ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 2, ISSUE 3, 2025

RESEARCH ARTICLE

POST-PANDEMIC AGRICULTURAL POLICIES: STRENGTHENING NIGERIA'S FOOD SECURITY IN A POST-COVID ERA

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ABSTRACT

This study examines Nigeria's food security crisis using a mixed-method approach, focusing on post-pandemic agricultural policies and economic factors such as inflation, interest rates, exchange rates, and production costs. The research uses national datasets and qualitative insights from policymakers, farmers, and NGOs to analyze food security trends over time. Key findings reveal that high inflation, driven by foreign exchange volatility, trade barriers, and rising production costs, has severely limited food affordability. Limited agricultural productivity, exacerbated by climate variability, insecurity, and infrastructural deficits, further restricts food availability and accessibility, particularly for rural and low-income populations. Policies like the National Agricultural Technology and Innovation Policy and the National Development Plan aim to revitalize the agricultural sector by strengthening value chains, promoting innovation, and enhancing resilience to shocks. However, structural weaknesses and insufficient investment challenge their effectiveness. The study recommends stabilizing inflation, expanding infrastructure investment, strengthening value-chain resilience, and enhancing targeted social protection programs to address gaps in affordability and accessibility. It underscores the need for integrated policy efforts to address immediate and systemic drivers of food insecurity, fostering a sustainable and resilient agricultural sector in the post-COVID era.

Key words: Post-COVID agricultural policy, food affordability, food accessibility, food availability, mixed-method analysis.
Jell Codes: I18; Q11; I38; Q02; C18

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Received: 24/10/2025; **Revised:** 19/11/2025; **Accepted:** 23/11/2025; **Published:** 31/11/2025

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INTRODUCTION

The COVID-19 pandemic has significantly disrupted global food supply chains, revealing vulnerabilities in agricultural systems, particularly in countries heavily dependent on imports or smallholder farmers (Kumareswaran and Jayasinghe, 2022). The pandemic has worsened Nigeria's food security crisis, exacerbated by a trilemma involving affordability, accessibility, and availability of food for domestic consumption and export, affecting over 70% of the population and contributing significantly to the GDP. High inflation, soaring interest rates, exchange rate volatility, and increasing business costs have tripled the cost of living since 2009, pushing 14 million Nigerians into poverty. In terms of accessibility, the number of Nigerians facing food insecurity surged from 66.2 million in Q1 2023 to an alarming 100 million in Q1 2024, with 18.6 million experiencing acute hunger and 43.7 million employing crisis-level coping strategies. This unprecedented hunger crisis underscores Nigeria’s urgent need for humanitarian and social protection interventions (NESG, 2024).

Despite the absence of immediate climate threats such as fire or drought, Nigeria's agricultural sector experienced a contraction in 2023 due to a persistent food deficit, declining productivity, and external challenges such as the Russia-Ukraine conflict. The conflict raised global food prices by 23 percent in 2021 and disrupted input supply chains, ultimately affecting Nigeria's agricultural output in 2022 (Haruna et al., 2023).

To address these challenges, the government has introduced several strategic policies. The government has expanded the National Food Security Program to decrease reliance on imports by encouraging the production of staple crops through subsidies and enhancing access to high-quality seeds and inputs. This program aims to enhance domestic food production while allowing farmers to adapt to market demands and climate pressures. Additionally, to stimulate agricultural investment and productivity, the Agricultural Credit Guarantee Scheme Fund (ACGSF), which provides financial assistance to smallholder farmers, has received increased funding, lower interest rates, and flexible repayment options (NESG, 2024).

The government is prioritizing investments in rural infrastructure development to tackle post-harvest losses and inefficient distribution. This includes modern storage facilities, improved transportation networks, and local market access. The Digital Agriculture Transformation Strategy is a key policy initiative, promoting digital platforms for farmers to access real-time weather data, market prices, and online training resources, fostering a more informed agricultural workforce. National agricultural policy is integrating sustainable farming practices to enhance climate resilience in food systems. Incentives for farmers to adopt agro-ecological methods, soil preservation techniques, and water conservation are being implemented to reduce environmental impacts.

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This study assesses Nigeria's post-pandemic agricultural policies, focusing on affordability, accessibility, and availability of food. It analyses interventions like the National Food Security Program and the Agricultural Credit Guarantee Scheme Fund, identifies policy gaps, and provides recommendations for strengthening food security strategies. The research assists in addressing immediate food security needs and building resilience against future crises.

The remainder of this study is organised as follows: Section Two presents the literature review, including the conceptual framework and previous studies. Section Three details the research methodology. Section Four examines Nigeria's food security trilemma, addressing structural weaknesses and external shocks, as well as the dimensions of affordability, accessibility, availability, and their interconnections. Section Five discusses Nigeria's post-pandemic agricultural policies and the external and internal stressors impacting food security. Section Six presents the discussion of findings, including a synthesis of results, policy implications, and a comparison with other nations. Finally, Section Seven concludes the study and provides recommendations for enhancing food security in Nigeria.

LITERATURE REVIEW

Conceptual Framework

This study adopts a conceptual framework designed to capture the complex dynamics of food security in Nigeria, particularly in the aftermath of the COVID-19 pandemic and in response to other external shocks. At its core, the framework centers on the food security trilemma, which comprises three interrelated dimensions: affordability, accessibility, and availability. These dimensions collectively shape the overall food security landscape and influence the effectiveness of agricultural policies.

