

Socioeconomic Factors Influencing Internal Migration among Cassava Smallholder Farmers in Southern Nigeria

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ABSTRACT

This study examined the socioeconomic characteristics influencing internal migration among cassava smallholder farmers in Southern Nigeria. Data were collected from 422 respondents and analyzed using Binary Logistic Regression model. The findings showed that 95% of households had at least one migrant, resulting in labour shortages in 88.4% of households. Migration was driven mainly by employment opportunities and higher urban incomes. Age, farm size, extension access, credit access, and distance to urban centres reduced migration, whereas male-headed households, education, household size, farming experience, and cooperative membership increased migration. Strengthening rural employment, credit, and extension services is essential for sustaining cassava production.

Keywords

Socioeconomic characteristics, internal migration, cassava farmers, labour availability, rural livelihoods and Binary Logistic Regression.

Introduction

Migration has become one of the defining demographic and socio-economic processes shaping agricultural transformation, rural livelihoods, and food systems in developing countries. Beyond its role as a mechanism of population redistribution, migration influences labour allocation, household welfare, agricultural productivity, and the resilience of rural economies. Consequently, migration has emerged as a central issue in global development discourse and is explicitly recognized within the United Nations Sustainable Development Goals (SDGs) because of its dual potential to accelerate economic development while simultaneously exacerbating rural inequality, labour shortages, and food insecurity [1,2]. Although international migration receives considerable policy attention, internal migration remains far more prevalent, accounting for the largest share of human mobility worldwide [3-5]. Internal migration encompasses rural-rural, rural-urban, urban-urban, and urban-rural movements, with rural-to-urban migration constituting the dominant pattern across most low- and middle-income countries owing to rapid urbanization, structural

transformation, and widening rural-urban income disparities [4,6]. Sub-Saharan Africa is the world's largest cassava-producing and consuming region, where the crop constitutes the second most important staple food and serves as a primary source of dietary energy for nearly 40% of the population [7,8]. Average per capita consumption exceeds 800g per day in several countries, highlighting its indispensable role in ensuring household food security and nutritional stability [8]. Beyond the storage roots, cassava leaves are widely consumed as nutrient-rich vegetables containing essential proteins, vitamins, and minerals [9,10]. Across West and Central Africa, cassava is processed into numerous traditional foods including gari, fufu, lafun, attiéké, tapioca, and dumby that remain integral to local food systems [11-14]. Increasingly, cassava is also serving as an industrial crop through the production of high-quality cassava flour, starch, ethanol, sorbitol, and other value-added products. This study therefore examines the determinants of internal migration among cassava smallholder farming households in Nigeria, providing evidence to inform migration, agricultural, and rural development policies.

Methodology

Study Area

In mid-2025, Nigeria's population was projected to be around 237.5 million people according to the United Nations based

estimates reported by Worldometer [15], reflecting an annual growth rate of approximately 2.08%, or an increase of roughly 4.85 million individuals within the year. The nation covers 923,800 square kilometres, representing about 14% of West Africa's total landmass. Nigeria as a country is made up of 36 States and the Federal Capital Territory (FCT). One of the major staple crops in the Southern region of the country is cassava production.

Sampling Procedures

In this research, a multistage sampling approach was used. First, **four (4) States** in Nigeria was purposively selected based on their high levels of cassava production. Four states in the southern Nigeria was selected which were Akwa Ibom, Cross River, Anambra and Enugu State.

Sample Size

The Cochran [16] formula was used to estimate the number of respondents.

$$n_0 = \frac{z^2 pq}{e^2} = \frac{(1.96)^2 (0.5)(0.5)p}{(0.05)^2} = 384$$

The symbol n_0 represents the sample size, while Z^2 denotes the squared value of the standard normal variable corresponding to the selected confidence level (e.g., 95% confidence). The parameter e indicates the acceptable margin of error, p is the predicted portion of the respondents with the features of interest, and q equals $1 - p$. The value of Z is obtained from standard normal distribution tables showing the area under the curve [16]. An extra 10% was included to allow for possible non-response giving a total sample size of 422 respondents for this study.

