# Resilience of nonprofit food supply chains in times of crisis: a multiple case study of food banks during COVID-19

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## Abstract

**Purpose** – The COVID-19 pandemic exacerbated food insecurity and revealed structural vulnerabilities within food bank supply chains (FBSC), underscoring the fragility of food aid systems. This study aims to examine how FBSC stakeholders build resilience by integrating reactive and proactive capabilities and develops a transferable, prescriptive framework to foster network-level resilience.

**Design/methodology/approach** – Using a qualitative multiple case study design, the study triangulates data from focus groups, semi-structured interviews and field observations to analyze how resilience emerges and evolves across short-, medium- and long-term horizons.

**Findings** – In the short term, FBSC stakeholders deployed reactive capabilities, including agility, flexibility, coordination and adaptability, to manage immediate disruptions, such as supply volatility, storage constraints and surging demand. Over the medium and long term, proactive capabilities, including enhanced visibility, redundancy and strengthened collaboration, supported system stabilization and transformation. Beyond documenting pandemic responses, the study identifies a structured repertoire of resilience-building interventions linking operational practices to the capabilities that sustain them. Three research propositions are advanced to articulate how capabilities, structural conditions and contextual factors interact to foster network-level resilience.

**Originality/value** – Moving beyond descriptive accounts of crisis response, this study demonstrates how stakeholders foster network-level resilience through coordinated reactive and proactive capabilities. By translating empirical insights into a transferable framework of actionable interventions, it advances resilience theory in nonprofit supply chains and provides prescriptive guidance for managers, policymakers and scholars seeking to strengthen food aid systems in times of crisis.

**Keywords** Supply chain resilience, Food banks, Food aid, Covid-19, Case study

**Paper type** Research paper

## 1. Introduction

The COVID-19 pandemic exposed significant vulnerabilities in global food assistance systems, placing unprecedented strain on food banks supply chain (FBSC) as they confronted surging demand and widespread operational disruptions (Mook *et al.*, 2020; FAO, 2022). In Canada, the scale of this crisis was particularly stark: by 2023, food banks (FB) visits had increased by 78% compared to pre-pandemic levels, and by March 2024, usage had nearly doubled (+90%) from 2019, surpassing two million monthly visits, a record high (Matern *et al.*, 2023). In Quebec alone, FBs responded to over 2.6 million monthly requests for assistance in 2023, a 73% increase

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from 2019, marking a historic high in food insecurity (BAQ, 2023). This surge in demand coincided with acute operational challenges, including declining food donations, persistent logistical bottlenecks and a shrinking volunteer base, many of whom were older adults at elevated risk from COVID-19 (Soundja and Afif, 2025; Blessley and Mudambi, 2022). These compounded pressures disrupted FBs operations, prompting some to ration critical supplies and leaving others unable to meet community needs fully (BAQ, 2023).

Despite growing scholarly attention to supply chain resilience, a significant gap remains in understanding how nonprofit food systems, particularly FBSC, adapt to large-scale crises and build resilience in ways that generate actionable guidance for managers and policymakers (e.g. Al Naimi *et al.*, 2022; Shaheen *et al.*, 2023; Rivera *et al.*, 2023). Existing research has predominantly emphasized firm-level strategies or retrospective policy evaluations, providing limited insight into how resilience emerges at the interorganizational level under the distinctive operational, relational and resource constraints of nonprofit supply chains (Ivanov and Dolgui, 2020; Blessley and Mudambi, 2022). Prior studies often conceptualize resilience as the outcome of individual organizational capabilities, overlooking how FBs anticipate, absorb, adapt to and recover from disruptions as part of a coordinated, multiactor system (Blessley and Mudambi, 2022; Capodistrias *et al.*, 2022). In practice, however, the effectiveness of food aid systems depends on coordinated action among heterogeneous actors with divergent objectives, capabilities and constraints, rendering resilience-building inherently collective and network-dependent (Ataseven *et al.*, 2020; Blessley and Mudambi, 2022). During large-scale crises, this interdependence intensifies, as resilience hinges not only on the agility of individual organizations but also on the capacity of the broader network to coordinate, adapt and recover in a timely and sustainable manner (Esmaeilidouki *et al.*, 2023; Shaheen *et al.*, 2023; Zhang *et al.*, 2023). Accordingly, resilience is more appropriately conceptualized as a systemic outcome that emerges over time through structured interaction, mutual adaptation and collective learning across the network. Together, these considerations point to a critical gap: how short-term reactive responses evolve into durable, proactive capabilities at the network level and how this knowledge can be translated into concrete, transferable interventions for nonprofit food supply chains.

To address this gap, the present study examines how nonprofit food supply chains build resilience during crises, using a multiple case study of FBs during the COVID-19 pandemic as an illustrative context. Drawing on qualitative data from focus groups, semi-structured interviews and field observations across a province-wide FBSC, we investigate how stakeholders responded to disruptions, which strategies proved effective, and how these strategies became institutionalized and mutually reinforcing over time. By examining the interplay between reactive and proactive capabilities across short-, medium- and long-term horizons, we identify a structured repertoire of resilience-building interventions and develop three research propositions articulating how capabilities, structural conditions and contextual factors interact to foster network-level resilience. Building on these insights, we propose a transferable, prescriptive framework that conceptualizes FBSC resilience as a staged, cumulative process encompassing short-term response, medium-term stabilization and long-term transformation. By linking operational practices to the underlying capabilities that sustain them, the study advances resilience theory while providing practitioners and policymakers with prescriptive, transferable guidance to strengthen forward-looking crisis preparedness in nonprofit and humanitarian settings.

The remainder of the paper continues as follows. The literature review and theoretical foundation are presented first, followed by the conceptual framework. The methods and research design are then outlined, with the findings subsequently presented and discussed. The paper concludes with a discussion of the theoretical, managerial and policy implications and outlines directions for future research.

## 2. Literature review and conceptual framework

### 2.1 The evolving role of FBs

FBs are nonprofit organizations responsible for collecting, organizing and distributing food to individuals in need (Rivera *et al.*, 2023; Bonku *et al.*, 2025). Originally established as a temporary emergency response during the economic recession of the early 1980s (Riches, 1986; Warshawsky, 2024), FBs have since evolved into enduring institutions within the social safety net. Over time, their role has expanded from providing emergency food relief to offering more holistic services, such as nutrition education, skill-building programs and community engagement initiatives (Campbell *et al.*, 2015; Rizvi *et al.*, 2021; Morrow *et al.*, 2024). Despite this evolution, FBs have remained heavily dependent on food donations and volunteer labor, which introduces persistent vulnerabilities into their operations (e.g. Esmaeilidouki *et al.*, 2023). Prior to the COVID-19 pandemic, demand for FBs was already rising, driven by growing levels of precarious employment, housing insecurity and systemic inequities (Blessley and Mudambi, 2022). Most users belong to vulnerable groups, including the unemployed, refugees, indigenous peoples, single-parent families and individuals experiencing homelessness or reliant on social assistance (Men and Tarasuk, 2021). However, FBs reach remains limited. In 2020, only 28% of food-insecure households in Canada used FBs (Tarasuk *et al.*, 2020), due to barriers such as stigma, limited operating hours, transportation constraints and childcare responsibilities (McPherson, 2006).

FBs usage is often situational and crisis-driven, typically triggered by sudden income shocks and ending once the acute phase passes (Wason, 2019; Black and Seto, 2020). This intermittency poses serious planning challenges, both for FBs managing supply chains and for policymakers seeking to develop responsive food security strategies (Orgut *et al.*, 2016). Furthermore, donations, FBs primary source of inventory, are notoriously inconsistent in volume, quality and type (Mohan *et al.*, 2013; Flora *et al.*, 2015). Donations level can fluctuate rapidly and vary widely among donors, sometimes changing "quickly, frequently, and without notice" (Blessley and Mudambi, 2022: 70), making it difficult for FBs to anticipate incoming supplies and plan effectively (Flora *et al.*, 2015; Mohan *et al.*, 2013). This unpredictability, compounded by rising demand, leaves FBs, especially those in rural or underserved areas, struggling to meet requests (Orgut *et al.*, 2016) or forced to prioritize the most vulnerable (McPherson, 2006).