Affordability addresses the economic ability of households to procure adequate and nutritious food, which is significantly affected by factors such as inflation, income levels, and agricultural input costs. In Nigeria, rising household food expenditures have pushed many families into food insecurity, highlighting the economic vulnerabilities embedded in the system. Accessibility refers to the physical and economic access to food, including availability in local markets and transportation infrastructure. Socioeconomic conditions, including poverty and rural-urban disparities, strongly determine households' capacity to access food. Availability focuses on the production, distribution, and stability of food supplies, which are influenced by agricultural productivity, climate variability, and external shocks such as global price fluctuations and conflicts. Understanding the interconnections among these three dimensions is essential for designing policies that address the root causes of food insecurity and improve resilience within Nigeria's agricultural and food systems.

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Previous Studies

Multiple studies underscore the severity of food insecurity in Nigeria and its complex drivers. According to UNICEF (2023), the October 2022 Cadre Harmonisé projected that 25 million Nigerians would be at risk of hunger between June and August 2023, up from 17 million at the time of reporting. The increase is largely driven by ongoing conflict, climate change, inflation, and rising food prices. Persistent violence in the northeastern BAY states; Borno, Adamawa, and Yobe, combined with armed banditry and kidnapping in states like Katsina, Sokoto, Kaduna, Benue, and Niger, has disrupted access to food. Environmental shocks have compounded these challenges; the 2022 rainy season caused flooding that destroyed over 676,000 hectares of farmland, reducing harvests and heightening the risk of food insecurity nationwide. Children remain particularly vulnerable, with approximately six million of the 17 million food-insecure individuals being under five years old, highlighting the urgency for preventive nutrition interventions.

Research indicates that food insecurity is not uniformly distributed across Nigeria. The northwest, including Katsina, Zamfara, and Sokoto, has emerged as a critical hotspot, with 2.9 million people facing acute food insecurity. Calls for urgent intervention emphasize the need for multi-sectoral collaboration among government agencies, the donor community, and private stakeholders to mitigate a potentially catastrophic food and nutrition crisis.

Several studies provide insights into the underlying determinants and policy implications of food insecurity. Adedipe (2021) highlights the exacerbating effects of climate change, economic instability, and conflict, advocating for effective policy implementation, increased agricultural productivity, infrastructure investment, and coordinated efforts among public and private actors. Similarly, Akpa (2021) stresses an integrated approach combining agricultural production, infrastructure improvements, and social protection to enhance food availability and access while addressing socioeconomic inequalities. Carson and Boege (2020) found that food availability alone does not guarantee food security; decisions around food acquisition are influenced by income, prices, and competing demands, with accessibility shaped by factors such as private transportation.

Onwe et al. (2024) employed econometric analyses to examine food security in Nigeria from 1980 to 2022, revealing that globalization, GDP, and population growth have nuanced impacts on food production and distribution. Oyeleke (2021) evaluated government initiatives like the National Food Security Program and the Agricultural Transformation Agenda, highlighting the critical role of resource access, infrastructure, and market stability, while Oji and Anih (2021) noted that COVID-19 intensified pre-existing gaps in Nigeria's food system, disrupting supply chains across rural and urban areas.

Empirical studies further illustrate the pandemic's impact on households. Amare et al. (2021) found that lockdowns and high COVID-19 incidence increased food insecurity, reduced labor

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participation, and disproportionately affected poorer and remote households. Villacis et al. (2022) highlighted the importance of agricultural productivity for household food security, noting that improvements in output reduced reliance on less preferred foods and mitigated reductions in meal size and variety. Ogunniyi et al. (2021) reported that access to credit, education, and participation in safety net programs were significant determinants of household food security.

Nosike and Ihugba (2019) examined the relationship between total government spending on agriculture and sectoral output in Nigeria from 1970–2015. Using cointegration and Granger causality analyses, they found that government expenditure positively impacts agricultural output in both the short and long term, with a 1% increase in spending potentially raising output by 10%. Their findings underscore the critical role of public investment in enhancing agricultural productivity, which directly affects food availability and affordability. However, while the study highlights macro-level impacts, it does not address how increased output translates to household-level food security, dietary diversity, or regional disparities, gaps that this study aims to address.

Several studies specifically examined the pandemic's effect on dietary practices and resilience strategies. Balana et al. (2023) observed that COVID-19 policies disrupted livelihoods, reduced dietary diversity, and limited the protective impact of social networks and safety nets. Omotayo et al. (2022) and Ibukun and Adebayo (2021) found that household characteristics such as income, size, education, and occupation influenced food security outcomes, with many households experiencing severe insecurity despite government interventions. Jafri et al. (2021) highlighted global trends, showing that stockpiling and rising staple food prices reduced access to adequate nutrition, particularly among vulnerable populations.

Overall, the literature highlights persistent gaps in Nigeria's food security research and policy. There is limited empirical analysis on how policies adapt to regional socioeconomic disparities, conflict impacts, and rural-urban vulnerabilities. Longitudinal studies examining the effectiveness of government interventions are scarce, and few analyses consider nutrition outcomes in the design of food security policies. This study seeks to address these gaps by evaluating post-COVID policy interventions, considering income and regional differences, and advocating for a data-driven approach to improving food security and nutritional outcomes.

METHODOLOGY

This study employs a mixed-method approach, combining quantitative data analysis and qualitative content analysis to investigate Nigeria's food security landscape in the post-COVID-19 era. The study evaluates the effectiveness of government-led food security policies and examines the impact of structural factors on their outcomes. Quantitative data are

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sourced from secondary sources including the National Bureau of Statistics (NBS), the Food and Agriculture Organization (FAO), and the World Bank. These datasets offer indicators related to agricultural production, food prices, import dependency, poverty, and nutrition. The study employs descriptive and inferential statistical techniques, to identify trends, relationships, and variations in Nigeria's food security performance over time.