Instruments

Data on internal labor migration was collected using household questionnaires administered to the heads of households.

Method of analysis

This study employed a descriptive statistics (frequencies, percentages, means, and standard deviations) and inferential statistics (Binary logistic regression). A binary logistic regression model was estimated because migration status is a dichotomous variable, taking the value of one if the household had at least one migrant member and zero otherwise.

The migration participation model was specified as:

Where:

M_i = migration status of household (1 = migrant household, 0 = non-migrant household);

X_i = vector of explanatory variables;

β = vector of parameters to be estimated

The explanatory variables included age of household head, gender, years of education, household size, farming experience, farm size, cooperative membership, access to extension services, access to credit, and distance to urban centres. Marginal effects were computed to facilitate interpretation of the estimated coefficients.

Result and Discussions

Socioeconomic characteristics of the cassava farming households

Gender

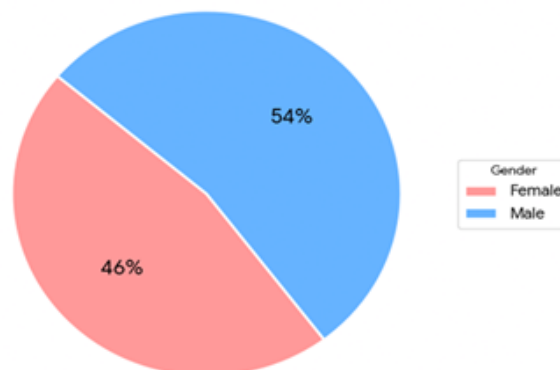


Figure 1: Gender Distribution

The gender distribution of the sampled cassava farming households is presented in Figure 1. The results indicate a relatively balanced sample, with a slight predominance of male respondents. Of the 422 cassava farmers surveyed, 226 (54%) were male, while 196 (46%) were female. This distribution suggests that cassava production in the study area is undertaken by both men and women, although men constitute a marginally larger proportion of household decision-makers or respondents. The slight male dominance may reflect prevailing socio-cultural norms in many parts of Nigeria, where men are often recognized as household heads and principal farm managers, despite women's substantial involvement in cassava production, processing, and marketing. Nevertheless, the high proportion of female respondents underscores the critical role women play in cassava value chains and rural livelihoods. Agza et al. [18] reported that the heads of migrant-sending households were significantly older than those of non-migrant households, a finding that corroborates the present study, where the majority (55%) of cassava farmers were within the economically active age range of 41–60 years.

Age

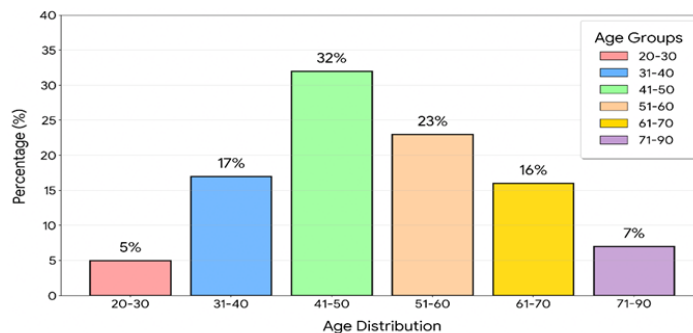


Figure 2: Age Distribution

The age distribution of the respondents, presented in Figure 2, indicates that cassava farming is predominantly undertaken by economically active and middle-aged individuals. The largest

proportion of respondents (32%) falls within the 41–50 years age group, followed by 23% in the 51–60 years category. This implies that more than half (55%) of the respondents are between 41 and 60 years of age. Furthermore, approximately 88% of the respondents are within the 31–70 years age range, indicating that the majority of cassava farmers are mature adults with considerable farming experience. In contrast, younger farmers aged 20–30 years constitute only 5% of the sample, while respondents aged 71–90 years account for 7%, suggesting limited participation at both extremes of the age spectrum. The low representation of younger farmers may reflect the growing trend of youth migration from rural areas to urban centres in search of education, employment, and better livelihood opportunities, leaving agricultural activities largely in the hands of older adults

