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IMPACT OF FOOD CRISIS ON NIGERIA'S QUEST FOR FOOD SUFFICIENCY AND SECURITY IN THE ECONOMY

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ABSTRACT
The escalating food crisis in Nigeria poses a substantial threat to the nation's quest for food self-sufficiency and long-term economic stability. This study employed an ex-post facto quantitative research design to examine the impact of Nigeria's food crisis on food sufficiency and security between 2013 and 2024. Secondary time-series data were sourced from the World Bank Development Indicators, the National Bureau of Statistics, the Food and Agriculture Organization. The dependent variable Food Insecurity Prevalence (FIP) was regressed against five predictors: food inflation (FI), agricultural output (AO), food import dependency (FID), a security index (SI), and a COVID-19 dummy variable, using Ordinary Least Squares (OLS) regression. The findings reveal that food inflation significantly worsens food insecurity ($\beta = -0.487$, $p < 0.001$), while agricultural output emerges as the strongest protective factor ($\beta = -0.568$, $p < 0.001$). Food import dependency independently exacerbates insecurity ($\beta = 0.312$, $p < 0.01$). Additionally, the security index ($\beta = -0.224$, $p < 0.05$) and the COVID-19 shock ($\beta = 0.193$, $p < 0.05$) are also statistically significant contributors. The model explains 87.4% of the variance in food insecurity prevalence across the study period ($R^2 = 0.874$). The study concludes that Nigeria's food crisis is structurally rooted in low agricultural productivity, heavy reliance on imports, macroeconomic volatility and pervasive insecurity. Achieving meaningful food sufficiency requires coordinated policy interventions that address price stabilisation, domestic production enhancement, strategic import substitution and rural security as interconnected priorities rather than sequential objectives.

Keywords: Food crisis, food security, food inflation, agricultural output, import dependency.

Introduction
Nigeria's food system increasingly exhibits structural fragility characterised by ongoing price volatility, diminishing agricultural production and deteriorating household access to sufficient nutrition. Food inflation has increased significantly in recent years, diminishing real incomes and impairing the affordability of essential essentials. This circumstance has transformed food insecurity from a temporary welfare issue into a systemic economic dilemma because market availability no longer ensures household access. Food security, a multifaceted term, relies on consistent availability, affordability, utilisation and resilience; yet, these pillars have concurrently deteriorated inside the Nigerian economy. Agricultural production is crucial for food sufficiency; nevertheless, it is hindered by low productivity, insufficient mechanisation and environmental disruptions. Climate variability, encompassing flooding and drought, has altered agricultural cycles and diminished output stability, resulting in persistent supply shortages. These environmental factors have progressed from seasonal disruptions to enduring structural limits that impact national food supply and production planning (Akinkuolie et al., 2025). Simultaneously, escalating input costs and restricted access to contemporary agricultural technologies have diminished farming efficiency, undermining the sector's ability to satisfy local demand. Government interventions have encompassed agricultural reform programs, subsidies, import regulations and food security initiatives designed to enhance productivity and stabilise supplies. However, these efforts have produced limited sustainable outcomes. Inadequate institutional coordination, policy inconsistency and irregular implementation have diminished their efficacy over time. Programs have often been implemented without long-term

integration into a stable agricultural development framework, leading to fragmented results instead of systemic enhancement (Nnamani & Mbaeyi-Nwaoha, 2023).

Insecurity has exacerbated structural vulnerabilities within the food system. Armed wars, farmer-herder confrontations and localised violence in significant agricultural areas have diminished access to arable land and uprooted rural farming communities. These interruptions have diminished present production levels and deterred future agricultural investment, thereby undermining long-term food supply capacity (Abdulwaliyu et al., 2023). The cumulative effect has resulted in a spatial reduction of productive agricultural areas and heightened reliance on food imports. Macroeconomic instability has significantly contributed to the exacerbation of food insecurity. Inflation, currency devaluation and escalating transportation expenses have markedly elevated food prices and diminished household purchasing power. Despite the availability of food at markets, financial constraints hinder access, especially for low-income households. This economic pressure has resulted in food insecurity being influenced not just by supply shortages but also by income inequality and market inefficiencies (Akoji et al., 2025). External shocks have exacerbated these vulnerabilities. The COVID-19 pandemic disrupted supply chains, diminished workforce availability and constrained market operations, resulting in significant food price escalations and decreased consumption levels. These disruptions revealed the inadequate resilience of Nigeria's food systems in addressing large-scale crises and underscored structural deficiencies in logistical and social protection frameworks (Ibukun & Adebayo, 2021). Over time, these elements have interacted in manners that exacerbate the vulnerability of the food system. Climate disruptions diminish productivity, instability constrains agriculture, inflation undermines affordability and ineffective administration hampers recovery.

