

Land acquisition and crop market participation among farmers in Peri-Urban areas of Ibadan, Oyo State, Nigeria

Abstract

This study examined the relationship between land acquisition and crop market participation among farmers in peri-urban areas of Ibadan, Oyo State, Nigeria. Multistage sampling procedure was used to select 200 respondents. Data were collected using structured questionnaire. Data were analyzed using descriptive statistics, Land Ownership Index (LOI), Crop Market Participation Index (CMPI) and Tobit regression model. Majority (77.5%) of the crop farmers were male, married (80.5%), natives (71.0%), and had an average household size of 7. Also, 81.0% of the respondents had formal education and on the average, farmers had 29 years of farming experience. The existing means of plot acquisition were inheritance (53.4%) - the most common, gift (2.6%), purchase (9.0%), rent (20.1%) and lease (14.9%). The prominent transaction-based land acquisition was rent (45.7%) while that of non-transaction based acquisition was inheritance (95.4%). The average plot size was 2.1 hectares and most (53.5%) of the farmers had full ownership of their total land holding (LOI=1). The cultivation methods adopted by farmers were mixed cropping (79.0%), monocropping (12.3%), intercropping (7.3%) and shifting cultivation (1.4%). The household CMPI was found to be 64.1% and maize was the major crop driving market participation with CMPI of 84.7%. The Tobit regression results indicated that at $p < 0.05$, sex, years of education, farming experience and use of improved maize planting material had positive effects on crop market participation. However, land ownership index ($p < 0.1$) had negative effect on crop market participation, implying that land ownership did not translate to crop market participation. Policy effort aimed at making farmers, both natives and non-natives, to acquire land through transactions (rent and lease) will be a potent tool in increasing crop production, thereby also increasing their crop market participation.

Keywords: agricultural land acquisition, market participation, Peri-Urban areas

Volume 5 Issue 4 - 2020

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Received: June 15, 2020 | **Published:** August 27, 2020

Introduction

Large majorities of the population in most countries of sub-Saharan Africa live in rural areas and earn their livelihoods primarily from agriculture.¹ Also, in most developing nations of the world, especially Nigeria, Agriculture contributes over one-quarter of the Gross Domestic Product (GDP).² According to Adegboye,³ agriculture employs about 70% of the labour force, meets more than 80% of the food need, contributes more than 30% to annual GDP, and accounts for over 90% of the non-oil exports in Nigeria.

Humans rely on land for various needs; material, social, cultural, societal and even spiritual. According to Akingbehin et al.,⁴ the satisfaction of basic needs of man; food, clothing, shelter, heat, production and exchange of goods and services, as well as leisure and recreation, spiritual engagement and satisfaction, territorial sovereignty, wealth creation, and etcetera, is from the use of land. On this basis, perhaps, land has been considered as the single most important natural resource. The land is the basis for the survival of any nation, city or rural area.

Land is the most important factor of production in Nigerian agriculture, therefore, policies that affect the land ultimately affect the farming population more than other members of the community.⁵ How land is owned and possessed in a given society is referred to as the land tenure system.⁶ As explained by Omuojine,⁷ during the pre-

colonial period in Nigeria, land was deemed not owned by individuals but by communities and families, in trust for all the family members. Because land is connected with the dead and the yet unborn, land held under customary tenure cannot be sold (alienation), as this is considered as depriving the future generation.⁸

To achieve the economic, social, and political objectives of the colonial authorities, land was required. Also, British merchants required land to establish their merchandise which was purely based on economic motive. However, land acquisition for such ends cannot be achieved with communal land ownership. Therefore, in order to acquire and convey titles to land for the purposes of commerce and governance, colonial authorities initiated laws and regulations governing land ownership and implemented them to eliminate the pre-colonial land tenure system in the country, facilitating private ownership of land, particularly in Southern Nigeria.⁹

The advent of colonial rule, commerce and commercialization brought about individual and private ownership of land, and subsequently, land began to be sold, leased or mortgaged to individuals or groups.⁹ Rapid population growth resulted into increased land fragmentation, making land holding smaller which cannot achieve high levels of commercialization among farmers.¹⁰ According to Omirin,¹¹ accessibility to land comprises availability and affordability of usable land, ease of transaction with the land, and security of the right of the owner. Land, as one of the factors of production, helps

in the production of food as well as raw materials. With reduction in land for agricultural purposes, the level of food production will reduce drastically and it will eventually affect the market participation of farmers.

