability in predicting market participation. Its value of 4.217 means that with other variables held constant, if market information increase by one unit the estimated probit would increased by 4.217 unit indicating a direct relationship between the two. This implies that as market information increases by one unit, the probability of participation increase by 4.217 per cent.

Contractual agreement was positive and is significant at 5% level of probability in predicting market participation. Its value of 2.803 suggests that with other variables held constant, if contractual agreement increase by one unit the estimated probit would increase by 2.803 units indicating a direct relationship between the two. This implies that as contractual agreement increases by one unit, the probability of participation increase by 2.803 per cent.

Group participation was positive and also significant at 5% level of probability in predicting market participation. Its value of 1.997 suggests that with other variables held constant, if group participation increase by one unit the estimated probit would increase by 1.997 units indicating a direct relationship between the two. This implies that as group participation increases by one unit, the probability of market participation increase by 1.997 per cent.

4 Conclusion

Smallholder farmers in Cross River State, Nigeria have potential to contribute to growth in the rural areas, reduce poverty and income disparity and hence contribute to economic growth. Lack of full participation in markets prevents them from transiting into commercial farming and hence their low contribution to economic growth. They are constrained by a number of factors in marketing, making it difficult for them to commercialize; such institutional, technical and socio-economic factor include lack of information, poor infrastructure, inability to have contractual agreements, lack of transport, poor organizational support, low access to extension agents, low use of improved seed, low use of fertilizer with relatively small marketable surpluses. In an effort to make information available, it is important to know the types of market information that is necessary for different markets, such as specific rules, pricing, grades and standards and educate the farmers on how to use the information. Of equal importance, is devising the means of disseminating the information, in order to reach all the smallholder farmers. It is also important to consider the non-homogeneity of smallholder farmers' in terms of education, location and availability of communication assets.

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TABLE 1
 Demographic and socio-economic characteristics of household heads

Household attributes	Frequency	Percentage
Sex		
Male	116	77.3%
Female	34	22.3%
Total	150	100
Age		
20 – 40	80	53.3
41 – 60	65	43.3
61 – 80	5	3.3
Education		
No formal education	9	6.0
Primary education	68	45.3
Secondary education	58	38.7
Tertiary	15	10.0
Marital status		
Single	12	8
Married	109	72.7
Widowed	14	9.3
Separated	15	10
Divorce	0	0
Household size		
1 – 4	99	66
5 – 8	25	16.7
9 – 12	26	17.3

TABLE 2
Probit estimates for determinants of market participation

Variable	Coef.	Std. Err.	Odds ratio	P> z
Sex (1=male, 0=female)	.2083539	.5048824	0.41	0.680
Age (years)	.0021142	.0171813	0.12	0.902
Household labour size (Man Equivalent)	0.444402	.17301	0.26	0.797
Literacy (1=literate, 0=illiterate)	-.6618196	.4198163	-1.58	0.115
Total value of crop produced	.0003351	.0000952	3.52	0.000***
Total land size (in hectre)	.2014662	.1125548	1.79	0.073*
Use Improved Seeds (1=yes, 0=no)	.8196615	.3642965	2.25	0.024**
Mktinfo	.2686	.1050	1.67	0.011*
Ext	.000606	.0868	1.83	0.485
Orgmem	.00788	.0788	2.19	0.316
Rdinfo	.000862	.0841	2.37	0.305
Mktinfo	.2557	.1030	1.28	0.013*
Contract	.00844	.0755	2.32	0.263
Trans	.00843	.0843	2.33	0.276
Part	.1899	.0854	6.68	0.026*
Constant	-3.647947	1.304025	-2.80	0.005

Note: ***1% significance level, **5% significance level, *10% significance level
Log likelihood = -37.206646
LR chi2(14) = 90.06
Prob>chi2 = 0.0000
Pseudo R2 = 0.5476

TABLE 3
Probit regression, results reporting marginal effects for market participation

Variable	dF/dx	Std. Err.	Z	P> z	x-bar
Sex (1=male, 0=female)	.2083539	.5048824	0.41	0.680	.216
Age (years)	.0031143	.0025703	0.12	0.902	44.784
Household labour size (Man Equivalent)	.0066057	.0259111	0.26	0.797	2.8096
Literacy (1=literate, 0=illiterate)	-.096164	.0700004	-1.58	0.115	.544
Total value of crop produced	.0000498	.0000202	3.52	0.000***	8778.84
Total land size (in hectre)	.0299465	.0186604	1.79	0.073*	5.438
Use Improved Seeds (1=yes, 0=no)	.134442	.0790921	2.25	0.024**	.568
Mktinfo	4.217	.0138861	1.73	0.006*	5.346
Ext	2.942	.2940041	0.20	0.282	33.810
Orgmem	0.788	.1384002	0.75	0.330	.253
Rdinfo	2.862	.2171111	0.53	0.168	.2167
Mktinfo	0.687	.0026703	0.34	0.735	2.709
Contract	2.803	.1912001	1.45	0.047*	5.421
Trans	0.449	.1644003	0.29	0.785	.434
Part	1.997	.1418402	1.78	0.039*	5.486
Obs. P	.632				
pred. P	.9200168 (at x-bar)				

Log likelihood = -37.206646
LR chi2(14) = 90.06
Prob>chi2 = 0.0000
Pseudo R2 = 0.5476