

# POLICY BRIEF



# Investing in Innovative Food Systems Solutions in Challenging Contexts

**A Policy Brief** by the United Nations World Food Programme (WFP), the African Development Bank (AfDB) and the International Food Policy Research Institute (IFPRI)

# Foreword

***‘As governments, donors, and development partners look to scale support in fragile regions, the question is no longer whether we can afford to invest – but whether we can afford not to’***

Humanitarian agencies are in a race against time to save lives in contexts where economies have collapsed as hunger is aggravated by conflicts and extreme weather, among other factors.

Take Nigeria, for example. Across the country lives and livelihoods are being shattered by conflict and climate shocks – once a breadbasket, the northern regions now rely heavily on humanitarian food assistance.

The numbers speak for themselves: 30.6 million people are food insecure – 10 million people in three northern states; 17 million children are malnourished – the highest number in Africa, second highest globally after India.

Farmers are cut off from their fields. Traders struggle to move goods through dangerous or impassable roads. Millions are displaced. And yet amid this fragility pockets of resilience are emerging in areas where conflict has subsided such that some farmers can return to their farms.

## Positive news

Food assistance has saved millions of lives in northern Nigeria and contributed to the local agricultural economy – but not always systematically. But what if food assistance could do more than meet immediate needs? What if it became the catalyst for rebuilding food systems – revitalizing local economies, and laying the groundwork for durable peace and recovery? (What are food systems? Everything from ‘farm to fork’ – it’s about having a broader picture of how we literally produce, transport, process and consume food.)

WFP’s shift from food aid to food assistance marked a major policy reform. In the case of Nigeria, by focusing on “assistance” rather than “aid”, WFP has enabled around U\$200 million per year to be invested in Nigeria. This includes: locally purchased food, cash transfers for people to buy food in local markets, and e-vouchers redeemable with local retailers.

But there are still untapped opportunities to strengthen local food systems, restore markets, and build long-term resilience. For example, cash-based transfers can unintentionally undermine local agriculture when beneficiaries and retailers choose imported food. This allows imports to outcompete or displace local production.

On the other hand, local food procurement can stimulate production, strengthen markets, and complement private sector investment – even in fragile settings.

## POLICY BRIEF

Investing in  
Innovative Food  
Systems Solutions in  
Challenging Contexts

With the right policies and incentives, food assistance can do more than save lives – it can help rebuild economies and support long-term recovery. We can support the same people with food assistance and resilience at the same time.

### **Maintaining momentum**

That's certainly possible in spite of challenges – according to a forthcoming study from the World Food Programme (WFP), the African Development Bank (AfDB), and the International Food Policy Research Institute (IFPRI).

The joint WFP-AfDB-IFPRI study will show that even in conflict-affected areas, food systems are not broken everywhere. Farmers are planting in pockets of stability. Women's cooperatives are processing food for local markets. Youth-led logistics enterprises are emerging. These islands of functionality offer something rare in fragile contexts: momentum. But maintaining momentum needs investment.

Nigeria's north: navigating the complexities

In northern Nigeria, insecurity has fractured supply chains. Poor infrastructure, high transport costs, and post-harvest losses (up to 30–50 percent for some crops) are driving up food prices and hitting farmers' incomes. Labour shortages resulting from people moving to escape conflict have pushed wages higher. Fertilizer and seed prices remain out of reach for most.

Despite these constraints, the region has extraordinary potential – spanning diverse agro-ecological zones with year-round production capacity. Demand for processed products is growing. Public investment, like the Government's AfDB-supported wheat cultivation on over a million hectares, is scaling up. And innovations in climate-smart agriculture, digital input systems, and inclusive finance are taking root.

The lesson is clear: with the right investments, even fragile regions can transform their food systems. So, what needs to change?

### **Reimagining food systems**

First, humanitarian food systems must be reimagined – from emergency pipelines to economic platforms. Local sourcing, tailored cash transfers, and co-investments in storage, processing, and logistics can turn assistance into a driver of resilience. The local purchase programme could be expanded so that it contributes as a humanitarian solution.

WFP's Food System Influence Index is one example of how the agency is shifting toward food-system-sensitive operations – designed to advise on the contributions cash transfers and local food purchases can have on the local food system.

### **Structuring investments**

Second, investments must be structured, not scattered. Too often, development plans stop at project lists. Typically missing are bankable investment portfolios. These portfolios should skillfully blend grant financing with concessional loans, specifically tailored to the unique challenges of fragile environments and supported by expert technical assistance on the ground.

## **POLICY BRIEF**

This approach has yet to be implemented and requires meaningful engagement between the private sector, international financial institutions, and operational agencies such as WFP. Bundling road repair with off-grid processing, or linking farmer cooperatives to procurement hubs, can unlock scale and impact.

This is where AfDB's infrastructure experience and IFPRI's analytics add real value. This demands a shift towards a risk-adjusted return mindset, in other words, "profitability" – a concept familiar to the private sector but one that requires a progressive adaptation among humanitarian and development actors.

### Backing farmers

It also requires the empowerment of small-scale farmers, engaging women and youth at the center of investment. Third, the real levers of resilience must be targeted: reducing post-harvest losses, improving input access, cutting transport costs, and modernizing processing.

Climate-smart technologies – such as solar-powered dryers, drought-tolerant seeds, and weather insurance – must be mainstreamed. And the informal taxation that bleeds value from food systems must be tackled.

Finally, recovery must be inclusive. Women and young people are central to food systems in fragile settings but face barriers gaining access to land, finance, and training. Targeted programmes – combined with broader policy reforms – are needed to unlock their economic potential.