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Moreover, the composition of food hampers often lacks nutritional quality and cultural appropriateness. FBs frequently distribute surplus or unmarketable products that may not align with the dietary needs or cultural preferences of beneficiaries (Mook *et al.*, 2020; Thériault and Yadlowski, 2000). Due to logistical constraints, FBs disproportionately offer nonperishable items, selected for their long shelf life and ease of storage and distribution, despite users expressed preferences for fresh produce, dairy and protein-rich foods (Cloutier *et al.*, 2024; Immel *et al.*, 2021; Mook *et al.*, 2020). These mismatches can exacerbate food insecurity rather than mitigate it, leaving certain populations underserved and underscoring persistent operational challenges within the FBSC (Campbell *et al.*, 2015; Thériault and Yadlowski, 2000).

### 2.2 FBSC and the impact of the COVID-19 pandemic

The FBSC typically involves three key actors: donors, who provide food items; FBs, which handle reception, quality control and distribution; and beneficiaries, who receive the food assistance (Rivera *et al.*, 2023). FB operations rely heavily on donations and volunteer labor (Mejia *et al.*, 2015; Tarasuk *et al.*, 2020), making them particularly vulnerable to disruptions. The COVID-19 pandemic severely disrupted food aid supply chains, compounding longstanding structural vulnerabilities within the sector (Bublitz *et al.*, 2021; Regnier-Davies *et al.*, 2023). Initial lockdowns triggered supply shortages, consumer stockpiling and a sharp decline in donor contributions, which significantly depleted FBs inventories (e.g. Immel *et al.*, 2021). During the COVID-19 pandemic, the sudden loss of a large portion of the volunteer workforce significantly amplified operational uncertainty for nonprofit organizations (Koppiahraj *et al.*, 2021). Prior research has shown that large-scale crises can severely disrupt volunteer engagement and continuity (e.g. Kebriyaii *et al.*, 2021; Windon *et al.*, 2022). Nonprofit organizations, including FBs, reported a marked decline in volunteer participation driven by health risks, mobility restrictions and broader organizational disruptions (Kim, 2025). These constraints not only reduced operational capacity but also exposed structural vulnerabilities, including chronic overreliance on food donations (Soundja and Afif, 2025), as well as persistent limitations in infrastructure and resource availability (Blessley and Mudambi, 2022).

Concurrently, the closure of commercial kitchens generated an influx of unstable and difficult-to-manage food donations (Capodistrias *et al.*, 2022). These challenges, already present under normal conditions, were exacerbated during the crisis, including fluctuating supply volumes, demand surges, limited logistical capacities (e.g. storage, transportation and equipment) and persistent difficulties in securing funding for infrastructure modernization (Zhu *et al.*, 2014; Mejia *et al.*, 2015; Blessley and Mudambi, 2022; Shaheen *et al.*, 2023). In response, many FBs adopted direct food purchasing, an atypical strategy for organizations historically reliant on donations. These emergency purchases were often enabled by public funding and government pandemic relief programs (Capodistrias *et al.*, 2022; Blessley and Mudambi, 2022). In Quebec, the provincial government introduced tax incentives for private donors and invested in infrastructure upgrades and food acquisition (Gaboury-Bonhomme *et al.*, 2023; MAPAQ, 2021), while the federal government launched targeted funding measures such as the Surplus Food Rescue Program to help address supply shortages and ensure continued access to food for vulnerable populations (BAQ, 2023).

Beyond food donations and in-kind programs, prior research emphasizes an ongoing debate between cash-based versus in-kind assistance in crisis contexts (e.g. García Castillo, 2021; Piotrowicz, 2018). This debate is particularly relevant to FBSC resilience, as both modalities influence demand pressures on FBs and shape the sourcing and distribution strategies available during systemic disruptions (Jeong and Trako, 2022; García Castillo, 2021). Cash-based programs have expanded rapidly since 2015, largely due to their perceived cost-efficiency, their potential to stimulate local markets and their ability to preserve beneficiaries' dignity and choice. However, cash assistance also exposes recipients to market uncertainties, including inflation, price fluctuations and limited product availability (García Castillo, 2021). Conversely, in-kind aid directly addresses specific needs and ensures the physical availability of essential goods, often benefiting vulnerable populations such as women, children and the elderly. Yet, it typically involves higher logistics costs, risks of spoilage and reduced flexibility for recipients (García Castillo, 2021).

Although cash transfers are gaining prominence in humanitarian assistance, in-kind support remains the dominant modality, particularly in contexts where local markets are fragile or supply chains are disrupted (Piotrowicz, 2018). Within FBSCs, these approaches should therefore be viewed not as substitutes but as complementary mechanisms that shape both reactive and proactive resilience capabilities (Jeong and Trako, 2022; Piotrowicz, 2018), including emergency procurement, inventory buffering and coordination with public authorities (Piotrowicz, 2018; Sheffi and Rice, 2005; Men and Tarasuk, 2021). Over the past decade, humanitarian assistance and social protection instruments such as FBs have increasingly converged, reflecting a policy shift toward leveraging the complementarities between these modalities rather than framing them in opposition (Jeong and Trako, 2022).

Pandemic-induced disruptions underscored the dual pressures on FBs: surging demand and declining inputs. Yet they also revealed a surprising degree of adaptability among FBSC stakeholders (Esmaeilidouki *et al.*, 2023). Local food producers demonstrated resilience by reorganizing marketing and sales channels, streamlining operations and engaging in cross-sectoral collaboration (Schreiber *et al.*, 2022). A rural food distribution cooperative, for example, responded to a sharp increase in demand by prioritizing health and safety, restructuring workflows and overcoming human resource constraints, all while strengthening organizational resilience (Kralt and Cole, 2021). These cases highlight how FBSC stakeholders adapted through a variety of resilience strategies, including operational adjustments, innovation and partnership-building, while navigating interrelated challenges in supply, demand and labor.

More broadly, local actors, including producers, cooperatives and social service organizations, contributed to food aid system continuity by initiating collaborative partnerships, experimenting with digital tools and reconfiguring service delivery. For instance, FBs leveraged public–private partnerships to build resilience during the COVID-19 (Blessley and Mudambi, 2022). These responses illustrate the capacity of the nonprofit food sector to

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adapt dynamically under crisis conditions, often compensating for structural deficits through improvization and interorganizational coordination (Esmaeilidouki *et al.*, 2023).

### 2.3 Conceptualizing FBSC resilience

Over the past two decades, a growing body of research has explored resilience in supply chain, particularly within humanitarian and nonprofit sectors (e.g. Capodistrias *et al.*, 2022). Resilience is commonly defined as the capacity to anticipate, absorb, adapt to and recover from disruptions while maintaining core operational functions (Pettit *et al.*, 2010; Adobor and McMullen, 2018; Zhang *et al.*, 2023). In the FBSC context, resilience entails sustaining access to food for vulnerable populations amid conditions of heightened uncertainty and constraint (Thompson *et al.*, 2019; Kovács and Sigala, 2020). Effective FBSC resilience depends on the ability to respond to short-term shocks with agility, adjust to evolving circumstances with adaptability and engage stakeholders through alignment and coordinated action (Sheffi and Rice, 2005; Kovács and Sigala, 2020). Building on Thompson *et al.* (2019), FBSC resilience can be conceptualized as the capacity to maintain essential services under stress by drawing upon both reactive and proactive capabilities. Reactive strategies include emergency procurement, rapid resource reallocation and contingency planning, while proactive strategies involve investing in infrastructure, institutionalizing learning and cultivating trust-based partnerships (Al Naimi *et al.*, 2022; Blessley and Mudambi, 2022).