A quantitative content analysis is performed on policy documents, official reports, and pertinent academic literature. This analysis facilitates the interpretation of policy objectives, evaluation of implementation outcomes, and identification of recurring themes or gaps in Nigeria's food security strategy.

The study is structured around a conceptual framework derived from the Food Security Trilemma, highlighting the relationships among affordability, accessibility, and availability. This framework offers an analytical perspective for examining the ways in which government policies address these three dimensions and how external shocks or structural weaknesses influence overall food security. All procedures comply with established ethical research standards. The study is based solely on publicly accessible data and institutional publications, ensuring proper citation of data sources and adherence to confidentiality where necessary. The method guarantees that the analysis is based on reliable secondary evidence, integrating empirical data and policy interpretation to yield a thorough understanding of Nigeria's current food security situations.

Nigeria's Food Security Trilemma

Nigeria's food security crisis is characterized by a complex trilemma involving affordability, accessibility, and availability of food, which affects both domestic consumption and export trade. High inflation, interest rates, and exchange rates, along with escalating business costs, drive the cost-of-living crisis, a key element of this trilemma. Between 2009 and 2023, the cost of living in Nigeria tripled across essential and premium goods. Between 2019 and 2022, factors like foreign exchange (FX) fluctuations, trade restrictions, and border closures contributed to food inflation.

In January 2024, Nigeria's food inflation rate reached 35.41%, reflecting an 11.10% increase from January 2023. This spike was due to rising prices for staple items like bread, cereals, potatoes, yams, oils, fish, meat, fruits, coffee, tea, and cocoa. The month-to-month inflation rate in January was 3.21%, which is 0.49% higher than December 2023's rate of 2.72%. Over the 12 months ending in January 2024, the average annual food inflation rate stood at 28.91% (NBS, 2024).

A report from the United Nations highlights that 25.3 million Nigerians face severe risks of food insecurity, attributed to factors such as violent conflict, climate change, inflation, and rising food prices. The 2022 Global Food Security Index ranks Nigeria 107 out of 113

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countries, with climate change and violent conflict identified as key contributors to its food security crisis (The Conversation, 2024). The COVID-19 pandemic and global conflicts further exacerbated inflation in imported goods. The Central Bank of Nigeria (CBN) implemented policy changes in 2023, such as demonetization, the removal of fuel subsidies, and the unification of the foreign exchange regime, which intensified inflationary pressures and negatively impacted business productivity and household welfare. Inflation peaked at 28.9% in December 2023, the highest in 18 years, with an annual average of 24.5%. High inflation drove approximately 14 million Nigerians into poverty in 2023, reducing their purchasing power (NESG, 2024).

According to the Office for the Coordination of Humanitarian Affairs (OCHA) (2024), of the 18.6 million people currently experiencing food insecurity, 3.3 million reside in the northeastern states of the BAY region. Without urgent intervention, this number could escalate to 26.5 million nationwide by the peak of the 2024 lean season. In October 2023, floods in Adamawa affected approximately 8,500 households, causing mass displacement among vulnerable populations, including women, children, and the elderly. Extreme weather patterns linked to the El Nio phenomenon are further threatening Nigeria's food security. Insecure areas outside Borno's garrison towns have claimed the lives of dozens of farmers over the past year, as they struggle with limited farmland and limited livelihood options (OCHA, 2024).

Structural Weaknesses and External Shocks

Nigeria's food system has longstanding structural weaknesses that external shocks have intensified. For example, the 2021 post-COVID war led to "imported inflation," increasing food prices by 23% and affecting fertilizer availability. Disruptions in wheat and fertilizer supply chains further hindered agricultural output in 2022, pushing up wheat product and animal feed prices (NESG, 2024). Demand for staples like maize and wheat has grown substantially, with maize demand doubling from 7.5 to 15 million metric tonnes between 2016 and 2022, while wheat demand rose from 4.7 to 6 metric tonnes. Nonetheless, Nigeria still faces 19% and 99% supply gaps for maize and wheat, respectively. Central Bank interventions in 2021 failed to bridge these gaps, underscoring the food system's vulnerability to natural disasters and macroeconomic instability. Addressing Nigeria's food security requires coordinated multi-sectoral strategies across humanitarian assistance, social protection, and food systems reform.

Affordability

Nigeria's food affordability is shaped by several interrelated macroeconomic factors, including inflation, interest rates, exchange rates, and high business costs, all of which directly affect essential food prices and consumer purchasing power. Over the past few years, rising inflation has significantly undermined food affordability, as consumer prices have increased sharply across key staples. By August 2023, food inflation had reached 26.72%,

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driven largely by rising costs for bread, cereals, potatoes, yams, meat, and fish. According to the World Bank (2022), inflation and currency depreciation have tripled the cost of living, with food prices being a major contributor. By early 2023, food inflation surpassed 24%, and subsequent policy changes, such as the removal of fuel subsidies and foreign exchange unification, further exacerbated costs, forcing approximately 63% of households to reduce meal sizes or eat less (NESG, 2024).

Nigeria's dependence on imports for staple foods has intensified these pressures, as global conflicts have increased the cost of key commodities. For instance, the Russia–Ukraine war triggered a surge in flour and grain prices by more than 10% between 2021 and 2022. These global disruptions continue to erode household budgets and encourage negative coping mechanisms, such as reduced food quality and consumption. The latest Consumer Price Index from the National Bureau of Statistics (Aro, 2024) indicates that overall inflation rose by 7.13 percentage points to reach 37.77% in September 2024. Key staples such as rice, maize, grains, yams, and oil led this increase, resulting in an average food inflation rate of 37.53% over the past year, an 11.88 percentage point rise.