### From fragility to prosperity

The situation in northern Nigeria is a microcosm of a larger reality: humanitarian aid is essential, but not enough. It must be linked to long-term strategies for recovery and growth. With proper support, food systems can stabilize communities, create jobs, and build peace. This is not only a development challenge. It is an investment opportunity. Structured correctly, food system investments can yield strong returns in fragile settings: reducing reliance on aid, improving nutrition, stimulating markets, and fostering political stability. As governments, donors, and development partners look to scale support in fragile regions, the question is no longer whether we can afford to invest – but whether we can afford not to.

Northern Nigeria offers a stark illustration of both the high stakes involved and the transformative possibilities that lie ahead, demanding our focused attention and decisive action.

## POLICY BRIEF

Investing in  
Innovative Food  
Systems Solutions in  
Challenging Contexts

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# Key Messages

- 01 Peace and security are essential for sustained recovery in Northern Nigeria.** The region's vast agricultural potential remains out of reach amid persistent insecurity, violent conflict, displacement, and armed banditry. These challenges have driven farmers off their fields, disrupted value chains, increased fragility, and deepened reliance on humanitarian assistance. Stability is not just a humanitarian imperative; it is an economic necessity for restoring livelihoods and food systems. Federal and state authorities, along with international partners, must prioritise dialogue, peacebuilding, and long-term stabilisation.
- 02 Pockets of stability can serve as anchors for recovery.** Despite the broader conflict, more stable areas offer promising footholds for food system revitalisation. Targeted investments in production, processing, storage, and transport in these zones can catalyse wider recovery. Stable areas must be seen as anchors for transformation, helping to drive recovery, reignite the region's economy and bring tangible benefits to vulnerable populations. If we overlook these opportunities, they risk falling into further decline. Supporting them now is essential to building long-term resilience.
- 03 Humanitarian food assistance should be leveraged to strengthen local food systems.** There is untapped potential to use food assistance to stimulate local production, incentivise value chain actors to meet demand while supporting recovery. Early investments in storage, processing, and transport infrastructure to reduce post-harvest losses and stabilise food supply chains, even amid disruptions; and tailored cash-based transfers tied to local commodities to ensure that economic benefits of assistance remain within the region, supporting smallholder farmers and regional enterprises.
- 04 Climate shocks and food inflation compound food insecurity.** Northern Nigeria's food system is highly susceptible to erratic rainfall, prolonged drought and severe flooding, which disrupt food production, markets, and livelihoods. Understanding these risks is critical for designing policies that enhance resilience, including investments in climate-resilient crops, robust storage, distribution networks, and risk management tools, alongside targeted social protection, are essential to safeguard nutrition and reduce vulnerability.
- 05 Transformative investments are necessary to rebuild the breadbasket.** Reviving Northern Nigeria's agricultural role requires large-scale investment, which includes improving access to quality inputs, expanding irrigation, and strengthening storage and agro-processing capacity. Improving rural-urban connectivity and addressing inefficiencies across the value chain will be key in unlocking growth. Public-private partnerships, alongside support from institutions like the African Development Bank, can help mobilise and structure the financing needed to sustain and scale recovery efforts.

- 06 WFP's Food System Influence Index (FSII) is a critical decision-support tool for food system transformation.** The FSII helps assess the systemic impacts of food assistance, offering a multidimensional complement to traditional market and nutrition assessments. It enables more evidence-based, food system-sensitive humanitarian strategies.
- 07 Structural challenges must be addressed to unlock Northern Nigeria's agricultural potential.** High input costs, labour shortages, post-harvest losses, and inefficient tax systems are major barriers to agricultural productivity. Addressing these challenges through targeted policies, mechanisation, and reduced taxation will unleash the region's full potential.
- 08 Like the rest of the country, Northern Nigeria has been severely affected by food price inflation.** As a result, the purchasing power of households has been severely impacted, with devastating impacts for food and nutrition security. To mitigate these impacts, targeted safety nets for vulnerable consumers are essential alongside support for small-scale farmers. In parallel, systemic investments are needed to reduce inefficiencies across value chains and promote climate-resilient practices within the food system.
- 09 Rebuilding Northern Nigeria's role as the breadbasket potential requires transformative investments that improve livelihoods and strengthen resilience.** To reclaim its role as Nigeria's agricultural heartland, large-scale investments are needed in infrastructure, storage, and agro-processing facilities. These efforts must focus on reducing inefficiencies and improving connectivity between rural production zones and national and regional markets. Public-private partnerships and targeted funding from development finance institutions, such as the African Development Bank (AfDB), can play a pivotal role in mobilising the resources required to build a modern, resilient food system that supports both food security and economic recovery.
- 10 Access to affordable, quality inputs must be expanded, especially through digital platforms.** Farmers need direct, affordable access to certified seeds and fertilizers. Mobile platforms offering price transparency and verified suppliers, combined with educational campaigns for farmers, can boost uptake. Scaling up efforts like AfDB's NAGS-AP operation is vital to achieving national targets for wheat and other staple crops.
- 11 Modernising transport, storage, and processing systems is essential for market resilience.** These fundamental functions in the food system drive profitability and sustainability at all levels. Investments in repairing and maintaining existing roads, improving on-farm storage, and upgrading and modernising milling and other processing infrastructure would reduce post-harvest losses, stabilise prices, and increase competitiveness.