Poole¹² explained that the participation of farmers in markets is an important determinant of well-being and development. According to Gani and Adeoti,¹³ market access facilitates better income and improves the welfare of smallholder farmers through various channels. Increased income increases purchasing power, thus creating demand for consumer goods, and enhancing farmers' welfare. Access to market and participation of smallholder farmers lead to declining real food prices as a result of increased competition and reduced costs in food marketing and processing. Asuming-Brempong et al.¹⁴ reported low market participation among smallholder farmers despite the benefits that are inherent in it, and low market participation has slowed down the contribution of agriculture to economic growth.

From the findings of Kirui and Njiraini,¹⁵ low market participation is explained by many factors such as remoteness of many villages, low productivity, low farm gate prices, high market margins, lack of information, and lack of market accessibility. All these factors hinder smallholder farmers from exploiting the benefits of participation in crop market. According to Olanrewaju et al.,¹⁶ even though smallholder agriculture contributes highly to food and nutrition in Nigeria and there are benefits of market orientation, market participation of the smallholders is low.

The paper answers the following research questions:

- i. By what means do farmers acquire land?
- ii. What cultivation methods are used by farmers?
- iii. To what extent do farmers participate in crop market?
- iv. What effect does land acquisition have on crop market participation by the farmers?

Research methodology

This study was carried out in peri-urban areas of Ibadan, Oyo state, Southwest Nigeria. Ibadan is the capital city of Oyo state. There are 11 Local Government Areas (LGAs) in Ibadan metropolitan area consisting of 5 urban local governments and 6 peri-urban local governments. Structured questionnaire was used in a field survey conducted to collect primary data. To select respondents for the study, multi-stage sampling procedure was used. In the first stage, there was a purposive selection of three local governments from the six peri-urban local governments in Ibadan; Akinyele, Lagelu and Egbeda. The three LGAs were chosen due to high concentration of farmers who acquired land for agricultural purposes. In the second stage, there was a random selection of 7 villages from each LGA making up 21 villages. In the third stage, there was selection of 10 farmers from each village. In all, 210 copies of questionnaire were administered. However, due to invalid and incomplete responses, only 200 copies were used for analysis.

Analytical techniques

The techniques used for the analysis of data include descriptive statistics, Land Ownership Index (LOI), Crop Market Participation Index (CMPI) and Tobit regression model.

The methods of land acquisition and identification of cultivation methods by farmers were analyzed using Land Ownership Index (LOI) and descriptive statistics such as percentages, mean and

standard deviation, and the results were presented in frequency distribution tables. Crop Market Participation Index (CMPI) was used to analyze the level of crop market participation by farmers. Tobit regression model was used to analyze the effect of land acquisition on crop market participation.

Land Ownership Index: Land Ownership Index (LOI) was used to assess the extent of land ownership by crop farmers. LOI is given as;

$$LOI_i = \frac{\text{Area of land owned by crop farmer } i}{\text{Total land holding by crop farmer } i}$$

LOI_i ranges between 0 and 1

Where LOI=0, if farmer owns none of the land held

LOI=1, if farmer has full ownership of the land held

0<LOI<1 refers to the extent of ownership of land held by the farmer

Crop Market Participation Index (CMPI): This was used to assess the extent of crop market participation among crop farmers in the study area. The index measures the ratio of the gross value of crop sales in year j to the gross value of all the crops produced by the farmers in the same year j expressed as a percentage.^{10,17,18} Maize and cassava were used because they were the two major crops cultivated in the study area.

$$CMPI_m = \frac{\text{Gross value of maize sales}_{\text{in year } j} \times 100}{\text{Gross value of maize production}_{\text{in year } j}}$$

$$CMPI_c = \frac{\text{Gross value of cassava sales}_{\text{in year } j} \times 100}{\text{Gross value of cassava production}_{\text{in year } j}}$$

$$CMPI_h = \frac{\text{Gross value of all crop sales}_{\text{in year } j} \times 100}{\text{Gross value of all crop production}_{\text{in year } j}}$$

CMPI_m = Crop Market Participation index for maize

CMPI_c = Crop Market Participation index for cassava

CMPI_h = Household Market Participation index for all crops

CMPI ranges between 0 and 100

CMPI = 100 if farmer sells all his output.

CMPI = 0 if farmer consumes all his output.