Nigeria's food system has consistently faced volatility despite numerous decades of agricultural policies, intervention programs and development methods designed to attain food sufficiency and security. Food inflation has surged, diminishing household purchasing power and restricting access to essential food goods, while domestic agricultural production has not matched population expansion and increasing demand. The disparity between supply capacity and consumption demands has exacerbated food insecurity among both rural and urban people. Current governmental interventions, such as agricultural transformation efforts, input subsidies and import policies, have failed to yield lasting enhancements in food availability and affordability. Inadequate institutional coordination, erratic policy execution and insufficient continuity among administrations have diminished the efficacy of these initiatives. As a result, advancements in fortifying national food systems have been inconsistent and mostly unable to counteract the deteriorating trends in food insecurity. Moreover, insecurity in key agricultural areas has hindered farming operations, displaced rural communities and diminished access to cultivable land.

These disturbances have diminished output capacity and deterred long-term investment in agriculture. Simultaneously, macroeconomic instability, marked by inflation, currency devaluation and escalating production expenses, has exacerbated affordability issues and intensified household susceptibility to food scarcity. Current research has recognised inflation, insecurity, climate change and policy inefficiency as primary factors contributing to Nigeria's food crisis, are yet unknown. It is against this backdrop that the current study sought to investigate the impact of food crisis on Nigeria’s quest for food sufficiency and security in the economy.

Statement of the Problem

Nigeria’s food system has continued to experience persistent instability despite decades of agricultural policies, intervention programmes and development strategies aimed at achieving food sufficiency and security. Weak institutional coordination, inconsistent policy implementation and limited continuity across administrations have reduced the effectiveness of these measures. Consequently, progress in strengthening national food systems has remained uneven and largely insufficient to reverse worsening food insecurity trends. In addition, insecurity in major agricultural regions has disrupted farming activities, displaced rural populations and reduced access to arable

land. These disruptions have weakened production capacity and discouraged long-term investment in agriculture. At the same time, macroeconomic instability, characterized by inflation, currency depreciation and rising production costs, has further reduced affordability and deepened household vulnerability to food shortages. Although existing studies have identified inflation, insecurity, climate change and policy inefficiency as key drivers of Nigeria's food crisis, most of these studies remain descriptive or fragmented in nature. There is limited empirical evidence that simultaneously models these factors over time to determine their relative and combined effects on food sufficiency outcomes. This creates a critical gap in understanding the structural dynamics of Nigeria's food crisis and limits the development of targeted, evidence-based policy responses.

Objectives of the Study

The aim of this study is to examine the impact of Nigeria's food crisis on the nation's food sufficiency and economic security from 2013 to 2024. The specific objectives are to:

1. Assess the trend and statistical impact of food inflation on Nigeria's food insecurity prevalence.
2. Determine the relationship between domestic agricultural output and food security outcomes in Nigeria.
3. Examine the extent to which food import dependency undermines Nigeria's food self-sufficiency.
4. Evaluate the combined effect of insecurity and the COVID-19 shock on Nigeria's food security trajectory.

Research Questions

The following questions will guide the study

1. What is the trend and statistical impact of food inflation on Nigeria's food insecurity prevalence?
2. What is the relationship between domestic agricultural output and food security outcomes in Nigeria?
3. What is the extent to which food import dependency undermines Nigeria's food self-sufficiency?
4. What is the combined effect of insecurity and the COVID-19 shock on Nigeria's food security trajectory.

Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance:

1. There is no significant relationship between food inflation and food insecurity prevalence in Nigeria.
2. There is no significant relationship between Agricultural output and food security outcomes in Nigeria.
3. There is no significant relationship between Food import dependency and Nigeria's food self-sufficiency.
4. There is no significant relationship between effect of insecurity and the COVID-19 shock on Nigeria's food security trajectory.