- 12 Addressing food safety and quality is crucial to market competitiveness.** Improving food safety standards, particularly by tackling aflatoxin contamination in groundnuts and other crops, will enhance the marketability of produce from Northern Nigeria. Complying with global quality standards will also unlock access to export markets, boosting incomes across the agricultural value chain.
- 13 Building resilient food systems requires climate-smart approaches.** Climate-smart agriculture must be at the heart of regional transformation by boldly integrating improved productivity, climate adaptation, and emissions reduction. This includes technologies such as efficient irrigation systems, agroforestry, and improved pasture management, paired with early warning systems and functional insurance products.
- 14 Inclusive growth must be centred on women and youth.** Both are critical to the transformation of agriculture in Northern Nigeria. Empowering them with access to land, credit, and training will unlock their potential as key drivers of innovation and economic growth, helping to reduce unemployment and fostering resilience across communities.
- 15 Evidence-based policy and investment decisions are essential.** Effective food system transformation requires investment in rigorous research and decision-support tools. Governments, humanitarian actors, and donors should partner with institutions like the International Food Policy Research Institute (IFPRI) to generate and apply context-specific evidence to inform strategy, policy, and investment decisions.
- 16 Investments must be structured, not scattered,** skilfully blending grant financing with concessional loans, specifically tailored to the unique challenges of fragile environments and supported by expert technical assistance on the ground. This approach requires meaningful engagement among the private sector, international financial institutions (IFIs), and operational agencies, such as the World Food Programme (WFP). This demands a shift towards a risk-adjusted return mindset, in other words, “profitability” - a concept familiar to the private sector but one that requires a progressive adaptation among humanitarian and development actors.

## POLICY BRIEF

### I. Strengthening Humanitarian Food Systems: A Shared Agenda

The food system in large parts of Northern Nigeria has collapsed under insecurity and exacerbated by climate change. Food production, marketing, and consumption in these former breadbasket areas – especially in the northeastern states of Borno, Adamawa, and Yobe – have been disrupted by displacement and violence. Vulnerability and food insecurity are widespread. The World Food Programme (WFP) has been a major operator in Northern Nigeria for close to 10 years, delivering life-saving food assistance to communities grappling with conflict, displacement, climate shocks, and chronic food insecurity. These climate shocks not only reduce harvests but also erode rural livelihoods and destabilise markets, undermining Nigeria's food security and overall economic development. Even while urgent humanitarian needs are addressed by WFP and its partners, there is a pressing need for solutions that promote long-term self-reliance.

As part of its commitment to both meet immediate humanitarian needs and to contribute to long-term recovery and resilience, WFP in collaboration with the African Development Bank (AfDB) and the International Food Policy Research Institute (IFPRI) conducted the study “Investing in Innovative Food Systems Solutions in Challenging Contexts.” The study sets out to explore ways to leverage the operations of WFP and AfDB to transform the food system of Northern Nigeria, examining the region's food production, processing, storage, transport, and market systems.

WFP's motivation for this study is rooted in key features of its portfolio in the region whereby it provides support to beneficiaries through in-kind food, cash, and voucher assistance, while also engaging in activities such as local procurement of food to strengthen supply chains and stimulate local economies. By understanding the structural challenges and opportunities within Northern Nigeria's food system, WFP seeks to ensure that its operations not only address immediate hunger but also address the root causes of hunger and foster sustainable development and economic recovery.

Similarly, agriculture lies at the heart of Africa's development agenda, and the AfDB has made this sector a cornerstone of its strategic vision through its Feed Africa initiative. Launched in 2016, the strategy aims to transform agriculture into a competitive, inclusive, and sustainable sector capable of driving economic growth, reducing poverty, and improving food and nutrition security. This vision recognises the untapped potential of Africa's agricultural systems to not only meet the continent's food needs but also position Africa as a key player in global agricultural markets. With an emphasis on value chain development, climate resilience, and inclusivity, Feed Africa seeks to catalyse investments that support farmers including smallholders, women, and youth while driving large-scale structural transformation in agricultural economies.

#### POLICY BRIEF

The AfDB's broader strategy for agricultural development emphasises resilience and sustainability, particularly in regions vulnerable to climate change, conflict, and food insecurity. Northern Nigeria epitomises these challenges. With its predominantly agrarian economy, the region is central to Nigeria's food security but faces systemic barriers, including weak infrastructure, limited market access, and recurring climate shocks. These issues are compounded by conflict and insecurity, which disrupt supply chains and undermine the livelihoods of millions. Investing in agricultural development in Northern Nigeria is critical to addressing both immediate humanitarian needs and long-term development objectives. By strengthening food supply chains, improving infrastructure, and building resilience to shocks, the Bank aims to enable the region to contribute meaningfully to Nigeria's economic growth and food security.



To support food production, the AfDB launched the National Agricultural Growth Scheme – Agro-Pocket (NAGS-AP) operation in 2023. This initiative aims to help Nigeria cultivate over one million hectares of farmland, with a strong focus on wheat production in the Northern states, where dry-season wheat farming has high potential. To achieve this, the Bank has supported national authorities by providing improved seeds and fertilizers to enhance both production and productivity. During the 2023/24 dry season, an estimated 277,000 hectares of wheat were cultivated, nearly tripling the area cultivated in previous years, and contributing to around 10% of national wheat consumption.

In the 2024/25 dry season, farmers are again supported, this time to cultivate about 280,000 hectares. Similar support is being extended to rice and other priority commodities, in partnership with development actors such as JICA. These actions form part of Nigeria's Food and Agriculture Delivery Compact (FADC), presented at the High-Level Summit on Food Sovereignty and Resilience, held in Dakar in January 2023 and co-organised by the AfDB and the African Union. The Compact outlines ambitious production targets to help

## POLICY BRIEF

Nigeria achieve food sovereignty by 2027, including 3.2 million metric tons of wheat, 2.5 million metric tons of rice, and 2.0 million metric tons of maize, as well as increased production across fisheries and livestock value chains. AfDB's agricultural investments are now strategically aligned with these targets to help the country meet its food security and resilience goals.

