

# What We Heard: Stress Testing The North American Food System

Februrary 2025 | Langdon Hall



HAVE  
**COURAGE**  
to ENVISION WHAT OUR  
FOOD SYSTEMS COULD BE

# STRESS TESTING



the NORTH AMERICAN  
FOOD SYSTEM

MAINTAIN  
FOCUS

on  
FOOD  
SECURITY and  
SUSTAINABILITY

Illustrations throughout this report created by Alex Sawatzky capturing key themes from the "Stress Testing the North American Food System" workshop, including environmental threats, systemic vulnerabilities, and opportunities for a more resilient and equitable food future.

# A LETTER FROM THE CO-CHAIRS OF THE STRESS TESTING THE NORTH AMERICAN FOOD SYSTEM WORKSHOP

When we convened this workshop, we couldn't have predicted the changes we'd see to international trade in the following weeks. Sweeping tariffs and counter-tariffs have been declared, paused and changed - with more yet to come. This volatility poses an incredible challenge for governments, businesses and consumers within our deeply interconnected North American food system.

Tariffs on Canadian products are deeply impacting American farmers, who import 85% of their potash – a critical fertilizer – from Canada. Meanwhile, tariffs on steel from Canada could make farm equipment much more expensive, while American consumers may end up paying more for their food, as over 60% of their fresh fruit and 45% of fresh vegetables are imported from Mexico.

Food products cross the border multiple times, and tariffs are already impacting food prices for consumers – with the biggest impact felt by those who are most vulnerable, as we are seeing through increasing demand for emergency food provision programs.

The changes we've seen to humanitarian aid and public health supports worldwide also stand to impact food security and public health across the globe, with the largest impacts expected for those who are already vulnerable.

Against the backdrop of trade challenges, our food system continues to face emerging biological risks such as avian influenza, which has drastically impacted the price of eggs this spring across the U.S. after widespread culling of poultry.



Meanwhile, the impacts of extreme weather are still being seen. Wildfires in California this year have already been catastrophic, damaging farmlands, impacting air quality, and affecting produce grown in surrounding areas – and wildfire season is only beginning.

What are our countries to do, in this new era? Firstly, with increased uncertainty in America as a trade partner, Canada and Mexico must seek to on-shore food production and processing and seek new trading partners to diversify their import and export markets. Scientists across our countries must continue to collaborate and share information on threats that will spread across our borders. And governments must continue to pursue international cooperation and collaboration, advocating for stability for businesses, farmers and consumers alike.

— **Evan Fraser, Ertharin Cousin, & Bram Govaerts** | *Co-Chairs, Stress Testing the North American Food System Workshop*

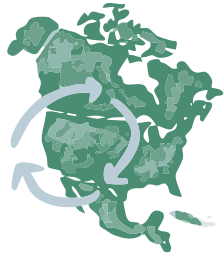


# Stress Testing the North American Food System

Food systems across the world are facing a series of complex and interrelated threats that have the potential to drastically impact our ability to produce and equitably distribute enough safe and nutritious food to feed the world's population. Recent events – supply chain disruptions due to the COVID-19 pandemic, impacts on food prices and availability from the conflict in Ukraine, and the looming threat of tariffs across borders – showcase the vulnerabilities of a system that we rely on every day to provide the food we need to survive.



In North America, our food systems are deeply interconnected – and deeply vulnerable to looming environmental, geopolitical and financial changes. Against this backdrop we must consider how our food systems can adapt to new challenges, understanding the complexity of the system, the levers for change, and the tradeoffs that must be managed as we work towards resiliency.



Given the disruptions of this unprecedented 'polycrisis', we can no longer extrapolate the future from what has happened in the past. Instead, we must use this change as an opportunity to analyze the weaknesses within the current system and build towards a food system that works for all, including the most vulnerable among us.

With that goal in mind, co-Chairs Evan Fraser (Arrell Food Institute), Bram Govaerts (CIMMYT) and Ertharin Cousin (Food Systems for the Future) convened a workshop that brought together experts working in policy, industry, academia and society from Canada, the United States of America, and Mexico to better understand the risks and opportunities facing our food system. From Feb 2-4, 2025, participants were asked to examine system vulnerabilities and opportunities to re-think how we produce and distribute food, maintaining a long-term system transformation lens while also acknowledging the urgency of immediate concerns.





