

Arable Crop Farmers Food insecurity and Coping strategies: Socioeconomic differential perspective in Southwest Nigeria

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ABSTRACT: Food insecurity remains a critical challenge among arable crop farmers in Nigeria, particularly in Southwest, where socio-economic vulnerabilities and climatic shocks continue to undermine food availability and accessibility. This study investigates the coping strategies adopted by arable crop farmers in the face of food insecurity, aiming to provide insights for policy interventions. A multi-stage sampling technique was employed to select 480 respondents across key agricultural zones in Oyo State. Primary data were collected using structured questionnaires and analyzed using descriptive statistics, including frequency distributions and percentage rankings of coping strategies. Findings reveal that the most frequently adopted coping mechanisms include allowing children to eat first (27.3%), eating once a day (37.2%), and selling household assets (16.5%). Other strategies such as reducing food quality, picking leftover food at events, and begging for food were less commonly reported, possibly due to associated stigma or cultural reservations. Additionally, a significant proportion of respondents (57%) occasionally bought food on credit, while 59.5% relied on food assistance from relatives or

friends. These coping strategies reflect both adaptive and erosive responses, with implications for long-term food system resilience and household welfare. The study concludes that food insecurity among arable crop farmers in Oyo State triggers a range of short-term coping mechanisms, many of which may compromise future livelihoods and productivity. It is recommended that government and development agencies strengthen rural social protection programs, enhance farmers' access to credit and productive assets, and promote community-based food support systems.

Keywords: *Arable crop; Food insecurity; Multistage; Nigeria; Vulnerable*

1. Introduction

Food insecurity remains one of the most pressing development challenges in sub-Saharan Africa, particularly in Nigeria where a significant portion of the population relies on agriculture for both livelihood and sustenance (Omotayo, Omotoso, et al., 2025a). Despite being a major producer of arable crops, Nigeria continues to grapple with high levels of food insecurity, as reflected in the Global Hunger Index and national surveys. According to the Food and Agriculture Organization (FAO), over 20% of Nigerian households experience moderate to severe food insecurity, with the rural poor especially smallholder farmers being the most affected (Ayodele et al., 2025; Iyiola et al., 2023). Notably, the arable crop farmers, who cultivate crops like maize, cassava, yam, sorghum, and vegetables, are paradoxically both food producers and among the most food-insecure groups.

Contributing factors include land fragmentation, limited access to credit and modern inputs, climate variability, and inadequate extension services (Abdo et al., 2025; Omotoso & Omotayo, 2024b). The food insecurity faced by these farmers is not only a reflection of insufficient food availability but also issues of food accessibility, utilization, and stability key pillars of food security. Consequently, arable crop farmers in the region often adopt various coping and adaptation strategies to mitigate the impacts of food insecurity. These may range from short-term consumption changes and asset liquidation to longer-term adjustments such as livelihood diversification, seasonal migration, and informal borrowing (Banda, 2024; Omotayo, Adediran, et al., 2025).

While much scholarly attention has been directed toward identifying the determinants of food insecurity at the household or national levels, fewer studies have focused on the coping strategies that rural households employ when faced with food insufficiency, particularly in specific agricultural contexts. In most cases, these strategies are not systematically evaluated for their effectiveness, sustainability, or socio-cultural implications. Furthermore, very few empirical studies (Omotoso & Omotayo, 2025; Pandey & Mishra, 2024) offer a disaggregated analysis specific to arable crop farmers, despite their critical role in the country's food system. As climate change, economic inflation, and global shocks such as pandemics continue to intensify vulnerability in the agricultural sector, there is an urgent need to deepen our understanding of how farmers navigate these risks through localized responses (Omotoso & Omotayo, 2024b).

Consequently, this research seeks to fill this empirical and policy-relevant gap by conducting a comprehensive assessment of food insecurity strategies among arable crop farmers in Oyo State. The study will investigate the types of strategies used, the socioeconomic and institutional drivers behind their adoption, and the extent to which these strategies contribute to household food and livelihood resilience. Such insights are essential for guiding government agencies, NGOs, and other stakeholders in designing targeted interventions that build adaptive capacities and promote long-term food security. By situating the study within the broader discourse on agricultural vulnerability and resilience, this research aims to contribute to both the academic literature and practical solutions for food systems transformation in Nigeria.