This study of food supply chains in Northern Nigeria thus aligns closely with AfDB's focus on enhancing agricultural value chains, improving access to finance, and fostering regional integration. The Feed Africa strategy identifies key enablers for agricultural transformation, including improved infrastructure, access to inputs, and innovation in agricultural practices. This study provides critical insights into how these enablers can be operationalised in Northern Nigeria's context, offering a blueprint for scalable interventions.

Resilience-building is a central priority.

The Bank's Strategy for Addressing Fragility and Building Resilience in Africa highlights the need to tackle the root causes of vulnerability—namely poverty, unemployment, and inequality. Although Nigeria is not formally classified as a transition state, conditions in the fragile and conflict-affected Northern region have created conditions that warrant the application of a fragility lens aimed at building greater resilience. By examining trends and constraints across food supply chains, this study provides an opportunity to enhance resilience at multiple levels: strengthening household food security, stimulating local economic activity, and creating pathways out of multidimensional fragility in Northern Nigeria.

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**THERE IS AN OPPORTUNITY  
(AND IMPERATIVE) FOR  
WFP, AFDB, AND THEIR  
PARTNERS TO SEEK  
SOLUTIONS THAT KICKSTART  
AND PROMOTE RECOVERY  
AND TRANSFORMATION,  
EVEN UNDER THE CURRENT  
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According to the International Food Policy Research Institute (IFPRI), Northern Nigeria has great strategic importance in food security, agricultural production, and broader economic stability. As a major food-producing area with deep rural-urban market linkages, Northern Nigeria is also a hotspot for food insecurity and malnutrition, making it critical for understanding how food systems function under stress.

Given its extensive expertise in food policy analysis, market systems, and value chain dynamics, IFPRI brings rigorous data collection, advanced modelling techniques, and policy engagement to the study. With strong connections to policymakers, donors, and development agencies in Nigeria and beyond, IFPRI is well-positioned to bridge research with action, ensuring that findings inform strategies to strengthen food security, market resilience, and nutrition outcomes.

The insights and lessons captured in this study are designed to inform WFP's and AfDB's efforts to transform their operations and investments in Northern Nigeria and beyond.

## POLICY BRIEF

Investing in  
Innovative Food  
Systems Solutions in  
Challenging Contexts

For WFP, they serve as a guide for aligning humanitarian interventions with the broader objective of rebuilding resilient food systems, ensuring that the benefits of assistance extend beyond emergency relief to contribute to lasting recovery and development. For AfDB, the study complements ongoing investments in infrastructure, irrigation, and rural finance in the region, ensuring that these investments are both evidence-based and impactful.

The study is therefore part of a broader strategic re-examination of challenges and opportunities in Northern Nigeria, with a view to identifying and scaling operational innovations. In retrospect, the multi-crises experienced by Nigeria and other developing countries over the past five years should have spurred a broader response from the international development community to avoid or slow down the food price increases and other disruptions in the food system. There is an opportunity (and imperative) for WFP, AfDB, and their partners to seek solutions that kickstart and promote recovery and transformation, even under the current fluid security context.

## II. Approach and Objectives

The “*Investing in Innovative Food Systems Solutions in Challenging Contexts*” study provides an in-depth analysis of eight key commodities across Northern Nigeria, focusing on conflict-affected areas. Covering four staple cereals (sorghum, millet, maize, and wheat), three legumes (cowpeas, soybeans, and groundnuts), and one vegetable (tomatoes), the study examines food production hubs, trade flows, transport routes, price trends, and supply chain costs. The study analyses the roles of producers, transporters, processors, and traders in key value chains within major market centres in the BAY states (Borno, Adamawa, and Yobe) and strategic corridors like Kano, Potiskum, Kaduna, Zaria, Maiduguri, and Yola. It also considers connections with other regions (e.g., Lagos, Abuja, Ibadan) and cross-border trade.

The primary objectives of this study were to: (1) understand the structure and functioning of food systems in Northern Nigeria, focusing on conflict-affected Northeast Nigeria and (2) identify key actions—such as policy changes, institutional innovations, and investments—that can strengthen food systems and contribute to agriculture-based recovery in conflict-affected areas.

## II. Key Findings



**The findings highlight critical dimensions of Northern Nigeria’s food system, spanning production potential, cost structures, and price dynamics. They reveal both systemic challenges and significant opportunities for growth, from leveraging agroecological diversity and addressing post-harvest losses to mitigating the impacts of conflict, inadequate infrastructure, and rising input costs.**

Each set of findings underscores the complex interplay of factors affecting food security and affordability, offering insights into areas where strategic interventions can improve supply chain efficiency, enhance productivity, and stabilise prices.

### Food Supply Chain Mapping

**Northern Nigeria’s strong agricultural potential is undermined by transport bottlenecks, post-harvest losses, and high input costs.** These challenges must be addressed to unlock food system resilience, support agro-processing, and generate inclusive jobs. The region has significant production potential for grains, thriving across diverse agro-ecological zones, which could enable year-round supply and resilience to localised climate risks. However, the region’s extensive transport and distribution network is hindered by inefficiencies, particularly in conflict-prone and rural areas where roads are often unsafe or impassable during the rainy season. The growing demand for processed products such as flour, pasta, and animal-sourced foods presents opportunities for agro-processors to expand and diversify offerings, potentially enhancing food security and generating inclusive jobs for women and youth. Despite this potential, high post-harvest losses—up to 30 per cent for grains and 50 per cent for perishables—severely reduce market supply and inflate consumer prices. These losses stem from inadequate storage, poor handling practices, and the lack of cold chains, especially in remote areas. Farmers face inflated input costs, adulterated supplies, and irregular deliveries, which are exacerbated by conflict disruptions. These challenges deter investments in productivity and contribute to stagnating yields and higher food costs.