# Potential Threat Analysis: What We Heard



Set against a backdrop of increasing protectionism in countries across the world and urgent climate challenges, participants at the workshop reflected on changes that will impact the North American food system between now and 2040. Taking a systems-level view of our complex food system, we considered how to leverage impactful drivers of change in policy and in finance, discussed the importance of including consumers in the discussion, and reflected on the importance of creating channels for communication amongst all interest-holders in the system.

An early scoping exercise asked participants to reflect on a suite of potential changes that may affect the food system, and to reflect on what changes would have the greatest impact and our readiness to deal with these changes.

Overwhelmingly, water scarcity emerged as the change that most participants believed would impact our food systems – a challenge we have low levels of readiness to manage. Trade wars and tariffs were also top of mind, while a series of linked environmental changes – soil health, the spread of pests and disease, and the loss of biodiversity – were expected by many to impact our food system in the years to come.

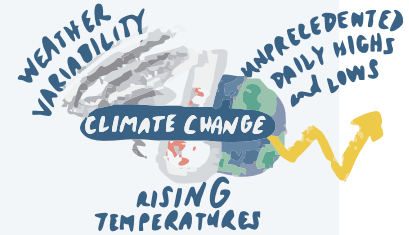
However, not all was doom and gloom; solutions such as regenerative agriculture and supporting policies or investments, along with productivity gains through technology and increased investment in agricultural innovations, also emerged as anticipated changes that we are closer to ready to move forward.



# Potential Threat Analysis: Overview

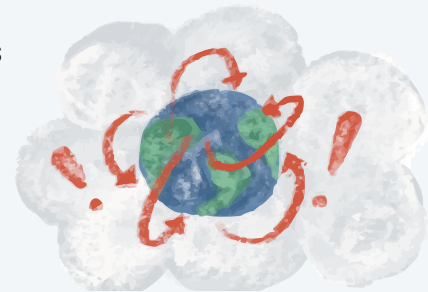
## ENVIRONMENTAL THREATS

- Water scarcity, groundwater depletion, drought and water governance/access
- Spread of invasive species, pests and disease to new regions
- Novel/ emerging zoonotic diseases
- Increasing variability in weather cycles, rising temperatures, wildfires and extreme storms
- Loss of biodiversity in agricultural and surrounding ecosystems
- Reduced soil health, water quality and air quality impacts
- Changes to agricultural land: desertification
- Changes in land use, and availability of new land
- Challenges in measuring agriculture's carbon footprint and ability to sequester greenhouse gas emissions



## GEOPOLITICAL THREATS

- Changes to the movement and availability of agricultural labour
- Changes to migratory flows, including an increase in environmental refugees
- Supply chain disruptions
- Impediments to international trade, including tariffs
- Conflict/national security concerns
- Shifts in consumption patterns
- Inequities in access to available food
- Access to emerging technologies
- Cybersecurity threats - malicious actors
- Regulatory change impacting food safety



## FINANCIAL THREATS

- Access to land ownership (and inequalities in ownership)
- Price of agricultural land (expected increases or decreases regionally)
- Access to credit (inequalities in access)
- Interest rates impact the cost of capital
- Rising input costs, coupled with increased demand to keep prices low
- Limited availability of venture capital and private equity to fund agri-food initiatives, particularly lack of capital expenditures (capex) funds
- Changes to public programs that de-risk or provide capital to agri-food system actors
- Increased volatility in the sector undermines long-term investment





## Environmental Threats

Discussions highlighted the critical importance of collective action and cross-border collaboration when it comes to environmental and production challenges such as water, pests, disease and extreme weather. These challenges, which do not respect political boundaries, will require coordinated responses across the U.S., Mexico and Canada and beyond. We will need a fundamental systems change; one that builds cooperation and integration between policy actors, but also between scientists and farmers across borders, while still supporting localized and regional solutions.

