Climate Risk and Adaptation Along Supply Chains: A Case Study Series

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INTRODUCTION

The University of Waterloo Climate Institute in partnership with the United Nations Office for Disaster Risk Reduction for the Americas and the Caribbean, the Trade Facilitation Office Canada (TFO Canada) and the Private Sector Alliance for Disaster Resilient Societies Canada (ARISE Canada) led a multiyear research project that sought to better understand how companies recognize and plan for shared climate risk along supply chains and the challenges for undertaking shared adaptation and disaster prevention measures to enhance resilience. Our team tested and scaled a methodology that drew on practical approaches to classifying multi-hazard risk and impacts and presented scenarios to companies to help explore how Canadian and Latin American businesses can better understand, plan for, and invest in climate and disaster resilience.

Working with more than 40 companies and industry associations, as well as trade organizations, small and medium-sized enterprises (SMEs), and local government departments in Canada, Colombia, Honduras and Mexico, the project identified risks from climate extremes and multi-hazard threats and generated an evidence base for private sector action. Insights from workshops and boardroom risk-mapping exercises informed the development of training curriculum and a suite of business tools that support supply chain integration, resilience planning, and climate adaptation investment. With core research activities now complete, these case studies present the insights from several companies across multiple industries.

The case studies highlight the challenges companies face in understanding risk, as well as current and proposed approaches for developing adaptation and disaster management strategies across multiple organizations.

The research team focused on working with companies across industries with varying levels of exposure to climate impacts and with supply chains located in high-risk regions of Latin America. These include fresh produce fresh produce, coffee, textiles, medical equipment, floriculture, and manufacturing companies. These examples highlight lessons for directors, risk managers, and planners on the impacts of climate-related events, organizational responses, and potential avenues for shared adaptation planning.

These companies also helped explore and identify key actions that government agencies can promote to support tactical and accelerated innovation processes oriented toward system adaptation. These actions help companies shift from organization-level responses to coordinated action among multiple organizations, that together recognize and address emerging risks over longer time horizons.

Overall, we found that Canadian companies with partners across Latin America recognize that effective adaptation planning and investment in true supply chain resilience must extend several degrees beyond individual operations. This requires expanding the scope of adaptation to include critical partners and locations along increasingly complex supply chains.

Across all sectors, a unifying insight emerged: climate resilience is not an isolated project, but a system wide approach built on transparency, coordination, foresight, and trust. Companies that embed these principles are better positioned to thrive amid uncertainty.

CASE STUDY:

FRESH PRODUCE (MONTREAL, QUEBEC)

Climate impacts are prompting food distributors to rethink risk and partnerships at the point of origin of supply chains.

Canada's food industry relies heavily on a globally interconnected supply chain, with a significant portion of its food supply imported from international suppliers, many of which are in regions projected to face high climate risk (Government of Canada, 2020; LaPlante et al., 2021). Canada's relatively short growing season requires year-round import of a wide variety of products, including fresh fruits and vegetables, spices, processed goods, and ingredients not produced domestically in sufficient quantities (Bajaj, 2023; LaPlante et al., 2021; Reza & Sabau, 2022). Key agri-food trading partners include the United States, Mexico, and China, with the United States accounting for more than half of Canada's food imports. This dependence makes the industry highly reliant on stable international logistics, trade agreements, and climate conditions in exporting regions (Government of Canada, 2021a). As a result, Canada's food system is particularly vulnerable to supply chain disruptions caused by extreme weather events and shifts in global production patterns driven by changing environmental conditions (Bajaj, 2023).

HIGHLIGHTS

1. Crops have varying climate sensitivities, meaning that small shifts in weather can lead to major losses or price spikes, especially for delicate or seasonal produce like peaches, melons, and lettuce. There is no single list or inventory to understand risk by crop or sensitivity, which was reported as a priority for managing climate risk in produce supply chains.
2. Adaptation is hindered by poor communication, short-term business models, and limited direct access to source suppliers, making it difficult for companies to plan or invest in building resilience at the most vulnerable points in the supply chain.
3. The relationship with suppliers is shifting towards building more stable trust-based long-term partnerships, which enable investment to address shared risk. In some cases, long-term partnerships that build trusted relationships and more resilient production are prioritized over consistent product quality.

