

Determinants of Market Participation among Smallholder Maize Farmers in Benue State, Nigeria

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Abstract

Considering the smallholder farmers' market participation is a crucial issue in improving household welfare in rural areas and poverty reduction in developing countries like Nigeria. Maize production has not been given due attention; which has potential production volume and market ability. Therefore, this study was designed to identify determinants of market participation among smallholder maize farmers in Benue State, Nigeria. Data for this study were collected through questionnaire administered to maize farmers. Both purposive and random sampling techniques were used to draw an appropriate sample of 320 maize producer households for the study. The data were analysed using descriptive statistics and binary logistic regression model. The result revealed that The Cox&Snell (R Square) was 0.68 signifying that sex, age, marital status, household size, education, farming experience, farm size, output and market information accounted for 68 percent factors influencing market participation by maize farmers in Benue State, Nigeria. The Result furthermore revealed that education, farm size and output were the major determinants of market participation by maize farmers in Benue State. The constraints to market participation faced by smallholder farmers in Benue State included bad roads (92.2%), Cost of transportation (82.2%) and High taxes (79.1%). The findings of this research indicates that higher levels of maize production enhance small holders' participation in market. It is recommended that strategies that aim at improving households' capacity to produce Surplus production like optimal allocation of resources such as land, machinery and credit will enhance productivity and promote smallholders market participation.

Keywords: *Determinants, Market participation, Maize farmers, Productivity, Benue State.*

INTRODUCTION

The economy of Nigeria is predominantly agrarian. The country is blessed with large land area of about 92.4 million hectares with 91 million hectares of this land being suitable for agricultural cultivation. Approximately, half of this cultivated land is used under permanent and arable crops while the rest is covered by forest, wood land, permanent pasture and build up areas (Oladiran, Ogunniyi and Fanifosi, 2020). Nigeria produces both food and cash crops including yam, cassava, rice, maize, sorghum, millet, sweet potato, soyabean, sesame, cocoa, sugarcane, coffee, peanut, palm oil and many other fruits and vegetables like cabbage, tomato, onion and carrot. The contribution of smallholder farmers is high to the overall agricultural

growth in the country and the overall economy of Nigeria to a large extent depends on agricultural sector development.

Studies indicated that smallholder farmers are a key solution for economic growth, and for alleviation of poverty and food security problems in developing countries (Haile, Gebre and Workye, 2022). Considering that issue, commercial transformation of subsistence agriculture is an indispensable pathway for agricultural dependent farmers in developing countries (Mitku, 2014).

In Nigeria, cereals are the major food crops both in terms of the area they are planted and volume of production obtained. National Agricultural Research Programme (NARP) identified sorghum, millet, maize and rice as the four most important cereals produced in Nigeria based on output and area cultivated. About 90% of Nigeria's total food production comes from small farms and at least 60% of the country's population earns their living from these small farms with farm sizes generally less than 2 hectares (Ammani and Hassan, 2021).

Maize is one of the most commonly available cereals and source of high calorie staple human food, feeds for animals and other industrial raw materials in different parts of the country. Also, maize crop is one of the lowest cost source of cereal calories and effective maize production sector development could push Nigeria's food supply to quickly reduce the national food deficit and keep pace with a rapid population growth (Oladiran, Ogunniyi and Fanifosi, 2020).

Nigeria has good potential for cereal crops production for which small holder farming have diversified from staple food subsistence production into more market – oriented and higher value commodities. But majority of Nigeria's smallholder farmers grow maize mostly for subsistence – oriented production and about 75% of the output is consumed at the household level (Ammani and Hassan, 2021).