Marital Status

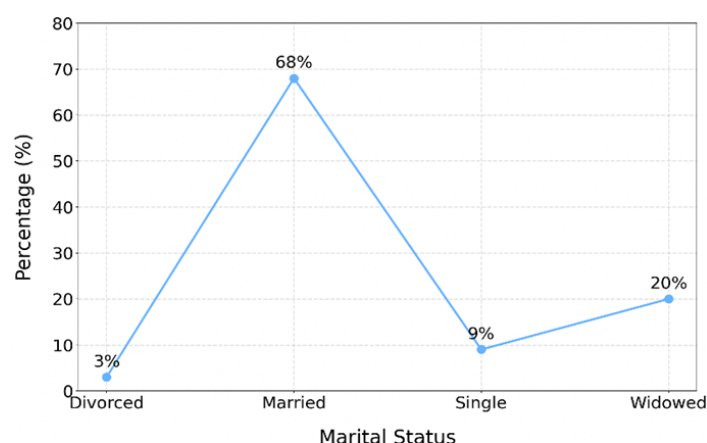


Figure 3: Marital Status

Analysis of Figure 3 indicates that a significant majority of the population is married, accounting for 68% of the total. The second most prevalent group is composed of widowed individuals, who represent 20% of the survey. In contrast, single individuals and those who are divorced form a small minority of the demographic, making up 9% and 3% respectively. When combined, married and widowed individuals represent 88% of the group, which strongly aligns with the mature age distribution previously observed.

Household Size

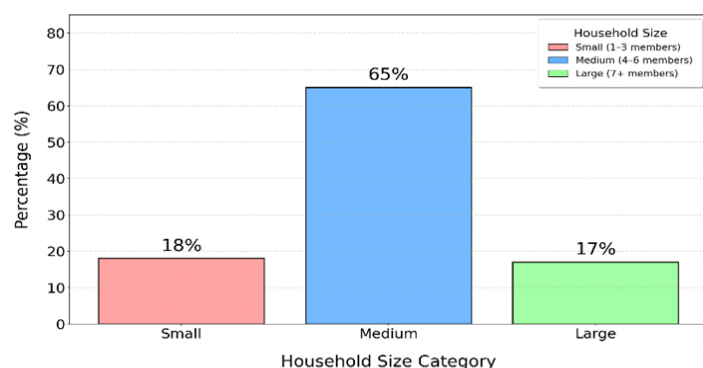


Figure 4: Household Size

The distribution of respondents by household size is presented in Figure 4. The results show that the majority of cassava farming households (65%) fall within the medium household size category. In comparison, 18% of the respondents belong to small households, while 17% are classified as large households. This indicates that cassava farming in the study area is predominantly undertaken by households of moderate size. Household size is an important socioeconomic characteristic because it influences the availability of family labour, household consumption needs, and farm management decisions. Medium-sized households may have sufficient family labour to support cassava production without placing excessive pressure on household resources. The result confirms that findings by Agza et al. [17] found that migrant-sending households had significantly larger family sizes than non-migrant households.

Years of formal Education of Household Head

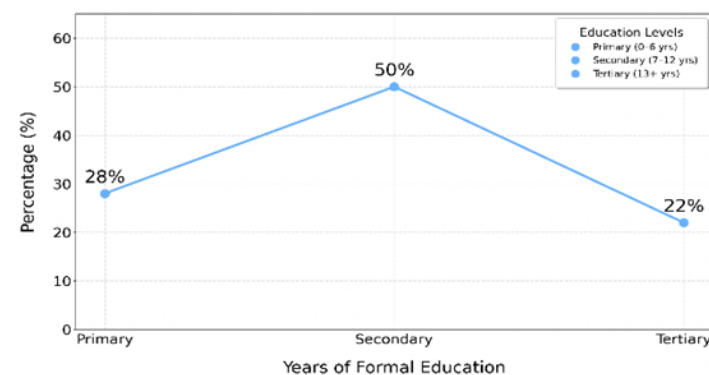


Figure 5: Years of Formal Education

The educational attainment of household heads is presented in Figure 5. The results reveal that 50% of the respondents attained secondary education, making it the most common level of formal education among cassava farmers. This is followed by 22% of respondents with tertiary education, while the remaining respondents have primary education. The findings indicate that the majority of household heads possess at least a basic level of formal education, with nearly one-quarter having acquired higher education. Education plays a critical role in agricultural development by enhancing farmers' ability to acquire, process, and utilize information on improved farming practices, modern technologies, and market opportunities. Farmers with higher educational attainment are generally more receptive to innovation, better able to access extension services and credit, and more capable of making informed production and resource allocation decisions.