CHALLENGES IN ADAPTATION PLANNING

- **Limited Supplier Engagement:** Direct involvement with suppliers is minimal. Importers often leave issues like port delays and field readiness to growers and marketers, without engaging in business continuity planning. This limits proactive adaptation and response to disruptions that could address risk at the point of origin of the supply chain.
- **Uncertain Harvest Timing:** Growers may provide misleading start and end dates for harvests to prevent importers from sourcing offshore alternatives. This lack of transparency, often driven by pricing strategies, complicates planning and can delay product availability.
- **Informal Communication:** Information sharing on operational issues or risk is largely informal, relying on phone calls and personal relationships rather than structured data or information flows. This makes it difficult to coordinate or plan effectively.
- **Lack of Coordination and Knowledge Gaps:** There is little coordination to address climate risks in key growing regions, where granular data and forecasting capacities are limited.
- **Rigid Relationships and Business Models:** Relationships with growers are often inflexible, typically managed through marketers. There is reluctance to change this model or pay growers in advance. Clients or end buyers often do not understand grower constraints, putting importers in a difficult middle position.

KEY COMPONENTS OF AN ADAPTATION PLAN

> "We rather have lower quality one year, but a stable relationship with our supplier to support and invest to manage risk, than seek produce in open market on a bad year. Trust is where our strategy is going"
> Wholesale produce buyer, Canada

- **Exclusivity Contracts:** Investing in suppliers is more feasible when exclusivity agreements are in place. These arrangements allow for targeted support, such as training and farm level improvements, and encourage better information sharing. It's harder to justify investment in suppliers who also sell to competitors, or those who operate transactionally.
- **Tailored Support by Supplier Type:** Relationships vary across supplier types. Smaller growers may be more open to collaboration and support, while larger operations can be more complex and less flexible. Customizing engagement strategies based on grower size and relationship type is essential.
- **Climate Risk and Crop Prioritization:** Understanding which crops are most vulnerable to climate change (e.g., a 1.5°C increase) by region and type is critical. Mapping impacts along key corridors (e.g., wheat zones) helps prioritize adaptation efforts and explore alternatives with specific partners.
- **On-the-Ground Insight:** Site visits, such as to supplier farms, are necessary to assess real conditions and to observe actions taken by growers. This helps identify alignment of local needs with business sustainability and risk management plans (e.g., addressing heat stress to protect people and crops).
- **Technology and Data Gaps:** Identify clear opportunities to integrate Artificial Intelligence (AI) into operations and its role in adaptation planning. Better deployment plans and shared information generated by using new solutions through collaboration is necessary to support longer-term strategies.

POLICY RECOMMENDATIONS

Governments can incentivize long-term supplier partnerships for climate change adaptation by establishing financial incentives such as preferential tax rates, blended finance opportunities, and other mechanisms that support enduring supplier relationships explicitly linked to adaptation outcomes. They can also build capacity for system wide supply chain adaptation planning by providing sector specific technical assistance, training, and coordination to enhance overall resilience. In addition, governments can develop and maintain a centralized, publicly accessible climate risk database by crop for key supplier locations, mapping climate sensitivities by crop, region, and domestic and international supply corridors. Such a database should integrate climate projections (for example, 1.5°C and 2°C scenarios) and logistics risks, enabling businesses to develop long-term adaptation strategies and build new partnerships with international partners.

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CASE STUDY:

COFFEE BEANS (VANCOUVER, BRITISH COLUMBIA)

Tracking climate risk requires “eyes on the ground” along the entire supply chain.

Canada’s coffee industry depends on complex global supply chains, sourcing most of its beans from climate-sensitive regions in Central and South America (Government of Canada, 2022; Statistics Canada, 2023). While the COVID-19 pandemic exposed vulnerabilities in these networks, climate change now poses a systemic risk (Fromm, 2022; Hochachka, 2023; Zhou et al., 2022). Climate change is projected to reduce both suitable growing land and yields in major producing regions. Under a 1.5°C warming scenario, land suitable for coffee cultivation is expected to decline by 33 percent in Brazil, with similar trends anticipated in Mexico and Central America (Intergovernmental Panel on Climate Change, 2022a; Warren et al., 2024).

