



Food insecurity and supply chain issues in fragile areas

EDITORIAL

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Abstract

This Special Issue examines how fragility and conflict affect food security outcomes by reshaping food supply chains. It collates evidence that collectively suggests global hunger arises less from insufficient production than from systemic disruptions in logistics, institutions, and the lack of coordination within fragile settings. The issue draws upon evidence from Europe, Africa, Asia, and Latin America, and the contributions are organized around three analytical pillars: macro-level shocks, meso-level supply chain fragility, and micro-level adaptive responses. Studies on conflict and infrastructure failures illustrate how political instability, energy crises, and war propagate through trade and transport systems, undermining market connectivity. Midstream analyses reveal that disruptions in processing, information provision, and service provision amplify food insecurity, while micro-level case studies show how producers and firms strategize under uncertainty. Together, the findings highlight that food insecurity is a systemic outcome of disrupted coordination among actors rather than reduced agricultural output. The issue calls for strengthening institutional linkages, technological innovation, and midstream capacity building to develop and sustain resilient food systems. It offers a framework for policymakers, researchers, and agribusiness managers to improve food system resilience by strengthening markets, institutions, and adaptive capacity.

Keywords: conflict, food insecurity, food supply chain, food system resilience, fragility

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1. Introduction

Food insecurity, one of the pressing global challenges of modern times, is increasingly recognized as an outcome of fragility and food system disruptions rather than global food scarcity. In 2023, an estimated 735 million people were undernourished worldwide, and over 2.4 billion people experienced moderate or severe food insecurity (FAO *et al.*, 2024). More than 70% of the world's food-insecure population now lives in fragile and conflict-affected settings, where violence, displacement, weak governance, and limited infrastructure undermine market functioning and institutional capacity (World Bank, 2022; WFP, 2023). At the same time, global agriculture produces sufficient calories to feed the world's population, yet failures in logistics, markets, and access prevent food from reaching those most in need (FAO *et al.*, 2024). These patterns suggest that hunger today is driven more by disruptions to food supply chains and the political and institutional environments in which they operate than by insufficient production (Barrett, 2021).

Fragility amplifies disruptions in food supply chains. In contexts marked by conflict, political instability, and weak regulatory capacity, the core pillars of food security — availability, access, and utilization — are systematically undermined. Shocks such as armed conflict, climate extremes, pandemics, and energy crises propagate through food systems by interrupting transportation networks, distorting prices, constraining information flows, and weakening coordination among value chain actors (OECD, 2020; World Bank, 2022). While food systems everywhere are exposed to shocks, fragile and conflict-affected areas are affected disproportionately due to limited adaptive capacity. Recent crises, including the COVID-19 pandemic and the Russia–Ukraine war, have further illustrated how breakdowns in logistics and trade can rapidly translate into food insecurity far beyond the immediate zones of disruption (FAO *et al.*, 2024; WFP, 2023). These dynamics position food security not only as an agricultural or humanitarian concern, but also as a systemic outcome of how supply chains function under conditions of institutional fragility.

Against this backdrop, this Special Issue of the *International Food and Agribusiness Management Review* was conceived to advance understanding of how food supply chains function under conditions of fragility and conflict, and how their performance shapes food security outcomes. The Call for Papers invited contributions that move beyond production-centered perspectives to examine the structural, institutional, and managerial dimensions of food system resilience in fragile settings. In particular, the issue sought to generate a critical mass of evidence on three interrelated domains: (i) how macro-level shocks such as conflict, trade disruptions, and geopolitical realignments propagate through food supply chains; (ii) how meso- and micro-level actors adapt through organizational, technological, and institutional responses; and (iii) how these dynamics influence food availability, access, and stability for vulnerable populations. By bringing together empirical studies, conceptual analyses, and systematic reviews across diverse geographical contexts, the Special Issue aims to contribute to a more integrated understanding of food security as an outcome of supply chain performance under institutional stress, with practical implications for agribusiness managers, policymakers, and development practitioners.

The contributions to this Special Issue span four continents: Europe, Africa, Asia and Latin America, encompassing a wide range of political, economic, and agroecological contexts. The cases include both low- and middle-income countries facing chronic fragility and conflict, as well as high-income economies confronting emerging systemic risks. This geographical diversity enables comparison across markedly different institutional environments and market structures, while also revealing common patterns in how shocks are transmitted through food supply chains. Despite variation in commodities, technologies, and governance structures, the papers converge on a shared finding: vulnerabilities in logistics, coordination, and information systems play a decisive role in shaping food security outcomes under stress. In this sense, the issue illustrates that fragility is not confined to a specific region or income category but reflects structural properties of food systems operating under conditions of institutional strain.