External shocks and domestic supply deficits have compounded the affordability crisis. Nigeria faces significant production gaps in major food commodities, including an estimated deficit of 80 million chickens and 4 million metric tonnes of rice and wheat. These shortfalls drive up domestic prices and increased reliance on costly imports. Deficits in fish, tomatoes, milk, soybeans, and cotton further reduce dietary diversity and nutritional quality. The 2021 Russia–Ukraine conflict also disrupted access to critical agricultural inputs such as fertilizer, with urea and potash prices rising sharply. The resulting shortages reduced agricultural output in 2022 and contributed to escalating grain and animal feed prices, exposing the vulnerability of Nigeria's food system to global crises, pandemics, and economic instability.

High interest rates further constrain food affordability by increasing borrowing costs for farmers and agribusinesses, thereby limiting investment and production. The Central Bank's recent policy rate hike to 18.5% (Ikpoto, 2024) has elevated the cost of credit, forcing businesses to absorb higher financial burdens, which are ultimately passed on to consumers through increased food prices. Studies (Iroh, 2012; Balana and Oyeyemi, 2022; Ali et al., 2017) indicate that elevated interest rates restrict access to affordable financing for farmers, hindering productivity and innovation in the sector. In contrast, lower rates could stimulate investment, enhance agricultural output, and improve food affordability.

In addition, high business costs, stemming from elevated input prices, labour expenses, unreliable energy supply, and inefficient logistics, further inflate the cost of food production and distribution. Fluctuating fuel prices and infrastructural limitations raise transportation and storage costs, while poor road networks and unstable electricity supply reduce production efficiency. These inefficiencies ultimately lead to higher consumer prices.

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The interaction between inflation, interest rates, and business costs creates a cyclical challenge. For instance, efforts by the Central Bank to curb inflation through higher interest rates can simultaneously suppress consumer purchasing power and economic growth, worsening food affordability. For low-income households, the combined effect of rising inflation, expensive credit, and high production costs has been devastating, reducing access to nutritious foods and deepening food insecurity.

Table 1: Demand, Supply, and Supply Deficit for Agricultural Products in Nigeria 2016

Agricultural Products	Demand (Million Tons / Birds)	Supply (Million Tons / Birds)	Supply Deficit (Million Tons / Birds)
Chickens	200 million	140 million	80 million
Yams	39 million	37 million	2 million
Maize	7.5 million	7.0 million	0.5 million
Sorghum	7.0 million	6.2 million	0.8 million
Oil Palm	8.0 million	4.5 million	3.5 million
Rice	6.3 million	2.3 million	4.0 million
Wheat	4.7 million	0.1 million	4.6 million
Cocoa	3.6 million	0.3 million	3.4 million
Fish	2.7 million	0.8 million	1.9 million
Tomato	2.2 million	0.8 million	1.4 million
Milk / Dairy	2.0 million	0.6 million	1.4 million
Soya Beans	0.8 million	0.6 million	0.2 million
Cotton	0.7 million	0.2 million	0.5 million

Source: NESG, 2024

Accessibility

Food accessibility refers to the freedom to obtain food without obstacles such as travel time, physical features, neighborhood safety, and transportation costs. Food accessibility is a crucial aspect that enhances food availability by ensuring people can access and obtain food, acting as a bridge between availability and affordability, thereby enhancing the overall quality of life (Carson and Boege, 2020). The number of food-insecure Nigerians soared from 66.2 million in Q1 2023 to 100 million in Q1 2024, with 18.6 million facing acute hunger and 43.7 million employing crisis-level coping strategies (NESG, 2024). Nigeria faces an unprecedented hunger crisis necessitating urgent humanitarian and social protection interventions.

Food accessibility in Nigeria is primarily due to economic and logistical challenges. Economic constraints, such as the removal of fuel subsidies and unification of foreign exchange rates, have increased food prices, pushing them beyond the reach of many households. Inflationary pressures, particularly on staple foods, have eroded household purchasing power, leading to drastic coping strategies like reducing meal portions or skipping meals entirely. Geographic disparities between rural and urban populations also affect food

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accessibility. Rural areas face poor infrastructure and limited transportation options, resulting in food shortages or higher prices. Urban centers have better access to markets but still face high economic burdens, which limit low-income households' ability to afford nutritious food (Losada-Rojas et al., 2021).

Nigeria's dependence on imported staples has exposed its food supply chains to global shocks, such as the Russia-Ukraine conflict, which led to significant disruptions in wheat and fertilizer supplies. This has weakened Nigeria's food system's resilience, making it more challenging for food to reach consumers at reasonable prices. Population growth (estimated 2.5% per year) in Nigeria continues to increase food demand, but agricultural productivity has not kept pace, creating a widening gap in food availability and accessibility (The Conversation, 2024). Regional access variability also varies, with northern Nigeria experiencing the highest rates of food insecurity. The growing rate of food insecurity disproportionately affects vulnerable groups, including low-income households, women, and children. The number of children suffering from malnutrition and other health-related issues is rising as families face limited options for a balanced diet.

To improve food accessibility in Nigeria, a comprehensive strategy involving infrastructure investment, targeted social programs, and agricultural reforms is needed, focusing on both economic aspects and logistical and structural barriers, especially for vulnerable communities.

Availability

Food availability is the consistent physical availability of food in desired quantities, influenced by production, distribution, and exchange patterns of food goods. Food availability is a crucial aspect of food security, focusing on the availability of healthy food and the presence of food retailers. Research on food availability is often focused on "food deserts," which are low-income areas with high poverty rates and low access to grocery stores or supermarkets (Jafri et al., 2021). The availability of food retailers is often a focus in research and policy efforts to promote food security and healthy eating.

