LEVEL OF FOOD CROP COMMERCIALIZATION AMONG SMALLHOLDER FARMERS IN NORTH CENTRAL NIGERIA

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ABSTRACT
This study examined the level of food crop commercialization among smallholder farmers in North Central Nigeria, focusing on Plateau, Niger, and Nasarawa States. Employing a multi-stage sampling technique, a total of 393 respondents were selected, and data were obtained through structured questionnaires and interview schedules. The Household Commercialization Index (HCI) was used to determine the extent of commercialization. Results revealed varying levels of land acquisition through inheritance, purchase, gift, and rental across the states, with inheritance being the most prevalent yet associated with smaller landholdings. Niger State accounted for the highest percentage of inherited and purchased land, while Nasarawa showed the highest average farm size for rented land. Productivity analysis showed Niger State leading in maize and yam output per hectare, while Plateau recorded the highest for cowpea. Overall, commercialization rates were relatively high across major food crops, with maize (64.04%), rice (63.99%), and cowpea demonstrating strong market orientation. The findings show the growing shift toward market-oriented agriculture in the study areas and highlight the need for supportive land policies, improved access to inputs and enhanced extension services to boost commercialization and productivity among smallholder farmers.

Keywords: food crop commercialization, smallholder farmers, North Central Nigeria, Household Commercialization Index, productivity and land tenure.

INTRODUCTION

Agricultural transformation thrives when there is a shift from low-productivity, subsistence farming to high-productivity, commercial agriculture (Olanrewaju, 2016). This shift drives broader economic changes, fostering diversification into services and manufacturing sectors. At the household level, agricultural transformation facilitates specialization in farming and enables rural families to diversify into non-farm activities, thus improving income stability (Haggblade and Hazell, 2010). Transformation involves not just the marketing of farm produce, but also the increased use of traded inputs and a shift towards market-driven decision-making by farming households, leading to stronger linkages between rural producers and broader markets (Jaleta *et al.,* 2009).

A critical pathway to achieving food security through agricultural growth is the transformation from low-input, low-productivity subsistence farming into a high-productivity, commercially oriented sector. Intensification, involving increased productivity per unit of land, is key to making smallholder farms economically viable and sustainable (Seng, 2016). With Nigeria's rapidly growing population and the limited possibility of farmland expansion, enhancing yields and market-oriented crop production has become essential for driving agricultural growth (Carletto *et al.,* 2017). In this regard, commercialization defined as a shift from production mainly for self-consumption to production for sale emerges as a crucial strategy. It not only raises farm incomes and productivity but also strengthens food supply chains, thereby fostering urban food security and supporting economic development (Olanrewaju, 2016; Papaioannou and De Haas, 2017).

However, achieving sustained commercialization among smallholder farmers in Nigeria is often complicated by land tenure issues. Land tenure, as a social construct, governs the relationships among individuals and groups regarding land ownership, use, and control (Economic Commission for Africa [ECA], 2004; Payne, 2002). In many developing countries, especially in Sub-Saharan Africa, customary tenure systems predominate, wherein land is communally owned and individuals exercise usage rights without formal ownership (Mabikke *et al.,* 2017). Such arrangements, while socially rooted, often limit farmers' incentives and capacities to invest in land improvements and commercial farming practices.

Several studies (Mitchell, 2011; FAO, 2016; Chikaire *et al.,* 2017; Olaniyan *et al.,* 2018) have examined land tenure governance and its implications. However, fewer researchers, notably Mahmuda and Tajuddin (2011) and Idoma and Ismail (2014), have explored the specific effects of land tenure systems on smallholder commercialization and resource allocation patterns, particularly in North Central Nigeria. This gap in the literature highlights the need for a deeper understanding of how tenure arrangements influence farmers' decisions on resource use and market engagement, which ultimately affects agricultural productivity and rural development.