Years of Experience

The distribution of respondents according to years of cassava farming experience is shown in Figure 6. The results indicate that the majority (57%) of household heads have 11–20 years of farming experience, while 24% have more than 21 years of experience. Only 19% of the respondents have 10 years or less of farming experience. Overall, about 81% of the farmers have more than a decade of experience in cassava production. The predominance of experienced farmers suggests that cassava production in the study

area is largely undertaken by individuals with substantial practical knowledge and skills acquired over many years. Farming experience enhances managerial ability, improves decision-making, and enables farmers to respond effectively to production challenges, climatic variability, and market fluctuations. Experienced farmers are also more likely to optimize the use of available resources and adopt production practices that improve yields.

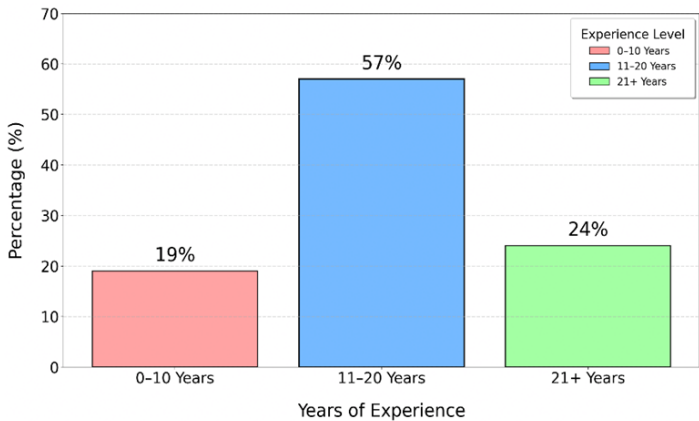


Figure 6: Years of Farming Experience

Primary occupation of the household heads

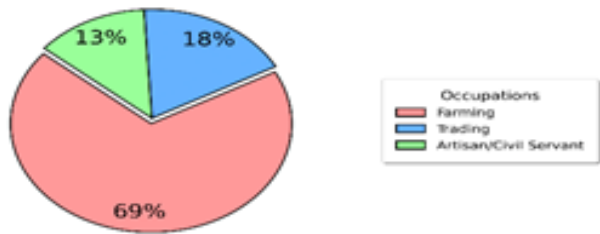


Figure 7: Primary Occupation of Household Head

The primary occupation of the respondents is presented in Figure 7. The findings show that 69% of the household heads identify farming as their primary occupation, while 18% engage primarily in trading. The remaining 13% are artisans or civil servants. The dominance of farming as the principal occupation demonstrates that agriculture remains the primary source of livelihood for most households in the study area. The high dependence on farming implies that household income, food security, and overall welfare are closely linked to agricultural performance. Households whose primary occupation is farming are more likely to devote greater time and resources to crop production, potentially enhancing productivity. In contrast, respondents engaged in non-farm occupations may benefit from income diversification, which can provide additional financial resources for farm investment while reducing vulnerability to agricultural risks.

Table 1: Labor Utilization

Labor Type	Mean (Man-days)	Proportion of Total Labor
Family Labor	26.1	73.1%
Hired Labor	9.6	26.9%
Total Labor Input	35.7	100%

The labour utilization pattern presented in Table 2 indicates that cassava production relies predominantly on family labour, which contributes an average of 26.1 man-days (73.1%), while hired labour accounts for only 9.6 man-days (26.9%). The average total labour input per production cycle is 35.7 man-days. The heavy reliance on family labour suggests that cassava farming in the study area remains largely subsistence-oriented, with households depending primarily on their own labour resources. Such production systems may be particularly vulnerable to internal migration, especially when economically active household members migrate in search of employment or other livelihood opportunities. In situations where financial resources are limited, households may find it difficult to replace lost family labour with hired workers, potentially affecting the timeliness of farm operations and overall productivity. This finding underscores the importance of labour availability in sustaining cassava production among smallholder farming households.