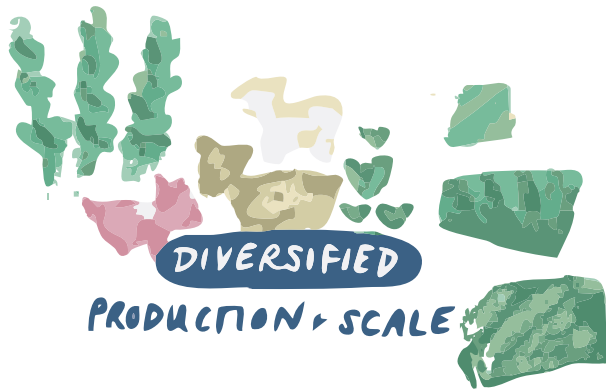
Regenerative agricultural practices, already practiced by many farmers, overwhelmingly emerged as a solution to many of the anticipated environmental challenges. It is important to note that here we are referring to a suite of principles that prioritize soil health, crop diversity, and avoiding bare soil. These are farming principles that all farmers, regardless of type or size, can move to in a process of continual improvement.

Moving toward more regenerative practices (often also called climate smart farming) should, for most farmers, result in better soil health, water management, biodiversity and climate resilience, and should reduce inputs while improving profitability. However, we need to build incentives into the market (from public, private and philanthropic sources) to pay farmers for ecological practices and to mitigate their risk of adoption. Knowledge transfer and agricultural extension networks will play a key role in helping farmers transition to more sustainable models at scale.





Advanced technologies, too, play a role in regenerative systems; AI, genomics and robotics are all part of a move towards more data-informed decisions. Such technologies can help us measure and reward sustainable practices, optimize more diverse cropping systems, help farmers monitor agricultural systems and identify opportunities to increase biodiversity, increase food safety, reduce food waste, and other benefits. Technological solutions, paired with traditional and regional knowledge, offer promise in building diverse, resilient systems.