In addition, pests such as the coffee berry borer and diseases like coffee leaf rust are expected to expand into new regions, forcing changes in cultivation practices and threatening bean quality and consistency (Torres Castillo et al., 2020). Water scarcity resulting from erratic rainfall and drought will further strain production, while extreme weather events may disrupt transport infrastructure in producing countries and at Canadian ports, including Delta, British Columbia (Becker et al., 2018; Islam et al., 2021; Semedo et al., 2018). Labor shortages linked to rural out-migration are likely to compound these pressures (Ruiz-de-Oña et al., 2019). For Canadian wholesalers, these dynamics translate into higher costs, increased price volatility, supply uncertainty, and growing regulatory and market pressure to adopt sustainable sourcing practices.

HIGHLIGHTS

1. Small and medium entreprises are disproportionately affected by climate related impacts due to limited resources, poor supply chain visibility, and a lack of formal adaptation strategies.
2. Building resilience requires stronger partnerships at origin, focused investments, proactive training, and coordinated contingency planning and risk management frameworks between business partners.

CHALLENGES IN ADAPTATION PLANNING

- **Unclear investment priorities:** Limited granular risk and impact data present a barrier for companies to determine where to prioritize investments for higher impact of adaptation solutions. This lack of data makes it very difficult for companies to identify the benefits and trade-offs of investing in points outside their immediate control (such as transit or supplier facilities).
- **Vulnerability of key transit hubs:** Disruptions at major transit hubs like the Panama Canal can significantly impact shipments, even if the company doesn't source from the region directly. Furthermore, operations are heavily reliant on key port infrastructure. There is limited understanding of climate risk and disaster management options for intermediate points and no clear access to information on contingency plans or government guidance. As such, companies remain highly exposed to local and global port disruptions.
- **Delayed Risk Communication:** Risk communication with buyers is cautious and often withheld until disruptions are unmanageable to avoid damaging trust. In contrast, supply side communication is more open but typically acted upon only after multiple confirmations of impacts and at the recovery stages, limiting prevention, preparedness, and crisis response.
- **Transactional Industry Relationships:** Most buyers opt to shift sourcing rather than support producers facing climate or logistical challenges. The absence of trust-based relationships limits collaboration and weakens the industry's collective ability to build resilience at origin.
- **Lack of Direct Supply Chain Visibility:** Companies rely on intermediaries (often importers or exporters) for updates from origin, with little direct connection to producers. This dependency delays information flow, limits quality control, and reduces transparency in the supply chain.
- **No Formal Adaptation Process:** There is no established framework to identify supply chain risks, define escalation paths when impacts begin to be observed, or to communicate disruptions. This gap leaves companies unprepared to respond strategically or consistently when climate or logistics challenges arise.

KEY COMPONENTS OF AN ADAPTATION PLAN

> "We need eyes on the ground to know what our partners need so we could help with investment to enhance their ability to manage risk"
> Wholesale coffee buyer, Canada

- **Direct Engagement at Origin and Transparency:** Building long term partnerships with cooperatives and origin groups to gain clearer insight into local conditions, programs, and financial flows enables more informed decision making and targeted support. Planning for field trips for firsthand data collection, leveraging technology for shipment tracking and monitoring of variable storage conditions, and improving transparency by reducing over reliance on third-party importers enhances supply chain visibility and control leading to stronger adaptation options in the long run.
- **Pilot Investment and Risk Prioritization:** Starting adaptation efforts by concentrating on one or two key regions and specific supply chains allows for learning, manageable data gathering, routine evaluations, and skill building in the company and with partners to build a scalable model for adaptation.
- **Internal Training and Awareness:** Developing understanding of climate risks and logistical vulnerabilities across the company, including the use of forecasting tools with thresholds adjusted to the supply chain, can help companies shift business strategy from reactive to proactive longer-term planning.
- **Incremental Problem Solving and Relationship Building:** Recognizing that building resilience is a gradual and ongoing process with many possible solutions to make important leaps, companies can plan to focus on developing strong relationships at origin and addressing key bottlenecks identified through direct engagement rather than temporary, technical short-term fixes.