0<CMPI<100 = the extent of crop market participation by farmer

Tobit regression model: Tobit regression model was used to analyse the effect of land acquisition on crop market participation by farmers. The Tobit model indicating the effect of land acquisition and other variables on the extent of household crop market participation (CMPI_h) is defined as;

$$Y^* = \beta_0 + \beta X_i + \beta C_i + \beta D_i + \varepsilon_i$$

Y* is the response variable CMPI_h (0≤CMPI≤100)

β_i is the vector of estimated parameters

X_i is the vector of socio-economic variables
 C_i is the vector of land acquisition variables
 D_i is the vector of cultivation practices variables
 ε_i is the disturbance term.
 Socio-economic variables:
 X_1 = age (years)
 X_2 = sex (male =1; otherwise= 0)
 X_3 = household status (head =1; otherwise = 0)
 X_4 = years of education (years)
 X_5 = farming experience (years)
 Land acquisition variables:
 C_6 = total plot distance (km)
 C_7 = land ownership index ($0 \leq LOI \leq 1$)
 Cultivation practices variables:
 D_8 = use of improved maize planting material (yes=1, no= 0)
 D_9 = use of improved cassava planting material (yes=1, no= 0)
 D_{10} = fertilizer application (yes=1, no= 0)
 D_{11} = use hired labour (yes=1, no= 0)
 D_{12} = monocropping (yes=1, no= 0)
 D_{13} = intercropping (yes=1, no= 0)
 D_{14} = mixed cropping (yes=1, no= 0)
 D_{15} = shifting cultivation (yes=1, no= 0)

Results and discussions

Description of respondents

Socio-economic characteristics: The socio-economic characteristics of the respondents are presented in Table 1. Results show that 39.0% of the farmers were between 46 and 60 years and the average age of the crop farmers was approximately 53 years. This is in line with the work of Muhammad et al.¹⁹ on “Assessment of commercialization on food crops among farming households in Southwest Nigeria”, in which most of the respondents (56%) were within the age range of 50-69 years, which makes it worrisome that young people are not into crop farming. Also, the level of productivity of food crops could be negatively affected because most of the respondents are ageing and this could be counterproductive, although the older household heads might have acquired better experience on cropping practices and market interaction over time.

Table 1 Socio-economic characteristics of respondents

Socio-economic characteristics	Frequency (n=200)	Percentage
Age (years)		
31-45	73	36.5
46-60	78	39
>60	49	24.5

Table Continued...

Socio-economic characteristics	Frequency (n=200)	Percentage
Mean 52.8 (±11.6)		
Sex		
Male	155	77.5
Female	45	22.5
Marital status		
Married	161	80.5
Widowed	36	18
Separated	3	1.5
Household size (numbers)		
1-5	82	41
6-10	82	41
>10	36	18
Mean 6.9 (±3.5)		
Educational status		
No Formal Education	38	19
Primary Education	79	39.5
Secondary Education	58	29
Tertiary Education	25	12.5
Immigrant status		
Native	142	71
Non-native	58	29

Source: Field Survey, 2019

Majority (77.5%) of the respondents were male, indicating that farming is an occupation dominated by men. This is in line with the work of Aderemi et al.²⁰ titled “Determinants of output commercialization among crop farming households in South Western Nigeria” in which 78.9% of the respondents were male. Also, More than three-quarters (80.5%) of the respondents were married, showing that the married engaged more in crop farming activities than others, which is expected of them, as they have responsibilities. This finding is supported by the work of Kuwornu et al.²¹ in which 82.0% of the respondents were married.

Further, 41.0% each of the respondents had household sizes ranging from 1-5 and 6-10. The average household size was 7. Large family size could indicate the availability of family labour for farming activities and thereby increases production, and further increase farmer’s market participation. However, large family size could also reduce market participation if there are many dependents in the household. This is because many dependents will increase the consumption rate of the household. This is in line with the findings of Tufa et al.²² in their work titled “Determinants of smallholder commercialization of horticultural crops in Gemechis District, West Hararge Zone, Ethiopia”, in which the average number of family size for the respondents was 6.

While 19.0% of the respondents had no formal education, 39.5% had primary education, 29.0% had secondary education and 12.5% had tertiary education. This shows that majority of the respondents could

at least read and write, an important factor in the commercialization of farming.²³ This is in line with Aderemi et al.,²⁰ who found that 38.3% of respondents had primary school education which represented the highest, followed by secondary school education with 31.3%.