To structure these insights, the articles in this Special Issue can be viewed as contributing to three complementary analytical perspectives. The first focuses on macro-level shocks and systemic disruptions, examining how conflict, trade interruptions, and geopolitical instability reshape food supply chains and market outcomes. The second addresses meso-level supply chain fragility and adaptation, highlighting the roles of traders, processors, service providers, and information networks in mediating the transmission of shocks. The third emphasizes micro-level responses and strategic adjustment, exploring how producers and local actors adopt technologies, reorganize practices, and make strategic choices under conditions of uncertainty. Together with a systematic synthesis of evidence across fragile settings, these perspectives allow the Special Issue to link global disruptions to localized food security outcomes and to situate individual case studies within a broader systems framework.

2. Pillar I: Macro-level shocks and systemic disruptions

Several contributions in this Special Issue examine how large-scale shocks propagate through food systems by disrupting trade, infrastructure, and market coordination. Together, they show that conflict and systemic crises reshape food security primarily through breakdowns in logistics, institutions, and connectivity rather than through production losses alone.

Broyaka *et al.* (2026) analyze how the Russia–Ukraine war has transformed Ukraine’s grain supply chains, documenting damage to agricultural land, storage facilities, and transportation infrastructure, alongside shifts in crop composition and export routes. Their study highlights how wartime risks necessitated rapid reconfiguration of logistics corridors away from traditional Black Sea ports toward alternative land and river routes. To address these constraints, the authors propose a knowledge-graph-based optimization framework that integrates geospatial risk data, infrastructure networks, and logistical constraints to identify safer and more efficient transport pathways. This approach illustrates how digital and analytical tools can support adaptive supply chain management in conflict zones, where conventional routing models fail to account for security risks. Beyond Ukraine’s domestic context, the findings underscore the global implications of such disruptions given the country’s role as a major grain exporter. The paper thus frames conflict as a structural shock that reverberates through both national and international food systems, linking localized infrastructure damage to broader market instability (Broyaka *et al.*, 2026).

Extending the discussion of geopolitical shocks to the global trading system, Shanoyan *et al.* (2026) examine how trade restrictions and geopolitical tensions reshape food security risks through disruptions in international agricultural markets. The authors develop a conceptual framework linking trade policy uncertainty, export restrictions, and geopolitical fragmentation to supply chain vulnerabilities across importing and exporting countries. Using Armenia as an illustrative application, the study demonstrates how policy-driven trade constraints amplify price volatility, distort market signals, and weaken the ability of supply chains to respond to shocks in trade-dependent economies. The framework emphasizes that food security risks increasingly emerge from the interaction between geopolitical dynamics and trade-dependent supply chains rather than localized production failures alone.

Complementing this perspective, Goeb *et al.* (2026) provide firm-level evidence from Myanmar following the 2021 military coup, examining how political violence and institutional collapse affected agrifood value chains from production to retail. Using panel data from agrifood businesses, they show that conflict-induced disruptions widened price spreads between farmers and consumers while raising the cost of nutritionally adequate diets. Importantly, their analysis reveals that food insecurity emerged not simply from reduced output but from failures in finance, fuel supply, transport, and communication networks. Traders and processors faced liquidity constraints and mobility restrictions, which amplified upstream and downstream bottlenecks. By tracing impacts across multiple stages of the value chain, the study demonstrates how fragility operates through midstream actors that are often overlooked in food security research. The Myanmar case

thus reinforces the argument that macro-level political shocks translate into food insecurity through market disintegration rather than absolute scarcity (Goeb *et al.*, 2026).

Fragility is not confined to conflict-affected low-income countries. Kleingräber and Efken (2026) examine the vulnerability of Germany's livestock sector under hypothetical prolonged power outages, revealing how critical infrastructure failures threaten food production even in highly developed systems. Drawing on expert interviews and a semi-systematic review, they identify dependencies on electricity for ventilation, water supply, feeding systems, and animal welfare compliance. Their findings expose gaps between national emergency preparedness frameworks and on-farm operational realities, particularly regarding time-sensitive risks and coordination across actors. The study challenges assumptions that advanced economies are inherently resilient, showing instead that high levels of technological integration can increase exposure to cascading failures when redundancy is limited. By situating livestock production within broader debates on critical infrastructure and business continuity management, the paper extends the concept of fragility beyond conflict to encompass systemic exposure to compound shocks (Kleingräber and Efken, 2026).

