

FOOD INSECURITY DYNAMICS AND DETERMINANT AMONG RURAL FARMING HOUSEHOLDS IN SOUTHWEST NIGERIA

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Abstract

Food insecurity continues to be a significant issue in rural Southwest Nigeria, notwithstanding the region's considerable agricultural potential. This research analyzed the factors influencing food insecurity in 240 rural farming households, which were selected using a multistage sampling method across Southwest region of Nigeria. Data were collected through interview guide and analyzed using descriptive statistics and PPMC. Result shows that high input costs, poor rural infrastructure, inadequate access to agricultural inputs, and water scarcity were major contributors to food insecurity. Increasing food prices and restricted market access have further limited household food availability and dietary diversity. Participation in institutions, such as cooperative membership (75.0%) and extension contact (82.6%), correlated with enhanced resilience; however, gender disparities and infrastructural deficiencies remained evident. The findings indicated that high fertilizer prices (97.5%), inadequate access to inputs (58.7%), poor rural infrastructure (98.3%), rising food prices (100%), and high transportation costs (100%) are the primary factors contributing to food insecurity. The PPMC analysis revealed significant associations between food insecurity status and inadequate input access, water scarcity, and farming income. The findings highlight the necessity for targeted interventions such as subsidized inputs, enhanced rural infrastructure, expanded irrigation facilities, and reinforced institutional support. This research offers empirical evidence to guide policies focused on improving food and nutrition security, in accordance with Sustainable Development Goals (SDGs) 1 and 2.

Keywords: Food insecurity, Rural farming households, Southwest Nigeria, Determinants, Agricultural inputs, Infrastructure, Sustainable Development Goals

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1. Introduction

Food insecurity remains one of pertinent developmental challenges in SSA, especially in Nigeria where the major proportion of the populace depends on agriculture for livelihood and sustenance (Ayodele et al., 2025; Omotoso & Omotayo, 2024a). Despite the agricultural potential of many rural regions,

rural farming households continue to experiences food insecurity attributable to a confluence of social, institutional, societal and environmental issues (Mrabet, 2023). In Southwest Nigeria, food insecurity persisted which are characterized by insufficient nutritional intake, and hunger, adversely impacting the overall well-being and

productivity of rural economy (Ayodele et al., 2025; Omotoso & Omotayo, 2025). The FAO, characterized food insecurity is a state whereby individuals or households lack consistent access to sufficient, safe, and nutritious food necessary for an active and healthy life (Omotoso & Omotayo, 2024a). In rural areas, food insecurity is often intensified by poor and unstable income, exorbitated by unpredictable climatic condition, insufficient access to resources and markets, restricted extension services, and demographic factors such as high family size or low educational attainment (Omotoso & Omotayo, 2024b).

Moreover, social factors such as education level, gender of the household head, household size, and livelihood diversification critically influence a household's capacity to access sufficient and nutritious food. Education enhances knowledge of nutrition and resource management, gender dynamics often determine decision-making power and access to resources, household size affects dependency ratios and food allocation, while livelihood diversification provides alternative income streams that reduce vulnerability to food shortages. Together, these factors shape the resilience of households to food insecurity (Mrabet, 2023; Omotoso et al., 2023). In Nigeria, where farming is predominantly subsistence-based and rainfall-dependent, these issues are further compounded by climate variability and poor infrastructural development (Dwivedi et al., 2017; Omotoso & Omotayo, 2024a). Intriguingly, several national programs and policies have been implemented to address hunger and malnutrition, the rural poor still face significant barriers in accessing sufficient food, and evidence-based research is required to inform targeted interventions.

Recently, empirical studies (Mrabet, 2023; Omotoso & Omotayo, 2025), have emphasized the need of household-level dynamics such as income, education, gender

roles, household size, and livelihood strategies, determine how resources are allocated, how nutritional needs are prioritized, and how households respond to shocks such as price fluctuations, climate variability, or conflict., to design more effective poverty reduction and agricultural development strategies. However, in the context of Southwest Nigeria, few studies have systematically explored the key socioeconomic and institutional drivers of food insecurity among farming households. Moreover, while some households adopt coping mechanisms such as food rationing, borrowing, or reliance on social networks, the long-term effectiveness of these strategies remains unclear. This study therefore seeks to analyze the role of household characteristics, livelihood assets, access to services, and external shocks in shaping food security outcomes. The research outcome would enhance policy insights for policy formulation, through development practitioners, and local institutions that enhance food-nutrition security, thus, enhancing rural livelihoods.

2. Methodology

2.1 Study area

The study was conducted in Southwest Nigeria, one of the six geopolitical zones of the country. The zone comprises six states: Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo. Southwest Nigeria is predominantly agrarian, with farming as a major livelihood activity, although urbanization and industrialization are rapidly expanding in parts of the region. The climate is tropical, characterized by a wet season (April–October) and a dry season (November–March), which influences agricultural production patterns and food availability. The choice of the region was informed by its mixed rural–urban dynamics, high dependence on agriculture, and growing concerns about household food insecurity (Omotayo, Omotoso, et al., 2025a). This agroecological setting supports the cultivation

of a variety of food crops like cassava, cocoyam, maize, 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 (Omotayo, Adediran, et al., 2025).