Herold *et al.* (2021) further emphasize a dual capability perspective, which frames resilience as both the management of downside risks and the leveraging of upside opportunities. In this view, downside risk management focuses on mitigating the immediate impacts of crises, such as donation volatility, supply interruptions or volunteer shortages, while leveraging upsides involves harnessing disruptions as opportunities for transformation, including through innovation, diversification and network strengthening. Moreover, FBs resilience is not solely an organizational attribute, but also a networked and systemic phenomenon (Shaheen *et al.*, 2023). FBs operate within a complex network of interdependent actors (e.g. donors, community-based organizations, government agencies and beneficiaries), each with distinct mandates, capacities and constraints. While FBs often operate downstream in distribution, the pandemic highlighted the critical role of upstream interventions in addressing structural vulnerabilities embedded in the broader food system (CFS, 2021). Therefore, system-wide resilience hinges on effective coordination, transparency and collaborative governance across this ecosystem (Al Naimi *et al.*, 2022).

Despite increasing attention to resilience in food assistance systems, existing research remains fragmented. Many studies focus on isolated organizational responses or single-case accounts (e.g. Kralt and Cole, 2021; Capodistrias *et al.*, 2022; Pimenta *et al.*, 2022), offering limited insight into how FBSC stakeholders collectively mobilized, coordinated and adapted during systemic disruptions like COVID-19. The interaction between reactive and proactive resilience strategies across different organizational levels, the role of collaborative governance in sustaining continuity during systemic shocks and the influence of structural and contextual factors on resilience-building efforts in nonprofit food systems, remain particularly underexplored.

Building on established resilience frameworks (e.g. Kovács and Sigala, 2020; Herold *et al.*, 2021; Blessley and Mudambi, 2022), this study adopts a dual-capability perspective on FBSC resilience that integrates insights from both humanitarian supply chain literature and nonprofit operations. The baseline conceptual framework (Figure 1), derived from prior research, provides a structured lens through which to position our empirical investigation. FBSC resilience capabilities are conceptualized along two complementary dimensions:

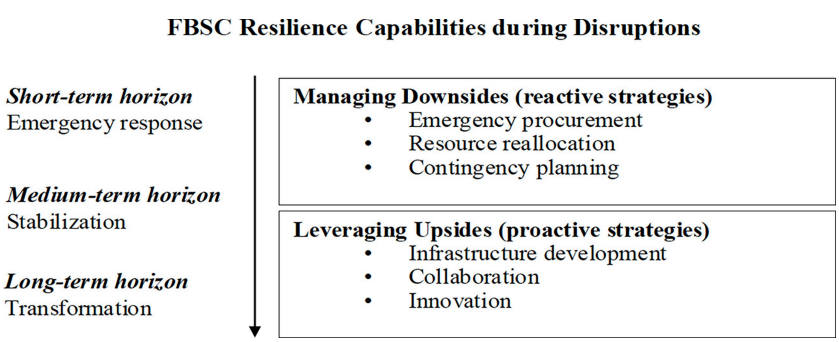
1. *Managing downsides*, that is, reactive strategies aimed at absorbing and mitigating immediate shocks (e.g. donation shortages, labor disruptions and supply interruptions); and
2. *Leveraging upsides*, that is, proactive strategies that foster transformation and long-term resilience, including infrastructure development, cross-sector collaboration and innovation.

These capabilities are examined across three temporal horizons, that is, short-term (emergency response), medium-term (stabilization) and long-term (transformation), to capture the dynamic and evolving nature of resilience in nonprofit food systems during disruptions (Herold *et al.*, 2021).

## 3. Methods and research design

An interpretive qualitative research approach was adopted (Darby *et al.*, 2019) to explore the proactive and reactive strategies implemented by FBSC stakeholders during the COVID-19 pandemic. This approach aims to deepen understanding of complex social phenomena rather than

**Figure 1** Conceptual framework

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produce replicable results (Herold *et al.*, 2021) and posits that interactions between researcher and participants create a process of *cooperative inquiry* (Darby *et al.*, 2019: 7).

### 3.1 Case study design

The case study method was adopted to explore real-world systems and address research questions related to contemporary phenomena (Yin, 2014). Considering the exploratory nature of this research, the approach provides a flexible research framework for collecting exhaustive, context-specific data. The FBSC serves as the primary analytical unit, or *collective level* (Yin, 2014), encompassing all key stakeholders involved in the Quebec food aid sector, including donors, Moissons (i.e. regional FBs in Quebec), community-based organizations (CBOs), *Banque Alimentaires du Québec* (BAQ), Food Banks Canada (FBC) and beneficiaries/users. Within this framework, these stakeholders are treated as subunits or *individual levels*. Rather than treating COVID-19 as the primary unit of analysis, we use the crisis as an analytical lens to identify the mechanisms, capabilities and operational practices that can be replicated and adapted in comparable systems.

The first subunit comprised five Moissons (Table 1), which act as intermediaries between donors and CBOs by collecting and distributing donated food across Quebec. While their primary mission is to supply CBOs, some Moissons also provide direct food assistance to individuals. Additional subunits included six donors, two CBOs and BAQ-a network comprising 19 Moissons and 13 associate members serving nearly 1,200 CBOs across the province. In this study, each Moisson and the actors directly connected to it (i.e. its affiliated donors and CBOs) are treated as individual cases. This case definition reflects the organizational reality of the Quebec FBSC, where each Moisson operates as a regional hub with its own supply chain configuration, resource base and governance structure. The cross-case comparison therefore draws on five cases, enabling the identification of both regional specificities and common patterns.

### 3.2 Data collection

Primary data was collected through focus groups, semi-structured interviews and workplace observations from November 2021 to June 2022 (Table 2). Interviewees were purposefully selected for their firsthand experience with the FBSC (Yin, 2014). Purposive sampling prioritized depth and relevance over representativeness, ensuring participants can provide detailed insights. The Quebec Ministry of Agriculture, Fisheries and Food (MAPAQ) and BAQ facilitated access by recommending knowledgeable individuals. This targeted approach enriched the data and offered a nuanced understanding of FBSC dynamics. Semi-structured interviews were conducted with the same participants as the focus groups to ensure depth and continuity of insights. Field observations validated and enriched the insights gathered during focus groups and interviews by capturing direct, unmanipulated behaviors in operational settings (Yin, 2014).

### 3.3 Data analysis strategy

An inductive thematic analysis of the focus group and interview transcripts was conducted using NVivo software. Codes were iteratively refined, merged or split based on their frequency and relevance within each theme, until thematic saturation was

**Table 1** Characteristics of the five Moissons studied (2021–2022)

| Moisson | A | B | C | D | E |
|---|---|---|---|---|---|
| **Area** | Urban | Urban | Rural | Urban | Rural |
| **Quantity of food distributed (kg)** | 4,270,583 | 17,096,840 | 875,693 | 4,342,956 | 567,775 |
| **Number of employees** | 22 | 46 | 12 | 14 | 10 |
| **Number of volunteer hours** | 9,420 | 55,643 | 12,043 | 39,235 | 4,801 |
| **Number of partnering CBOs** | 115 | 303 | 50 | 127 | 18 |
| **Number of donation points** | 182 | 352 | 50 | 165 | 40 |

**Source(s):** Data retrieved from the annual reports of Moissons

**Table 2** Data collection methods

| FBSC stakeholders | Identification codes | Data collection methods and number of participants |
|---|---|---|
| **Donors** | a, b, c, d | 2 focus groups (11 participants) |
| **Moissons** | A, D | |
| **BAQ** | BAQ | |
| **MAPAQ directorate of policy, planning and economic studies** | MAPAQ | |
| **Donors** | a, b, e | Semi-structured interviews (12) |
| **Moissons** | A, B, D, E | |
| **BAQ** | BAQ | |
| **MAPAQ directorate of policy, planning and economic studies** | MAPAQ | |
| **Food collection points of donors** | d, e | Workplace observations (7) |
| **Moissons warehouse** | A, C, D | |
| **Community-based organizations facilities** | CBO | |

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reached, and no new codes emerged. This process identified seven main themes and their corresponding subthemes. Transcripts, originally in French, were analyzed in their original language, with key quotes translated into English for reporting. Field notes and photographs from workplace observations were also coded and analyzed using NVivo, further enriching the data set. Data triangulation, drawing on interviews, focus groups, field observations and documentary sources, helped ensure the validity and reliability of the findings. The data analysis followed a two-phase process (Figure 2):

1 evaluating the background, operations and challenges of each stakeholder; and
2 conducting a cross-case analysis of FBSC structure, challenges faced during the pandemic and response strategies.