Taken together, these studies demonstrate that macro-level shocks undermine food security primarily by disrupting transport, energy, finance, and coordination mechanisms. Whether through armed conflict or infrastructure failure, food insecurity emerges as a consequence of systemic fragility in supply chain organization rather than as a direct result of reduced agricultural output.

3. Pillar II: Meso-level supply chain fragility and adaptation

A second group of contributions focuses on how fragility manifests within food supply chains themselves, particularly through weaknesses in processing, service provision, and information networks. These studies demonstrate that food insecurity is often shaped less by aggregate shortages than by failures in coordination, quality control, and market intermediation.

Ross *et al.* (2026) examine structural vulnerabilities in Georgia's wheat and flour supply chain, a system characterized by heavy dependence on imported grain, particularly from Russia. Through laboratory analysis of wheat quality and assessment of milling performance, the authors show that domestically produced wheat exhibits weaker gluten strength and inconsistent baking properties relative to imported alternatives. These technical constraints limit the competitiveness of domestic production and reinforce import dependence, thereby increasing exposure to geopolitical and trade shocks. The study highlights how food security is shaped not only by the volume of grain available but by the ability of processing systems to meet quality standards demanded by millers and bakers. Ross *et al.* (2026) argue that investments in standardized quality testing, agronomic improvement, and milling technology are necessary to strengthen domestic supply chain resilience. Their findings underscore that fragility can arise from institutional and technical weaknesses within midstream segments of the value chain, linking food security directly to industrial upgrading and quality governance rather than to farm output alone (Ross *et al.*, 2026).

Baker *et al.* (2026) analyze how information and coordination failures affect food systems in the eastern Democratic Republic of Congo, a post-conflict region marked by weak infrastructure and persistent insecurity. Using a mixed-methods evaluation of ICT-enabled extension among cacao farmer cooperatives, the authors show that digital communication platforms improved farmer-extension interactions and strengthened farmer-to-farmer networks. These changes facilitated collective action around production challenges and theft prevention, while enhancing the flow of technical knowledge under conditions where physical mobility is constrained. The study emphasizes that extension services function not merely as channels for agronomic advice but as institutional connectors that sustain supply chain relationships in fragile contexts. Baker *et al.* demonstrate that relatively low-cost communication technologies can mitigate coordination failures that otherwise disrupt production and marketing. Their findings highlight the role of information systems as

meso-level infrastructure that enables resilience by stabilizing linkages between producers, organizations, and service providers (Baker *et al.*, 2026).

Staying within the African technological context, Fiamohe and Agossadou (2026) focus on mechanized harvesting services in Nigeria's rice sector, addressing postharvest losses as a critical bottleneck in food supply chains. Using contingent valuation and a double-hurdle model, they analyze farmers' preferences and willingness to pay for mechanical harvesting technologies. The results reveal strong demand for mechanization driven by perceptions of labor savings and loss reduction, yet adoption remains constrained by affordability and service availability. Their survival analysis further indicates high price sensitivity, suggesting that market-based diffusion of mechanization may be limited without targeted support. The study situates mechanization within a service market framework, emphasizing that technology adoption depends on the viability of intermediary actors who provide equipment and maintenance. By linking farmer behavior to supply chain performance, Fiamohe and Agossadou show that meso-level institutions such as service providers and pricing structures mediate the relationship between technological potential and food security outcomes. Their findings reinforce the view that reducing losses requires coordinated investments in service delivery systems, not simply technological availability (Fiamohe and Agossadou, 2026).

In an aggregate sense, these studies reveal that fragility within food systems often arises from weaknesses in processing capacity, service markets, and information flows. Across diverse contexts, food insecurity is shaped by the performance of midstream actors who translate production into marketable food, underscoring the centrality of meso-level coordination in sustaining food availability under stress.

4. Pillar III: Micro-level responses and system-wide synthesis

The third analytical perspective emphasizes how producers and local actors respond strategically to fragility, and how these micro-level adaptations connect to broader system dynamics. Together, these contributions highlight that food system resilience is shaped not only by infrastructure and institutions but also by decision-making under uncertainty.

Lopez Barrera (2026) examines these dynamics through a strategic teaching case set in Colombia's Orinoquía beef industry, a region shaped by intersecting pressures from climate risk, post-conflict governance, and evolving international sustainability standards. The case situates producers within a landscape marked by land tenure uncertainty, environmental regulation, and emerging requirements for traceability and ESG compliance in export markets. Rather than presenting resilience as a technical problem, the case foregrounds strategic dilemmas faced by firm-level actors who must weigh short-term survival against long-term positioning in increasingly regulated and competitive markets. Through scenario planning and value chain analysis, the case illustrates how decisions regarding market orientation, collective action, and investment in traceability systems are shaped by institutional fragility and exposure to external shocks. By framing these choices within a pedagogical structure, Lopez Barrera (2026) demonstrates how strategic management tools can be used to analyze agrifood systems operating under conditions of political and environmental uncertainty. The case underscores that micro-level strategies are constrained by governance arrangements and infrastructure but also capable of shaping pathways toward more inclusive and resilient value chains (Lopez Barrera, 2026).