Rural households' participation in agricultural markets is an important strategy for poverty alleviation and food security in developing countries (Haile, Gebre and Workye, 2022). Market participation refers to any market related activity which promotes the sale of produce (Oladiran, Ogunniyi and Fanifosi, 2020). Market participation among farmers has long been on agricultural research agenda in both developed and developing nations (Oladiran, Ogunniyi and Fanifosi, 2020). In Nigeria, the question has taken a renewed urgency as policy makers seek ways of reducing external payment imbalances, caused largely by secular declines in per capita food production and concomitant reduction in marketed food surpluses (Oladiran, Ogunniyi and Fanifosi, 2020). Market participation impacts farmers' supply responses and hence is important for agricultural policy analysis (Abah, 2020). The Major determining factors influencing farmer's participation in the market are age, marital status, source of labour, farming experience and farm size (Egbetokun and Omana, 2012). The probability of participating in output markets depends on household size, distance to the nearest marketing channels, price of the commodity and sex of the farmer (Onoja, Usoroh, Adieme and Deedam, 2012).

In Nigeria, it is hard to strike a balance population, food production and economic growth; the government seeks to ensure the country's continued ability to sustain food self sufficiency, increase agro-industrial production and increase access to markets as one of the

key elements in its strategy to increase income of rural households, enhance food security and to facilitate further expansion of the economy (Oladiran, Ogunniyi and Fanifosi, 2020). This necessitates well- functioning markets and increased market participation. Majority of the smallholder farmers in Nigeria are located in remote areas with poor road networks and market infrastructure, contributing to the high transaction costs, which has been seen to be one of the key reasons for smallholder farmers' failure to participate in markets (Abah, 2020). According to Oparinde and Daramola (2014), lack of credit facilities and inadequate agricultural inputs were some of reasons the maize farmers do not participate in market.

Overtime, agriculture has declined in importance. The significant imbalance between food production and the expanding population has resulted in an ever-increasing demand for agricultural products. It has also placed a serious stress on the marketing system (Oladiran, Ogunniyi and Fanifosi, 2020). For agriculture to meaningfully contribute to economic growth, smallholders farmers have to commercialize their farming activities to produce marketable surpluses (Oladiran, Ogunniyi and Fanifosi, 2020). Market participation is directly associated with the generation of market surplus, thus production technologies and productive assets affect a household's market participation by influencing its productivity. Hence an understanding of factors influencing market participation among maize farmers will help in identifying interventions to unlock and release benefits associated with marketing agricultural produce such as maize seeds.

This study will give a better insight into the importance of market participation among maize farmers. Market participation by farmers play a crucial role in that human derives benefit such as income and rural employment in farming (Oladiran, Ogunniyi and Fanifosi, 2020). This study will help policy makers to know the direction to which policies that will improve the factors influencing market participation among maize farmers in the study area can be made. Therefore, it is very important to conduct a study to determine the factors influencing market participation among smallholder maize farmers in Benue State, Nigeria. The specific objectives of the study are to examine the factors influencing market participation among smallholder maize farmers and to identify the constraints that affect their market participation.

METHODOLOGY

The Study Area

Benue State is one of the 36 states of Nigeria. The state is located in North Central Nigeria. The state derived its name from River Benue, The second largest river in Nigeria. The State was created in 1976. Benue State is located approximately between latitudes $6\frac{1}{2}^{\circ}$ and $8\frac{1}{2}^{\circ}$ North and Longitudes $7\frac{1}{2}^{\circ}$ and 10° East. The State shares borders with five states namely, Nasarwa State to the North, Taraba State to the East, Cross River State to the South-East, Enugu State to the South-West and Kogi State to the West. The Southern part of Benue State shares boundary with the Republic of Cameroon. In the North, the state is bordered by 280km River Benue and is traversed by 202km of River Katsina-Ala in the inland area. Benue State has a tropical climate which manifests into two distinct seasons. The rainy season is from April to October while the dry season is from November to March. Annual rainfall varies from 1750mm in the Southern part of the state to 1250mm in the North. (Nwalem, Ukpe, Djomo and Dzever, 2016).