Nigeria's food availability is being impacted by domestic and external challenges, particularly in agriculture. Productivity setbacks in 2023 and external disruptions have severely limited staple food supply, deepening food insecurity. This underscores the need for systemic reforms in Nigeria's agricultural sector to ensure steady and resilient food availability.

In 2023, agricultural productivity in Nigeria declined due to economic constraints, insufficient investment, and environmental challenges. Rising fuel prices and transportation costs have impacted farmers' efficiency, making essential inputs less accessible for smallholder farmers. Policy changes, such as removing fuel subsidies and unifying the foreign exchange rate, have increased operational costs, reducing agricultural investment and resulting in lower productivity. Climate variability and unpredictable weather patterns have also negatively affected crop yields, with extreme weather events like floods damaging crops and displacing farming communities. Despite not being at high risk for famine or drought, extreme weather events have further reduced food production volume (Touch et al., 2024).

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Nigeria's food availability has been significantly impacted by global events, particularly the Russia-Ukraine war. This conflict disrupted the global supply of essential agricultural inputs, including fertilizer and wheat, leading to sudden shortages and inflated costs. The war also exacerbated global inflation, increasing the cost of food imports and other commodities. Nigeria's dependence on these imports, such as rice and wheat, resulted in a 23% rise in food prices between 2021 and 2022. This led to reduced local food stocks as more households struggled to afford basic commodities. The war's impact on Nigeria's food supply has been significant, affecting farmers' ability to achieve optimal yields and reducing crop outputs.

Nigeria's food system is vulnerable to shocks due to its reliance on imports and inadequate infrastructure for food storage and distribution. Poor rural infrastructure, including inadequate storage facilities and limited road networks, leads to post-harvest losses of over 30% annually, reducing food availability, especially in remote areas. Nigeria also faces large supply gaps for staple crops, such as wheat and maize, which increase its dependency on imports and make it more susceptible to external price fluctuations and availability issues. These structural weaknesses have led to significant food shortages and inefficiency in the country.

Nigeria's population growth rate of 2.5% annually has led to a rise in demand for staple foods like maize, rice, and wheat. However, the country's agricultural output has not kept up, widening the availability gap. For example, maize demand nearly doubled from 2016 to 2022, while supply remained below demand levels, highlighting the urgent need to increase production capacity. Climate change poses ongoing risks to food availability in Nigeria, including soil degradation, desertification, and flooding. These environmental challenges limit arable land and agricultural yields, complicating food supply maintenance efforts. Nigeria's agriculture is highly climate-sensitive, with most farmers relying on rainfall rather than irrigation, limiting productivity during dry seasons.

Linking Affordability, Accessibility, and Availability

Nigeria’s food security trilemma is defined by the complex and interconnected relationship among affordability, accessibility, and availability. Each of these dimensions influences the others, forming a cyclical pattern that can intensify food insecurity if not addressed comprehensively. The interactions among these three pillars reveal the structural and economic factors that continue to shape Nigeria’s food landscape.

Affordability and accessibility are closely intertwined, as rising food prices—driven by inflation, high interest rates, and increasing production costs—directly constrain access to essential food items. For many low-income households, particularly in rural and conflict-affected regions, price increases severely limit their purchasing power and ability to obtain sufficient and nutritious food. Additionally, high fuel and transportation costs restrict the efficient distribution of food, especially to remote areas, further diminishing accessibility. As household incomes fail to keep pace with rising prices, families are forced to reduce food consumption, compromise on nutritional quality, and rely on less diverse diets, worsening both economic and nutritional insecurity.

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The link between availability and affordability is equally significant. Nigeria's continued dependence on imported staples such as wheat and rice exposes the country to fluctuations in global supply and price shocks, making locally available food less affordable. Environmental and external factors—such as floods, droughts, and international conflicts, further constrain domestic production, reducing food availability and driving up prices. Moreover, high interest rates discourage investment in agriculture, infrastructure, and food processing, limiting productive capacity and innovation. These factors contribute to shortages in supply, which in turn elevate food prices and erode affordability.

Accessibility and availability are also closely connected, particularly through infrastructural and environmental challenges. In many regions, especially the northeastern states affected by insecurity, poor transportation networks hinder the movement of food from production zones to consumer markets. This spatial disconnection restricts availability in some areas while leading to post-harvest losses in others. Climate-related disruptions; such as flooding, drought, and irregular rainfall, further reduce agricultural yields, constraining the flow of food to local markets and intensifying nationwide price pressures. Global supply chain vulnerabilities, including shortages of fertilizer and seeds, have compounded these challenges by limiting input availability and weakening overall food production capacity.

These interdependencies create a cyclical dynamic in which deficiencies in one dimension exacerbate weaknesses in the others. When food becomes unaffordable, accessibility declines for vulnerable households; when food is scarce, prices rise and affordability worsens; and when infrastructure or production fails, both availability and accessibility diminish simultaneously. This self-reinforcing cycle perpetuates food insecurity, reduces dietary diversity, undermines health and productivity, and deepens poverty levels across the population. Breaking this cycle requires integrated policy responses that simultaneously enhance production capacity, stabilize prices, and improve access to affordable, nutritious food for all Nigerians.