Meanwhile, 71.0% of the respondents were natives while 29.0% were non-native farmers. This could imply land access; native farmers can acquire lands through non-market means such as inheritance while non-natives can acquire land mainly through market means such as lease, purchase and rent. This finding is in line with the work of Alawode et al.¹⁰ titled “Rural land market and commercialization among crop farming households in Southwestern Nigeria”, in which majority (77.1%) of the respondents were natives.

Enterprise characteristics of respondents

The enterprise characteristics of the respondents are presented in Table 2. From the results, most (30.5%) of the farmers had 21 to 30 years of farming experience. The mean of farming experience was 29.4 years (± 14.5), which shows that the respondents were experienced in crop farming activities. This is in line with the work of Nmadu et al.²⁴ on “Acquisition and management of land resources for Agricultural production in Benue State, Nigeria”, in which the respondents had an average of about 26 years of farming experience. Also, more than half (69.5%) of the respondents engaged in farm activities as their only source of livelihood. The high percentage of the respondents that engaged in full time farming indicates the presence of extensive farming activities in the study area. This is in line with the work of Adamu²⁵ on “Land acquisition and types of crops cultivated by farmers in Ayedaade Local Government Area, Osun State, Nigeria”, in which 70.8% of the farmers were into full time farming.

Table 2 Enterprise characteristics of respondents

Enterprise characteristics	Frequency (n=200)	Percentage
Farming experience (years)		
1-10	13	6.5
11-20	64	32
21-30	61	30.5
31-40	27	13.5
41-50	13	6.5
51-60	22	11
Mean 29.4 (± 14.5)		
Mode of farming		
Full Time	139	69.5
Part Time	61	30.5
Farm size (hectares)		
0.5-4.5	181	90.5
4.6-8.5	6	3
8.6-12.5	12	6
>12.5	1	0.5
Mean 2.8 (± 2.6)		

Table Continued...

Enterprise characteristics	Frequency (n=200)	Percentage
Access to local market and market information		
Yes	177	88.5
No	23	11.5
Road status		
Fairly good road	83	41.5
Bad road	51	25.5
Very bad road	66	33
Access to credit		
Yes	67	33.5
No	133	66.5
Access to extension agents	200	100

Source: Field Survey, 2019

A majority (90.5%) of the crop farmers cultivated between 0.5-4.5 hectares of land. On the average, 2.8 hectares of land were cultivated by the crop farmers. This is supported by the work of Dube and Guveya²⁶ titled “Determinants of Agriculture commercialization among smallholder farmers in Manicaland and Masvingo Provinces of Zimbabwe” in which the mean total land holding for the sample farmers was 2.7 hectares.

Further, majority (88.5%) of the respondents had access to local markets and market information, although, less than half (41.5%) had access to fairly good road in their communities. This implies that most of the farmers did not have access to good road, and this may increase their post-harvest loss as a result of not being able to transport their products in good condition to the market. On the other hand, 33.5% of the respondents had access to credit, implying that most of the farmers were not able to get much funds to run their farming activities. This is in line with the findings of Alawode et al.¹⁰ in which majority (98.0%) of the respondents did not have access to credit. However, all the respondents had access to extension agents. This implies that the farmers were privileged to have timely information on new innovative ideas in crop farming.

Methods of land acquisition by farmers

Plot characteristics of respondents: The plot characteristics and means of land acquisition by farmers are presented in Table 3. The total number of plots held by respondents equals 423, implying an average of 2.1 plots. This means, on the average, a farmer holds 2 plots. Therefore, the analysis in this section was based on plots. Results show that majority (90.1%) of the plots had sizes that ranged from 0.2 to 3.0 hectares. Descriptive results also show a minimum plot size of 0.2 hectare and maximum of 12.0 hectares, and most (98.6%) of the plots were fertile. This could be due to the practice of mixed cropping by farmers. The distance covered from most plots (63.1%) to market ranged from 1 to 5km with a minimum of 1km and maximum of 12km, and on the average a farmer covered 5.2km (± 4.5). Too far distance to the market with poor roads can increase their post-harvest loss.