## 4. Findings

The pandemic introduced significant structural and operational pressures across the FBSC, reshaping demand, supply and coordination dynamics. Across cases, these pressures prompted the deployment of both short-term reactive responses and longer-term adaptive practices that progressively strengthened network-level capabilities. The findings below document how resilience emerged through concrete interventions across demand management, supply, handling, distribution and workforce organization.

### 4.1 Effects of the pandemic on food aid needs and donations/purchases

Public health measures had a profound and enduring impact on both food aid needs and donation patterns across the FBSC. The pandemic triggered a sharp and sustained surge in demand for food assistance, placing significant strain on the capacities of Moissons and CBOs. As illustrated in Figure 3, the number of beneficiaries increased markedly across nearly all Moissons.

Responses to this growing demand varied by context. Moisson B, serving a densely populated urban area, experienced steady growth in service usage, reflecting persistent and escalating urban food insecurity. Smaller urban Moissons D and A reported more gradual increases in beneficiaries, suggesting delayed impacts or slower organizational adjustments. In rural areas, Moissons C and E assumed broader intermediary roles, coordinating donors and CBOs while directly distributing emergency food boxes (Figure 4).

The surge in demand overwhelmed FBs reception capacities and generated a wave of inquiries from households not previously reliant on food aid. Among rural Moissons, responses varied depending on local infrastructure and resource constraints. For instance, Moisson C prioritized highly productive volunteers, enabling it to maintain broader service coverage. In contrast, other rural Moissons faced more acute structural limitations. As the director of Moisson E explained, "Our main challenge is the lack of space, which sometimes forces us to refuse donations from sharing platforms [...] Being far from Quebec City also means higher transportation costs and fewer opportunities to access large donors, unlike urban Moissons." These constraints (i.e. limited storage capacity, inadequate loading facilities and high transportation costs) limited the ability of Moisson E to absorb rising volumes and exposed pronounced urban–rural disparities.

To compensate, rural Moissons such as C and E embraced adaptive strategies. As noted by the director of Moisson C, "Because of our rural location, we rely on partnerships with local producers and even a solidarity garden that donates 75% of its harvest to us. We also developed small-scale food processing, such as freezing, canning or dehydrating surplus produce." These initiatives exemplify how rural Moissons sought to offset structural disadvantages by strengthening local partnerships and investing in small-scale processing to extend the shelf life of perishable products. In contrast, urban FBs such as Moisson A and B benefited from stronger community

**Figure 2** Data collection and analysis

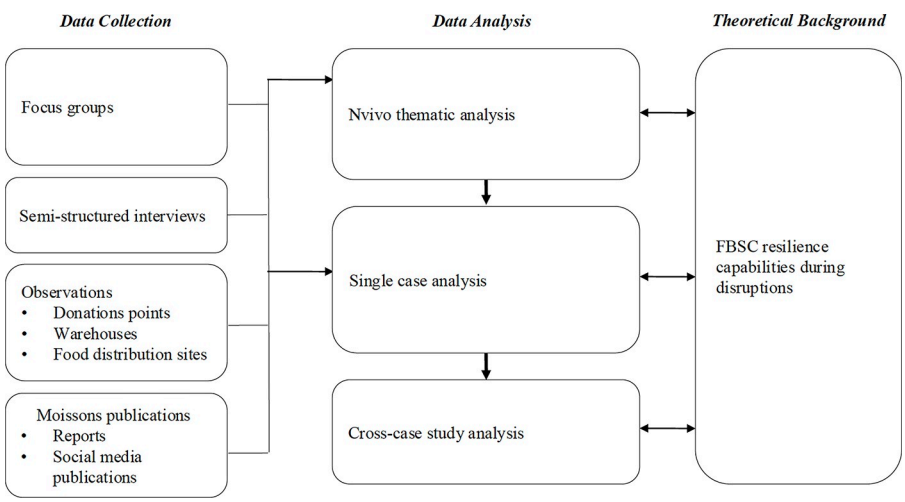


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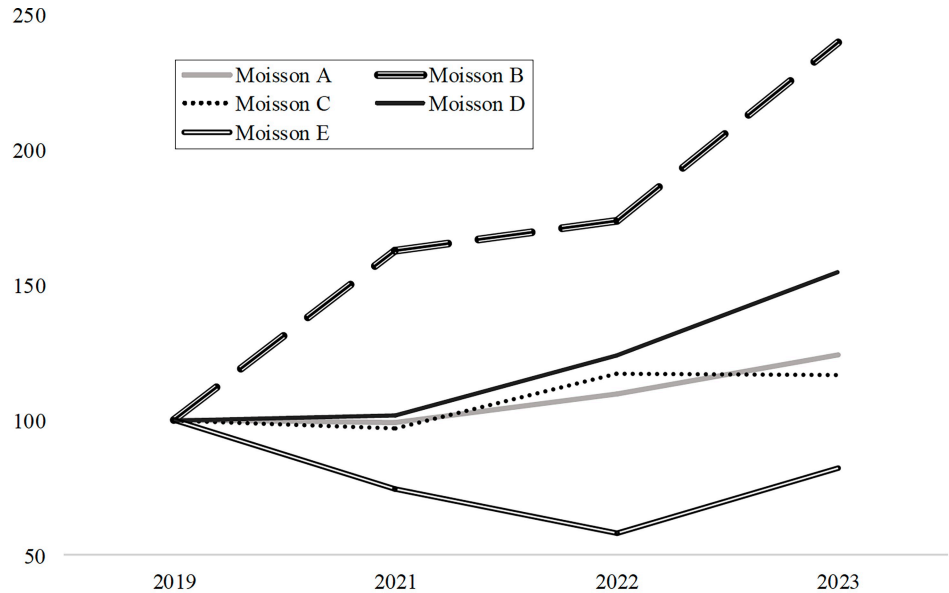
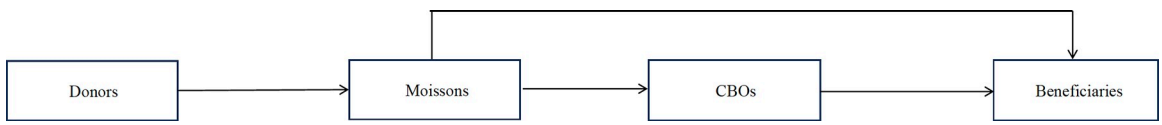
**Figure 3** Changes in the number of beneficiaries (2019–2023)




* Beneficiaries include individuals served directly by Moissons and those indirectly served through CBOs. Data are unavailable for 2020.

Source: Adapted from BAQ (2023)

**Figure 4** FBSC configurations in Quebec, Canada




ties, larger donor networks and more developed infrastructures, which facilitated food redistribution between donors and community-based organizations and enhanced system responsiveness to surging demand.

Food donations initially declined as households stockpiled and suppliers faced disruptions. Concurrent labor shortages and operational uncertainty compounded these pressures. Although donations later rebounded due to strong community support, volumes remained insufficient to match demand. Interviewees identified a lack of foresight as a central factor contributing to the vulnerability of the FBSC. As one donor remarked, "Since COVID began, unpredictability has been the most predictable." FBs were thus compelled to operate within a rapidly evolving and uncertain environment. Although donations to the five Moissons eventually rebounded, driven by strong community support, they remained insufficient to meet rising demand. As the director of Moisson E explained, "We feel a great surge of generosity; people want to give to us, and companies also do." Nonetheless, he and other participants emphasized that this unprecedented wave of generosity was insufficient to offset structural shortages and the scale of food insecurity. A representative from BAQ confirmed that: "The period during which donations fell was very short, but it has not grown enough to meet demand."