To break this cycle, targeted interventions are necessary. Figure 1 illustrates four interconnected strategies aimed at breaking the cycle of food insecurity in Nigeria. These strategies target the critical dimensions of affordability, accessibility, and availability. Stabilizing inflation is essential to control rising food prices, particularly benefiting low-income households by improving their purchasing power. Investing in agricultural infrastructure, such as irrigation systems, storage facilities, and rural roads, enhances both the availability of locally produced food and its physical accessibility across regions. Strengthening food supply chains ensures the consistent movement of food from production zones to markets, reducing distribution bottlenecks and improving both availability and accessibility. Providing targeted social protection such as food subsidies, conditional cash transfers, or emergency food aid, enhance affordability for vulnerable populations, safeguarding against acute food insecurity. These measures are mutually reinforcing and should be implemented as part of an integrated policy framework to improve Nigeria's food system resilience.

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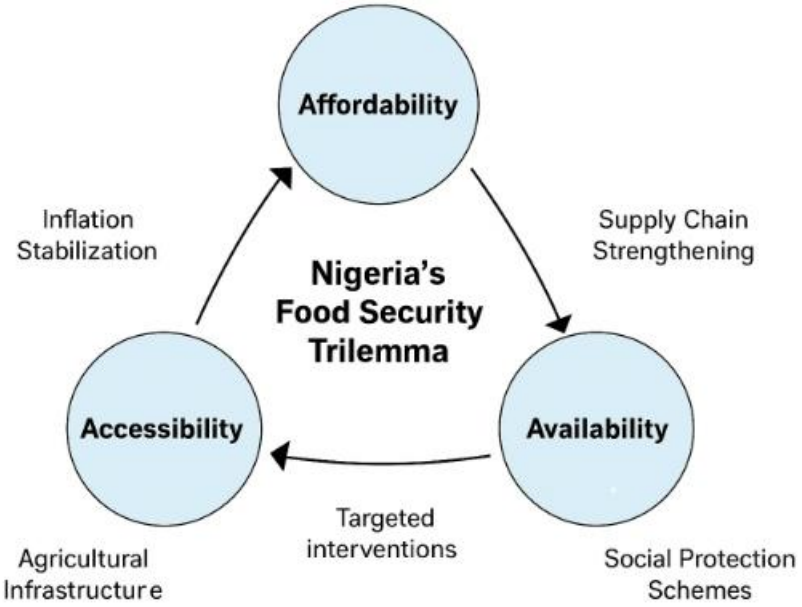
Figure 1: Cyclical Impacts and Interventions in Nigeria's Food Security Challenge



Nigeria's Post-Pandemic Agricultural Policies

The Nigerian government has implemented several policies to tackle the COVID-19 pandemic, focusing on agriculture's role in food security and economic recovery. The National Agricultural Technology and Innovation Policy (NATIP) 2022-2027 aims to diversify Nigeria's economy through agricultural development, enhancing food security across agriculture, livestock, and fisheries. It includes targeted interventions for the agricultural sector, such as strengthening research and training systems, accelerating mechanization, establishing agricultural development funds, advancing livestock development, and enhancing value chains for priority crops (FMARD, 2022).

The NDP 2021-2025 builds on the ERGP and aims for a diversified economy, investment in infrastructure, stronger security and governance, and a healthier, more educated populace. The plan aims to achieve an average economic growth of 4.6%, lift 35 million people out of poverty, create 21 million jobs, raise the revenue-to-GDP ratio to 15%, and improve health and education by 2025. Realizing these targets requires a N348.1 trillion investment, with N49.7 trillion from the government and N298.3 trillion from private sector contributions (NPC, 2021).

The Nigerian government, alongside NATIP and NDP, has initiated initiatives aimed at boosting agricultural productivity and financial empowerment for smallholder farmers. The initiatives include the following:

1. Agricultural Development Fund: The agricultural sector faces challenges due to a lack of sustainable funding. The country has not established a functional Agricultural Development Fund (ADF) to direct resources to research, technology upgrading,

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extension, innovation, and critical value chain development. The ADF will coordinate fund generation, project planning, monitoring, and evaluation, reducing over-reliance on external and foreign debt and retaining ownership of major agricultural interventions. Policy support programs include aligning the bill, securing government approval, ensuring qualified managers, and building a multi-stakeholder approach.

2. Extension Service Delivery: The Nigerian government is aiming to revitalize the extension service system by producing 130,000 extension workers annually using both conventional and e-extension systems. This will involve training and mentoring of specialized agents in remote locations, with an estimated 170,000 village extension agents. The policy support programmes include implementing the National Agricultural Extension Policy, strengthening research-extension-farmer linkages, training 130,000 extension workers annually, monitoring extension activities, encouraging private sector participation, improving extension personnel welfare, promoting ICT use, and establishing farmer helpline-centres.

3. Livestock Development: Nigeria is implementing major livestock intervention programs to address its net importation of meat and dairy products. These include the National Livestock Transformation Plan, Ruminant Livestock Intervention Programme, National Livestock Breed Improvement Programme, National Pasture Development Program, National Dairy Development Programme, and Livestock Productivity, and Resilience Support (L-PRES) Project. The focus is on improving animal genetic resources, establishing functional models, and promoting productivity improvement.

4. Strengthening Value-Chains for Priority Crops: The plan aims to improve agricultural value chains by identifying and promoting high-potential commodities and utilizing knowledge, technology, and capital for development. It will focus on 20 value chains, including rice, maize, sorghum, wheat, cassava, sesame, tomatoes, yam, cowpea, soybeans, cocoa, palm oil, hibiscus, cashew, potatoes, cotton, ginger, groundnuts, sugarcane, and oranges. Collaboration with states will generate specific value chains based on ecological or comparative advantages.