Table 3 Plot characteristics of the respondents

Plot characteristics	Frequency (n=423)	Percentage	Statistic
Plot size (hectares)			
0.2-3.0	381	90.1	Min 0.2
3.1-5.0	30	7.1	Max 12.0
>5.0	12	2.8	Mean 2.1 (±1.5)
Soil quality			
Very fertile	150	35.5	
Fertile	267	63.1	
Not fertile	6	1.4	
Distance to market (km)			
5-Jan	267	63.1	Min 1
10-Jun	144	34.1	Max 12
>10	12	2.8	Mean 5.2 (±2.5)

Source: Field Survey, 2019

Methods of land acquisition by farmers

Analysis in this section was also done on plot basis. Table 4 shows the means of land acquisition found in the study area; inheritance, gift, purchase, rent and lease. The results show that more than half (53.4%) of the plots were acquired through inheritance. High level of land acquisition by inheritance could be attributed to the fact that majority (71.0%) of the farmers were natives (Table 1). On the other hand, acquisition through gift and purchase were not common among respondents.

Table 4 Land acquisition by farmers

Acquisition methods	Frequency (n=423)	Percentage
Inheritance	226	53.4
Gift	11	2.6
Purchase	38	9
Rent	85	20.1
Lease	63	14.9
Transaction based acquisition methods		
Purchase	38	20.4
Rent	85	45.7
Lease	63	33.9
Total	186	100
Non-transaction based acquisition methods		
Inheritance	226	95.4
Gift	11	4.6
Total	237	100

Source: Field Survey, 2019

Table 5 Ownership of land by farmers

Ownership index	Frequency (n=200)	Percentage
0	55	27.5
0.01-0.5	19	9.5
0.51-0.99	19	9.5
1	107	53.5

These means of land acquisition can be divided into transaction-based methods; purchase, rent and lease, and non-transaction based methods; inheritance and gift. On this basis, results from non-transaction based land acquisition methods show that 95.4% and 4.6% of the plots were acquired through inheritance and gift respectively, implying that inheritance was the main non-transaction based method of land acquisition in the area. Meanwhile, the results from transaction-based land acquisition method show that 45.7% and 33.9% of the plots were acquired through rent and lease respectively. Also, 20.4% of the plots were acquired through purchase, implying that rent and lease were the main transaction-based methods of land acquisition in the area. The high percentage of plots acquired by transaction based methods underscores the importance of land market in peri-urban areas.

Ownership of land by farmers

Ownership of land by the respondents was measured by land ownership index. From Table 5, results show that 53.5% of the farmers had full ownership of their total land holding (LOI=1), while 27.5% had no ownership of the total land holding (LOI=0). Meanwhile, 9.5% each owned 1-50% and 51-99% of their total land holding. Most of the farmers had full ownership of their total land holding due to the fact that majority of them were natives and they had their lands primarily through inheritance (non-transaction based), and through purchase (transaction-based). Those that did not own their land holding could be non-natives and would have acquired land through rent, and lease (transaction-based) or gift (non-transaction based) where lands revert back to the owner.

Cultivation practices by farmers

The cultivation practices by farmers are presented in Table 6.

Table 6 Cultivation practices by farmers

Cultivation practices	Frequency (n=423)	Percentage
Cultivation method		
Monocropping	52	12.3
Intercropping	31	7.3
Mixed cropping	334	79
Shifting cultivation	6	1.4
	Frequency (n=200)	Percentage
Use of improved planting material		
Maize	88	44
Cassava	102	51
Use of fertilizer		
Maize	90	45
Cassava	84	42
Use of herbicide		
Maize	165	82.5
Cassava	165	82.5
Use of hired labour		
Maize	186	93
Cassava	186	93
Use of machinery		
Maize	34	17
Cassava	34	17

Source: Field Survey, 2019

Cultivation methods

Analysis of the cultivation methods was based on plots (n=423). Farmers practised mixed cropping on majority (79.0%) of the plots, monocropping on 12.3% of plots, intercropping on 7.3% of plots while shifting cultivation was practised on 1.4% of the plots. This implies that majority of the farmers planted more than two crops on a particular plot. This finding is supported by the findings of Adamu²⁵ in which most of the farmers practised mixed cropping and most combination of crops had either cassava/maize in it.

Use of improved planting materials

Analysis in this section was based on farmers (n=200). More than half (51.0%) of the farmers used improved cassava planting material than improved maize planting material (44.0%).

Use of fertilizer

More than half of the farmers did not use fertilizer for maize (55.0%) and cassava (58.0%). This could be because they considered that most of the lands were fertile. Also, availability and use of fertilizers could improve the level of crop production.