Table 2: Qualitative Attributes (Quantitative Counts)

Frequency distribution of categorical migration data.

Variable	Categories	Count (\(n\))	Percentage (%)
Reason for Migration	Employment	63	39.6%
	Business	41	25.8%
	Marriage	36	22.6%
	Education	19	12.0%
Migrant Identity	Child	122	76.7%
	Spouse	15	9.4%
	Sibling	14	8.8%
	Other	8	5.1%

Field survey, 2026

Table 3 presents the major reasons for internal migration among members of cassava farming households. The results show that employment was the most frequently cited reason for migration, accounting for 39.6% of all migrants. This finding suggests that the scarcity of employment opportunities in rural communities compels economically active household members to migrate to urban areas in search of paid work. The result is consistent with the findings of Tesfahun et al. [17-19], who identified unemployment and limited livelihood opportunities as major drivers of rural–urban migration. It also supports the neoclassical migration theory, which argues that individuals migrate to maximize expected earnings and improve their economic welfare.

Business was the second most common reason for migration, representing 25.8% of respondents. This indicates that a considerable proportion of migrants relocate to establish or engage in commercial activities that are either unavailable or less profitable in rural areas. The finding suggests that migration is

not driven solely by the search for wage employment but also by entrepreneurial opportunities and livelihood diversification.

Marriage accounted for 22.6% of migration decisions, making it the third most important reason for migration. This reflects the continued influence of social and cultural factors on migration patterns, particularly among women, who often relocate after marriage in accordance with prevailing cultural norms. Similar findings have been reported in studies of internal migration in developing countries, where marriage remains an important determinant of population mobility alongside economic factors.

Education was the least cited reason for migration, accounting for 12.0% of respondents. Although education contributes to human capital development and future employment opportunities, relatively few household members migrated primarily for educational purposes. This finding suggests that economic survival takes precedence over educational aspirations among cassava farming households, where migration decisions are largely motivated by the immediate need to improve household income.

The results further reveal that children of household heads constituted the overwhelming majority of migrants, accounting for 76.7% of all migrants. This indicates that migration among cassava farming households is predominantly a youth phenomenon, with young adults leaving rural communities in search of employment, business opportunities, education, or other livelihood prospects. The migration of children has important implications for agricultural production, as it removes the most productive labour force from farming households, potentially reducing labour availability during critical farming operations. This finding is consistent with Agza et al. [17], who reported that economically active household members constitute the largest proportion of rural–urban migrants.

Spouses represented 9.4% of migrants, while siblings accounted for 8.8%. These relatively smaller proportions suggest that migration among married adults is less common, possibly because they remain responsible for managing household farming activities and family welfare. Nevertheless, their migration may still reduce household labour availability and alter the allocation of productive resources.

The "other" category constituted only 5.1% of migrants, indicating that migration among extended family members or non-immediate relatives is relatively uncommon. Overall, the distribution of migrant identity demonstrates that migration is concentrated among younger household members, reinforcing concerns about the gradual ageing of the rural agricultural workforce and the associated labour shortages in cassava production.

Table 3 presents respondents' perceptions of the importance of various factors influencing internal migration among cassava farming households in Southern Nigeria.

The Binary Logistic Regression model was estimated to identify the socioeconomic factors influencing internal migration among cassava smallholder farming households in Southern Nigeria. The model exhibited a good overall fit, as indicated by the highly significant likelihood ratio statistic ($LR \chi^2 = 168.42, p < 0.001$), suggesting that the explanatory variables jointly explain variations in household migration decisions. The model's Pseudo R^2 of 0.314 implies that approximately 31.4% of the variation in internal migration status is explained by the included socioeconomic and institutional variables. This level of explanatory power is considered satisfactory for cross-sectional household migration studies, reflecting the multifaceted nature of migration decisions.