5. Fisheries & Aquaculture, Marine and Inland Fisheries Resources Development: Nigeria, despite its abundant water resources, is a net importer of fish and marine resources, contributing insignificantly to the country's GDP. To stimulate investment and productivity, the Fisheries and Aquaculture Import Reduction Strategy will be implemented, aiming to encourage local fish and marine production and processing, reduce fish importation, and create 500,000 new jobs. Policy Support Programmes and Actions will accelerate research, provide infrastructure, strengthen professional organizations, prevent over-exploitation, enhance fish breeding, and improve quality control.

6. Market Development: Infrastructural challenges, poor aggregation, and unorganized commodity markets limit farmers' ability to drive value on their commodities. A multi-stakeholder approach is proposed to upgrade major commodity markets,

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establish functional exchanges, promote warehouse receipt systems, and reorganize rural markets. This will increase income and create over 300,000 new jobs. Policy Support Programmes and Actions will ensure adequate Agricultural Market Information Services, minimize supply variations, reduce food shortages, balance export-led growth with import substitutions, and enforce standardized weights and measures.

7. Securing Agricultural Lands and Investments: The Partnership on Secure Agriculture Land and Investments (PSALI) is a multi-stakeholder approach aimed at restoring security in farming communities in Nigeria. It involves security agents, states, local communities, and civil society organizations. A Joint Task Force will be created to implement PSALI across the country. When properly structured, it could generate over 1 million jobs in rural communities. The policy supports re-examining the Land Use Act to make it more conducive to agriculture and investments.

8. Development of Rural Infrastructure: The Nigerian rural sector faces challenges in infrastructure development, poverty reduction, and job creation due to a lack of reliable data and programming. The National Development Plan aims for integrated rural development, focusing on infrastructure, resilience, and enabling environments.

9. Nutrition: The country plans to reverse malnutrition and stunting by accelerating initiatives under ATA and APP, focusing on nutrient-rich food production, agriculture research, and transforming food systems through mass media campaigns, social marketing, and awareness campaigns. The program aims to target at least 100,000 high-income jobs and enhance value chains for improved nutrition, particularly targeting women and increasing access to micronutrient-rich foods.

10. Standardization for Export: Nigeria is losing $10 billion in annual export opportunities from groundnut, palm oil, cocoa, and cotton due to declining production and quality. A multi-MDA approach aims to make agricultural inputs and outputs more cost-effective, benefiting the African Continental Free Trade Agreement and other export opportunities.

11. Promoting Digital and Climate SMART Agriculture: Climate change poses significant challenges to Nigeria's agricultural sector, including food security threats. Digital agriculture, using technologies like drones and the internet, can enhance agricultural development, productivity, and environmental protection. Policy Support Programmes & Action (PSPAs) aim to encourage digital technology development, create ecosystem-driven platforms, support sustainable business models, improve agricultural productivity, and engage over 50,000 graduates and 150,000 non-graduates in Nigeria's agricultural sector.

12. Strengthening Agricultural Lending and Insurance: Farmers in the Philippines face limited access to finance and high interest rates due to poor synergy among MDAs, weak delivery mechanisms, low capitalization, and negligible involvement of the Bank of Agriculture and National Agricultural Insurance Corporation in agricultural

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lending and insurance. To reverse this trend, recapitalization and reorganization of these institutions are proposed.

13. Data and Information Management: The National Agricultural Data Management and Information System (NADMIS) is being implemented in collaboration with stakeholders to improve agricultural policy and strategy, enhance data generation, conduct socio-economic impact assessments, conduct continuous policy analysis, produce aerial statistics, and ensure sustainability.

14. Access to Quality Agricultural Inputs: The Philippines is implementing fertilizer and seeds laws to improve agricultural competitiveness and access to high-quality inputs. A subsidy will cushion COVID-19's impact, and deregulation of fertilizer importation will incentivize private sector investments. Policy Support Programmes will support domestic production, promote organic fertilizer use, and facilitate organized markets.
15. Sustainable Use of Land and Water Resources: Nigeria's land and water resources are underdeveloped, requiring inter-ministerial and private sector partnerships to strengthen land clearing, degradation, and water resource management. This includes expanding agricultural land, utilizing existing dams, reservoirs, and waterways for irrigation, fisheries, and hydro-electric power generation.
16. Women and Youths in Agriculture: The 2019 Gender Policy and youth empowerment initiatives aim to mainstream women and youths' participation in value-chains, with two projects aiming to add 1 million jobs and promote rural development and small farmers' associations.
17. National Food Reserve and Food Security: The Nigerian government is collaborating with state governments and private sector operators to revamp the national food reserve, increasing its capacity to 2 million tons. This will reduce supply volatility, enhance price stability, and mitigate disaster impacts. Interventions include funding for Silo Complex stocking, storage facility overhauls, and policy support programs.
18. Cooperative Revitalization: Nigeria has 350,000 cooperative societies, crucial for grassroots mobilization and resource administration. Policy support programs include censusing, governance strengthening, education expansion, funding, technology promotion, trade network development, and law amendment.
19. Result-Based Monitoring and Evaluation: The PSPAs aim to achieve milestones through multi-MDA and multi-stakeholder approaches, including adopting efficient technologies, establishing strong linkages, increasing viable agricultural cooperatives, reducing food insecurity, improving nutrition, achieving efficient extension delivery systems, certification of high export potential commodities, increasing agricultural product value, generating 10% of the nation's foreign exchange earnings through agro-industrial exports, and enhancing agro-industrialization and employment.

Nigeria's post-pandemic agricultural policies aim to revitalize the sector and ensure food security. However, challenges include implementation gaps, limited financial resources, and climate change and environmental concerns. These issues can lead to delays and inefficiencies in delivering support to farmers. To ensure long-term success, Nigeria must address these challenges and enhance support for smallholder farmers, as well as address climate change and environmental concerns.