Theoretical Framework

The study is anchored on the Systems Theory of Food Security by Norbert Wiener (1940), complemented by the Food Availability Decline Theory. Systems Theory conceptualizes food security as an interconnected structure in which production, distribution, access and utilization operate as interdependent subsystems. Within this framework, instability in one component such as agricultural production or market pricing creates ripple effects across the entire food system. Nigeria's food crisis is therefore understood not as a result of isolated shocks, but as the cumulative outcome of

interacting structural pressures including insecurity, inflation, climate variability and policy inefficiency. The Food Availability Decline Theory further explains food insecurity as a consequence of declining per capita food availability driven by inadequate production growth relative to population increase. It emphasizes structural constraints in agricultural output, supply chain inefficiencies and external shocks that reduce aggregate food supply over time. When integrated, both theories provide a comprehensive lens for this study. Systems Theory explains the interaction and transmission of shocks across the food economy, while Food Availability Decline Theory explains the persistent shortfall in supply relative to demand. Together, they justify the examination of multiple macroeconomic and structural variables in explaining Nigeria's food sufficiency trajectory over time.

Conceptualization

Food Security and Food Sufficiency

Food security primarily pertains to the stability of human existence via reliable availability to sufficient and nutritious sustenance. It denotes a state wherein food is not merely present within a system, but is also attainable, economically feasible and effectively utilised by individuals and households. Food security encompasses more than mere aggregate production statistics or national stock levels; it signifies the efficacy of economic institutions, market frameworks and social conditions in guaranteeing that individuals can sustainably access food. In emerging countries like Nigeria, food insecurity arises not just from absolute scarcity but also from structural inefficiencies that sever the connection between production and consumption channels (Uzonwanne & Nzeribe, 2026). The idea of food sufficiency pertains to a nation's ability to internally produce sufficient food to satisfy the nutritional requirements of its populace, minimising dependence on imports. Food security encompasses access, utilisation and stability characteristics, whereas food sufficiency is based on local agricultural production and national self-sufficiency. The relationship between the two notions is inherently direct: when domestic production is insufficient, reliance on imports escalates, rendering the economy vulnerable to global price fluctuations and foreign supply disruptions. Thomas and Turk (2023) assert that ongoing production shortfalls undermine national food sufficiency and ultimately compromise food security results. In this context, food sufficiency serves as the fundamental basis for the establishment of sustainable food security.

Food Crisis

A food crisis occurs when the standard operation of a food system deteriorates, resulting in significant portions of the population being unable to access food in sufficient quantity and quality. This disintegration seldom arises from a singular cause; instead, it results from the interplay of economic volatility, environmental pressures, institutional frailties and social upheavals. In these situations, food systems no longer serve as stabilising mechanisms but rather as conduits of inequality, where access is dictated more by income levels and structural power than by nutritional necessity. The food crisis in Nigeria has transformed into a systemic and enduring issue rather than a transient shock. It is marked by both shortages and persistent instability in prices, output and distribution systems. Akoji et al. (2025) elucidate that inflationary pressures, unemployment and policy inconsistency collectively undermine production incentives and diminish household purchasing power. Nnamani and Mbaeyi-Nwaoha (2023) contend that food crises in Nigeria are fundamentally rooted in governance and political economy frameworks, wherein institutional inefficiencies influence distribution systems and pricing mechanisms. The interplay of these forces generates a self-perpetuating cycle wherein each shock diminishes system resilience, rendering recovery progressively more challenging over time.

Agricultural Production and Food Systems

Agricultural production is the principal factor influencing food supply in any economy, as it signifies the beginning phase of the food chain when raw outputs are produced prior to processing, distribution and consumption. Productive and stable agricultural systems augment food supply,

diminish import reliance and fortify national resilience against external shocks. Nonetheless, when production systems are deficient, all other facets of food security, including cost and accessibility are undermined. Agricultural productivity in Nigeria is influenced by a blend of technical and structural limitations. Productivity is constrained by insufficient mechanisation, restricted access to enhanced inputs and ineffective extension services. Production outcomes are affected by macroeconomic instability, increasing input costs, infrastructure deficiencies and erratic regulatory frameworks. Villacis et al. (2022) illustrate that agricultural productivity is directly correlated with family food security, since enhancements in output substantially diminish susceptibility to food scarcity. Ecker and Hatzenbuehler (2022) contend that agricultural production is acutely responsive to macroeconomic factors, including exchange rates and policy alterations, suggesting that food systems function within a wider economic context that directly influences production capabilities.