The age of the household head exerted a negative and statistically significant influence on internal migration ($\beta = -0.0184; p =$

Table 3: Socioeconomic factors influencing internal migration among the cassava farming households.
Log-Likelihood: -184.21 | Pseudo (R2): 0.314 | LR Chi-Square (10 df): 168.42 ($p < 0.001$)

Explanatory Variable Factor (Xi)	Logit Coefficient (β)	Standard Error	z-Statistic	p-Value	Marginal Effect (dy/dx)	Significance	
Constant	-0.6842	0.3145	-2.18	0.029	—	*	
	Age of Household Head (Years)	-0.0184	0.0076	-2.42	0.016	-0.0035	**
	Gender of Head (1 = Male, 0 = Female)	0.4124	0.1842	2.24	0.025	+0.0784	**
Years of Formal Education	0.0482	0.0151	3.19	0.001	+0.0092	***	
	Household Size (Demographics)	0.4418	0.0482	9.17	<0.001	+0.0841	***
Farming Experience (Years)	0.0112	0.0054	2.07	0.038	+0.0021	**	
	Farm Size (Total Hectares)	-0.2941	0.1042	-2.82	0.005	-0.0559	***
Cooperative Membership (Binary)	0.2145	0.0984	2.18	0.029	+0.0408	**	
Access to Extension Services	-0.2418	0.1102	-2.19	0.028	-0.0460	**	
Access to Credit Last Season	-0.3841	0.1412	-2.72	0.007	-0.0731	***	
Distance to Urban Center (km)	-0.0912	0.0105	-8.69	<0.001	-0.0173	***	

Field survey, 2026 Note: *** Significant at 1%; ** Significant at 5%; * Significant at 10%. Marginal effects (dy/dx) report the discrete change for binary terms and the instantaneous slope at the mean for continuous variables.

0.016). The marginal effect indicates that each additional year of age reduces the probability of migration by approximately 0.35 percentage points. This finding suggests that younger household heads are more likely to engage in internal migration than older farmers. Younger individuals generally possess greater physical mobility, are more willing to take risks, and are more motivated to pursue employment opportunities outside agriculture. Older household heads, on the other hand, tend to have stronger attachment to farming activities, accumulated assets, and established social networks that reduce the likelihood of migration. Similar findings have been reported by Adepoju & Obayelu [20]; Liverpool-Tasie et al. [21], who observed that younger rural residents are more inclined to migrate in search of improved livelihood opportunities.

Gender of the household head had a positive and significant effect on migration decisions ($\beta = 0.4124$; $p = 0.025$). The marginal effect shows that male-headed households are 7.84 percentage points more likely to experience internal migration than female-headed households. This finding reflects the predominance of males in labour migration within Nigeria, where men often migrate to urban centres to secure employment and diversify household income. The result supports previous studies by Anderson et al. [22], which highlighted gender differences in labour mobility and economic decision-making among rural households.

Years of formal education positively influenced migration and was highly significant ($\beta = 0.0482$; $p = 0.001$). Each additional year of education increased the probability of migration by approximately 0.92 percentage points. Education enhances individuals' access to labour market information, improves employability, and raises aspirations for higher-paying occupations outside agriculture. Educated household members are therefore better positioned to compete for non-farm employment opportunities in urban areas. Similar relationships have been documented by Liverpool-Tasie et al. [21].

Household size emerged as one of the strongest determinants of migration, exhibiting a positive and highly significant coefficient ($\beta = 0.4418$; $p < 0.001$). The marginal effect indicates that an additional household member increases the probability of migration by 8.41 percentage points. Larger households often experience greater consumption pressures and may adopt migration as a livelihood diversification strategy to generate remittance income and reduce dependency on agriculture. At the same time, larger families possess surplus labour that enables some members to migrate without completely disrupting farm operations.

Farming experience also exerted a positive and significant effect on migration ($\beta = 0.0112$; $p = 0.038$), although the magnitude of the effect was relatively small. Farmers with greater experience may possess stronger social and financial networks that facilitate migration or enable households to strategically allocate labour between farming and non-farm employment. Alternatively, experienced farmers may encourage younger household members to migrate while they continue managing agricultural production.