A broader analytical context through a scoping review conducted by Wang *et al.* (2026) synthesizes evidence from studies examining food price shocks and food supply chains in fragile states. Drawing on a systematic screening of thousands of articles, the review identifies consistent patterns linking price volatility to disruptions in food availability and household food security. Importantly, the synthesis highlights the stabilizing role of informal markets and locally driven coordination mechanisms when formal institutions weaken. While price shocks are shown to undermine supply chains across contexts, their effects depend critically on institutional capacity and market structure. The review further reveals significant gaps in existing research, particularly regarding the role of midstream actors and the effectiveness of policy interventions aimed at stabilizing supply

chains under fragility. By integrating household-level coping strategies with market-level dynamics, Wang *et al.* provide a system-wide perspective that connects micro-level behavior to macro-level outcomes. Their findings reinforce the argument advanced across this Special Issue: food insecurity in fragile environments is not simply a consequence of reduced production but an emergent property of disrupted coordination across markets, institutions, and actors (Wang *et al.*, 2026).

These contributions demonstrate that micro-level adaptation and strategic behavior are integral to understanding food system resilience. Producer decisions regarding technology adoption, market participation, and collective organization are shaped by institutional uncertainty and external shocks, while also influencing how fragility is transmitted through supply chains. When viewed alongside the macro- and meso-level evidence presented in this Special Issue, these findings underscore the interdependence of strategic action, institutional context, and system-wide performance in shaping food security outcomes.

5. Concluding remarks

The evidence presented in this issue affirms that institutional weaknesses, coordination failures, and disruptions in logistics, finance, and information flows are central determinants of food insecurity under conditions of fragility. This aligns with the Call for Papers' emphasis on resilience as the capacity to anticipate, absorb, adapt to, and transform in the face of diverse and profound shocks from armed conflict and governance breakdowns to market volatility and climate extremes, while maintaining essential food system functions such as availability, access, and utilization for vulnerable populations.

For agribusiness managers and policymakers, these findings underscore the need to move beyond crisis response toward proactive resilience-building strategies that integrate technological, institutional, and human capital solutions. For researchers, the issue highlights persistent gaps in understanding midstream dynamics and the mechanisms through which localized adaptation can scale to system-wide resilience. By situating individual case studies within a broader systems perspective, this Special Issue advances a holistic interpretation of food security that connects agribusiness management practice with systemic fragility and vulnerability.

Building on the insights generated here, we can state that resilience in fragile economies cannot be treated as an add-on to traditional agrifood policy, but must become central to how agribusinesses and governments design supply chains, manage risk, and organize governance systems. The Call for Papers for this issue specifically invited research that addresses strategies for inclusive value chains, adaptive rural agribusiness development, institutional innovation, crisis response, and transformational adaptation, areas where the current collection has made important strides but where future research remains crucial.

Specifically, our findings point to several avenues for future inquiry and practical action:

- (1) Deepening understanding of midstream actors: especially how traders, processors, and service providers operate under fragility and how they can be supported through policy and finance mechanisms.
- (2) Evaluating institutional innovations: including governance reforms, community-based risk pooling, and public–private coordination platforms that enhance adaptive capacity.
- (3) Harnessing technology for resilience: from ICT-enabled extension services to data-driven logistics and decision-making tools that help agribusinesses anticipate and respond to disruptions.
- (4) Bridging informal and formal systems: recognizing the stabilizing role of informal markets, networks, and local coordination mechanisms that are often overlooked in formal policy frameworks.

These areas represent a research and practice agenda that builds on this Special Issue's findings to advance more resilient, inclusive, and adaptive food systems in the world's most fragile settings. In an era marked by geopolitical instability, climate extremes, and persistent socioeconomic fragility, this Special Issue demonstrates that food security must be understood as the outcome of dynamic supply chain processes

embedded in institutional environments. By integrating three interdependent pillars of macro shocks, meso-level coordination, and micro-level adaptation, the contributions collected here show that resilience emerges not from production alone but from the capacity of systems to absorb, adapt, and transform under pressure. Taken together, a consistent policy message emerges: strengthening food security in fragile economies requires a systemic focus on supply chain resilience, institutional connectivity, and adaptive capacity.

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