Use of herbicide

The majority (82.5%) of the farmers used herbicides on maize and cassava, which could be because they had access to contact agents. This implies an increase in their output as a result minimal loss of farm produce.

Use of hired labour

The majority (93.0% each) of the farmers engaged hired labor in carrying out farm activities on maize and cassava plots. This could be due to the farmers who were no longer in their active working age.

Use of machinery

Only 17.0% of the farmers made use of machinery. Few of the farmers had access to machinery and only used it to prepare the land. This discourages the youths from participating in crop farming due to drudgery. Also, farmers with small land holdings cannot effectively utilize machinery.

Extent of crop market participation by farmers

There were variations in the extent of crop market participation among farmers. From Table 7, crop market participation indices indicate that all the farming households (100%) sold between 51-99% of their maize while 59.5% of the farmers sold between 51-99% of their cassava. The household crop market participation index (CMPI_h) was found to be 63.7% (±6.9), implying that on the average, households sold more than half of their total crop production in the area. This means that the households in the study area have moved from subsistence farming but not into full commercialization. Also, crop market participation index for cassava, CMPI_c=53.9%, shows that farmers sold more than half of cassava produced. Crop market participation in peri-urban Ibadan is moderately high. This could be adduced to being close to Ibadan, which is a large urban center, with high population. Crop produce are sold to urban and local markets in Ibadan metropolitan area. However, crop market participation index for maize, CMPI_m=84.7%, indicate that farmers sold 84.7% of maize produced. This implies that the crop driving market participation in the study area is maize. This may be because maize is being cultivated twice in a year. This is supported by the findings of Alawode et al.¹⁰ in which the household commercialization index was found to be 63.4% and the crop driving commercialization in southwest Nigeria area was maize.

Table 7 Crop market participation by respondents

Crop	Frequency (n=200)	Percentage
Maize		
≤ 50	0	0
51-99	200	100
100	0	0
CMPI _m		84.7
Cassava		
≤ 50	81	40.5
51-99	119	59.5
100	0	0
CMPI _c		53.9

Table Continued...

Crop	Frequency (n=200)	Percentage
CMPI for Household		
≤ 50	1	0.5
51-99	199	99.5
100		0
CMPI _h		63.7

Source: Data analysis, 2019

CMPI_m =Crop Market Participation index for maize

CMPI_c =Crop Market Participation index for cassava

CMPI_h =Household Market Participation index for all crops

Effect of land acquisition on crop market participation

Table 8 shows the Tobit regression results of the effects of land acquisition on crop market participation. The model is significant at

Table 8 Tobit regression results on effects of land acquisition on crop market participation

Variables	Coefficients	Standard error	Z	P > z
Socio-economic variables				
Age	-0.0006	0.00077	-0.76	0.446
Sex	0.0585***	0.02284	2.56	0.01
Household status	-0.0604**	0.02551	-2.37	0.018
Years of education	0.0034**	0.00148	2.27	0.023
Farming experience	0.0160**	0.00065	2.46	0.014
Land acquisition variables				
Total plot distance	-0.0012	0.00099	-1.23	0.22
Land ownership index	-0.0358***	0.01328	-2.69	0.007
Cultivation practices				
Maize improved planting material	0.0852***	0.02121	4.02	0
Cassava improved planting material	-0.0601***	0.01977	-3.04	0.002
Fertilizer application	-0.0513***	0.0171	-3	0.003
Hired labour	-0.0590**	0.02758	-2.14	0.032
Monocropping	0.022	0.01728	1.27	0.203
Intercropping	0.0198	0.02084	0.95	0.342
Mixed cropping	0.0203	0.02236	0.91	0.364
Shifting cultivation	-0.0561	0.03384	-1.66	0.096
Sigma	0.0774	0.0039		

Source: Data Analysis, 2019

Numbers of observation 200, LR Chi2 (15) 61.02, Prob >chi2 0.0000, Pseudo R2 -0.1575, Log likelihood 224.27958

***represents 1% significance, **represents 5% significance

Household status: There was a negative relationship between the respondents' household status (being the head) and crop market participation at 5% level of significance. Being the head of household reduces the likelihood of crop market participation by 6.0%. This could be because of the requirements of the household heads to feed

1%. From the results, nine variables that were found to be significant were grouped into socio-economic variables - sex, household status, years of education and farming experience; land acquisition variable - land ownership index; and cultivation practice variables - use of improved maize planting material, use of improved cassava planting material, fertilizer application and use of hired labour.