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 adequately captured the diversity of farming households across the study area. In the first stage, three states (Oyo, Osun, and Ondo) were purposively selected because of their high concentration of rural farming households and their significant contributions to food production in Southwest. In the second stage, two Local Government Areas (LGAs) were randomly selected from each of the three states, making a total of six LGAs. In the third stage, two rural communities were randomly selected from each of the six LGAs, resulting in 12 rural communities for the study. 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 240 respondents were systematically selected from the list.

2.3 Data analysis

The data collected were analyzed using both descriptive and inferential statistics. Descriptive statistics such as frequency counts, percentages, and means were used to summarize the variables and achieve the study objectives. Inferential statistics such as the Chi-square test and the Pearson Product-

Moment Correlation (PPMC) were used to test the hypotheses of the study.

3. Results and discussions

3.1 Summary statistics of variables used

The descriptive statistics (Table 1) highlight the socioeconomic and farm-level attributes of rural farming households in Southwest Nigeria, which are critical to understanding food insecurity determinants. Average farm productivity, measured as the value of produce sales, stood at ₦210,533.90, indicating modest commercial output levels typical of smallholder farming systems in Nigeria. The average farm size of 5.6 hectares, suggesting potential for higher production and diversification. However, productivity gains from larger landholdings are often limited by land quality, access to inputs, and market linkages (Mrabet, 2023; Omotayo, Omotoso, et al., 2025b). Demographically, the mean age of household heads was 48.4 years, reflecting a predominance of middle-aged farmers with potentially significant agricultural experience. Gender analysis shows that 67.2% of households were male-headed, in line with rural Nigerian patterns where women often face reduced access to land and resources. Marital status data indicate that 71.0% of respondents were married, a factor that may increase household labor availability but also raise consumption demands, affecting food security outcomes (Behnassi et al., 2021; Omotayo, Omotoso, et al., 2025a).

Furthermore, 66.0% of households earned off-farm income, which can buffer agricultural risks and improve purchasing power, while the mean farming experience of 11.1 years suggests a considerable accumulation of farming knowledge. Institutional and social capital indicators also feature prominently in the sample. A substantial proportion (75.0%) belonged to cooperatives, which can improve access to inputs, credit, and market information (Khan et al., 2023). Extension

contact was reported by 82.6% of households, highlighting a relatively strong link to advisory services, which has been shown to promote the adoption of productivity-enhancing practices (Behnassi et al., 2021). However, only 48.0% had access to potable water, underscoring an infrastructural gap that can impact both health and agricultural productivity. Market accessibility, measured as an average distance of 6.11 km, influences transaction costs, market participation, and postharvest losses (Khan et al., 2023; Omotoso et al., 2022).

Noteworthy, 61.5% of respondents had access to community-based food security outreach programs, suggesting existing engagement with interventions that could be leveraged for targeted nutrition-sensitive agriculture policies. Collectively, these variables underscore the complex interplay between demographic characteristics, resource access, and institutional support in shaping household food security. They also reveal key areas—such as gender equity, water access, and infrastructural development—where targeted policy interventions could enhance resilience and reduce food insecurity in Southwest Nigeria.

Table 1: Descriptive statistics (n = 240)

Variables	Mean	Std. Dev.
Productivity	210,533.90	115,093.11
Farm size	5.6	2.1
Age	48.4	36.7
Sex	0.672	0.441
Marital Status	0.710	0.471
Off Income	0.660	0.285
Experience	11.1	6.9
Cooperative	0.750	0.552
Hh Size	6.1	3.8
Extension	0.826	0.510
Water	0.480	0.227
Distance	6.11	2.95
Program	0.615	0.511

3.2 Determinant of food insecurity level

The distribution of respondents based on the determinants of food insecurity in the study area, as presented in Table 2, highlights varying degrees of vulnerability among households. A majority (56.2%) of the respondents reported that they rarely worried

about their household not having enough food, while 32.2% sometimes worried about food insufficiency. However, food access constraints were evident in dietary choices, as 55.1% of the respondents indicated that they or members of their households sometimes could not eat their preferred foods due to lack of

resources. Similarly, 55.4% and 57.0% reported that they or members of their households sometimes had to eat monotonous diets or foods they would rather avoid due to resource limitations. Furthermore, 33.9% and 24.0% stated that they or their households sometimes ate smaller meals or fewer meals per day, respectively, because of food scarcity. On the other hand, severe food insecurity indicators were relatively low. A significant proportion (68.6%) reported that there had

never been a time when there was no food at all in their household due to lack of resources, while 62.0% had never gone to bed hungry. Notably, an overwhelming 98.3% indicated that they had never gone an entire day without eating. These findings suggest that although food insecurity exists in the study area, it is more commonly experienced in the form of dietary compromise and meal reduction rather than complete deprivation.