2. Literature gap and theoretical framework

2.1 Determinants of Food Insecurity in Nigeria and Empirical Outcomes

Food insecurity in Nigeria is shaped by a complex interplay of socio-economic, environmental, institutional, and demographic factors. Despite the nation's vast agricultural potential and natural resource endowments, structural bottlenecks and systemic challenges continue to undermine food availability, accessibility, utilization, and stability core dimensions of food security defined by the FAO (Abdo et al., 2025; Ayodele et al., 2025). Empirical studies have consistently highlighted several key determinants of food insecurity at the household and community levels in Nigeria. Noteworthy, household income remains a crucial determinant, with numerous studies indicating that low-income households are

more likely to experience food shortages (Mrabet, 2023; Omotoso & Omotayo, 2024a). Land ownership and farm size also influence food production and self-sufficiency; farmers with insecure land tenure or fragmented plots often produce below subsistence levels (Ajibade et al., 2024; Khan et al., 2022). Educational attainment of household heads has been found to enhance food security through better resource management and uptake of improved technologies (Daud et al., 2018; Omotoso & Omotayo, 2024a).

Interestingly, household size and dependency ratio affect consumption needs relative to available income, often increasing the risk of food insecurity (Dwivedi et al., 2017; Omotoso & Omotayo, 2025). Additionally, environmental factors such as climate variability, droughts, and flooding significantly affect crop yields and food supply chains, particularly among smallholder farmers who lack irrigation and climate adaptation technologies (Ayodele et al., 2025; Omotayo, Omotoso, et al., 2025b). Market access, price volatility, and poor rural infrastructure (like roads, and storage facilities) also contribute to food insecurity by limiting farmers' ability to store, sell, and purchase food at favorable times (Abdo et al., 2025; Omotayo & Omotoso, 2025). Additionally, gender-related constraints constituted as another major drivers of food insecurity in rural areas (Khan et al., 2022; Omotoso et al., 2022).

3. Methodology

3.1 Study area

The study was conducted in Southwest Nigeria which is one of the six geopolitical zones of Nigeria and is comprised of six states: Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo. The region is located within the tropical rainforest and derived savannah zones offering favorable conditions for diverse agricultural activities and agricultural practices (Omotayo, Omotoso, et al., 2025a). Mean annual rainfall ranges between 1,200 mm and 2,000 mm, while temperatures are relatively high throughout the year, averaging between 21°C and 34°C (Omotayo, Adediran, et al., 2025). This agroecological setting supports the cultivation of a variety of crops such as maize, cassava, yam, cocoyam, cocoa, kola nut, and oil palm, as well as livestock production. However, the region's agriculture remains predominantly rain-fed, making it highly susceptible to seasonal and inter-annual climate variability.

2.2 Sampling population, technique and size

The target population for this study comprised rural-based food crop farmers across Southwest Nigeria. This region consists of six states: Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo and is one of the nation's major agricultural hubs, producing staples such as maize, cassava, yam, cowpea, and vegetables. A multistage sampling technique was employed to ensure that the sample captured the diversity of farming households across the region. In the first stage, three states Oyo, Osun, and Ondo were purposively selected based on their high concentration of rural farming households and significant contributions to food production in Southwest Nigeria. The second stage involves selection of two LGAs randomly from each of the states (6 LGAs). Additionally, the third stage involves random selection of 3 rural communities from the 6 selected LGA (16 communities). While the final stage involves collecting lists of arable crop farmers registered with ADP from ADP officers where the respondents were randomly selected systematically to avoid biasness. A sample size of 480 respondents was systematically selected from the list.

4. Results and discussion

4.1 Socioeconomic profile of arable crop farmers

The age distribution (Table 1) reveals that the majority of respondents (64.6%) were above 50 years, with a mean age of 53.91 years. This finding aligns with the aging trend of rural agricultural populations reported by (Ayodele et al., 2025; Iyiola et al., 2022) where the youth are increasingly absent from the agricultural workforce due to rural–urban migration and the allure of white-collar jobs. The advanced age profile implies a potential decline in physical productivity, highlighting the urgent need to incentivize youth engagement in farming through targeted policy interventions, training, and technological support. Gender distribution shows that 90.1% of the respondents were male, underscoring the gender imbalance in access to productive agricultural resources. This pattern is consistent with the findings of (Ajibade et al., 2024; Ayodele et al., 2025), who noted that despite women's substantial contribution to food production, they are often underrepresented in formal agricultural systems due to socio-cultural constraints and unequal access to land and extension services.