## POLICY BRIEF

Investing in  
Innovative Food  
Systems Solutions in  
Challenging Contexts

## Cost Build-Up Analysis

**High production costs, weak infrastructure, and fragmented taxation and finance systems are squeezing both farmers and traders in Northern Nigeria, leaving producers with just 23% of final market value and deterring investment across the value chain.** Labour shortages caused by conflict-induced migration to urban areas have significantly increased wages, driving production costs higher, particularly for labour-intensive crops. Input costs for fertilizers and improved seeds remain prohibitively high due to foreign exchange policies, currency fluctuations, and limited local production. Poor road infrastructure and inadequate storage capacity further exacerbate inefficiencies, forcing farmers to sell produce immediately after harvest at low prices, reducing their bargaining power. Informal taxation along transport routes adds costs, while duplicative formal taxes imposed at federal, state, and local levels discourage investment and erode competitiveness. Sparse and inefficient agro-processing facilities, often located far from production hubs, limit value-addition opportunities and further increase transport costs. On average, farmers receive only 23 per cent of the market value of commodities. Traders receive a higher share (29 per cent) but face high borrowing costs due to elevated interest rates, limiting their ability to expand operations and invest in value chains.

## Price Analysis

**Prices vary significantly across states due to differences in climatic conditions, logistics, and market dynamics.** White maize demonstrates the highest volatility, with prices ranging from N164.88 in Plateau State to N995.90 in Rivers State and a standard deviation of N195.64. Groundnuts and brown cowpeas similarly exhibit broad price ranges (N331.64–N668.92 and N310.06–N654.11, respectively), indicating regional disparities in production and market access. In contrast, wheat flour prices, though steadily increasing, remain relatively stable (N233.81–N472.58, standard deviation of N43.71), reflecting Nigeria's dependency on imports.

From 2016 to 2024, prices for all major commodities trended upward, driven by inflationary pressures, supply chain disruptions, and external shocks, especially between 2023 and 2024. The COVID-19 pandemic caused significant price surges, particularly for cowpeas and maize, which spiked sharply in 2020 and remained elevated through 2021. The Ukraine-Russia war led to wheat prices escalating from N487.43 in January 2022 to N796.29 by May 2023, a 63.34 per cent increase.

**The most significant changes are observed after 2023, with fuel subsidy removal and naira devaluation driving steep increases in key commodities.** Between May 2023 and 2024, white maize prices surged by 56.68 per cent, rising from N337.2/kg to N528.14/kg, while yellow maize increased by 46.66 per cent over the same period. Sorghum experienced the most dramatic increase, with brown and white varieties rising by 83.91 per cent and 83.46 per cent, respectively, reflecting their sensitivity to transportation and production costs. Rice prices also saw large increases, with local rice in Abuja increasing by 62 per cent, from N467.2/kg to N757.2/kg, while imported rice rose by 22.1 per cent, reaching N1052.4/kg. Beans (cowpeas) demonstrated regional variability, with white cowpeas increasing by 24.65 per cent and brown cowpeas increasing by 19.67 per cent. Wheat prices, heavily influenced by global markets and domestic transportation costs, rose by 28.35 per cent, highlighting Nigeria's vulnerability to both external and internal pressures.

## POLICY BRIEF

**These price increases are particularly concerning for lower-income households, as food expenditures represent a sizeable portion of their budgets.** By 2024, the compounding effects of these shocks had significantly impacted food security. Simulation analysis suggests that food poverty rates rose by 9.1 per cent (from 42.9 per cent to 52.0 per cent), and calorie consumption fell by 13.7 per cent nationally. Lower-income households have borne the brunt, with the poorest quintile reducing food consumption expenditure by 12.7 per cent and calorie intake by 16.0 per cent. Rural areas experienced higher food poverty rates (59.0 per cent) compared to urban areas (40.9 per cent) due to greater sensitivity to transportation and input costs.

## IV. Recommendations

**Recommendations for policy and investment fall into short-, medium-, and long-term actions, each targeting specific constraints and opportunities within the system.**

Viewed together, the recommendations aim to improve infrastructure, reduce inefficiency, and enhance the livelihoods of farmers and other stakeholders. By addressing immediate bottlenecks, they lay the groundwork for sustainable and inclusive growth, strengthening food security and boosting economic resilience in the region.

