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## COMMERCIALISATION AMONG SMALLHOLDER MAIZE FARMERS IN FEDERAL CAPITAL TERRITORY, ABUJA, NIGERIA.

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### Abstract

Lack of marketable surplus is a major constraint to commercialization among smallholder farmers. Therefore, this study analyzed commercialization among smallholder maize farmers in the Federal Capital Territory, Abuja. Multistage sampling technique was used to sample 180 maize farmers across the territory. Descriptive statistics was used to describe the socio-economic characteristics of the respondents; while the Household Commercialization Index (HCI) was used to measure extent to which a household crop (maize) production is oriented towards the market. It also quantifies and estimates the factors that influence the level of commercialization using the multiple regression analysis. The results indicated that majority of maize farmers were in their active age with relatively large households. Most of the maize farmers were commercially oriented with commercialization index of 0.57. The regression result revealed that age of maize farmers, farm size and household size positively and significantly influenced the level of commercialization of maize. There is the need for capacity building of maize farmers on production techniques and effective marketing of their output. To increase commercialization of smallholder farmers, there is the need for them to form strong and viable cooperative groups so that they can have access to more fund for expanded production.

**Keywords:** Maize, marketable, commercialization index

### Introduction

The smallholder farmers, who constitute the bulk of the rural poor have also not fully benefited from agriculture's multiple functions. This is because they predominantly practice consumption- oriented subsistence agriculture which excludes them from the formal market system and the related income-mediated benefits (IFPRI, 2005; World Bank, 2008).

Agricultural commercialization is the process by which farmers increase their productivity by producing more output per unit of land (and labour), produce greater surpluses which can be sold in the market and thus increase their market participation with the attendant beneficial effect of higher incomes and living standards (Jayne, *et al.*, 2011). Smallholder commercialization is envisioned as the strength of the link between smallholder farm households and markets at a particular point in time. These household-to-market linkages relate to output or input markets either in buying, selling, or both (Osmani *et al.*, 2015). In addition, smallholder commercialization can also be regarded as a dynamic process: at what speed the proportion of outputs sold and inputs purchased are changing over time at household level (Musah, 2013).

Maize (*Zea mays L.*) is a major staple food crop in Nigeria. It is not only an important cereal crop produced in Nigeria on the basis of output but also on the basis of number of farmers that produced it, as well as for its economic value (Olaniyi and Adewale, 2012). According to FAO (2013), maize has been rated as the second grown food crop in Nigeria after cassava, then followed by sorghum and rice. However, about 70% of the maize producers are smallholder farmers, cultivating between 0.5-2.0 hectares with low technology (Oyelade and Anwanene, 2013). Because of this, Jayne *et al.*, (2011) found out that most smallholder farmers are constrained to participate in markets as sellers because they

often have no or too little surpluses to sell. Asumugha *et al.*, (2009) found that poor infrastructure, lack of market, transport, dearth of market information, insufficient expertise on grades and standards, inability to have contractual agreement and poor organizational support have led to the inefficient use of markets, hence commercialization bottlenecks. In Nigeria most researches on the commercialization among smallholder farmers were in the southern part of the country (Asumugha *et al.*, (2009); Ele *et al.*, (2013); Agwu *et al.*, (2013) and Muhammad-Lawal *et al.*, (2014). However, there is a dearth of researches on the commercialization among smallholder maize farmers in the Federal Capital Territory, Abuja. Therefore, this research intends to bridge this gap by determining the extent and factors affecting the level of commercialisation.

Therefore, the main objective of this study is to examine the commercialization level among small scale maize farmers, while the specific objectives are to:

- (i) describe the socio-economic characteristics of small scale maize farmers in the study area;
- (ii) determine the commercialization index of the sampled farmers and;
- (iii) determine the factors affecting the commercialization index of the maize farmers.