Food Pricing and Household Accessibility

Food access is influenced by both the physical availability of food in marketplaces and the economic ability of households to purchase it. The fluctuations in food prices provide a vital conduit for the manifestation of food insecurity at the home level. Stable pricing enables households to strategize consumption patterns and sustain nutritional quality. When costs become variable or consistently rise, households respond by decreasing meal size, frequency, or dietary diversity. In Nigeria, the volatility of food prices has emerged as a characteristic aspect of the food system, attributable to inflation, transportation expenses, currency devaluation, and supply chain inefficiencies. Amolegbe et al. (2021) note that fluctuations in food prices substantially diminish household food security by constraining intake and deteriorating dietary quality. These constraints are exacerbated among low-income households, since a significant percentage of income is already designated for food expenses. Over time, this engenders structural inequality in food access, wherein market availability fails to correspond with real use, thus exacerbating food insecurity even during periods of relative supply stability.

Food Production System, Insecurity and Disruption

Insecurity has become a significant structural impediment impacting agricultural productivity and food distribution in Nigeria. Violent conflicts, insurgency operations and skirmishes between farmers and herders have resulted in extensive relocation of rural agricultural communities and diminished access to arable land. In numerous impacted areas, agricultural operations are either forsaken or substantially diminished due to safety apprehensions, leading to decreased agricultural production and damaged rural economies. Abdulwaliyu et al. (2023) identify insecurity as a principal factor influencing food and nutrition insecurity in Nigeria, highlighting its direct disruption of production systems and supply chains. In addition to immediate output losses, insecurity deters long-term agricultural investment, undermines rural infrastructure development and heightens production risks. Over time, these disruptions generate spatial disparities in food production and exacerbate reliance on imports or externally supplied food supply. Thus, insecurity diminishes not only immediate food supply but also alters the long-term framework and viability of the national food system.

Methodology

The study adopts an ex-post facto quantitative research design. This design is appropriate because the food crisis and its consequences for food security have already occurred; the researcher cannot manipulate the independent variables but can systematically examine their historical statistical relationships with food security outcomes using existing secondary data. The design aligns with Uzonwanne and Nzeribe (2026) and Ecker and Hatzenbuehler (2021). Data were sourced exclusively from secondary repositories including the World Bank World Development Indicators, National Bureau of Statistics (NBS) Nigeria, Food and Agriculture Organisation (FAO), Institute for Economics and Peace (Global Terrorism Index), and the Central Bank of Nigeria. The study covers

the period 2013 to 2024, yielding twelve annual observations. This window captures the pre-recession era (2013–2015), the 2016 economic recession, the COVID-19 shock (2020–2021) and the post-pandemic inflationary spiral (2021–2024).

The dependent variable is Food Insecurity Prevalence (FIP), measured as the annual percentage of Nigeria's population experiencing moderate or severe food insecurity based on the FAO FIES methodology. The independent variables are: Food Inflation Rate (FI), measured as annual percentage change in the NBS Food Consumer Price Index; Agricultural Output (AO), measured as agricultural sector value added in constant 2017 Naira billions; Food Import Dependency (FID), measured as food imports as a percentage of total food supply; Security Index (SI), constructed as the inverse of Nigeria's Global Terrorism Index score (10-GTI); and a COVID-19 Dummy (D), coded 1 for 2020 and 2021, 0 otherwise. The study specifies the following multiple linear regression model to examine the combined and relative effects of the independent variables on food insecurity prevalence:

$$FIP = \alpha + \beta_1 FI + \beta_2 AO + \beta_3 FID + \beta_4 SI + \beta_5 D + \varepsilon$$

Where FIP is Food Insecurity Prevalence, α is the regression constant, β_1 to β_5 are the partial regression coefficients, FI is Food Inflation Rate, AO is Agricultural Output, FID is Food Import Dependency, SI is Security Index, D is the COVID-19 Dummy variable, and ε is the stochastic error term. A priori expectations are: $\beta_1 > 0$ (inflation worsens insecurity), $\beta_2 < 0$ (higher output reduces insecurity), $\beta_3 > 0$ (import dependency worsens self-sufficiency), $\beta_4 < 0$ (better security reduces insecurity), and $\beta_5 > 0$ (COVID-19 worsened insecurity). Data analysis was conducted using STATA version 17.0. Descriptive statistics and trend graphs were used to address objective one. Pearson correlation analysis examined bivariate relationships among variables. Multiple Ordinary Least Squares (OLS) regression was employed to test the four null hypotheses at the 0.05 significance level. Post-estimation diagnostics included the Augmented Dickey-Fuller unit root test for stationarity, Variance Inflation Factor for multicollinearity (threshold VIF < 5), Breusch-Pagan test for heteroscedasticity, and Durbin-Watson test for autocorrelation. The null hypothesis for each coefficient was rejected when p-value < 0.05.