POLICY RECOMMENDATIONS

Governments can support the generation of climate risk information for critical sector supply chains by providing companies and their partners with curated data on climate change impacts, projected pest and disease risks, and transport disruption risks along strategic supply routes. These tools can be tailored to specific commodities, such as coffee, and designed for use by small and medium sized enterprises. Governments can also reinforce stability and facilitate investment in disaster risk reduction while foregrounding the importance of longer-term climate change adaptation through incentives such as tax credits and supportive finance. These measures can encourage companies to develop foresight capabilities, establish stable supply relationships, and minimize frequent supplier switching as climate impacts continue to intensify. In addition, governments can jointly strengthen contingency planning for critical transport and port infrastructure, as climate disruptions at chokepoints can fracture supply chains and currently lack coordinated responses. Developing sector specific contingency and escalation frameworks for critical trade infrastructure, including ports and key transit corridors, would help address these vulnerabilities.

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CASE STUDY:

TEXTILE MANUFACTURING (SAN PEDRO SULA, HONDURAS)

Extreme weather and public infrastructure test operational continuity.

Canada's domestic apparel market was valued at $12.7 billion in 2020, with approximately 95% of apparel purchased in Canada being imported (Government of Canada, 2021b). The industry experienced a significant decline in retail volumes during the COVID-19 pandemic, leading to widespread job losses and exposing vulnerabilities in globally dispersed supply chains (Castañeda-Navarrete et al., 2021; Government of Canada, 2021b). Beyond pandemic-related shocks, climate change now poses escalating systemic risks to the apparel sector (e.g., Senadeera et al., 2025). As global temperatures approach 1.5°C above pre-industrial levels, climate impacts are intensifying in key sourcing regions such as Central America and South Asia (Intergovernmental Panel on Climate Change, 2022b). Extreme weather events such as hurricanes, floods, and droughts are expected to disrupt raw material production, damage manufacturing infrastructure, and delay international shipments (Bag et al., 2025; Qian et al., 2020; Usha Rani et al., 2025). Cotton yields may decline due to heat stress and altered rainfall patterns, increasing price volatility and sourcing uncertainty (Usha Rani et al., 2025). Rising temperatures also threaten worker health and productivity in manufacturing hubs (Qian et al., 2020). As climate change creates operational risks across global supply chains, these impacts extend directly to apparel companies operating in Canada, and their suppliers abroad.

HIGHLIGHTS

1. A limited understanding of shared risks along critical trade corridors leaves critical facilities and ports vulnerable to climate impacts, disrupting flows between Canada and Latin America.
2. It is necessary for more formal and integrated coordination between the private sector and governments to enhance understanding of risk and identify areas for strategic investments in critical infrastructure.
3. Tiered approaches to testing business continuity and adaptation plans can support longer-term learning and adaptation planning across businesses.

CHALLENGES IN ADAPTATION PLANNING

- **Informal Risk Awareness:** Ports, as midway points, represent a high level of risk for large shipments or high volumes of product; however, there are significant information gaps, and risk information is shared mostly anecdotally rather than systematized.
- **Jurisdiction of Infrastructure:** Complex bureaucracies make it challenging for international companies to identify the appropriate contact points for communicating risks related to critical public infrastructure—such as roads or bridges—thereby limiting cooperation between the public and private sectors.
- **Short-Term Business Focus:** Many companies operate on a quarter-to-quarter financial cycle, which limits their ability to engage in long range planning or invest in infrastructure resilience. This makes it difficult to prioritize climate adaptation or risk mitigation strategies.
- **Vendor Resilience:** Enterprise risk teams assess supplier readiness through structured questionnaires, since full business continuity plans are typically not shared across organizations. This limits planning and understanding of disaster recovery timelines, the identification of weak points, and the ability to find opportunities for coordination.