Emergency government interventions partially mitigated immediate shortages. In 2020, the Government of Canada introduced a $100m emergency fund and a $50m Surplus Food Rescue Program to redirect surplus food to vulnerable populations (Gorverment of Canada, 2020a). While these measures stabilized operations during the acute phase, interviewees emphasized that temporary funding did not address structural drivers of food insecurity, underscoring the need for longer-term solutions to tackle the root causes of food system vulnerability.

### 4.2 Pandemic and post-pandemic FBSC resilience strategies

#### *4.2.1 Supply strategies*

Disruptions to traditional donation channels prompted Moissons to diversify supply sources and expand partnerships beyond their usual donor base. Several Moissons collaborated with restaurants, supermarkets and local businesses, creating alternative inflows that partially compensated for declines in surplus food donations. At the same time, temporary closures of some CBOs generated reverse flows of unused food back to Moissons, further reshaping supply patterns and requiring adjustments in sorting, storage and redistribution processes. In parallel, provincial actors strengthened coordination by

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negotiating new supplier agreements and launching additional collection programs. Both FBC and BAQ actively engaged stakeholders to raise awareness of evolving supply challenges and to support the development of new donation arrangements. These collective efforts resulted in expanded supplier agreements across the network. As the director of Moisson E explained, "With our networks [. . .] we have more donations. [FBC and BAQ] developed national agreements with various suppliers for a better food supply."

Alongside these institutional initiatives, local experimentation played a complementary role in stabilizing supply. For example, Moisson E partnered with a private firm to collect food directly from households, embedding donations into everyday routines: "Food is now collected at home [. . .] We are working to make it a recurring activity." In parallel, a representative from Donor C described how their organization partnered with local supermarkets to "collect food at the checkout" (Director of Moisson E). These locally driven arrangements broadened the range of donation modalities and reduced reliance on a single supply channel.

Advocacy activities also shaped supply-demand conditions indirectly. Income support measures modeled on the Canadian Emergency Response Benefit (CERB) temporarily reduced pressure on FBs by stabilizing household incomes. Both the BAQ representative and the director of Moisson A highlighted the positive effects of CERB in temporarily reducing demand for food assistance. Through sustained political engagement during the pandemic, BAQ consolidated its position as the primary intermediary representing FBs in Quebec, becoming the central actor in dialogues with policymakers. However, this growing centralization also generated tensions within the network. While some Moissons valued a unified provincial message, others, such as Moisson B, expressed concern that "speaking with one voice" risked overlooking important local specificities.

To address regional disparities in supply availability, BAQ established an additional logistics hub and introduced a centralized digital platform enabling real-time inventory monitoring and redistribution across Moissons. As one BAQ representative noted, "We were hesitant to make changes, but they loved it because it made their lives easier." Increased visibility facilitated resource sharing, improved donor accountability and reduced mismatches between supply and local needs. As the BAQ representative further explained, "With our new logistics platform, we can show [donors] exactly how many kilos they have given us, the environmental impact, the social impact and where it was redistributed." These initiatives supported greater redundancy and coordination within the network during periods of volatility.

Finally, the suspension of in-person fundraising events due to public health restrictions led Moissons to shift toward digital and media-based outreach campaigns. Initiatives such as "Hunger is not a virus" and "The Big Collection to Fight Hunger" leveraged traditional and social media to engage the public and policymakers. As the director of Moisson A observed, "The food issue was thrust to the forefront at the expense of other philanthropic concerns [. . .] the pandemic put a spotlight on [FBs], and it has been going on for two years." These campaigns helped reverse initial declines in food donations. In some cases, Moissons also strategically redirected smaller contributions toward CBOs to concentrate their own efforts on managing larger and more efficient deliveries.

#### *4.2.2 Food handling strategies*

Food handling practices were rapidly reconfigured across FBs, Moissons and CBOs in response to evolving public health regulations. Organizations implemented enhanced protocols, including the procurement of protective equipment (e.g. disinfectants, gloves and masks), the enforcement of physical distancing guidelines, sanitation routines and travel logs for staff and volunteers. Several Moissons adopted additional preventive measures tailored to perceived risk. For example, Moisson E introduced a holding period for donations prior to redistribution, while Moisson C mandated glove use for all food handlers. As sanitary directives changed repeatedly over the course of the pandemic, organizations continuously adjusted workflows and reconfigured physical spaces. As the director of Moisson A reflected, "We had to navigate numerous versions of the sanitary measures." This ongoing adaptation illustrates how food handling practices evolved through iterative operational adjustments rather than through a single standardized response.

Digital communication emerged as a central coordination mechanism within the FBSC, supporting more frequent interaction, faster information exchange and collective adaptation under rapidly changing conditions. Regular virtual meetings replaced infrequent in-person encounters, strengthening interorganizational ties and facilitating ongoing problem-solving. As the director of Moisson A explained, "Zoom meetings brought us closer [. . .] We met at some point each week; it created ties, and it brought people together. Before then, we saw each other face-to-face twice yearly." This shift increased the density and regularity of communication across actors, enabling more timely responses to emerging operational challenges. Digital forums also supported the expansion and increased activity of BAQ thematic committees focused on outreach, food logistics and governance. These spaces provided structured venues for coordination and alignment across Moissons and partner organizations. As the director of Moisson D emphasized, "We want to be more present for BAQ. It is an actor that can play an important role in supplying food [. . .] by bringing in money, [and promoting] ethics, transparency, and visibility." Consistent with this perspective, the role of BAQ within the FBSC intensified during the pandemic, as daily interactions between Moissons and BAQ personnel became routine rather than exceptional. This strengthened coordination extended beyond information sharing to joint operational initiatives. For example, Moissons and BAQ collaborated on the Supermarket Recovery Program, which relied on real-time monitoring of donation bin activity and rapid logistical adjustments in response to fluctuations in supply. These practices illustrate how digital communication infrastructure enabled sustained coordination and responsiveness across organizational boundaries during the crisis.

At the same time, rising volumes of food donations and distributions exposed infrastructure bottlenecks across several Moissons. Limited storage capacity and loading infrastructure constrained throughput, forcing some organizations to rent additional warehouse space and thereby increasing operational

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complexity and costs. As the director of Moisson D explained, "We were in three warehouses, so there was a loss of time and transport between each of the warehouses. There was more need for human resources, and everything was longer and more complicated." These constraints generated coordination challenges and inefficiencies that could not be resolved through procedural adjustments alone. In response, several Moissons undertook more durable infrastructure modifications aimed at increasing handling capacity and reducing congestion. These included investments in loading docks, warehouse layouts and handling equipment. For example, Moisson C constructed a larger loading dock to facilitate food pick-ups by CBOs, while Moisson E reconfigured its warehouse layout to optimize storage capacity. These changes reflect how operational pressures during the pandemic translated into observable structural adjustments within food handling operations.

#### *4.2.3 Food distribution strategies*

Food distribution practices were continuously reconfigured to maintain service continuity under evolving public health restrictions. Across cases, CBOs and Moissons relied on a recurring set of adaptive responses, including appointment-based access, pre-assembled food boxes and the dynamic reallocation of food flows, to stabilize distribution in the face of rapidly changing operating conditions.

To comply with COVID-19 safety protocols, many CBOs reduced physical interactions with beneficiaries by closing waiting rooms and shifting to appointment-only services. Some modified beneficiary-choice models by introducing pre-assembled food boxes. For example, CBO 2, which normally emphasized beneficiary choice, adopted pre-assembled boxes for users with disabilities or those affected by COVID-19. While these adjustments constrained flexibility for beneficiaries, they enabled continued service delivery under strict health requirements. At the same time, temporary closures and reductions in operations significantly limited local food access. CBO 1 curtailed its services, while CBO 2 was required to relocate to continue distribution.