Table 2: Distribution respondents based on determinant of insecurity level in the study area

S/N	Statements	Never	Often	Sometimes	Rarely
		Freq (%)	Freq (%)	Freq (%)	Freq (%)
1.	Did you worry that your household would not have enough food to eat?	26 (10.7)	2 (0.8)	78 (32.2)	136 (56.2)
2.	Was any household member not able to eat the kind of food you preferred because of lack of resources?	4 (1.7)	28 (11.6)	126 (52.1)	84 (34.7)
3.	Did you or any household member eat just a few kinds of food day after day due to lack of resources?	0	44 (9.1)	138 (57.0)	86 (35.5)
4.	Did you or any household member eat food that you prefer not to eat because of lack of resources to obtain other types of food	0	42 (17.4)	82 (33.9)	146 (60.3)
5.	Did you or any household member eat smaller meal than you felt you needed because there was not enough food?	4 (1.7)	10 (4.1)	58 (24.0)	174 (71.9)
6.	Did you or any household member eat fewer meal in a day because there was not enough food?	6 (2.5)	4 (1.7)	10 (5.0)	74 (31.4)
7.	Was there ever no food at all in your household because there were no resources to get more?	150 (62.0)	0	1 (0.8)	80 (33.1)
8.	Did you or any household member go to sleep at night hungry because there was not enough food?	238 (98.3)	0		0
9.	Did you or any household member go a whole day without anything because there was not enough food?		1 (0.8)		

4.3 Causes of food insecurity among arable crop farmers

The distribution of respondents based on causes of food insecurity among arable crop farmers was presented in Table 3. About

57.9% of the respondents accepted that unavailability of seed caused food insecurity while 42.1% of the respondents said unavailability of seed did not cause food insecurity, 72.7%, 97.5%, 100%, 98.3 % and

96.7% of the respondents said yes that struggle to purchase equipment, high price of fertilizers, high transportation cost, poor rural infrastructure (road) and fluctuation price of tools respectively also caused food insecurity, while 31.4% of the respondents said yes that access to water (scarcity) caused food

insecurity level while 68.6% of the respondents said no access to water (scarcity) contributing to food insecurity, also 52.1%, 52.1%, 58.7% and 100% of the respondents said yes soil fertility, poor farming practice, inadequate access to input and rising food prices respectively caused food insecurity.

Table 4: Causes of food insecurity level among arable crop farmers

S/N	Causes of food insecurity	Yes	No
		Frequency (%)	Frequency (%)
1.	Unavailability of seed	140 (57.9)	100 (42.1)
2.	Struggle to purchase equipment	174 (72.7)	66 (27.3)
3.	High prices of fertilizer	234 (97.5)	6 (2.5)
4.	High transportation cost	240 (100)	0
5.	Poor rural infrastructure (roads)	236 (98.3)	4 (1.7)
6.	Fluctuation price of tools	232 (96.7)	8 (3.3)
7.	Access to water (scarcity)	76 (31.4)	164 (68.6)
8.	Soil fertility	126 (52.1)	104 (47.9)
9.	Poor farming practices	126 (52.1)	104 (47.9)
10.	Inadequate access to input	140 (58.7)	100 (41.3)
11.	Rising food price	240 (100.0)	0 (0.0)

4.4 Test of hypothesis

4:5 There is no significant relationship between causes of food insecurity status among arable crop farmers and coping strategies among the respondents

Result showing the relationship between causes 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.

4. Conclusion and recommendations

This study examined the dynamics of food insecurity in Southwest, revealing that despite the region's agricultural potential, significant socioeconomic and institutional challenges persist. Descriptive analysis highlighted that while most households engage in farming on relatively large plots (average 5.6 ha) and maintain strong cooperative and extension linkages, issues like inadequate infrastructure, high input costs, and market constraints continue to undermine food security. The perceived food insecurity status of the households revealed that a considerable proportion of households sometimes consumed less preferred foods, reduced meal

portions, or relied on limited diets due to lack of resources. Furthermore, major causes of food insecurity identified include unavailability of seed, high fertilizer prices, transportation costs, poor rural infrastructure, and inadequate access to inputs. Pearson correlation analysis confirmed that inadequate access to inputs, water scarcity, and low farming income were significantly associated with higher food insecurity, underscoring the multi-dimensional nature of the challenge.

From the foregoing, the following recommendations were proposed:

1. Government and development agencies should strengthen input subsidy programs and facilitate bulk-purchasing arrangements through cooperatives, thus, reducing high costs of seeds, input, and equipment.
2. Extension services should intensify training on soil fertility management, water conservation, and climate-resilient cropping systems to mitigate productivity shocks.
3. Expand the coverage of community-based food security outreach programs and integrate nutrition education to improve dietary diversity.
4. Encouraging rural entrepreneurship and non-farm employment can reduce over-dependence on seasonal farm incomes and enhance household resilience.

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