"We tried to make sure ports consider climate risk , but they didn't do any climate risk assessment, they told us they were worried about wind more than rising water. We didn't leave comfortable that they are thinking about climate. Past hurricanes have not flooded the ports because their structure is high in elevation and according to them, water will not impact them. But [it is not the only risk] there is a problem with roads and access to the port."
Manufacturing Company

KEY COMPONENTS OF AN ADAPTATION PLAN

- **Advocacy with Government:** Adaptation requires advocacy and coordination strategies by companies to work with the public sector and their partners in highlighting operational risk and informing investment in high-risk public infrastructure, especially in flood- and hurricane-prone regions.
- **Cross-Functional Coordination:** Effective adaptation requires collaboration across supplier operations, maintenance, engineering, human resources, and enterprise risk management, with project managers identifying which information is relevant to understand and address shared risks among companies.
- **Tiered Business Continuity Assessment and Testing:** Business continuity plans can incorporate components of upstream and downstream partners in order to assess real-world readiness. While robust climate adaptation strategies will require more comprehensive reviews, companies can expand and enhance continuity plans through regular testing, reviews, and updates to ensure readiness, track plan activation, and identify gaps in resilience planning. Companies can assess supplier business continuity plans with a three-tiered approach: (1) Do companies have a business continuity plan? (2) Has it been tested?, and (3) Has it been activated?

POLICY RECOMMENDATIONS

Governments can support coordination with foreign governments by taking a lead role in planning, financing, and implementing climate resilience investments that address shared infrastructure risks, particularly flooding and hurricane impacts that affect companies across borders. They can also enhance international cooperation funding to strategically reinforce infrastructure in critical trade corridors, with a focus on flood protection and hurricane preparedness, prioritizing assets that directly safeguard communities and livelihoods.

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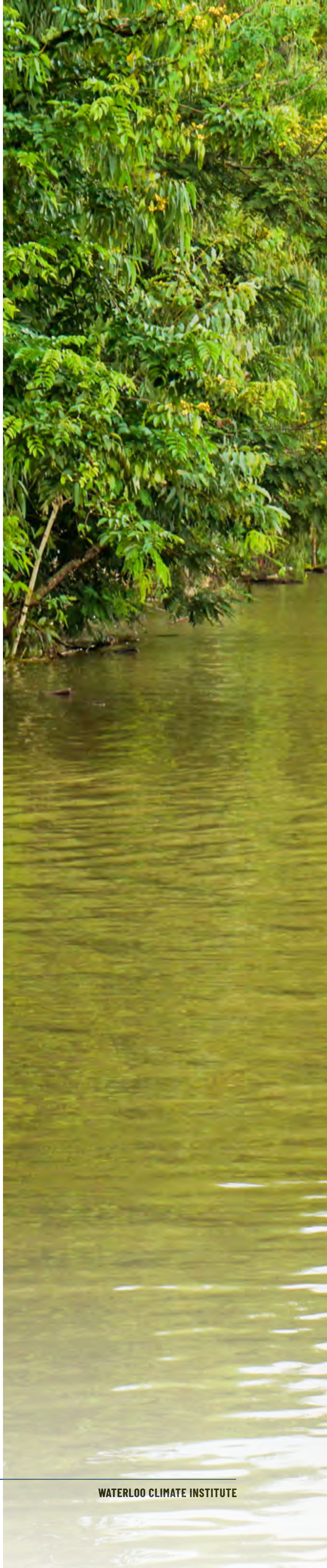

CASE STUDY:

MEDICAL EQUIPMENT (TORONTO, CANADA)

Manufacturing and assembly of medical equipment in high-risk areas.

In 2024, Canada's medical devices market was valued at US$10.06 billion, representing approximately 2.5% of the global market excluding in vitro diagnostics (Government of Canada, 2025). The sector is dominated by small- and medium-sized enterprises that supply critical products such as surgical tools, catheters, and bandages to hospitals, clinics, and physician offices (Government of Canada, 2025). Between 2019 and 2024, Canadian medical device exports increased from CAN$4.3 billion to $5.5 billion, while imports rose substantially from $9.4 billion to $14 billion, underscoring Canada's heavy reliance on global supply chains (Government of Canada, 2025). Under a 1.5°C warming scenario, climate change poses escalating risks to both domestic operations and international sourcing. Essential medical products, such as sterile water, hydration solutions, and surgical masks, are often manufactured in regions with high climate vulnerabilities such as Florida, North Carolina, and Puerto Rico, where hurricanes and flooding have caused recurring production shutdowns (e.g., Kolbe & Beleche, 2024). Within Canada, ice storms, flooding, and rising temperatures threaten infrastructure, logistics, and energy systems, potentially delaying access to essential medical supplies (Berry & Schnitter, 2022).