### Conceptual Framework and Literature Review

Smallholder commercialization is defined as a situation where farmers of small individual and family farms have greater engagement with markets either for inputs, outputs or both (Asuming-Brempong *et al.*, 2013). Many development economists viewed smallholder commercialization as a pathway from semi-subsistence agricultural society to a more diversified, food secure economy and higher standard of living. For example, Kirimi *et al.*, (2013) viewed it as an avenue to improve household food security due to its comparative advantages over subsistence production. On the other hand, Asuming-Brempong *et al.*, (2013) asserted that commercialization among smallholder farmers as a development strategy for increased incomes to households who are able to maximize the returns to land and labour through market opportunities. Commercialization allows increased participation of individuals and poor households in the domestic, national and international exchange economy and results in higher average farm incomes and lower farm inequality (Oteh *et al.*, (2014). Similarly, Zhou *et al.*, (2013) considered agricultural commercialization as an agricultural transformation process whereby farmers graduate from mainly consumption-oriented subsistence production towards market and profit oriented production systems.

Many research studies on commercialization among smallholder farmers revolve around determination of the commercialization level and the various demographic factors that influence the extent of commercialization. For example, Martey *et al.*, (2012), Agwu *et al.*, (2013) and Muhammad-Lawal *et al.*, (2014) employed the Household Commercialization Index (HCI) to measure commercialization. Muhammad-Lawal *et al.*, (2014) went further to categorize level of commercialization among farmers thus: 0-30 % (not commercializing), 31-50% (moderately commercializing) and 51-100% (fully commercialized). On the other hand, Bekele *et al.*, (2011) reported that a crop commercialization index greater than 50% signifies a commercial oriented farmer for a crop under consideration. This study employed the former method in measuring the commercialization level of maize farmers in the study area.

### **Methodology**

#### Study area:

This study was carried out at the Federal Capital Territory, Abuja. Abuja that was created by Decree No. 6 of 1976 and located between latitude  $8^{\circ} 25'$  and  $9^{\circ} 25'$  North of the equator and longitudes  $6^{\circ} 45'$  and  $7^{\circ} 45'$  East of Greenwich Meridian. It covers an area of 8000 square kilometers, with an estimated population of 3,324,000 people in 2015 (UNFPA, 2015). Lying close to the center of the country, Abuja is situated wholly within the generally referred to as the middle belt. Its bordered by the following

states; Niger State to the West and North, Kaduna to the Northeast, Nassarawa to the east and Kogi to the Southwest.

There are six Area Councils in Abuja which include Abaji, Kwali, Kuje, Gwagwalada, Bwari and Abuja municipal area councils. Federal Capital Territory is situated within the savannah region with moderate climatic conditions. A typical year in the study area consist of wet (March- October) and dry seasons (November-February). Major crops grown in the area include yam, cassava, Sorghum, rice, Okra, pepper and garden egg, maize, plantains.

#### Method of Data Collection and Sampling Procedure

Multistage sampling procedure was used for the collection of primary data from 180 maize farmers with the aid of well-structured questionnaire complemented with interview schedule. The first stage involved the purposive selection of three (3) area councils (Kuje, Kwali and Gwagwalada) in the Federal Capital Territory (FCT) based on the presence of maize farmers. The second stage involved the purposive selection of two (2) villages from the selected area councils, thereby making it six villages. The final stage was the random selection of thirty maize farmers from each of the selected villages given the total respondents selected to be 180.

#### Data Analysis

Data collected were analyzed using both descriptive and inferential statistics. Descriptive statistics such as percentages were used to describe the socio-economic variables and commercialization index of the small scale maize farmers. The commercialization index was calculated using the formula as adopted by Martey *et al.*, (2012) and Muhammad-Lawal *et al.*, (2014).

$$HCI_i = \left[ \frac{\text{Gross value of maize sales}_{hhiyearj}}{\text{Gross value of maize production}_{hhiyearj}} \right] * 100$$

Where  $HCI_i$  is Household Commercialization Index for  $i^{th}$  household.