Socio-economic variables

Sex: Sex was significant at 1% level and had a positive relationship with crop market participation. This implies that being male increases the likelihood of market participation by 5.8%. This could be as a result of more male venturing into the cultivation of food crops that are oriented towards the market. The finding is supported by that of Muhammad et al.¹⁹ who found that due to the intensive labour required for farming activities, male farmers have the ability to do more tedious work than their female counterparts and this could call for increase in the production of food crops that are directed towards the market.

their family members, and as such, the farmers would be unable to reach high market participation.

Years of education: Years of education of household head was significant at 5% and positively related to crop market participation. Education is known to influence a household head's understanding of

market dynamics and therefore improve decisions about the amount of output sold. The level of commercialization of crop increases by 0.3% for every additional year of education attained by a household head.

Farming Experience: Farming experience had a positive effect on crop market participation at 5% level of significance. One year increase in farming experience will lead to increase in crop market participation by 0.2%, implying that the more the farming experience, the higher the likelihood of market participation.

Land acquisition variable

Land ownership index: This was significant 1% and negatively related to the level of crop market participation. This could be because most of the farmers (53.5%) were not paying rent on land use (Table 5), that is, they owned their lands (LOI=1) and therefore could not maximize the usage of the land. The payment of rent could encourage farmers to utilize their land for production by increasing the production level, thereby increasing their market participation. Also, ownership of land does not mean that all the land holdings were used for cultivation.

Cultivation practices

Use of improved maize planting material: This had positive relationship with crop market participation at 1% level of significance. This shows that the use of improved maize planting material increases the likelihood of market participation by farmers by 8.5%.

Use of improved cassava planting material: A negative relationship was found between the use of improved cassava planting material and crop market participation by the respondents at 1% level of significance. This means that an increase in usage of improved cassava planting material will reduce the likelihood of respondents' market participation by 6.0%. This finding is against the *a priori* expectation. This could be as a result of inadequate information on how the cassava improved planting material would be planted to get optimum yield and it could also be as a result of unavailability of improved cassava planting material among respondents.

Fertilizer application: Findings show a negative relationship between fertilizer application and crop market participation by the respondents at 1% level of significance. This means that an increase in application of fertilizer to maize crop will lead to decrease in the likelihood of farmer's market participation by 5.1%. This is also against *a priori* expectation. This could be as a result of inadequate information on how fertilizer would be applied to the maize crop to get optimum yield and it could also be as a result of unavailability of fertilizer among respondents.

Use of hired labour: The use of hired labour had a negative relationship with crop market participation by the respondents at 5% level of significance. This means that the more the hired labour used, the less the likelihood of crop market participation by 5.9%. This could be as a result of the high cost of hired labour and the farmers could not afford as much to increase their level of production thereby having small quantity for sale. Also, most of the farmers paid both in cash and kind using their farm produce. This signifies that the more the hired labour, the more wages paid to them and the less output farmers will take to the market.

Conclusion

Farmers in peri-urban areas of Ibadan mainly acquired land through inheritance (non-transaction based method) and also acquired

land through transaction means, especially rent and lease. Land acquisition through inheritance and purchase made land ownership to be moderately high at the peri-urban areas. However, land ownership did not translate to crop market participation since many farmers had full ownership of their land (not paying rent on land use). Transaction-based land acquisition drew attention to growing land market at the peri-urban interface, redistributing land through rent and lease to more efficient users of land. Crop market participation by farmers was moderately high and maize was the major driver of crop market participation. Also, years of education, farm experience, and use of improved maize planting materials drive crop market participation.

Policy effort aimed at making native and non-native farmers acquire land through transaction-based methods (rent and lease) will be a potent tool in increasing crop production, thereby increasing their crop market participation. Also, plans must be put in place to ensure that fertilizers, farm machineries and other improved planting materials are easily accessible and affordable by farmers to increase their yield which will enable them to participate more in crop market and also make crop farming attractive to youths. To feed her population, increased crop production and crop market participation are extremely important at this time when Nigeria is also striving to bounce back from the negative impact of Covid-19 on agriculture (food security) and all other sectors of the economy.

Acknowledgments

None.

Funding

None.

Conflicts of interest

The authors declare there are no conflicts of interest.

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