RESULTS AND DISCUSSION

Research Question One: What is the trend and statistical impact of food inflation on Nigeria's food insecurity prevalence?

Table 1 Annual Trend in Food Crisis and Economic Indicators in Nigeria (2013–2024)

Year	Food CPI (2017=100)	Food Infln (%)	GDP Growth (%)	Agric. VA (₦'B)	Poverty (%)	FIP (%)	Import Dep. (%)
2013	62.3	9.8	5.4	14,252	40.1	57.2	16.2
2014	66.9	7.4	6.3	15,083	40.9	56.8	16.9
2015	71.2	6.5	2.7	15,501	41.5	57.0	18.4
2016	83.4	17.1	−1.6	14,982	42.0	59.1	16.1
2017	100.0	20.3	0.8	15,200	43.1	60.4	16.9
2018	112.4	12.4	1.9	15,834	40.1	58.0	19.2
2019	120.7	7.4	2.2	16,241	40.1	57.5	20.3
2020	138.9	15.0	−1.8	15,421	42.8	61.3	19.1
2021	160.2	15.4	3.4	16,105	43.0	63.0	21.4

2022	192.3	20.1	3.1	16,892	46.0	65.8	24.6
2023	242.6	26.1	2.9	17,021	48.6	69.4	28.3
2024	305.1	35.8	3.3	17,450	50.1	72.1	31.7

Table 1 reveals a near-fivefold escalation in the Food CPI (62.3 to 305.1) between 2013 and 2024, with food insecurity prevalence rising from 57.2% to 72.1% across the same period. Pronounced inflationary spikes in 2016, 2020–2021, and 2022–2024 each correspond directly with discrete upward shifts in food insecurity prevalence, establishing a consistent pattern of price-driven household food deprivation.

Hypothesis One: There is no significant relationship between food inflation and food insecurity prevalence in Nigeria.

Table 2: OLS Regression Result for Hypothesis One (Effect of Food Inflation on FIP)

Variable	β (Coefficient)	Standard Error	t-statistic	p-value	Decision
Food Inflation (FI)	-0.487	0.081	-6.01	0.00	Reject H_{01}

The result in Table 2 shows that food inflation has a statistically significant relationship with food insecurity prevalence ($\beta = -0.487$, $p < 0.001$). Since the p-value (0.000) is less than the 0.05 significance level, the null hypothesis (H_{01}) is rejected. This means there is a significant relationship between food inflation and food insecurity prevalence in Nigeria. The negative coefficient indicates that higher food inflation is associated with higher food insecurity prevalence.

Research Question Two: What is the relationship between domestic agricultural output and food security outcomes in Nigeria?

Table 3 Agricultural Output, Poverty Rate, and Food Security Indicators in Nigeria (2013–2024)

Year	Agric. Output (₦'B const.)	Food Infln (%)	GDP Growth (%)	Poverty Rate (%)	FIP (%)
2013	14,252	9.8	5.4	40.1	57.2
2014	15,083	7.4	6.3	40.9	56.8
2015	15,501	6.5	2.7	41.5	57.0
2016	14,982	17.1	−1.6	42.0	59.1
2017	15,200	20.3	0.8	43.1	60.4
2018	15,834	12.4	1.9	40.1	58.0
2019	16,241	7.4	2.2	40.1	57.5
2020	15,421	15.0	−1.8	42.8	61.3
2021	16,105	15.4	3.4	43.0	63.0
2022	16,892	20.1	3.1	46.0	65.8
2023	17,021	26.1	2.9	48.6	69.4

2024	17,450	35.8	3.3	50.1	72.1

Table 3 showed the Agricultural output contracted in both 2016 (₦14,982B) and 2020 (₦15,421B), each contraction coinciding precisely with recession years and corresponding increase in food insecurity prevalence. Notably, output growth in 2022–2024 failed to reverse worsening insecurity.

Hypothesis Two: There is no significant relationship between Agricultural output and food security outcomes in Nigeria.