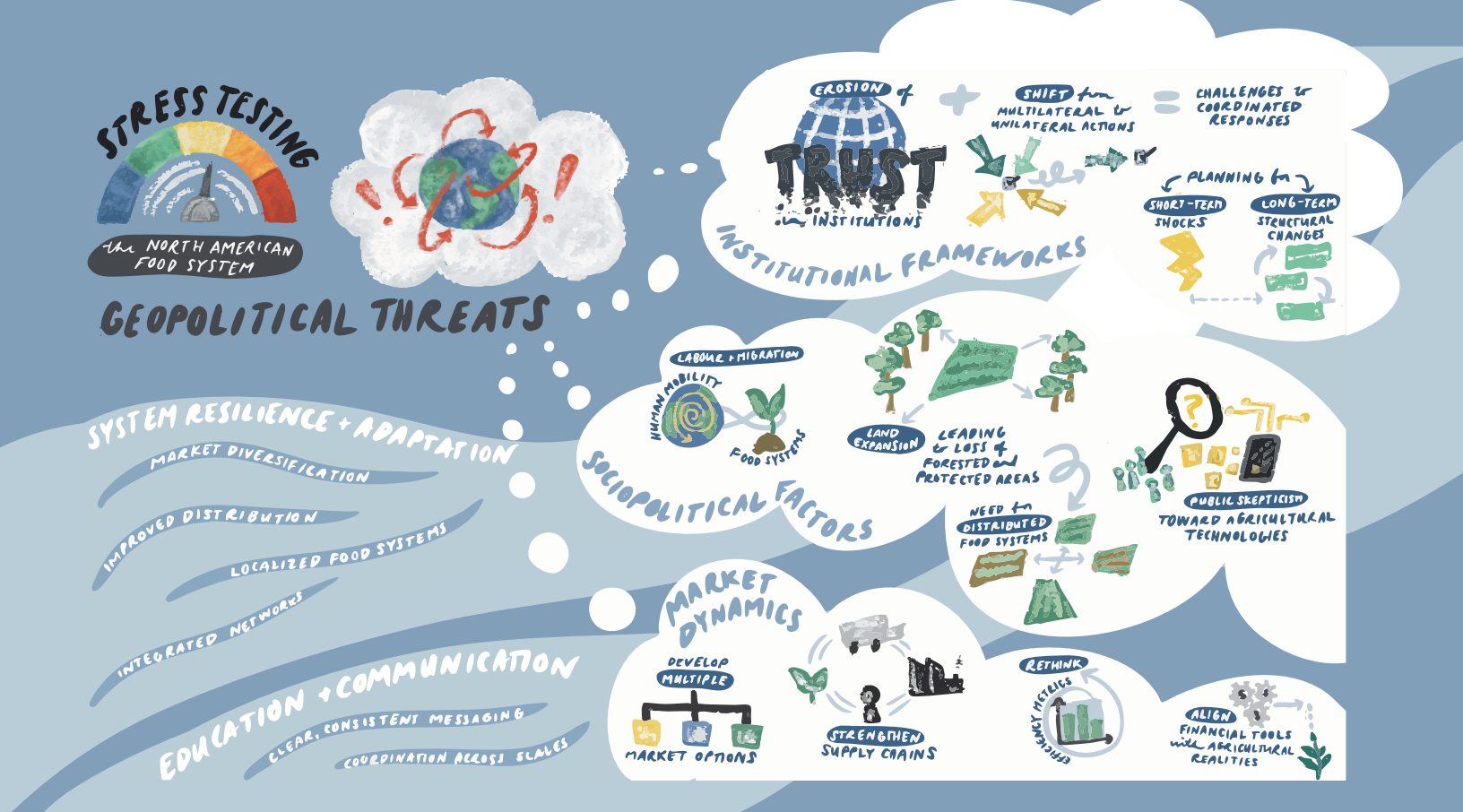


We cannot forget the human dimension of these environmental threats and our related responses, as they will impact food security, rural communities, and economic viability for businesses. Consumers, industry and policy-makers must all be engaged to build trust; we must measure success not only as improved productivity, but also in impact on people and our environment. All interest-holders must be involved in proactive emergency response planning and policy solutions that enable communities to respond smoothly to threats.

Conversations thus pointed to a clear need for transformative change in food systems to address environmental challenges, while also highlighting the complexity of implementing such change across diverse political, geographical, and economic contexts.







## Geopolitical Threats

The workshop also focused on geopolitical threats that may disrupt the flow of labour or goods across borders; discussions highlighted the complex interplay between institutional frameworks, market dynamics, and sociopolitical factors that affect food system resilience.



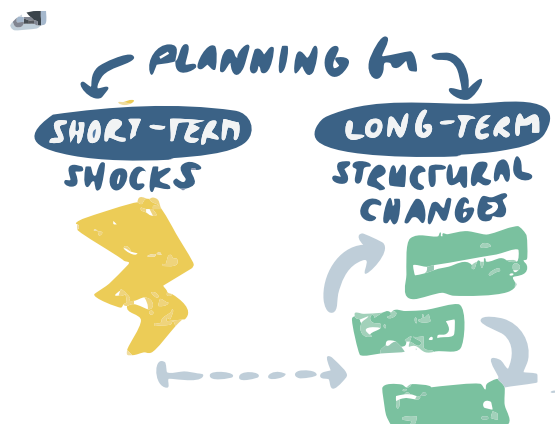
We are seeing an erosion of trust in institutions and governing bodies, and a shift from multilateral to unilateral actions that poses a challenge to coordinated international responses. This is particularly evident when looking at increased uncertainty in international trade relationships and limitations to the enforcement of global rules of trade.

Resilient food systems must be responsive to both short-term shocks as well as long-term structural changes, such as tariffs, that will change trade relationships and may become permanent features; building such resiliency will require nuanced and localized solutions, rather than a 'one size fits all' approach. However, these changes are also opportunities to explore new and beneficial opportunities such as diversified export markets, additional channels for distribution, and increased opportunities to build local food systems.

Changes to labour and migration will deeply impact the food system in all three North American countries. Agricultural labour needs cannot be separated from broader discussions around immigration, and any approach must be nuanced, recognizing that current food systems are dependent on skilled labour for success.



The application of emerging technologies and innovations offer potential for the agri-food sector; technology will help us adapt to labour force shortages, increase productivity on existing agricultural land, react to changing consumer demands, diversify the market for our agri-food products, cooperate on data sharing, standards and regulations, and create more distributed, resilient food systems that reduce centralization of production and distribution.