HIGHLIGHTS

1. Hurricanes and floods cause the most severe supply chain disruptions, threatening access to critical products and services, especially in disaster prone production hubs.
2. Systemic barriers (e.g., rigid procurement rules, weak information sharing, and short-term cost priorities) undermine efforts to diversify and adapt supply chains.
3. Resilience depends on strategic partnerships, cross-functional coordination, data-driven risk management, and proactive government policies that support flexible, innovative procurement.

CHALLENGES IN ADAPTATION PLANNING

- **Barriers to Multi-Sourcing:** Efforts to diversify suppliers are undermined by high barriers to entry and procurement systems that heavily favor the lowest price. Although multi-sourcing is promoted, in practice, 90% of business often goes to the cheapest vendor, leaving little room for innovation or resilience.
- **"Perverse Procurement Incentives":** Government procurement structures

prioritize cost (80% of scoring) over value or risk mitigation. This “80/20” model is ineffective, as 20% of diversified supply is ignored until a crisis hits. Long-term value and innovation are often sidelined due to short-term cost savings.

- **Lack of Environmental and Ethical Standards:** Offshore manufacturing, especially for products like vinyl gloves, often lacks environmental accountability. Suppliers in countries with weak regulations continue to dominate due to low costs, despite the long-term risks and ethical concerns.

> “Products come from highly exposed and vulnerable areas, but it is not feasible to switch suppliers as everything ultimately depends on cost. Additionally, it is not feasible for alternatives in the market as companies all source from the cheapest.”
> Medical Equipment Company

- **Poor Information Sharing:** Supply chain risk information is rarely shared proactively. Communication is informal, anecdotal, and often withheld unless necessary. Companies are reluctant to disclose manufacturing challenges, making risk management difficult.
- **Organizational Instability:** Frequent turnover and unstable teams (e.g., entire divisions gone in 3 years) disrupt continuity and institutional knowledge, weakening long-term planning and supplier relationships.
- **Limited Investment Capacity:** Companies operate with tight margins (e.g., 5 cents per dollar for product distribution), limiting their ability to invest in innovation, risk mitigation, or supplier development.
- **Canada’s Market Disadvantage:** As a small market, Canada is often deprioritized by global suppliers which was seen clearly during COVID-19. Public procurement rules further complicate this by consolidating volume into single contracts, eliminating backup options.
- **Rigid and Outdated Procurement Models:** Procurement is split between capital and operational budgets, with little flexibility. Funds must be spent by fiscal deadlines, leading to rushed, inefficient purchases, sometimes of unnecessary products just to use up budgets.

KEY COMPONENTS OF AN ADAPTATION PLAN

- **Streamlined Systemized Communication:** Establish clear communication protocols and assign responsibility for maintaining an up-to-date contact matrix so everyone knows who to contact during issues.
- **Prioritized Partnerships:** Focus on top partners, which can be based on sales and strategic alignment and/or those who are willing to collaborate. Use revenue incentives and contracts to secure commitment.
- **Supply Chain Risk Mapping:** Develop a system to track supply chain and vendor locations. Link this data to revenue to assess exposure and respond quickly to disruptions like climate events.
- **Data-Driven Agreements:** Require vendors to share risk-related data and continuity plans as part of supply contracts. Avoid partnerships with high-risk or unprepared suppliers.
- **Revenue Exposure Tracking:** Monitor how much revenue is tied to each partner to identify over-dependence and guide diversification efforts.
- **Shared investments:** The types of investments which could be jointly undertaken with supply system partners are: (1) Technology, (2) integrations, (3) training, (4) and communication.