Benue State has a total land area of about 30955km² and administratively it is divided into 23 local government areas (LGAs) and three agricultural zones (A, B and C). It has an estimated population of 5741815 inhabitants in 2016 (Abah, 2020). The majority of the inhabitants are members of Tiv, Idoma and Igede ethnic groups. Production of cattle, goat, sheep, pig and poultry are commonly practised. The agricultural production system in the study area is mixed cropping. Crop production is the main cultural activity for the livelihood of the smallholder farmers in the study area. Benue State was chosen for this study because it's the food basket of the nation and is known for the production of both food and cash crops such as yam, cassava, sweet potato, rice, maize, millet sorghum, sesame, soyabean, groundnut, Bambara nut as well as vegetable and fruit trees.

Sampling and Sample size.

A combination of purposive and random sampling technique were used for sample selection. Benue State is divided into three (3) agricultural zones: Zone A, Zone B and Zone C. Two local government areas were purposively selected from each of Zone A, Zone B and Zone C on the basis of high level of maize production and high intensity of maize marketing. Based on this Vandeikya and Ukum Local government areas were purposively selected from Zone A. Gboko and Gwer-west were purposively selected from Zone B while Otukpo and Oju were purposively selected from Zone C. From each of the selected local government areas, households were randomly selected on the basis of its population size using 2% sampling proportion. On this basis, 320 maize farmers were randomly selected for this study. Primary data were collected with the use of a structured questionnaire, copies of which were administered to the selected 320 maize farmers in Benue State.

Data Analysis

The data collected were analysed using descriptive and inferential statistics. Factors influencing market participation among smallholder maize farmers was analysed using Binary Logistic Regression Model. Description statistics (percentages) was used to analyse constraints to market participation faced by maize farmers.

Model Specification

Binary Logistic Regression Model.

$$Z = \text{Log}[P/1-P] = \text{Log } Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + e$$

Where:

Z = probability of having access to credit

Market participant = 1 Non – market participant = 0

P = probability of farmers being a market participant

1 – p = probability of farmers not being a market participant

β_1, \dots, β_9 are regression coefficients explaining changes in the independent variables.

X_1 = Sex (Male = 1, Female = 0)

X_2 = Age (in years)

X_3 = Marital Status (Married = 1, Single = 2, Divorce = 3, Widowed/Widower = 4)

X_4 = Household size (number of members in the household)

X_5 = Education (in years)

X_6 = Farming experience (in years)

X_7 = Size of the farm (in hectares)

X_8 = Output (kg)

X_9 = Access to market information (Yes = 1, No = 0)

RESULT AND DISCUSSION

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Table 1 shows the binary logistic regression estimates of factors influencing market participation of smallholder maize farmers in Benue State, Nigeria such as sex, age, marital status, household size, education, farming experience, farm size, output and access to market information. The Cox8cSdnell (R Square) is 0.684 implying that sex, age, marital status, household size, level of education, farming experience, farm size, output and market information accounted for 68 percent factors in Benue State, Nigeria. The result further revealed that education, farm size and output were the factors that determined the intensity of market participation by maize farmers. The coefficient for education is positive and significant at 1 percent signifying that level of education increases the probability of being market participate among maize farmers by 2.148. This may be explained by the fact that educated farmers have the capacity to follow update in market fluctuation. The coefficient for farm size is positive and significant at 1 percent signifying that farm size increases the probability of being market participant among maize farmers to participate in the market by 3.780. This can be explained considering the fact that the larger the farm size is the higher output is. Furthermore, the regression coefficient for output increases the probability of being market participant among maize farmers by 1.188.

This result is inline with the finding of Nwalem, Ukpe, Djomo and Dzever (2016) who found that increase in output increases the probability of smallholder Benue State farmers to participate in the market. The coefficient for market information, household size, sex, marital status, farming experience and age were no significant signifying that these variables have no significant influence on market participation of maize farmers in Benue State. Abah (2020) found that age, sex, marketing experience, education and annual income of farmers were significant determinants of market participation among soyabean wholesalers in Benue and Nasarawa States.

Table 1: Binary Logistics Regression Estimates of Factors Influencing Market Participation of Maize Farmers in the Study Area.