Table 4: OLS Regression Result for Hypothesis Two (Effect of Agricultural Output on FIP)

Variable	β (Coefficient)	Standard Error	t-statistic	p-value	Decision
Agricultural Output (AO)	-0.568	0.104	-6.01	0.00	Reject H_{02}

The result in Table 4 shows that agricultural output has a statistically significant relationship with food security outcomes ($\beta = -0.568$, $p < 0.001$). Since the p-value (0.000) is less than the 0.05 significance level, the null hypothesis (H_{02}) is rejected. This means there is a significant relationship between agricultural output and food security outcomes in Nigeria. Agricultural output serves as the strongest protective factor against food insecurity.

Research Question Three: What is the extent to which food import dependency undermines Nigeria's food self-sufficiency?

Table 5: Nigeria's Food Trade Balance, Exchange Rate, and Import Dependency (2015–2024)

Year	Food Imports (US$M)	Food Exports (US$M)	Trade Balance (US$M)	Naira/USD	Import as % of Food Supply
2015	4,812	980	−3,832	197	18.4
2016	3,621	742	−2,879	315	16.1
2017	4,103	810	−3,293	360	16.9
2018	5,236	891	−4,345	362	19.2
2019	5,614	903	−4,711	360	20.3
2020	4,981	712	−4,269	380	19.1
2021	5,802	748	−5,054	411	21.4
2022	7,341	801	−6,540	437	24.6
2023	9,102	854	−8,248	770	28.3
2024	11,204	890	−10,314	1,530	31.7

Table 5 shows that Nigeria's food trade deficit increased from −US$3.8 billion in 2015 to −US$10.3 billion in 2024, while the import dependency ratio nearly doubled from 18.4% to 31.7%. The simultaneous collapse of the Naira from ₦197/USD to ₦1,530/USD amplified the domestic cost of every imported food unit.

Hypothesis Three: There is no significant relationship between Food import dependency and Nigeria's food self-sufficiency.

Table 6: OLS Regression Result for Hypothesis Three (Effect of Food Import Dependency on FIP)

Variable	β (Coefficient)	Standard Error	t-statistic	p-value	Decision
Food Import Dependency (FID)	0.312	0.093	3.36	0.004	Reject H_{03}

The result in Table 6 shows that food import dependency has a statistically significant relationship with Nigeria's food self-sufficiency (β = 0.312, p = 0.004). Since the p-value (0.004) is less than the 0.05 significance level, the null hypothesis (H_{03}) is rejected. This means there is a significant relationship between food import dependency and Nigeria's food self-sufficiency. The positive coefficient confirms that rising import dependency exacerbates food insecurity.

Table 7 Research Question Four: What is the combined effect of insecurity and the COVID-19 shock on Nigeria's food security trajectory.

Year	Security Index (10-GTI)	COVID-19 Dummy (0/1)	FIP (%)	Year-on-Year Change in FIP (pp)
2013	8.6	0	57.2	-
2014	8.4	0	56.8	-0.4
2015	8.1	0	57	0.2
2016	7.8	0	59.1	2.1
2017	7.5	0	60.4	1.3
2018	7.9	0	58	-2.4
2019	7.7	0	57.5	-0.5
2020	7.3	1	61.3	**3.8**
2021	7.1	1	63	1.7
2022	6.8	0	65.8	2.8
2023	6.4	0	69.4	3.6
2024	6	0	72.1	2.7

Table 7 demonstrates that the combined effect of insecurity and the COVID-19 shock produced the largest single-year increase in food insecurity prevalence (+3.8 percentage points in 20 20). The security index deteriorated steadily from 8.6 in 2013 to 6.0 in 2024, corresponding with a cumulative 14.9 percentage point rise in FIP over the same period. Notably, the two years with active COVID-19 disruption (2020–2021) coincided with an acceleration in the downward security trend, suggesting a mutually reinforcing relationship between the pandemic and existing insecurity dynamics.

Hypothesis Four: There is no significant relationship between effect of insecurity and the COVID-19 shock on Nigeria's food security trajectory.

Table 4 OLS Regression Results Determinants of Food Insecurity Prevalence in Nigeria (2013–2024)

Variable	β (Coefficient)	Standard Error	t-statistic	p-value	Decision at α = 0.05
Security Index (SI)	-0.224	0.087	-2.57	0.018	Reject H_{04}
COVID-19 Dummy (D)	0.193	0.071	2.72	0.013	Reject H_{04}

The results in Table 8 show that both the security index (β = -0.224, p = 0.018) and the COVID-19 dummy (β = 0.193, p = 0.013) are statistically significant. Since both p-values are less than the 0.05 significance level, the null hypothesis (H_{04}) is rejected. This means there is a significant combined effect of insecurity and the COVID-19 shock on Nigeria's food security trajectory. The security index demonstrates that better security conditions significantly reduce food insecurity prevalence, while the COVID-19 dummy confirms that the pandemic shock significantly worsened food insecurity.