Promoting gender-sensitive programs is essential for enhancing inclusivity in agricultural interventions in Oyo State and Nigeria at large. Marital status indicates that 79.3% of the farmers are married. Studies by (Mrabet, 2023; Omotoso & Omotayo, 2024a) suggest that married individuals are more likely to be food secure due to household cooperation in labor and shared economic responsibilities. Additionally, household size averages at 6 persons, aligning with large rural household sizes in Nigeria as noted by (Mrabet, 2023; Omotayo, Omotoso, et al., 2025b) which can be a double-edged sword providing labour supply but also increasing dependency burden and food consumption pressures.

Economic factors such as farm size (mean = 2.95 ha), years of experience (mean = 5.52 years), and access to cooperative financing (90.9%) show that farmers operate at a semi-subsistence level with limited capacity to scale production. This supports earlier evidence from (Ayodele et al., 2025; Iyiola et al., 2022), who found that credit access and farm size are crucial determinants of productivity among Nigerian smallholder farmers. Additionally, the reliance on informal sources of information, such as family and friends (57%), and the dominance of personal savings and cooperatives as capital sources, highlight the weak penetration of formal agricultural extension and financial services in the area issues also raised by (Iyiola et al., 2022).

Table 1: Socio economic characteristics of the respondents in the study area

Variables	Frequency	Percentage	Mean
Age			
Less than 30	16	3.2	
30 – 40	48	9.9	53.91
41 – 50	108	22.3	
Above 50	318	64.6	
Sex			
Male	432	90.1	
Female	48	9.9	
Religion			
Christian	200	41.3	
Muslim	260	53.7	
Traditional	24	5.0	

Marital status			
Married	96	79.3	
Widow	7	5.8	
Divorced	7	5.8	
Separated	10	8.3	
Single	1	0.8	
Household size			
2 – 5	34	28.1	6.05
6 – 9	87	1.9	
Education level			
No formal education	28	23.1	
Primary	20	16.5	
Secondary	59	48.8	
Tertiary	14	11.6	
Farm size			
1 – 4	112	92.5	2.95
5 – 7	9	7.5	
Years of experience			
2 – 7	104	85.9	5.52
8 – 15	17	14.1	
Land tenure			
Family	78	64.5	
Purchased	40	33.1	
Communal ownership	3	2.5	
Source of information			
Arable crop farmer association	4	3.3	
Family and friend	69	57.0	
Television	6	5.0	
Radio	42	34.7	
Source of capital			
Cooperative society	61	50.4	

Bank loan	5	4.1	
Personal saving	39	32.2	
Friends and family	16	13.2	
Annual income			
Less than 100,000	2	1.7	
100,001 – 500,000	41	3.39	
500,000 – 1,000,000	77	63.6	
Above 1,000,000	1	0.8	
Income spent on food			
45,000 – 75,000	55	45.4	86,074.38
80,000 – 150,000	66	54.6	
Source of finance			
Cooperative society	110	90.9	
Own savings	11	9.1	
Source of labour			

4.2 Coping strategies employed by arable crop farmers in the study area to manage food insecurity

The coping strategies adopted by arable crop farmers in Oyo State, as revealed in the study (Table 2), reflect a multidimensional response to food insecurity, shaped by socio-economic constraints and limited institutional support. The frequent adoption of consumption-based strategies such as reducing meal frequency (83.5%) and lowering food quality (59.5%) indicates acute food stress and highlights the prioritization of caloric sufficiency over dietary diversity. These findings align with the work of (Dwivedi et al., 2017; Iyiola et al., 2022), who noted that in food-insecure households, dietary adjustments are the first line of response due to their immediate impact and reversibility. Such strategies, while initially effective in mitigating short-term hunger, may have long-term implications for nutrition and health, especially among vulnerable groups like children and women.

The use of financial coping mechanisms such as buying food on credit (57%) and selling household assets (37.2%) reflects more severe and chronic dimensions of food insecurity.

Notably, (Mrabet, 2023; Omotoso & Omotayo, 2024a) observed that asset depletion is a last-resort strategy and signifies a household's transition from transitory to chronic food insecurity. This form of coping undermines the long-term resilience of farming households, as the disposal of productive assets compromises their capacity to recover and sustain future agricultural productivity. Interestingly, the practice of collecting leftover food at social gatherings (13.2%) indicates extreme coping behaviour and social vulnerability. This aligns with the work of (Iyiola et al., 2023), who categorized such strategies as indicative of severe food insecurity and social exclusion. The use of such strategies may also reflect a breakdown in formal support systems and the need for government or institutional intervention. It raises concern about the dignity, psychosocial well-being, and agency of the affected households, suggesting that food insecurity is not only a material deprivation but also a social and psychological burden. The spectrum of coping mechanisms adopted by arable farmers in Oyo State reveals a layered experience of food insecurity ranging from reversible dietary adjustments to irreversible livelihood compromises.