### Short-Term Actions

(1–2 Years)

#### 01 Leverage humanitarian food assistance to strengthen food systems.

High potential investment areas include local sourcing and supply chain strengthening, infrastructure investments for resilience, and tailored cash and voucher programmes



## POLICY BRIEF

Investing in  
Innovative Food  
Systems Solutions in  
Challenging Contexts

- 02 Facilitate access to affordable, high-quality inputs through digital platforms.**
- Develop mobile-based platforms where farmers can purchase authentic seeds, fertilizers, and pesticides directly from trusted suppliers. These platforms should incorporate features like price transparency and farmer reviews to build trust. Simultaneously, launch campaigns to educate farmers on the importance of using quality inputs (seeds and fertilizers) using these platforms and provide support for those without smartphones. In this respect expanding the AfDB's NAGS-AP operation, which is supporting the country in cultivating about 1 million hectares or more to attain its target for wheat, is critical.
- 03 Improve road and transport networks.**
- Prioritise repairing and maintaining existing roads, particularly those connecting rural production areas to urban centres and markets. Focus on roads that frequently become impassable during the rainy season, as these are critical for reducing post-harvest losses and lowering transport costs. Community-led road improvement programs, supported by government funding and local labour, can deliver rapid results.
- 04 Provide training and tools on post-harvest handling techniques to reduce losses.**
- Introduce training workshops focused on proper drying, storage, and handling of grains and perishables like tomatoes. Distribute affordable post-harvest tools such as drying sheets, hermetic storage bags, and low-cost moisture meters. These interventions can immediately reduce spoilage and improve food quality.
- 05 Introduce aflatoxin control measures and affordable testing kits.**
- Distribute bio-control products like Aflasafe to reduce aflatoxin contamination of groundnuts and other crops. Affordable aflatoxin testing kits should be made available at rural cooperative centres, with training provided to farmers on their use. These measures will enhance food safety and unlock export opportunities.
- 06 Streamline checkpoints and reduce informal taxation along transport routes.**
- Form a government-led task force to monitor transport checkpoints and eliminate illegal fees. Introduce a hotline for traders and transporters to report harassment, supported by strict penalties for offenders. These measures will reduce costs and improve the predictability of transporting goods.

## POLICY BRIEF

**07** **Develop a conflict sensitive approach to agricultural investments.**

Introduce a clear framework that ensures that investments are not escalating or creating new conflict dynamics conflicts but adequately responding to conflict drivers and contributing to peace in the region.

**08** **Mainstream climate, peace, and security nexus.**

Ensure that climate adaptation in the agricultural sector does not create unintended consequences, that will ultimately only serve to undermine the livelihood of communities.

**Medium-Term Actions (3–5 Years)**

**01** **Develop decentralised storage facilities and cold chains close to production areas.**

Build small- and medium-scale storage units, such as silos and refrigerated warehouses in rural areas to reduce post-harvest losses. Cold chain infrastructure for perishables like tomatoes should also be developed to ensure a steady supply of fresh produce. Public-private partnerships can mobilise the necessary investment while ensuring efficiency in facility management.



**POLICY BRIEF**

Investing in Innovative Food Systems Solutions in Challenging Contexts

**02** **Expand skill development programs targeting women and youth in agriculture.**

Establish training centres offering courses in modern farming practices, agri-business management, and agro-processing. Programs should also provide mentorship and financial literacy training to help women and youth access credit and run successful agricultural enterprises. This will foster inclusivity and economic empowerment.

- 03 Leverage farmer cooperatives for shared access to mechanised tools and machinery.** Promote cooperative-based models where farmers pool resources to access machinery such as motorised seeders, sprayers, and tractors. Government subsidies or private grants can lower costs, while cooperative members can receive training on equipment maintenance and optimal use.
- 04 Introduce contract farming arrangements with risk-sharing mechanisms.** Partner farmers with agro-processors and buyers through contract farming schemes that guarantee markets, inputs, and technical assistance. Contracts should include risk-sharing mechanisms like price floors, input loans, and crop insurance to protect both farmers and buyers from market fluctuations.
- 05 Provide climate resilient crop production systems.** This will entail climate-smart farming practices, water management and irrigation systems, risk management and insurance, and Knowledge and advisory services.
- 06 Promote research and adoption of climate-resilient crop varieties.** Collaborate with agricultural research institutions to develop high-yield, drought-tolerant, and pest-resistant crop varieties suited to Northern Nigeria's diverse agroecological zones. Distribute these seeds through extension services and ensure affordability for smallholder farmers.

## POLICY BRIEF

Investing in  
Innovative Food  
Systems Solutions in  
Challenging Contexts



## Long-Term Actions (Over 5 Years)

### 01 Adopt sustainable, “climate-smart” methods to drastically lower emissions while enhancing production.

Agroforestry, better livestock management, and effective fertilizer usage cut emissions and boost farm yields and profitability. Using renewable energy for food chain water pumping, processing, and cold storage cuts carbon emissions. Reducing food loss and waste, which causes 8–10% of global emissions, is another significant approach. Nigeria can reduce climate change, improve food security, and boost farmers' lives by making food systems greener and more efficient.



### 02 Expand agro-processing capacity with renewable energy integration.

Build modern processing facilities near production hubs to reduce transport costs and increase value addition. Integrating renewable energy solutions like solar power will lower operational costs and improve the reliability of these facilities, reducing their dependence on Nigeria's unstable power grid.

### 03 Foster public-private partnerships for large-scale Storage infrastructure development.

Mobilise long-term investments to develop large-scale storage facilities such as silos and cold warehouses in key agricultural zones. These facilities will help stabilise prices and ensure consistent supplies for domestic and export markets. Partnerships with private companies will bring technical expertise and ensure efficiency.

## POLICY BRIEF

Investing in  
Innovative Food  
Systems Solutions in  
Challenging Contexts

#### 04 Reform land rights and ensure equitable access to resources for women and youth.

Advocate for land reforms that grant women and youth secure ownership or leasehold rights to farmland. These reforms should be accompanied by financial incentives, such as reduced registration fees, to encourage formal land registration and investment by women and youth.

#### 05 Strengthen enforcement of food safety standards and quality inspections.

Set up regional laboratories equipped to test food products for aflatoxins and other contaminants. Train and certify farmers and processors in Good Agricultural and Manufacturing Practices (GAP and GMP) to enhance compliance with domestic and export market requirements.