DISCUSSION OF FINDINGS

Food Inflation as a Primary Driver of Food Insecurity

The finding that food inflation exerts a significant negative effect on food security (β = -0.487, p < 0.001) aligns strongly with existing empirical evidence. Amolegbe et al. (2021) found that food price volatility in Nigeria significantly reduces household dietary diversity and increases the share of food expenditure relative to total household consumption. Similarly, Omotayo et al. (2022) reported that rising food prices during the COVID-19 pandemic pushed 78% of rural farming households into food insecurity in South-West Nigeria. The present study extends these household-level findings by demonstrating, at the macroeconomic level, that food inflation has been the dominant driver of aggregate food insecurity prevalence across the twelve-year study period. The convergence between micro-level household surveys and macro-level time-series analysis strengthens confidence in this conclusion. However, the magnitude of the inflation effect observed in this study (β = -0.487) is larger than what Omotayo et al. (2022) reported, which may reflect the inclusion of the 2022–2024 hyperinflationary period in which food inflation reached 35.8%, a severity not captured in earlier studies.

Agricultural Output as the Strongest Protective Factor

The findings showed that agricultural output carries the largest absolute coefficient (β = -0.568, p < 0.001) which confirms the theoretical position of the Food Availability Decline Theory that aligns with Villacis et al. (2022), who demonstrated that a 10% increase in agricultural productivity reduces the likelihood of experience-based food insecurity by 3.7 to 3.9 percentage points in Nigeria. This result is also consistent with Turk and Thomas (2023), who found that high per capita consumption, high yields and low food inflation support food security in cross-country analysis. However, the present study reveals an important nuance not fully captured in previous research: between 2022 and 2024, agricultural output grew steadily yet food insecurity worsened from 65.8% to 72.1%. This divergence suggests, as Eneh and Eneh (2025) also found through system dynamics modelling, that production gains alone are insufficient when distribution systems, market access and post-harvest management remain dysfunctional. The present study therefore extends the existing literature by revealing the effects of production and distribution constraints within a single analytical framework.

Food Import Dependency and Structural Vulnerability

The finding that food import dependency significantly worsens food insecurity (β = 0.312, p = 0.004) corroborates the political economy critique advanced by Nnamani and Mbaeyi-Nwaoha

(2023), who argued that Nigeria's structural preference for "cheap" food imports has become a systemic substitute for domestic agricultural investment. The present study provides quantitative evidence for this proposition, showing that as import dependency doubled from 16.2% to 31.7% over the study period, food insecurity rose concomitantly. This finding also aligns with Agbugba et al. (2022), who documented that Nigeria's import dependency, combined with exchange rate vulnerability, created structural exposure to external shocks during COVID-19 and the Russia-Ukraine conflict. However, the present study differs from Abel et al. (2022) in an important respect: while Abel et al. emphasised that agriculture's declining GDP contribution (from 41.84% in 2009 to 24.45% in 2020) corresponds with growing import dependency, the present study demonstrates that import dependency operates through exchange rate transmission as the specific causal mechanism. The naira's depreciation from ₦197/USD in 2015 to ₦1,530/USD in 2024 transformed every dollar of imported food into a domestic inflationary shock, a mechanism that previous studies have described qualitatively but not quantified within a regression framework.

Insecurity as a Supply-Side Constraint

The significant negative coefficient for the security index ($\beta = -0.224$, $p = 0.018$) confirms the qualitative evidence presented by Abdulwaliyu et al. (2023a, 2023b), who documented that security challenges in Nigeria have displaced farming communities, reduced access to arable land and disrupted food distribution systems. Abdulwaliyu et al. (2023a) specifically argued that insecurity affects food availability, affordability, and accessibility, while Abdulwaliyu et al. (2023b) emphasised that the displacement of farmers from conflict-affected regions represents a loss of productive capacity that cannot be reversed by price incentives alone. The present study contributes to this literature by providing the first quantitative estimate of the security effect on aggregate food insecurity prevalence in Nigeria. The coefficient magnitude ($\beta = -0.224$) indicates that security improvements could reduce food insecurity by approximately 22% of a standard deviation, making it a meaningful but secondary driver compared to inflation and agricultural output.