Table 2: Distribution of respondents based on coping strategies employed against food insecurity

S/N	Statements	Never	Occasionally	Regularly	Very often
		Freq (%)	Freq (%)	Freq (%)	Freq (%)
1.	Eating once a day	101	19 (15.7)	1 (0.8)	0
2.	Allowing children to eat first	(83.5)	18 (14.9)	45 (37.2)	33 (27.3)
3.	Selling of assets	25 (20.7)	20 (16.5)	2 (1.7)	1 (0.8)
4.	Buying food on credit	98 (81.0)	69 (57.0)	0	0
5.	Picking of leftover food on social	52 (43.0)	12 (9.9)	1 (0.8)	0
6.	fun	108	72 (59.5)	32 (26.4)	1 (0.8)
	Reduction the quality of food served	(89.3)			
	to household	16 (13.2)	25 (20.7)	1 (0.8)	1 (0.8)
7.	Relatives or friend bringing foods				
		94 (77.7)			

4.3 Test of Hypothesis

4.3.1 There is no significant relationship between the socio-economic characteristics of the arable crop farmers and their coping strategies for managing food insecurity

The test of the hypothesis was achieved using Chi-square and presented in Table 3. The result revealed that sex, religion, marital status, education level, land tenure, source of information, source of capital, and source of labour were statistically significant. Therefore, the hypothesis was rejected.

Table 3: Chi-square results showing relationship between the socio-economic characteristics of the arable crop farmers and their coping strategies for managing food insecurity

Variable	Df	χ^2	p- value	Decision
Sex	1	77.760	0.000	S
Religion	2	46.628	0.000	S
Marital status	4	268.050	0.000	S
Educational level	3	39.694	0.000	S
Land tenure	2	69.736	0.000	S
Source of information	3	96.421	0.000	S
Source of capital	3	61.579	0.000	S
Source of labour	3	88.157	0.000	S

4.3.2. There is no significant relationship between causes of food insecurity status among arable crop farmers and their coping strategies for managing food insecurity

The result showing the relationship between the determinants of food insecurity and coping strategies used by arable crop farmers was analyzed using Person Product Moment Correlation (PPMC) and presented in Table 4. The result revealed that unavailability of seed, Struggle to purchase equipment, High price of fertilizer, poor rural infrastructure (road), fluctuation in price of tools, poor farming practice were statistically not significant with their coping strategies. Therefore, the null hypothesis was rejected.

Table 4: PPMC test showing significant relationship between causes of food security and coping strategies used

Variables	r-value	p- value	Decision
Unavailability of seed	0.100	0.274	NS
Struggle to purchase equipment	-0.067	0.465	NS
High price of fertilizer	- 0.073	0.426	NS
Inadequate access to input	-0.273**	0.002	S
Poor road infrastructure	0.006	0.951	NS
Fluctuation in price of tools	-0.063	0.495	NS
Access to water	0.237**	0.009	S
D8	0.243**	0.007	S
Poor farming practice	-0.013	0.891	NS

5. Conclusion and recommendations

This study provides a comprehensive analysis of the socio-economic characteristics of arable crop farmers in the study area and their relationship with food insecurity coping strategies adopted in the study area. The findings reveal that majority of the farmers are older males with limited educational backgrounds and operate on small scale farming system. It also highlights the significant relationships between the selected socio-economic of the respondents and the coping strategies employed. From the foregoing, enhancing food security and improve the livelihoods of arable crop farmers, it is pertinent to implement targeted policies that provide better access to credit, modern farming technologies, and training on enhanced agricultural practices. Additionally, improving rural infrastructure and stabilizing input and market prices can significantly reduce food insecurity levels. The study recommends that financial support through loans, grants, or subsidies should be made more accessible to arable crop farmers, especially for purchasing modern farming tools and inputs. Microfinance institutions and cooperative societies should be empowered to provide affordable credit facilities with flexible repayment terms. Extension services should be strengthened to provide technical support and regular training programs tailored to local needs. Government and stakeholders should prioritize the development of rural infrastructure such as roads, electricity, and storage facilities. This will enhance farmers' access to markets, reduce post-harvest losses, and encourage the adoption of modern farming practices.

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