RESEARCH METHOLOGY

The study was undertaken in Plateau, Niger and Nasarawa in North Central Nigeria. Plateau is located

within Latitudes 70° 00′-110° 30′ N and Longitudes 4° 00′ - 11° 00′ E. It enjoys the tropical continental climate characterized by wet and dry seasons. Wet season is the planting season since agriculture in the area is mainly rain-fed. Mean annual rainfall ranges between 1,200mm and 1500mm while mean temperature ranges between 18°C and 37°C.

Niger State is a State in Central Nigeria and the largest state in the country (Rossazana and Musa, 2020). It covers a total land area of 76,363 km^2 (29.484 sq miles) with a total projected population of 5,843, 954 as at 2020 (Rossazana and Musa, 2020).

Nasarawa was created on 1st October, 1996. The state is bounded in the North by Kaduna State, in the west by the Federal Capital Territory, in the south by Kogi and Benue States and in the east by Taraba and Plateau States. It has a total population of 4,249,679 as at 2020 and land mass of 27,117 km^2. Nasarawa State has agriculture as the mainstay of its economy with the production of varieties of cash and food crops throughout the year. It also contains various minerals such as salt, baryte, and bauxite, which are mostly mined by artisanal miners.

Multi-stage sampling techniques were employed to select 82, 124 and 174 respondents from Nasarawa, Plateau and Niger respectively. Primary data were elicited from the respondent with the aid of a structured questionnaire complemented with interview schedule. Data collected were analyzed using household commercialization index.

Household Commercialization Index

The Household Commercialization Index (HCI), which was estimated using the equations 1-3.

$$HCI_i = \frac{\text{gross value of all crop sales (₦)}}{\text{gross value of all crop production (₦)}} \quad (1)$$

$$CAO_i = \frac{\text{Value of agricultural sales in markets}}{\text{Agricultural production value}} \quad (2)$$

$$CAI_i = \frac{\text{Value of inputs from markets}}{\text{Agricultural production value}} \quad (3)$$

Where, CAO= Commercialization of agriculture (output side) and CAI= Commercialization of agriculture (input side). The farm households involved in greater sales of crop output with index value of fifty or more ($HCI_i \geq 50$) are commercial oriented while those with lesser or no sales ($HCI_i < 50$) are subsistence oriented (Bekele *et al.*, 2010; Birara *et al.*, 2020; Strasberg *et al.*, 1999).

RESULT AND DISCUSSION

The pooled result under inheritance in Table 1 revealed that 100% of the farmers who inherited the farmland were 325 and had an average of 2.04Ha/farmer with 44.9% of farmers in Niger State who had an average farmland of 1.96Ha/farmer. Farmers in Plateau and Nasarawa States accounted for 34.2% and 20.9% of inherited land with an average farmland size of 1.64Ha/farmer and 2.87Ha/farmer respectively. In Nasarawa State, inherited land tenure is common but contributed more to the pooled average. Inheritance is the most dominant form of land tenure but is associated with smaller land sizes, especially in the study area. This agrees with Eze *et al.* (2011) who asserted that inheritance was the predominant land practice Nigeria.

In terms of purchased land, the result revealed that the farmers had total farm size of 80.0 Ha with an average farm size of 2.16Ha/farmer with 48.6% of farmers in Niger State accounting for 37.8 Ha of purchased land with an average farm size of 2.1Ha/farmer. The study further revealed that 32.4% and 19% from Plateau and Nasarawa States accounted for the remaining 42.2Ha purchased land and a mean farm size of 1.92Ha/ farmer and 2.71 Ha/farmer respectively. Land purchase is less common but tends to result in slightly larger holdings compared to inheritance. This result agrees with the result of Qui *et al.* (2021) on the impact of land renting on farm productivity of maize in China, who asserted that rented land was less common among farmers in China