This HCI measures the extent to which household crop production is oriented toward the market. A value of zero implies a totally subsistence-oriented household; and a household with an index value of 100 infers that it is completely commercialized (Govereh *et al.*, 1999).

The inferential statistics that was used is the multiple regression analysis.

The implicit form of the regression is stated as follows:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, e)$$

Where:

Y= Commercialization index (No.)

$X_1$  = Age of the farmer (years)

$X_2$  = Years of formal Education (years)

$X_3$  = Farm size (ha)

$X_4$  = Farming experience (Years)

$X_5$  = Household size (No.)

$X_6$  = Access to credit (Yes =1, otherwise =0)

$X_7$  = Maize Output (kg)

$\varepsilon$  = error term

The four functional forms of the model, linear, semi-log, double log and exponential were used. The lead equation based on the size and statistical significance of the coefficient of determination,  $R^2$ ; the magnitude, sign and the standard error of the regression estimate was chosen.

## Results and Discussion

The mean commercialization level as shown in Table 1 was 0.576, this means that about 58% of maize harvested was sold out. This means that majority of the maize farmers were fully commercializing or that the farmers were commercially oriented for the crop under consideration (Bekele *et al.*, (2011) and Muhammad-Lawal *et al.*, (2014). The mean age of household heads was 39 years. The maize farming households in the Federal Capital Territory, Abuja can therefore be described as young and belong to the economically active group of the country, they are likely in the best position to produce for the market. This result is in agreement with the findings of Ele *et al.*, (2013) that younger household heads produce more for the market than other (older) farmers.

The mean years of education shows that the highest level of education attained by a household head was primary education. It is expected that higher education will be associated with more commercially oriented agriculture. Table 1 showed that all the respondents had one form of education or the other (they are all literate); this must have accounted for the high commercialization level of the maize farmers sampled. Higher farmers' level of education is likely to enhance farmers' access to production and market information and new agricultural technologies. This finding is consistent with those of Boniphase *et al.*, (2014); Oparinde and Daramola, (2014) and Alhassan, (2017).

The mean farm size was 3.4 hectare, with 2 and 7 hectares being the minimum and maximum farm sizes respectively. The standard deviation of 1.39 hectare indicates that the spread or variability between the minimum and maximum farm size was low. Large farm size serves as incentive for farmers to produce surplus for the market. This is in agreement with the findings of Martey *et al.*, (2012) who observed that large farm size, when well-managed, has positive influence on output market access since it enables farmers to generate production surpluses for the market.

Maize producing household heads had on the average 26.9 years of farming experience. This is an indication that maize farmers are experienced. The average household size was 8. The implication of this is that households with more members might have more people available for production, which will also help to reduce cost of hired labour. However, households with more dependents are likely to have less for the market due to likely increase in consumption of food crop like maize. This is consistent with the observation of Agwu *et al.*, (2013) that the decision to sell is preceded by a decision to consume.

The linear regression was chosen as the best fit due to the  $R^2$  value of 0.81 implying that 81% of the variability was explained in the model. Table 3 showed that age of maize farmers, farm size and household size positively and significantly determined the level of commercialization at 1% level of probability among small scale maize farmers. This means that 1% increase in age, farm size and household size will increase the level of commercialization by 0.02%, 0.04% and 0.02 respectively. This result is in line with *a priori* expectation and in agreement with the findings of Apind *et al.*, (2015) for age. Farm size is very important in market oriented agricultural production. The coefficient of farm size was significant at 1% probability. This finding agrees with those of Martey *et al.*, (2012) and Agwu, *et al.*, (2013). They found that farm size influences the level of agricultural commercialization in Ghana and Nigeria respectively.