In response to shifting and uneven demand across CBOs, Moissons implemented distribution models tailored to heterogeneous organizational constraints. Moisson A launched a delivery service to serve CBOs lacking transportation or storage capacity, while Moisson D introduced a just-in-time delivery system for organizations with limited space, ensuring food arrived only hours before distribution. As the director of Moisson D explained, "If a CBO did not have enough space, we would deliver at the last minute, and they would not need to store anything." These practices demonstrate how differentiated logistics arrangements were used to accommodate variability in CBO capacity while maintaining overall network functionality.

To enhance coordination and responsiveness, several Moissons adopted the BAQ digital platform to manage food requests and distribution logistics more efficiently. In parallel, some Moissons hired community relations officers to maintain direct contact with CBOs, assess evolving needs and facilitate communication. These roles functioned as boundary-spanning positions, linking CBOs with Moissons and other actors within the FBSC and enabling rapid adjustments to allocation decisions as conditions changed.

#### *4.2.4 Human resource management strategies*

At the onset of the pandemic, volunteer shortages, particularly among older adults who comprised a large share of the FB workforce, significantly reduced available labor. As a BAQ representative noted, "There were far fewer volunteers because many were elderly people." This sudden contraction in human resources created immediate operational constraints across Moissons, especially during periods of rising demand.

In response, Moissons rapidly reorganized work processes and diversified their labor sources. Tasks were restructured to reduce on-site presence where possible, remote work was introduced for administrative functions and recruitment efforts targeted younger volunteers. During peak demand periods, public sector employees and new community members supplemented capacity. As the director of Moisson D observed, "City employees came to work full time, whether driving trucks, or working in warehouses." These efforts were reinforced by provincial initiatives encouraging individuals under the age of 65 to volunteer. As the crisis progressed, volunteer participation gradually increased, driven both by altruistic motivations and the search for social engagement during periods of social isolation.

Over time, recruitment strategies became more selective and increasingly aligned with operational requirements, marking a shift from emergency mobilization toward more structured workforce management. For example, Moisson A excluded high school students, Moisson B reduced reliance on corporate volunteering and Moisson C prioritized high-performing volunteers while expanding outreach to students and marginalized groups. These adjustments enabled Moissons to sustain or even increase distribution volumes despite reduced staffing levels. As one BAQ representative summarized, "[Moissons] had no choice but to make contingency plans; they managed to handle more volume with fewer people." Together, these practices illustrate how workforce reorganization functioned as a central mechanism for maintaining operational continuity under prolonged disruption.

## 5. Discussion

The COVID-19 pandemic exposed systemic vulnerabilities within the FBSC, compelling stakeholders to deploy a broad repertoire of resilience-building strategies. These strategies encompassed both short-term reactive responses aimed at mitigating immediate disruptions and medium- to long-term proactive initiatives designed to strengthen adaptive capacity (see Table 3). Building on the patterns identified in our case study, we extend the baseline conceptual framework (Figure 1) to develop a more comprehensive and integrative framework (Figure 5). The proposed framework comprises three interrelated components:

1. managing downsides through reactive capabilities;
2. leveraging upsides through proactive capabilities; and
3. structural and contextual factors, including organizational characteristics and external environmental conditions, that shape the scope, direction and effectiveness of these responses.

By integrating structural and contextual dimensions that are not captured in prior models, the framework clarifies how empirically observed practices within the FBSC translate into

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**Table 3** Mapping resilience capabilities to observed practices and key FBSC stakeholders

| Strategies | Temporal horizon | Resilience capability | Observed resilience practices | Key FBSC stakeholders |
|---|---|---|---|---|
| **Reactive** | Short-term | Flexibility | Strengthened hygiene protocols; staff retraining; enhanced storage and handling standards | Moissons, CBOs |
| | | | Reconfiguration of workflows and physical spaces to comply with evolving health directives | Moissons, CBOs |
| | | Agility | Rapid development of alternative procurement channels; partnerships with restaurants, supermarkets, and household food drives | Moissons, donors |
| | | | Just-in-time deliveries to CBOs with limited storage capacity | Moissons |
| | | Coordination | Coordination with local authorities to ensure continuity of at least one CBO per region | Moissons, CBOs, policymakers |
| | | Adaptability | Construction of additional loading docks; reconfiguration of warehouses | Moissons |
| | | | Redeployment and recruitment of volunteers, including younger and municipal staff | Moissons, volunteers, policymakers |
| | | | Refined recruitment criteria to prioritize students and socially marginalized populations | Moissons, CBOs |
| **Proactive** | Medium-term | Redundancy | Creation of a centralized warehouse; upgrades of local facilities; rental of additional storage space | BAQ, Moissons, CBOs |
| | | | Development of buffer capacity in staffing and procurement | Moissons |
| | | Visibility | Implementation of BAQ centralized digital platform for inventory, requests, and surplus management | BAQ, Moissons, CBOs |
| | | | Donor dashboards displaying redistributed quantities, environmental impact, and social outcomes | BAQ, donors |
| | | Communication | Regular virtual meetings and thematic committees | BAQ, Moissons |
| | | | Joint initiatives (e.g. supermarket recovery program) with real-time monitoring | BAQ, Moissons, donors |
| | Long-term | Collaboration | Partnerships with local producers and solidarity gardens; small-scale processing (freezing, canning, dehydrating) | Moissons, donors |
| | | | Institutionalization of collaboration through structured mechanisms, trust-building, and transparency | BAQ, Moissons, CBOs, donors |
| | | Technology integration | Adoption of new fundraising models, such as digital campaigns | Moissons, donors, policymakers |
| | | | Province-wide rollout of digital platform for real-time coordination and monitoring | BAQ, Moissons |
| | | Policy advocacy | Lobbying for income support programs; raising public awareness of food insecurity | BAQ, Moissons, policymakers |
| | | | Request for provincial funding to upgrade facilities | BAQ, Moissons, policymakers |

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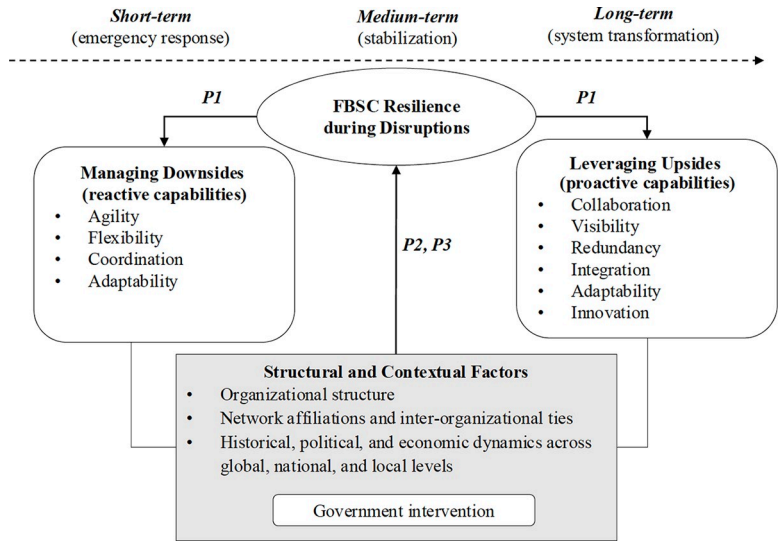
**Figure 5** Comprehensive framework




analytically distinct yet mutually reinforcing resilience pathways. The three components are systematically linked to our research propositions, which theorize the dynamic interplay between organizational capabilities and contextual constraints in fostering FBSC resilience. Grounded in rich empirical evidence, the framework advances theoretical understanding of nonprofit supply chain resilience while also offering actionable guidance for practitioners and policymakers seeking to enhance the robustness, adaptability and scalability of nonprofit supply chains in the face of systemic disruptions.

### 5.1 Managing the downsides: the short-term response

At the onset of the pandemic, FBSC stakeholders rapidly mobilized reactive capabilities to address immediate operational disruptions. This short-term response represents the first layer of the resilience repertoire, where rapid action was necessary to absorb shocks under conditions of heightened uncertainty and resource constraints. Consistent with prior research (e.g. Esmaeilidouki *et al.*, 2023), the key capabilities activated during this phase included flexibility, adaptability, agility and coordination.