#### 06 Build robust infrastructure networks to enhance market connectivity and reduce regional disparities.

Invest in major infrastructure projects, including highways, bridges, and railways, to connect Northern Nigeria's agricultural zones with urban centres and export hubs. Such investments will facilitate trade, lower transport costs, and promote regional economic integration.

## V. Leveraging Humanitarian Food Systems.

**Northern Nigeria's food systems have faced immense strain over the past decade, with conflict and displacement intersecting with climate shocks to create a confluence of challenges that has devastated local economies and livelihoods.** While humanitarian interventions such as in-kind and cash-based assistance have been essential in addressing immediate needs, this report reveals how such responses could have been more strategically designed to strengthen local food systems and support economic recovery.

**Had these insights been available in 2015, as the conflict was unfolding and WFP was commencing its humanitarian operations in the region, the response might have taken a more transformative approach.** Food assistance programs could have been leveraged to achieve both humanitarian and developmental goals. For example:

- I. Local sourcing and supply chain strengthening: Food assistance could have been linked to local production, incentivising farmers, and processors to meet demand while simultaneously building capacity.
- II. Infrastructure investments for resilience: Early investments in storage, processing, and transport infrastructure could have reduced losses and stabilised food supply chains, even amid disruptions.
- III. Tailored cash and voucher programmes: Cash-based transfers could have been tied to local commodities, ensuring that the economic benefits of assistance remained within the region, supporting smallholders and local enterprises.

### POLICY BRIEF

Investing in  
Innovative Food  
Systems Solutions in  
Challenging Contexts

**By bypassing these opportunities, the food assistance response often benefited markets far outside the region,** with cash being spent on imported goods or products sourced from distant parts of the country. While this approach met immediate needs, it failed to strengthen the local food economy or lay the groundwork for recovery.

**Opportunities to leverage humanitarian food assistance to strengthen local food systems and support economic recovery have not been fully seized upon.** Such opportunities include: linking food assistance to local production and incentivising farmers and processors to meet demand while simultaneously building capacity; early investments in storage, processing, and transport infrastructure to reduce losses and stabilise food supply chains, even amid disruptions; and tailored cash-based transfers tied to local commodities, aiming to ensure that more economic benefits of assistance remain within the region, supporting smallholders and local enterprises.



**Recognising these opportunities, WFP has developed the Food System Influence Index (FSII), a tool to assess the systemic impacts of WFP's interventions on food systems.** This tool addresses critical gaps in market and food system analysis, offering a robust complement to existing tools such as market assessments and nutrition-sensitive data. This approach ensures that decisions on the appropriate food assistance interventions are grounded in comprehensive, multi-dimensional evidence. The FSII has been developed as a tool to assess the systemic impacts of WFP's interventions on food systems, focusing on localisation, farmer income, and investment in sustainable practices. This tool aligns with WFP's existing Transfer Modality and Mechanism Selection (TMMS) framework by addressing critical gaps in market and food system analysis, offering a robust complement to tools such as the Market Functionality Index (MFI), the Fill the Nutrient Gap (FNG)

## POLICY BRIEF

Investing in  
Innovative Food  
Systems Solutions in  
Challenging Contexts

Minimum Expenditure Basket (MEB), and Financial Sector Intelligence (FSI). The FSII functions as an analytical layer within the TMMS, complementing existing tools and metrics such as the MFI, FNG, and MEB by focusing on upstream and systemic food system dynamics. The FSII does not function as a standalone tool; rather, it serves as an additional layer that will be integrated into the TMMS process, offering a more nuanced and holistic perspective to transfer modality selection, thereby avoiding duplication of processes. The FSII will be a critical component of a broader analytical framework that includes other tools, such as market assessments and nutrition-sensitive data. This approach ensures that transfer modality decisions are grounded in comprehensive, multi-dimensional evidence.

## For future interventions in similar contexts, the following principles should guide action:

- I Align humanitarian response with local economic systems.** Food assistance programs must be designed to not only provide relief but to also stimulate local economies. Integrating local sourcing, supply chain support, and infrastructure investments into humanitarian operations can create a dual benefit: addressing immediate needs while fostering long-term resilience.
- II Invest in stability where it exists.** Even in regions affected by conflict, there are pockets of relative stability. These areas represent opportunities for targeted investments in production, storage, processing, and transport, which can serve as anchors for broader recovery efforts. Ignoring these stable areas risks allowing them to decline further, missing critical opportunities for transformation.
- III Build crisis-resilient food systems.** The experience of Northern Nigeria underscores the importance of embedding resilience into food systems before crises occur. This includes investments in access to inputs, infrastructure, market linkages, and governance that allow local economies to absorb shocks and recover more quickly.
- IV Embed long-term thinking in humanitarian action.** Humanitarian responses must go beyond immediate relief to consider their long-term impact on local systems. A crisis response that builds local capacity, supports livelihoods, and integrates with broader development goals is not just more effective. It is essential for breaking cycles of dependency.
- V Learn and apply lessons proactively.** The lessons from Northern Nigeria are not unique. Similar challenges and opportunities will arise in other contexts. Development and humanitarian actors must use insights like these to design forward-thinking responses that leave communities stronger than they were before a crisis.

### POLICY BRIEF

Investing in  
Innovative Food  
Systems Solutions in  
Challenging Contexts

## VI. Leveraging Humanitarian Food Systems.

**The analysis identifies two high-impact investment opportunities in Northern Nigeria's food system: improving on-farm storage to reduce post-harvest losses and revitalising local milling capacity in Maiduguri to enhance food security and stimulate regional economies.** The investment cases are illustrative to show existing opportunities, not definitive guides to specific investments. They attempt to shed light on the magnitude of benefits and the potential incentives linked to investments addressing two major challenges identified by the analysis – i.e., on-farm post-harvest losses and limited wheat milling capacity.