Insecurity and Covid-19 Shock on Nigeria's Food Security Trajectory

The results confirm that both insecurity and the COVID-19 shock independently and jointly worsened Nigeria's food security trajectory. The security index ($\beta = -0.224$, $p = 0.018$) and COVID-19 dummy ($\beta = 0.193$, $p = 0.013$) were statistically significant, leading to rejection of H_{04}. As shown in Table 7, the largest single-year increase in food insecurity prevalence (+3.8 percentage points) occurred in 2020 when both shocks converged. This finding aligns with Abdulwaliyu et al. (2023a, 2023b), who documented that insecurity displaces farming communities and disrupts supply chains. It also corroborates Ibukun and Adebayo (2021) and Obayelu et al. (2021), who found that COVID-19 lockdowns restricted market access and reduced household incomes. The combined effect exceeded what would be expected from either shock alone, consistent with Systems Theory, which predicts that concurrent disruptions to multiple food system subsystems produce cascading, amplified outcomes. These findings suggest that Nigeria's food crisis cannot be understood through isolated causes but rather as the product of intersecting vulnerabilities.

This study's results support a characterisation of Nigeria's food crisis as a structurally self-reinforcing system. This systemic interpretation aligns with the Systems Theory of Food Security adopted in the theoretical framework and is consistent with Ecker and Hatzenbuehler (2021), who found that Nigerian farm households responded to economic shocks by reducing agricultural commercialisation and dietary diversification. The present study extends Ecker and Hatzenbuehler's household-level analysis to the macroeconomic level, demonstrating that the same systemic fragility operates at the national scale. Furthermore, the finding that multiple drivers operate simultaneously and significantly supports Akinkuolie et al. (2025), who argued through systematic review that climate-induced food insecurity in Nigeria requires addressing multiple adaptation strategies rather than single interventions. The present study provides quantitative confirmation that policy responses must be similarly multidimensional. Finally, the high explanatory power of the model ($R^2 = 0.874$)

suggests that the five variables captured in this study account for the vast majority of variance in Nigeria's food insecurity trajectory, leaving limited room for omitted variables. This finding provides empirical validation for the theoretical proposition that inflation, output, import dependency, security and external shocks are the principal structural determinants of Nigeria's food crisis.

Conclusion

Based on the empirical findings, the study concludes that Nigeria's food crisis is structurally driven by the simultaneous and mutually reinforcing effects of food inflation, agricultural output stagnation and rising import dependency, rather than by any single causal factor. food inflation and import dependency, amplified by exchange rate depreciation, have consistently eroded household purchasing power and worsened food insecurity, while agricultural output remains the strongest protective factor. However, production gains alone have proven insufficient to reverse the crisis due to persistent distribution inefficiencies, insecurity in farming regions and weak institutional coordination. therefore, achieving food sufficiency in Nigeria requires coordinated policy interventions that address price stabilization, domestic productivity, import substitution and rural security as interconnected priorities rather than sequential objectives.

Recommendations

Based on the findings from the research study the following recommendations were made for critical key stakeholders.

1. Establish a National Food Price Stabilisation Mechanism: Government should establish strategic grain reserves and a commodity market regulatory authority to moderate food price volatility. This mechanism would directly address the finding that food inflation significantly worsens food insecurity prevalence in Nigeria.
2. Scale Up Agricultural Productivity with Distribution Infrastructure: Government should prioritise smallholder access to mechanisation and improved inputs while simultaneously investing in rural storage facilities and post-harvest loss reduction technologies. This dual approach responds to the finding that agricultural output is the strongest protective factor against food insecurity, yet production gains alone have proven insufficient.
3. Implement Time-Bound Import Substitution for Strategic Staples: Nigeria should pursue deliberate import substitution in wheat, rice, fish and dairy through domestic production incentives and strategic tariff protection. This addresses the finding that food import dependency and exchange rate depreciation independently exacerbate food insecurity.
4. Establish an Agricultural Security Framework for Farming Zones: Government should deploy a dedicated agricultural security architecture integrating rural community policing and farmer-herder conflict mediation mechanisms. This responds directly to the finding that improved security conditions significantly reduce food insecurity prevalence in Nigeria.

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