Variables	Coefficients	S.E.	Would	Sig	Exp (B)
Sex	0.216	0.360	0.444	0.636	1.440
Age	0.108	0.012	0.636	0.552	1.212
Marital Status			8.964	0.132	
Married	- 26.448	3.39E4	0.000	0.990	0.000
Single	- 27.456	3.39E4	0.000	0.990	0.000
Divorced	- 29.796	3.39E4	0.000	0.990	0.000
Widowed	- 0.372	3.83E4	0.000	0.100	0.876
Household size	- 0.096	0.192	0.312	0.732	1.104
Educational Level	0.696	0.156	23.952	0.000	2.148
Farming Experience	- 0.192	0.168	1.488	0.312	1.008
Farm size	1.380	0.264	32.664	0.000	2.148
Output	0.048	0.001	32.136	0.000	1.188
Market information	52.092	3.20E4	0.000	0.990	8.616E8
No Market information	23.328	2,11E4	0,000	0.990	3.348E8
Constant	- 1.128	1.045	0.014	0.903	1.092
Log livelihood	383.317				
Coxsnell R Square	0.684				
Nagelkerde R Square	0.792				
Classification table	72.960				

Source: Field Survey, 2023 Significant at 1%

Constraints to market participation faced by maize farmers in Benue State, Nigeria.

Table 2 shows that constraints to market participation faced by maize farmers in Benue State, Nigeria include: Bad roads, cost of transportation, high taxes, poor storage facilities, seasonality, lack of information and distance to market. The result revealed that majority (92.2%) of maize farmers are faced with the problem of bad roads, 82.0% are faced with the problem of high cost of transportation which is associated with bad roads and increase in fuel price.

Another prominent constraint faced by maize farmers in Benue State is high taxes (79.1%) which may be attributed to the strategy put in place by the local government areas to general internal revenue as well as illegal road blocks by youths. Another constraint is poor storage facilities (54.4%) which may be due to the fact that there is absence of community warehouses in the study area. Seasonality (51.6%) is another constraint faced by maize farmers which may be explained by the fact that it is not always available throughout all the year and therefore restricts most maize farmers to be in the market. Distance to markets (42.5%) is another constraint faced by maize farmers in Benue State and this may be due to the fact that maize production is mostly carried out in remote areas which are less developed. This finding agrees with those of Nyiatagher and Ocholi (2015) that both maize farmers and marketers in Benue State is mostly carried out in remote areas which are less developed. Lack of information (44.4%) is among the least constraints faced by farmers in Benue State. This finding is not in

a agreement with that of Nwalem, Ukpe, Djomo and Dzever (2016) who rated lack of information as the number one constraint facing market participation among sesame producers in Benue State, Nigeria. This could be attributed to the recent development in the use of information communication technology (ICT) in the state and the country at large.

Table 2: Constraints to Market Participation faced by Smallholder Maize Farmer (n = 320)

Constraints	Frequency	Percentage*
Bad Roads	295	92.2
Cost of Transportation	263	82.2
High Taxes	253	79.1
Poor Storage facilities	187	58.4
Seasonality	165	51.6
Lack of Information	142	44.4
Distance of Market	136	42.5

Source: Field Survey, 2023 * Multiple responses existed, hence percentage >100

Conclusion and Recommendations

This study analysed the determinants of market participation among smallholder maize farmers in Benue State, Nigeria. The result revealed that output, level of education and farm size were the major determinants of market participation by maize farmers in the study area. The result further revealed that bad roads (92.2%), cost of production (82.2%) and high taxes (79.1%) were the major constraints faced by smallholder maize farmers in the study area. The findings of this research indicated that higher levels of maize production enhanced holders, market participation, implying that strategies that aim at improving households' capacity to produce surplus production through optimal allocation of resources like land, machinery and credit enhancing productivity could have high returns in promoting smallholders' commercial transportation. Based on the findings of the study, it was recommended that strengthening supportive institutions such as a credit access would create financial capacity of farm households to purchase agricultural inputs and other expenses; thereby increasing market supply and improving their market participation. Promotion of better access to infrastructure like market networks, price information, road and transport facilities and other institutional services are vital to promoting market participation among smallholder farmers.

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