Flexibility emerged most prominently at the FB level. Organizations rapidly enhanced sanitation protocols, retrained staff, reorganized volunteer roles and reinforced storage practices to ensure service continuity while complying with evolving public health requirements. Simultaneously, FBs intensified collaboration with Moissons and CBOs, particularly in volunteer recruitment and emergency operations. This relational dimension of flexibility aligns with prior work emphasizing the importance of interorganizational ties in crisis contexts (Adobor and McMullen, 2018). Human resources proved especially strategic: volunteers functioned as a critical operational asset, echoing findings from humanitarian logistics research (Kebriyaii *et al.*, 2021). Our findings extend this literature by demonstrating that the effective allocation and coordination of volunteer resources substantially enhance network-level responsiveness during systemic disruptions.

Adaptability was particularly evident in the logistics backbone of the network. Moissons and CBOs revised workflows, reconfigured facilities and reallocated food flows to comply with rapidly changing safety protocols, thereby exemplifying what Pettit *et al.* (2010) conceptualize as structural adaptability. As food donations declined, agility became increasingly salient. FBs diversified procurement channels, established partnerships with previously untapped sectors, and, often for the first time, leveraged government subsidies to purchase food directly, signaling a strategic shift away from exclusive reliance on in-kind donations. Within this context, BAQ assumed a pivotal coordinating role. By reallocating grants and organizing bulk purchasing initiatives, it generated scale efficiencies and stabilized supply flows, while simultaneously prompting debate regarding the implications of greater centralization (Mohan *et al.*, 2013). More broadly, coordination underpinned the effectiveness of these reactive measures. Resource redistribution efforts underscored the value of decentralized decision-making, as CBOs adapted service delivery models in collaboration with Moissons and municipal authorities to maintain uninterrupted food access.

Collectively, these findings indicate that managing downside risks during the initial shock phase does not depend on isolated organizational adjustments. Rather, it requires the orchestration of multiple, interdependent reactive capabilities across organizational levels, thereby reinforcing resilience as a networked and systemic phenomenon.

### 5.2 Leveraging the upsides: the medium-term response

As the immediate crisis stabilized, FBSC stakeholders shifted their focus from shock absorption to strategic consolidation. This medium-term phase marked a transition from predominantly reactive responses to the deliberate development of proactive capabilities aimed at reinforcing operations, institutionalizing emergent practices and capitalizing on newly identified opportunities. A central priority during this phase was the enhancement of communication and organizational visibility. Digital platforms and virtual outreach initiatives transformed

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visibility from a largely passive function into a strategic capability that facilitated stakeholder alignment and strengthened engagement with public and private partners (Blessley and Mudambi, 2022). BAQ-facilitated virtual meetings enhanced horizontal coordination across the Moisson network and supported the establishment of thematic committees dedicated to outreach, logistics and governance. These structures formalized knowledge-sharing processes and contributed to more coherent network-level decision-making. Operationally, stakeholders also invested in intentional redundancy to buffer against ongoing uncertainty. The development of capacity reserves in warehousing, staffing and procurement enabled FBs to better absorb fluctuations in both supply and demand (Adobor and McMullen, 2018). For instance, the establishment of a centralized warehouse in Quebec City, coupled with targeted upgrades to local facilities, strengthened the robustness and integration of the logistics network. These investments resonate with broader humanitarian supply chain research emphasizing the importance of local adaptability and infrastructural reinforcement in responding to COVID-19 disruptions (Kovács and Sigala, 2020). Our findings demonstrate that procedural refinements further reinforced operational continuity. Revised volunteer screening and management protocols professionalized human resource practices and reduced vulnerability to future disruptions. Importantly, these proactive measures did not supplant earlier reactive capabilities; rather, they built upon them. The medium-term response thus illustrates how crisis-induced improvization can evolve into structured capacity-building, enabling organizations not only to withstand shocks but also to leverage them as catalysts for systemic strengthening.

### 5.3 Leveraging the upsides: the long-term response

As stakeholders moved beyond immediate recovery, they increasingly adopted forward-looking strategies aimed at consolidating and transforming the FBSC to enhance system-wide resilience (Regnier-Davies *et al.*, 2023). In this long-term phase, resilience extends beyond maintaining operational continuity to encompass institutional repositioning and structural reform. A central dimension of this transformation was policy advocacy. BAQ assumed a prominent provincial leadership role, advocating for reforms to social safety nets, promoting new income support measures and elevating food insecurity as a sustained public policy priority. These efforts reflect a shift from operational crisis management toward shaping the broader institutional environment within which the FBSC operates. Technological integration also emerged as a strategic lever of long-term resilience. The deployment of a province-wide digital platform enhanced network-wide visibility by improving traceability, coordination and performance monitoring, capabilities increasingly recognized as foundational to resilient supply systems (Pimenta *et al.*, 2022). By embedding digital infrastructure into routine operations, stakeholders strengthened not only transparency but also their capacity for data-informed decision-making. Importantly, our findings show that long-term resilience depends not solely on the durability of crisis-era partnerships, but on deeper alignment across incentives, governance structures and localized adaptation. Individual Moissons refined and tailored their strategies to reflect regional needs and resource configurations, demonstrating an increasingly mature capacity for targeted flexibility. In this phase, resilience was not uniformly standardized across the network; rather, it was strategically differentiated to accommodate heterogeneous contexts and priorities. Collectively, these findings suggest that resilience in nonprofit food systems is best understood as an evolving, path-dependent process shaped by strategic learning, institutional alignment and governance reconfiguration, rather than as a 'static' organizational attribute (Sheffi and Rice, 2005).

### 5.4 Research propositions

Cross-case evidence demonstrates that FBSC resilience is fundamentally relational, context-dependent and unevenly distributed across the network. The effectiveness of the resilience repertoire does not stem from the mere presence of specific capabilities, but from the ways in which these capabilities interact with structural conditions. Rural and urban Moissons, for instance, experienced the pandemic through markedly different structural constraints: rural Moissons contended with elevated transportation costs and limited donor access, whereas urban counterparts benefited from denser donor bases and more robust logistical infrastructures. Our findings show that resilience emerges from the dynamic interplay among internal organizational structures, stakeholder relationships and external environmental conditions. Structural characteristics, such as specialization, scale and geographic location, systematically shaped the distribution of resilience capacities across the FBSC. Donor diversity surfaced as a central enabler of resilience, consistent with prior research linking diversified resource bases to greater supply stability (Bublitz *et al.*, 2021; Warshawsky, 2024). However, our findings also reveal a resilience paradox: efforts to secure and diversify resource inflows could generate new operational vulnerabilities, including storage constraints and increased pressure on donor relationships. Managing these tensions required logistical agility, such as just-in-time inventory practices and synchronized delivery systems, thereby illustrating how operational flexibility, interorganizational coordination and strategic foresight must be jointly orchestrated. These insights reinforce our central theoretical claim that resilience is best conceptualized as a dynamic balance between reactive and proactive capabilities enacted over time, rather than as a static organizational attribute (Herold *et al.*, 2021). This temporal perspective is particularly salient in FBSCs, where chronic resource constraints intensify the tension between short-term coping and long-term adaptation. Illustrative cases, such as Moisson A's rapid deployment of grocery cards as a reactive measure and BAQ's creation of thematic committees to institutionalize collaboration, demonstrate how this balance materializes in practice. Together, these dual capacities provide a more integrated and temporally nuanced understanding of resilience in nonprofit food systems:

*P1.* FBSC resilience is contingent upon balancing downside management through reactive capabilities (e.g. agility, flexibility) with the strategic pursuit of upside opportunities through proactive capabilities (e.g. redundancy, collaboration) during disruptions. Effective resilience therefore requires immediate operational

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responsiveness coupled with sustained investment in long-term system transformation.