Education and communication with interest-holders should be a priority: we need to communicate and build trust with consumers, investors, policy-makers and industry. We must actively involve those most vulnerable to geopolitical threats in generating solutions.

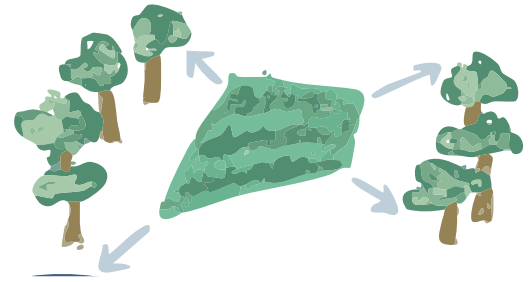
Overall, the current geopolitical situation means we must adopt a balanced approach that maintains the benefits of integrated markets while building resilience through diversification and localization. Investments and financial incentives, along with educational initiatives, should be aligned with this goal.





## Financial Threats

Several interconnected challenges may impact the financial stability of the North American food system. A core issue is the distribution of risk; small and mid-sized farmers, as well as young and minority farmers, often bear a disproportionate and costly burden of risks such as weather, pests and market fluctuations, and may not know about financial resources or have difficulty accessing credit or applying to incentive programs. It is becoming increasingly difficult for those involved in the agri-food industry to make a profit, as they work to keep prices low while managing rising input costs and volatility.



This volatility – from spikes in input costs, weather-related disruptions leading to record insurance payouts, and exchange rate fluctuations that impact international trade – is extremely challenging for all actors in the agri-food system, from growers to distributors to retailers.

As the system works to transition to more sustainable practices, producers face significant costs meeting new standards and may experience drops in yield during transition periods. We need specific funding to support this transition period, coupled with simplified, accessible government incentive programs, increased awareness about available financial tools for farmers (which can be challenging to navigate), and programs to bridge technology access divides.





Consumer affordability is a critical concern, as deep levels of income inequality mean many consumers cannot afford to adapt to changing food systems that may come with a higher cost; any sustainable farming solutions must keep food security as a key priority, not an afterthought.

Innovation and emerging technologies offer opportunities to reduce financial inefficiencies in the food system.

Innovations such as algorithms that predict yield and reduce uncertainty, improved data sharing systems, and crop monitoring technologies can help to reduce financial risk or inform financial decisions – but can be challenging to scale across the diverse North American system.

Thus, addressing financial threats will require alignment amongst all players in the system, and any approach must understand and address the risks to all interest-holders while ensuring that these levers for change drive us towards a sustainable, secure and inclusive food system.

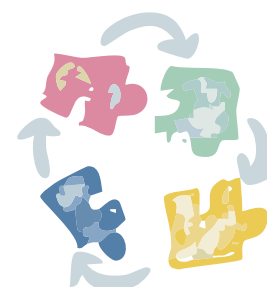


# In Conclusion: Turning Discussion into Action

Balanced food system transformation must ensure that the system continues to deliver enough high quality, safe and nutritious food to consumers while we pursue systematic changes and ensure we are ready to respond to threats.



We must continue to collaborate and share information across borders, both international and inter-regional, engaging the public and all system actors, leveraging the power of technology and data to help us make change, and building incentives into the system that help us move towards a resilient, sustainable and equitable food system.



## About This Event

The goals of this event were threefold: firstly, to build relationships and begin to bring together a 'community of practice' of actors working to make change in the food system; secondly, to kickstart discussions and understand priorities of this group; and thirdly, to set the stage for an ongoing, multi-year program of work around food system resiliency.

As such, we share this report outlining 'what we heard' during the initial workshop for participants and other interested parties, while acknowledging that our discussions were reflective of those participants and opinions in the room, and many voices and opinions can and should be reflected in future and ongoing work. Discussions at the workshop took place under Chatham House Rules, and as such, we are happy to share insights from the workshop without attribution to specific individuals, while acknowledging that individual views and opinions on these complex topics may differ from those presented here.



This event was convened by the Arrell Food Institute at the University of Guelph, in partnership with CIMMYT (International Maize and Wheat Improvement Center) and Food System for the Future.



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