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External and Internal Stressors on Food Security

Economic Factors: High inflation reduces purchasing power, making food less accessible. Increased interest rates hinder investment in agriculture and food production. Exchange rate fluctuations impact the cost of imported food and agricultural inputs.

Global Factors: The Russia-Ukraine War caused supply chain disruptions for essential commodities like wheat and fertilizer, leading to increased global food prices affecting local markets and availability.

Environmental Factors: Current climate conditions are stable, but long-term projections suggest potential future challenges like droughts and flooding. Building resilience against climate-related impacts is crucial.

DISCUSSION OF FINDINGS

Syntheses of Findings

The Nigerian food security issue is a multifaceted issue involving affordability, accessibility, and availability, influenced by macroeconomic and agricultural sector challenges.

1. Key Strengths of Current Policies: The Nigerian government has been enhancing the agricultural sector post-COVID by focusing on increasing food production, reducing import dependency, and developing rural agricultural capacity through policies like the National Agricultural Technology and Innovation Policy (NATIP) and the National Development Plan (NDP). These initiatives aim to diversify the sector, foster innovation through digital and climate-smart agriculture, and increase job creation. The Partnership on Secure Agricultural Land and Investments (PSALI) also aims to address food security and promote sustainable rural development.
2. Challenges and Weaknesses: The current policy framework has limitations, including high inflation, exchange rate instability, and soaring interest rates, which increase production costs and impact food affordability. The removal of fuel subsidies and foreign exchange adjustments has increased operational costs for farmers and agribusinesses, limiting productivity and investment. Structural issues like inadequate infrastructure, logistical barriers, and low agricultural yield further exacerbate food scarcity and inflation. Reliance on imported staples exposes the food system to global shocks, further increasing prices.
3. Intersecting Factors: Nigeria's food security policies face challenges due to external and internal stressors, including global conflicts and climate change. Rising food prices, imported inflation, and climate-induced crop failures reduce accessibility, while increasing population demand amplifies the supply gap. This leaves low-income populations particularly vulnerable.

Policy Implications

Nigeria's post-pandemic food security policies have significant long-term impacts on the country's economy and food security. These include:

1. Nigeria's focus on domestic food production aims to reduce import dependency, stabilize economy, and protect from global price shocks. However, climate-resilient practices and improved irrigation systems may hinder growth.

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2. Expanding social safety nets can mitigate food insecurity, improve public health, reduce malnutrition, and build a productive workforce. However, inconsistent funding and targeting may hinder their full potential and sustainability.
3. Agricultural infrastructure projects improve rural roads, storage facilities, and market access, reducing post-harvest losses and encouraging investment. Sustaining these investments can enhance livelihoods, stabilize food supply chains, and attract private sector involvement.
4. Nigeria's agricultural stability relies on climate-resilient policies like drought-resistant crops and improved water management. Failure to address climate risks could lead to frequent food shortages, compromising food security and economic stability.
5. Addressing regional conflicts through coordinated policy actions can improve food accessibility, reduce violence, and enhance local economies, but insecurity may continue to disrupt food production and distribution in conflict-affected areas.

Nigeria's food security policies can enhance food access, stabilize prices, and support rural development, but their success depends on consistent implementation, security improvements, climate adaptation, and adequate funding.

Comparison with Other Nations

Nigeria's response to post-pandemic food security challenges is similar to other developing countries, but reveals unique challenges and strategic variations. The country has focused on domestic food production, similar to Kenya and Ethiopia, but often relies on staple crops like rice and maize, which may not be climate-resilient. Nigeria launched social safety net programs to support households during COVID-19, but these programs were limited in reach, leaving many unsupported. Unlike countries like Brazil and South Africa, Nigeria relies heavily on international aid for food security and crisis response. The country also faces unique challenges due to regional conflicts affecting food access, particularly in the Northeast and Northwest, which hinder the implementation of food security initiatives.

Conclusion

Nigeria's food security crisis is a multi-dimensional issue influenced by affordability, accessibility, and availability of essential food items. Economic constraints like inflation, currency depreciation, high interest rates, and rising production costs impact food affordability, reducing the purchasing power of Nigerian households, particularly among low-income groups. Import reliance, global supply chain disruptions, and climate-related challenges further strain domestic food supply, compromising nutrition for millions. Inadequate infrastructure and regional security issues further limit accessibility, particularly in rural areas.

The government's policy interventions, such as the National Development Plan and the National Agricultural Technology and Innovation Policy, aim to stabilize the agriculture sector and enhance food security by expanding value chains, strengthening rural development, and integrating digital and climate-smart agriculture. However, addressing systemic issues requires further integration of multi-sectoral approaches, including policies supporting localized production, climate resilience, and strengthened agricultural financing. Prioritizing vulnerable populations and regional inequalities in food access will ensure a more inclusive response to food insecurity.

Recommendations

1. The government should invest in rural infrastructure to improve market access and reduce post-harvest losses.
2. Promote sustainable agricultural practices by strengthening agricultural financing and investing in research and development to enhance productivity and resilience.
3. Food security programs should be implemented to address vulnerable populations' needs, while local food production should be promoted to reduce import reliance.
4. Market access should be strengthened through commodity exchanges and cooperatives.
5. The government should encourage public-private partnerships to mobilize resources for agricultural development.
6. Social protection measures should be strengthened to protect vulnerable populations from economic shocks.
7. Improving policy coordination among agencies and stakeholders in agriculture, trade, and food security is crucial, along with empowering women and youth in agriculture.

Competing Interest

The authors' had declared that no conflicting interest exist in this manuscript.

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