Government interventions further played a pivotal role in shaping FBSC resilience. Infrastructure grants, procurement subsidies and direct cash transfers addressed immediate operational shortfalls while simultaneously expanding long-term organizational capacity and legitimizing the role of FBs in sustaining resilience. Interview data illustrate this dynamic: a BAQ representative emphasized that federal subsidies enabled food purchases when donations declined, while a Moisson director noted that emergency funds supported warehouse expansion and temporary staffing. Field observations corroborated that several Moissons upgraded storage facilities during this period. Although a strict counterfactual cannot be established, the evidence strongly suggests that key resilience outcomes, such as increased warehouse capacity, supplementary food procurement and short-term staffing reinforcement, would have been difficult to achieve in the absence of government support. At the same time, resilience was not externally imposed. Stakeholder-led strategies, including procurement diversification, volunteer reorganization and sustained advocacy, complemented government support. By reducing exclusive reliance on charitable food distribution through a combination of cash transfers and in-kind support, government interventions operated synergistically with internal organizational adaptations. This co-production dynamic aligns with humanitarian scholarship, emphasizing that cash-based and in-kind modalities are complementary rather than mutually exclusive (Piotrowicz, 2018; García Castillo, 2021). Therefore, our study extends prior theoretical understandings of resilience by demonstrating that, within nonprofit supply chains, organizational strategies and institutional interventions are mutually reinforcing. Resilience does not reside solely in internal capabilities or external assistance; rather, it emerges from their iterative interaction over time, enabling both short-term stabilization and long-term adaptation:

*P2*. FBSC resilience is co-produced through the interaction of internal organizational strategies and targeted government interventions, which jointly enable operational continuity, resource stability and long-term system transformation.

To further theorize the broader conditions shaping FBSC resilience, our findings identify a set of interdependent structural and contextual factors that condition both vulnerability and adaptive capacity. These include: internal organizational configurations (e.g. governance arrangements, logistical infrastructures, staffing models); network affiliations and relational embeddedness (e.g. ties with CBOs, donors and umbrella organizations); and multiscalar contextual environments encompassing historical, political and economic dynamics operating at global, national and local levels. Together, these dimensions demonstrate that resilience cannot be reduced to internal organizational capabilities alone; rather, it is embedded within and mediated by broader structural environments (Blessley and Mudambi, 2022; Shaheen *et al.*, 2023). Our cross-case comparisons make this interaction visible. Rural Moissons (e.g. C and E) faced elevated transportation costs and restricted access to diversified donor bases, which constrained operational flexibility and limited the scope of proactive investment. By contrast, urban Moissons benefited from denser donor networks, stronger logistical infrastructures and greater economies of scale, amplifying both their reactive responsiveness and their capacity for longer-term strategic adaptation. These contrasts illustrate that structural conditions do not merely provide background context; they actively shape the distribution, configuration and effectiveness of resilience strategies across the FBSC. Building on these insights, we argue that FBSC resilience emerges from the dynamic interaction between organizational strategy and structural context. Effective resilience therefore depends on alignment across temporal horizons: short-term reactive responses must be coherently integrated with medium- and long-term proactive adaptation, while remaining attuned to contextual constraints and opportunities. This systemic perspective echoes Shaheen *et al.* (2023), who contend that strengthening resilience requires moving beyond episodic crisis management toward sustained cross-sector collaboration, institutional learning and structural transformation:

*P3*. FBSC resilience is shaped by the structural and contextual conditions in which organizations operate. Differences in organizational scale, network embeddedness and multilevel socioeconomic and institutional contexts create uneven capacities for resilience, making some organizations more able than others to absorb shocks and leverage opportunities.

## 6. Conclusion

Based on a qualitative multiple case study of the FBSC, this study examined how stakeholders responded to pandemic-induced disruptions in food demand, supply and logistics. The study offers contribution at theoretical, methodological, managerial and policy levels.

Theoretically, this study makes three key contributions to the literature on supply chain resilience and nonprofit logistics. First, it conceptualizes FBSC resilience as a dynamic interplay between reactive and proactive capabilities, showing how stakeholders evolved from short-term crisis response to long-term system-building. Second, it highlights the interaction and evolution of these capabilities over time, emphasizing that resilience emerges from coordinated system-wide approaches rather than isolated organizational actions. Third, the study proposes a comprehensive framework that integrates core resilience capabilities across temporal horizons while accounting for structural and contextual conditions that shape vulnerability and adaptive capacity. Although the temporal classification draws on prior resilience frameworks (e.g. Kovács and Sigala, 2020; Herold *et al.*, 2021; Blessley and Mudambi, 2022), this study advances the literature by operationalizing these dimensions in a nonprofit food supply chain context, a setting that remains underexplored. By doing so, it extends the applicability of resilience concepts to multiactor systems operating under chronic resource constraints, complementing work predominantly focused on for-profit supply chains. Within this framework, three research propositions were developed, theorizing the relationships among capabilities, contextual conditions and resilience outcomes.

Methodologically, the multiple case study design enabled a nuanced understanding of how nonprofit supply chains dynamically respond to crises. This approach captures networked interactions, relational dependencies and structural

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constraints, providing a robust empirical foundation for future research in humanitarian and nonprofit logistics.

From a managerial perspective, the study provides actionable insights into cultivating and coordinating resilience capabilities across the FBSC. Empirical evidence illustrates how capabilities such as agility (e.g. just-in-time deliveries for CBOs), redundancy (e.g. creation of centralized warehouses) and collaboration (e.g. redistribution through municipal partnerships) translate into concrete strategies (see Table 3). Managers can leverage these insights to strengthen operational responsiveness, resource management and adaptive capacity. For example, reorganization of volunteer recruitment, digital platform deployment and adaptation of fundraising models exemplify practical interventions that enhance resilience. Interorganizational collaboration emerges as a cornerstone of effective resilience: it should be continuous, initiated pre-crisis, reinforced during crises and institutionalized afterward. Structured mechanisms supported by trust, transparency and alignment around shared objectives, combined with pooled tangible resources such as refrigerated trucks, storage facilities and volunteer management platforms, enhance logistical coordination and responsiveness to future shocks.

From a policy perspective, the findings underscore the critical role of government support and institutional partnerships in strengthening FBSC resilience. Infrastructure grants, emergency funds and targeted cash-based programs enabled warehouse expansions, supplementary food procurement and temporary staffing, while complementing in-kind assistance. These interventions demonstrate the co-production of resilience, in which external support reinforces internal organizational strategies. Policymakers should adopt frameworks that not only facilitate immediate crisis response but also strengthen the long-term capacity of FBs to contribute to food security. Targeted investments in information systems, infrastructure and funding mechanisms can foster a more equitable, sustainable and adaptive food assistance system.

This study is not without limitations. The qualitative and exploratory design of the research limits generalizability beyond the Quebec context. While data triangulation enhances credibility, broader applicability remains constrained. Future research could test the proposed resilience framework using quantitative methods or comparative case studies across regions. Future research could build on the framework summarized in Table 3 to examine the relative effectiveness of different resilience practices across diverse institutional contexts. This could include empirically testing the causal relationships between specific capabilities (e.g. redundancy, visibility and policy advocacy) and resilience outcomes. Quantitative and comparative approaches would further help identify tradeoffstradeoffs between operational efficiency and equity within FB systems, thereby clarifying how lessons from this case can inform broader resilience-building efforts. The insights derived from the Quebec context are likely transferable to FBSCs with similar governance and funding structures, as observed in several European settings (e.g. Capodistrias *et al.*, 2022). However, in countries where FBs are more institutionalized, such as the USA (Blessley and Mudambi, 2022) or South Korea (Rivera *et al.*, 2023), these strategies would require adaptation to account for government-led procurement and distribution systems. In such institutionalized contexts, vulnerabilities tend to be concentrated in storage, distribution and demand management rather than food sourcing (Blessley and Mudambi, 2022; Rivera *et al.*, 2023). Overall, further investigation into how FBs balance operational efficiency with social mission fulfillment would provide valuable insight into how resilience mechanisms identified in this study could be scaled or adapted to strengthen food security systems in the face of future disruptions.

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## Ethics statement

Ethics approval was obtained by the Research Ethics Committee of Université Laval (No. 2021–287/26–10-2021).

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