Furthermore, the total farmers who were gifted land had a total farm size of 34.8 Ha with an average farm size of 1.83 Ha/farmer. The result showed that 52.6% of farmers were in Plateau State and had an average of 1.58 Ha/farmer that was gifted while 26.3% and 21.1% of farmers in Nasarawa and Niger States had a mean farm size of 2.6 Ha/farmer and 1.5 Ha/farmer respectively. Land received as a gift is relatively rare and often results in small holdings compare to inheritance and purchased land. This suggests the need for state-specific land policies that address regional disparities in land availability and ownership and community-based interventions, such as cooperative farming and shared-use agricultural equipment, can help farmers maximize output despite limited land sizes. This result is in line with Mdoda and Gidi (2023) who stated that land obtained as gift are mostly rare and tend to result small land holdings.

Table 1: Level of land tenure

State	Inheritance			Purchase			Gift			Rent		
	No. of farmers	No. of Ha	Ha/ farmer	No. of farmers	No. of Ha	Ha/ farmer	No. of farmers	No. of Ha	Ha/ farmer	No. of farmers	No. of Ha	Ha/ farmer
Pooled	325 (100)	663	2.04	37 (100)	80	2.16	19 (100)	34.8	1.83	116 (100)	261.7	2.26
Nasarawa	68 (20.9)	195.1	2.87	7 (19)	19	2.71	5 (26.3)	13	2.6	10 (8.6)	36.4	3.64
Niger	146 (44.9)	285.5	1.96	18 (48.6)	37.8	2.1	4 (21.1)	6	1.5	88 (75.9)	188.8	2.15
Plateau	111 (34.2)	182.4	1.64	12 (32.4)	23.2	1.92	10 (52.6)	15.8	1.58	18 (15.5)	36.5	2.03

Numbers in parenthesis are percentages
Source: Field survey, 2022. The numbers in parenthesis are percentages

The pooled results indicate that farmers who rented farmland collectively managed 261.7 hectares, with an average farm size of 2.26 hectares per farmer. When analyzed by state, the average farm size for renters varied: Nasarawa recorded the largest at 3.64 hectares per farmer, followed by Niger at 2.15 hectares and Plateau at 2.03 hectares per farmer. Notably, while Nasarawa had fewer renting farmers, they held the largest average land sizes. In contrast, renting was more prevalent in Niger State, but with moderately sized holdings. These findings suggest that in Nasarawa, farmland rental facilitates access to larger land parcels, although its overall prevalence remains lower. This observation aligns with the assertions of Benjaminsen *et al*. (2021) and Liu *et al*. (2019), who noted that inherited and rented lands often face challenges such as fragmentation and short-term tenure insecurity, whereas purchased land with formal titles offers greater investment potential and enhances agricultural productivity.

The result on level of productivity of maize farmers in Table 2 revealed that pooled had output/Ha of 1.914Tons, with Plateau State recording the highest output/Ha of 2.029Tons and Nasarawa State recording the lowest output/ Ha of 1.746Tons

Also, the result on level of productivity of rice farmers in Table 2 revealed that the pooled 2.011Tons/Ha, with Plateau State having the lowest output/ Ha of 1.756Tons. Niger State had output/ Ha of 2.243Tons while Nasarawa State had output/ Ha of 1.823Tons. The low productivity in Plateau State could have stem from traditional farming methods, poor water management, or lack of irrigation facilities. (Mdoda and Gidi 2023)

The output/ Ha of pooled for cowpea and yam was 0.785 and 10.753Tons respectively. Nasarawa State had the lowest output/ Ha for cowpea of 0.584Tons. Niger State had the highest output/ Ha for cowpea with output/ Ha of 0.875Tons. Niger State had highest output/ Ha of 11.223Tons for yam. The results are in consonance with Marenya *et al*. (2023) who observed that when farmers began to commercialize their production, they were more likely to adopt new agricultural technologies (e.g., hybrid seeds, modern irrigation systems) because of exposure to new market demands and better access to information through extension services.