Household size was positive and significant, this finding contradicts those of Agwu *et al.*, (2013) and Apind *et al.*, (2015) in their studies found out that as the number of mouths to feed increases and therefore the probability of farmers' orientation towards commercialization reduces. Farming experience was also significant at 1% probability level but with a negative sign. This result implies that as the number of years of the farmers' experience increases, the level of commercialization likely decreases. This result contradicts those of Agwu *et al.*, (2013). This might be due to the fact that these household heads relied on just past experiences without recourse to new production technologies and trading opportunities.

Access to credit is very important in agricultural productivity among small scale farmers. Accessibility to credit by small scale maize farmers was significant but negative at 1% level of probability. This means that it negatively influences farmers' orientation towards commercialization in the study area.

This is contrary to a priori expectation and to other findings such as that of Martey *et al.*, (2012) and Agwu, *et al.*, (2013). The reason could be that the loan was too little to make any significant impact on the farmers' commercialization level or that those who have access diverted them to other uses other than maize production.

### Conclusion and Recommendations

Majority of the small scale maize farmers were commercially oriented. It can also be concluded that if the farmers are to maintain their commercialization level, factors such as age of smallholder farmers, farm size, farming experience, household size and access to credit need to be sustained. It was therefore recommended that farmers should store their excess properly during harvest so that they can be made available during scarcity. There is the need for capacity building of maize farmers on production techniques and effective marketing of their output. To increase commercialization of smallholder farmers, there is the need for them to form strong and viable cooperative groups so that they can have access to more fund for expanded production.

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Table 1: Summary Statistic of socio-economic variables of maize farmers

Variables	Mean	Standard deviation	Minimum	Maximum
Comm. Index (No.)	0.576	0.157	0.36	0.90
Age (No.)	39.477	11.728	23	56
Edu. Level (No.)	10.055	4.883	0	20
Farm size (ha.)	3.427	1.39	2	7
Years of exp. (yr.)	26.905	12.85	8	43
Household size (No.)	8.16	3.57	3	15
Output (kg)	92.75	70.330	12	300

Table 2: Commercialization index of maize farmers

Index	Frequency	Percentage
<0.40	8	4.44
0.41-0.80	152	84.44
>0.80	20	11.11
Total	180	100

Table 3: Determinants of commercialization among small scale maize farmers

Variables	Linear	Semi-log	Double log	Exponential
Constant	0.37718 (6.94)***	-0.34890 (1.73)	-0.95956 (-6.59)***	-0.41988 (-10.35)***
Age (X <sub>1</sub> )	0.02212 (5.97)***	1.34583 (4.72)***	1.00162 (4.87)***	0.01493 (5.40)***
Education (X <sub>2</sub> )	-0.00024 (0.12)	-0.06850 (-2.19)**	-0.03883 (-1.72)*	0.00005 (0.04)
Farm size (X <sub>3</sub> )	0.04602 (8.02)***	0.44221 (7.34)***	0.3173 (7.31)***	0.03487 (8.13)***
Farm Experience (X <sub>4</sub> )	-0.02916 (-7.89)***	-0.99094 (-7.60)***	0.72918 (-7.77)***	-0.02000 (-7.24)***
Household size (X <sub>5</sub> )	0.02156 (5.60)***	0.02822 (0.33)	0.02911 (0.47)	0.01662 (5.78)***
Access to credit (X <sub>6</sub> )	-0.2367 (-8.83)***	114.6822 (3.26)***	72.11951 (2.85)***	-0.15792 (7.89)***
Output (X <sub>7</sub> )	-0.00020 (-1.72)	-0.02533 (-0.92)	-0.02115 (-1.07)	-0.00006 (-0.72)
	R <sup>2</sup> =0.81 R <sup>2</sup> =0.80	R <sup>2</sup> =0.76 R <sup>2</sup> =0.75	R <sup>2</sup> =0.75 R <sup>2</sup> =0.74	R <sup>2</sup> =0.78 R <sup>2</sup> =0.77

t- values are in parenthesis; \*\*\*, \*\* and \* = 1%, 5% and 10% level of probability respectively.

Source: Field survey; 2016.