Farm size exhibited a negative and highly significant relationship with migration ($\beta = -0.2941$; $p = 0.005$). Each additional hectare reduced the probability of migration by approximately 5.59 percentage points. Larger farms require greater labour inputs and generally generate higher agricultural income, thereby reducing the economic incentives for household members to migrate. Conversely, households with limited land resources are more likely to seek alternative income sources through migration. Similar findings have been reported by Wossen et al. [23].

Membership in cooperatives positively influenced migration ($\beta = 0.2145$; $p = 0.029$), increasing the likelihood of migration by 4.08 percentage points. Although cooperative membership often improves farmers' access to information and financial resources, it may also expand members' social networks and awareness of employment opportunities beyond the farming community. The finding supports evidence that social capital plays an important role in shaping migration decisions by lowering information and transaction barriers.

Access to extension services significantly reduced the probability of migration ($\beta = -0.2418$; $p = 0.028$). Farmers receiving extension support were 4.60 percentage points less likely to migrate. Extension services improve farmers' technical knowledge, increase productivity, and strengthen farm profitability through the dissemination of improved technologies and management practices. This finding aligns with studies demonstrating that agricultural support services improve rural livelihood opportunities and reduce migration pressures.

Similarly, access to agricultural credit had a negative and highly significant effect on migration ($\beta = -0.3841$; $p = 0.007$). Households with access to credit were 7.31 percentage points less likely to engage in migration. Credit relaxes financial constraints by enabling farmers to invest in improved planting materials, fertilizers, mechanization, and other productive inputs that increase agricultural income. As farm profitability improves, the incentive to migrate diminishes. Improved access to credit reduces the need to rely on migration as a means of overcoming capital constraints.

Finally, distance to the nearest urban centre exhibited a negative and highly significant relationship with migration ($\beta = -0.0912$; $p < 0.001$). Every additional kilometre from an urban centre reduced the probability of migration by approximately 1.73 percentage points. Households located closer to urban areas incur lower transportation costs, have better access to labour market information, and can more easily participate in temporary or permanent migration. This finding is consistent with migration theory, which emphasizes that migration costs increase with distance and reduce migration flows.

Conclusion and Recommendations

Conclusion

The study demonstrates that internal migration has become a common livelihood strategy among cassava-producing households in Southern Nigeria, with almost all surveyed households reporting the migration of at least one member. Migration is

driven predominantly by economic factors, particularly the search for better employment opportunities and higher incomes in urban areas. Although migration provides households with opportunities to diversify income and improve their livelihoods, it also significantly reduces the availability of family labour, which remains the principal source of labour for cassava production.

The Binary Logistic Regression results further reveal that internal migration is significantly influenced by a combination of demographic, socioeconomic, institutional, and geographical factors. Younger household heads, male-headed households, higher levels of education, larger household sizes, greater farming experience, and cooperative membership increase the likelihood of migration. Conversely, larger farm sizes, access to extension services, access to agricultural credit, and greater distance from urban centres significantly reduce the probability of migration. These findings suggest that migration decisions are not solely individual choices but are strongly shaped by households' access to productive resources, institutional support, and economic opportunities.

The predominance of rural–urban migration among economically active household members, particularly children of household heads, raises concerns about the long-term sustainability of cassava production and the ageing agricultural workforce. Limited access to agricultural credit and extension services, coupled with relatively low participation in farmer organizations, further constrains farmers' ability to adopt productivity-enhancing technologies and offset labour shortages. Overall, the study concludes that strengthening rural agricultural systems, improving farm profitability, and expanding institutional support services are critical to reducing migration pressures while enhancing the productivity and resilience of cassava smallholder farming households in Southern Nigeria.

Recommendations

Overall, the study concludes that strengthening rural agricultural systems, improving farm profitability, and expanding institutional support services are critical to reducing migration pressures while enhancing the productivity and resilience of cassava smallholder farming households in Southern Nigeria.

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