POLICY RECOMMENDATIONS

Governments can anticipate emerging risks and market changes by investing in early risk assessment, targeted funding, and incentives that enable adaptation before crises escalate. Modernizing procurement through diversified supplier networks and streamlined approval processes would allow healthcare organizations to respond more quickly to evolving needs while adopting sustainable and innovative products. Together, these reforms would foster a healthcare system that is more agile, resilient, and capable of delivering safe, effective care in a rapidly changing environment.

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CASE STUDY:

FLORICULTURE (BOGOTÁ, COLOMBIA)

A climate-sensitive industry under growing extreme weather stress.

Flower supply chains in Latin America play a critical role in the global floriculture market but are highly exposed to climate change associated risks (Sree et al., 2025). Under a 1.5°C warming scenario, rising temperatures and shifting precipitation patterns threaten the stable growing conditions required for commercial flower production. These changes are expected to disrupt bloom cycles, reduce yields, and increase exposure to pests and plant diseases (Sree et al., 2025). More frequent and prolonged droughts may reduce flowering, distort foliage, and compromise overall aesthetic quality, while intensified storms can damage greenhouses, farms, and transport infrastructure (Chachar et al., 2025; Ikram et al., 2025). Higher temperatures also increase the risk of quality degradation during harvesting, storage, and transport, particularly for flowers (Tun et al., 2021). Collectively, these impacts heighten supply variability, increase production and logistics costs, and create challenges for exporters and downstream markets that depend on consistent, high-quality floral imports.

HIGHLIGHTS

1. Certain products with high sensitivity to climate impacts require rapid responses, not measured in days or weeks, but hours.
2. Early warning and tactical measures are essential for building resilience.
3. Incorporating technology to monitor micro variations in climate patterns and hydro-meteorological conditions can enhance adaptation actions, but capacity is necessary to understand and act on the data generated by new tools.

CHALLENGES IN ADAPTATION PLANNING

- **Lack of Structured Contingency Plans:** Companies operate reactively, with no standardized protocols in place for impacts and a rapidly degrading product, leading to inconsistent responses when disruptions occur with damages within hours, not days or weeks as in many industries.
- **Fragmented Communication:** Notification of disruptions is unreliable, forcing companies to make decisions with limited information and narrow opportunities to be effective in crisis.

- **Coordination and Cultural Barriers:** Differences in communication styles and company cultures across geographic regions hinder agile collaboration and slow negotiation processes, especially in high-volume bulk business relationships with many small suppliers.
- **Market Concentration Risks:** Reliance on a few dominant suppliers or markets creates vulnerability, reducing flexibility during disruptions.

> "We know how heavily we depend on water when 90% of a flower stem is water, you're essentially exporting it. That's why water supply is so critical for us, and why we use technology to monitor not just the climate but also soil and moisture conditions to get irrigation right."
> Flower Company, Colombia

KEY COMPONENTS OF AN ADAPTATION PLAN

- **Risk assessment and supplier management:** Create a supplier risk matrix, rate supplier vulnerabilities, and prioritize those with strong business alignment and transparency.
- **Data and intelligence:** Enhance decision making speed with tools for data generation, sharing, and monitoring, including supply chain maps, automatization, and artificial intelligence.
- **Strategic alternatives and diversification:** Reduce dependency by enabling self-supply of key inputs, minimizing reliance on distributors, and maintaining flexible sourcing.
- **Effective communication:** Maintain clear, timely communication with partners and internal teams, guided by well-defined objectives and response protocols.

POLICY RECOMMENDATIONS

Governments can reduce systemic vulnerability through capacity building and policy alignment by embedding climate resilience objectives into agricultural, trade, and export promotion policies, while workforce training programs focused on disaster risk reduction and adaptation help address capacity gaps across the sector. They can also enhance technology transfer mechanisms for small- and medium-sized enterprises by using public funding to support initiatives that make AI monitoring tools and climate modelling more accessible, complemented by commitments by the private sector to work towards establishing data sharing protocols across the industry that improve collective intelligence on climate risks.
In addition, governments in Latin America where flower producing regions are located can work towards investing in resilient transportation infrastructure and integrated Early Warning Systems for extreme weather at sub-national levels in economic clusters, with the private sector co-financing these systems and participating in public-private infrastructure projects to strengthen regional resilience.

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