Table 2: Level of productivity in the study area

State	Maize			Rice			Cowpea			Yam		
	Output (Tons)	Ha	Output /Ha(Tons)	Output (Tons)	Ha	Output /Ha(Tons)	Output (Tons)	Ha	Output /Ha(Tons)	Output (Tons)	Ha	Output /Ha(Tons)
Pooled	1665.4	869.7	1.914	1293.1	643.1	2.011	134.2	171	0.785	18032.6	1,677	10.753
Nasarawa	531.8	304.5	1.746	505.24	277.2	1.823	30.93	53	0.584	6944.78	685.75	10.127
Niger	536.0	270.6	1.981	672.76	300.0	2.243	59.53	68	0.875	10782.7	960.75	11.223
Plateau	597.7	294.6	2.029	115.05	65.5	1.756	43.71	50	0.874	305.125	30.5	10.004

Table 3 present the distribution of respondents according to level of commercialization. The pooled results indicate significant levels of commercialization across major food crops, highlighting their economic viability. For maize, a total output of 1665.4Tons was harvested, of which 1065.9Tons was sold, resulting in a commercialization rate of 64.04%. This implies that 599.5Tons (36%) was either consumed by farmers or allocated for non-commercial purposes. Rice

production followed a similar trend, with 1293.05Tons harvested and 955.55Tons sold, leaving 337.5Tons (26%) for on-farm consumption or alternative use. Cowpea demonstrated a comparable commercialization rate, with 134.17Tons harvested and 88.55Tons sold, reflecting a differential of 45.62Tons (34.%) retained. Yam production exhibited the highest output, reaching 18032.6Tons, with 11721.17Tons sold, signifying that 6311.43Tons (35.00%) remained unsold. These findings underscore a strong market orientation among food crop farmers, with the majority of their harvest directed towards commercial sales. Nwafor and Vander Westhuizen (2020) and Zondi *et al.* (2022) who in separate studies reported that farmers in Africa were operating above subsistence level. The study across the three states in the study area reveals a similar trend with the pooled. Except for Nasarawa State which only had a larger difference in cowpea (indicating that the farmers were tending towards commercialization) but remaining two crops (maize and yam) showed that the farmers were not tending towards commercialization. This agrees with the findings of Agwu *et al*. (2013), who reported that farmers in Africa sold less 30% of their food crops. But the overall result show that the smallholder farmers are gradually tending towards commercialization.

Table 3: Level of commercialization

State	Maize (Tons)			Rice (Tons)			Cowpea (Tons)			Yam (Tons)		
	Output harvested	Output sold	Output difference	Output harvested	Output sold	Output difference	Output harvested	Output sold	Output difference	Output harvested	Output sold	Output difference
Pooled	1665.4	1065.9	599.5	1293.05	955.55	337.5	134.17	88.55	45.62	18032.6	11721.17	6311.43
Nasarawa	531.8	239.84	291.96	505.24	272.83	232.41	30.93	17.94	12.99	6944.78	3329.2	3615.6
Niger	536	401.47	134.53	672.76	498.57	174.19	59.53	46.43	13.1	10782.7	8108.6	2674.1
Plateau	597.7	426.54	171.16	115.05	72.6	42.45	43.71	19.23	24.48	305.125	184.03	121.10

Conclusion and Recommendation

From the study, it can be concluded that the predominant mode of land acquisition was through inheritance, although it often limited the farm size due to fragmentation. Rented and purchased lands offered relatively larger farm sizes but were less accessible due to financial constraints. The level of commercialization, as measured by the Household Commercialization Index (HCI), showed that maize, rice, and cowpea were the most commercially oriented food crops among the respondents. Moreover, there were significant variations in crop productivity across the states, with Niger State demonstrating higher output per hectare for most crops. The study also showed that land tenure systems, access to markets, and extension services were vital determinants of commercialization levels. The study recommended that government and policymakers should develop and implement land reform policies that ensure secure and equitable access to land, especially for smallholder farmers. This will encourage long-term investments in land productivity and facilitate commercialization.

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