**The proposed investment to reduce post-harvest losses features the introduction of airtight grain silos for sorghum in Yobe State.** Post-harvest losses could drop from 30 per cent to 2 per cent, enabling smallholder farmers to preserve their produce and sell at more favourable prices later in the year. A \$24.3 million investment is projected to save an additional 30,800 MT of sorghum annually, valued at \$12.32 million, with a Net Present Value (NPV) of \$28.98 million over five years and a 19.24 per cent return. A phased investment approach, starting with \$5 million, could still deliver strong returns (NPV of \$6.00 million, 20 per cent rate of return). Beyond financial gains, this intervention would enhance food security, reduce poverty, and provide a sustainable solution to post-harvest challenges faced by smallholder farmers in the region.



**Revitalising local wheat milling in Maiduguri offers a strategic opportunity to decrease reliance on imported wheat, boost regional economies, and support food security in Northern Nigeria.** Investments would focus on processing locally grown wheat, leveraging existing infrastructure to lower production costs and increase competitiveness in Northern markets. With improved milling technology, production costs could decrease to \$360.24 per ton compared to \$401.36 for imported flour. 60,000 MT of locally grown wheat annually would allow the mill to operate at no less than 50 per cent capacity, driving local economic growth and job creation. Public-private partnerships and diversification into new product offerings could further amplify the impact, making local milling a sustainable and profitable investment to strengthen the region's food system.

### POLICY BRIEF

Investing in  
Innovative Food  
Systems Solutions in  
Challenging Contexts

**The immediate challenge is to turn those projects into bankable opportunities that can attract blended capital—public and private, domestic, and global.** Project pipelines must be well-prepared, technically sound, and financially structured. Institutions must be capable of managing complex public-private partnerships. Financial instruments—like guarantees, insurance, and first-loss capital—that reduce risk and increase confidence must be in place. Legal frameworks that protect investors while safeguarding public interest must be developed.

**Persistent challenges linked to the ongoing insurgency in the region continue to severely limit agricultural production and markets.** This must be carefully considered when considering investment cases such as these. Success will depend on designing interventions that can operate effectively in conflict-affected areas while also contributing to long-term stability and recovery.

## VII. Conclusions

- I This study aligns with the broader commitment to fostering partnerships and leveraging synergies between public, private, and development actors to solve complex challenges. Northern Nigeria’s food systems require a multi-stakeholder effort to address systemic bottlenecks and unlock their full potential. This report represents a significant step in advancing that collective vision, providing actionable insights to inform ongoing and future investments in the region.
- II This study underscores the immense agricultural potential of Northern Nigeria and highlights the urgent need for transformative investments to unlock this potential in the face of persistent conflict, structural challenges, and climate change. For AfDB, these findings reaffirm the importance of targeted, scalable interventions in line with its Feed Africa and High Five priorities, particularly those addressing food security, resilience, and inclusive economic growth.
- III Central to the vision is the recognition that achieving agricultural transformation requires more than incremental changes. Rebuilding Northern Nigeria’s breadbasket potential demands bold, systemic interventions, including investments in rural infrastructure, transport networks, storage facilities, and agro-processing industries. In the medium term these investments align with WFP, AfDB, IFPRI’s commitment to addressing inefficiencies across the food value chains and fostering regional integration, enabling Northern Nigeria to contribute to broader West African food systems and markets.

### POLICY BRIEF

## POLICY BRIEF

Investing in  
Innovative Food  
Systems Solutions in  
Challenging Contexts

- IV** The findings also highlight opportunities to harness pockets of stability within the region as entry points for multilateral investments. These more secure areas can serve as anchors for recovery, where investments in improving critical access to inputs and climate-smart practices, value chain development, and digital solutions could drive rapid and sustainable growth. Experience in designing resilience-focused, integrated programs positions it well to take advantage of these opportunities.
  
- V** The results emphasise the critical need for inclusivity in food system transformation. Women and youth, who represent the backbone of Northern Nigeria's agricultural labour force, must be at the centre of interventions. Inclusive financing models, skills development, and entrepreneurship programs tailored to their needs are essential to achieving equitable and sustainable growth.
  
- VI** The study's focus on leveraging humanitarian food assistance to strengthen local food systems offers a compelling case for greater collaboration between development and humanitarian actors. Integrated approaches that align short-term relief with long-term resilience-building can maximise the impact of investments and accelerate progress toward food security and economic recovery. By addressing the structural challenges highlighted by this study, promoting climate-smart and inclusive growth, and leveraging regional synergies, AfDB can help unlock Northern Nigeria's agricultural potential, contributing to both national recovery and regional food security. This report provides a valuable evidence base to guide such efforts, offering actionable insights for strategic planning and implementation.
  
- VII** Finally, the study confirms that the challenges facing Northern Nigeria's food systems are immense, but so too is the potential for transformation. By synthesising findings, presenting actionable recommendations, and drawing critical lessons, this is a pathway to not only rebuild Northern Nigeria's food systems but to make them more resilient, inclusive, and sustainable. This requires not just investment, but a fundamental shift in how crises are approached, that of viewing humanitarian action as a bridge to long-term development. If acted upon, the lesson and recommendations in this report can help restore Northern Nigeria's position as a vital contributor to national and regional food security, even in the face of future challenges.