# Global agricultural supply chains face unprecedented disruption from climate change and geopolitical tensions



Amir Lehr, the CEO of Acclym, perceives the global agricultural supply chain as one beset by a plethora of unpredictable pressures. His company, which focuses on digitising and modernising supply and value chains, is at the forefront of addressing the increasingly uncertain landscape shaped by climate change, geopolitical strife, and fragmented infrastructure. "The supply and value chain is really suffering today," he asserts, pinpointing climate change as a central culprit.

Recent reports reveal that the upcoming year is projected to be historically alarming, with surface temperatures forecasted to exceed 1.8 degrees Celsius above pre-21st century levels. Such warming conditions disrupt long-established weather patterns and agriculture, creating an environment of unpredictability. This volatility manifests in various forms—droughts, floods, and shifting growing seasons—all of which jeopardise crop yields and threaten the stability of agricultural supply lines. A recent EU-backed report indicated that extreme weather alone costs the European agricultural sector an average of €28.3 billion annually, representing a staggering 6% of total crop and livestock production.

Lehr highlights the urgent need for resilience in the food and beverage sectors, which often rely on sourcing from numerous small farms globally. For example, he points to the struggles of coffee companies working with various growers, where inefficiencies amplified by unpredictable weather can lead to dramatic yield losses. He recalls a specific instance where untimely rainfall resulted in a 26% reduction in coffee yield for a customer. Real-time visibility into supply chain operations emerges as a crucial necessity; it allows better assessment of weather patterns, local conditions, and economic factors, enabling more informed decisions to mitigate risk.

One promising development lies in the digital traceability systems that have gained traction within the industry. Such systems enhance operational efficiencies, streamline food safety protocols, and build consumer trust through transparency. However, Lehr argues that effective integration of digital tools remains inconsistent across the sector. Many technologies, including mobile sensors and enterprise resource planning (ERP) systems, exist but are not widely adopted.

Compounding these challenges are the financial pressures inflicted by tariffs and geopolitical tensions. Sourcing grapes from multiple regions like California and Latin America highlights this reality. The evolving tariff landscape complicates pricing structures and increases financial strain on producers, as evidenced by the volatility affecting crop quality and consistency.

The quest for sustainable agricultural practices is also increasingly shaped by these disruptive forces. With climate change influencing growing regions—where traditional yields may shift locations—efforts to develop climate-resilient seed varieties are underway. Regenerative agricultural practices, while often spearheaded by larger farms, hold promise for long-term benefits, including enhanced biodiversity and improved soil health. However, cultivating these practices requires a fundamental restructuring of relationships and workflows within the supply chain.

The current agricultural landscape is further exacerbated by a host of external pressures. Recent analyses highlight a concerning trend in food inflation, driven largely by climate-related disasters. For instance, olive oil prices spiked by 27% in the U.S. due to droughts impacting Spanish olive harvests. Projections indicate food inflation could rise by as much as 50% by 2035 and potentially reach 200% by 2060 if action is not taken to confront these risks.

Lehr and other industry experts advocate for a cooperative approach to building resilience within global food supply chains. Proposals include establishing supply chain climate adaptation plans (S-CAPs), aimed at identifying vulnerable sectors and formulating strategies to buffer against risks. International collaboration and innovation in agricultural finance are deemed essential for stabilising food prices and ensuring food security amidst climate unpredictability.

Despite the myriad challenges, there is a glimmer of optimism surrounding the agricultural sector’s ability to adapt. Improving the supply chain is not solely about technological advancement but also about fostering meaningful connections between farmers and food producers. With the right tools and a commitment to adaptive practices, it is possible for supply chains to evolve into smarter, more resilient systems capable of withstanding the effects of a warming world.

## Reference Map:

* Paragraph 1 – [[1]](https://www.scmr.com/article/rooted-in-uncertainty-why-the-agricultural-supply-chain-is-ripe-for-transformation/news), [[2]](https://www.reuters.com/sustainability/cop/extreme-weather-costs-eu-farmers-28-billion-euros-year-eu-says-2025-05-20/)
* Paragraph 2 – [[1]](https://www.scmr.com/article/rooted-in-uncertainty-why-the-agricultural-supply-chain-is-ripe-for-transformation/news), [[2]](https://www.reuters.com/sustainability/cop/extreme-weather-costs-eu-farmers-28-billion-euros-year-eu-says-2025-05-20/)
* Paragraph 3 – [[1]](https://www.scmr.com/article/rooted-in-uncertainty-why-the-agricultural-supply-chain-is-ripe-for-transformation/news), [[3]](https://www.reuters.com/sustainability/sustainable-finance-reporting/food-brands-investors-scramble-stave-off-risk-stranded-assets-2024-08-22/), [[4]](https://time.com/7010929/climate-disaster-food-cost-essay/)
* Paragraph 4 – [[1]](https://www.scmr.com/article/rooted-in-uncertainty-why-the-agricultural-supply-chain-is-ripe-for-transformation/news), [[5]](https://www.lemonde.fr/en/opinion/article/2024/11/11/cop29-adaptation-finance-for-small-scale-producers-is-an-investment-in-the-future-of-affordable-food-for-the-entire-planet_6732415_23.html)
* Paragraph 5 – [[1]](https://www.scmr.com/article/rooted-in-uncertainty-why-the-agricultural-supply-chain-is-ripe-for-transformation/news), [[6]](https://www.lemonde.fr/en/environment/article/2024/10/18/2024-a-year-of-agricultural-calamities-driven-by-climate-change_6729802_114.html)
* Paragraph 6 – [[1]](https://www.scmr.com/article/rooted-in-uncertainty-why-the-agricultural-supply-chain-is-ripe-for-transformation/news), [[7]](https://www.ft.com/content/125e89c0-308a-492f-ae8e-6834847d1186)

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## Bibliography

1. <https://www.scmr.com/article/rooted-in-uncertainty-why-the-agricultural-supply-chain-is-ripe-for-transformation/news> - Please view link - unable to able to access data
2. <https://www.reuters.com/sustainability/cop/extreme-weather-costs-eu-farmers-28-billion-euros-year-eu-says-2025-05-20/> - Extreme weather driven by climate change is costing the European Union's agriculture sector an average of €28.3 billion ($31.9 billion) annually, equating to 6% of its total crop and livestock production. According to an EU-backed report by insurance broker Howden, only 20-30% of these losses are insured, leaving most farmers without adequate financial protection. EU Agriculture Commissioner Christophe Hansen called on member states to utilize farming subsidies to address climate risks more effectively. The report warns that without stronger climate action, average crop losses could rise by up to 66% by 2050, with droughts currently responsible for over half of the damages. Southern European countries like Spain and Italy are particularly vulnerable, with potential annual losses reaching €20 billion during catastrophic years. Amid growing pressure on both environmental sustainability and farmer livelihoods, the European Commission recently proposed easing some environmental conditions tied to subsidies and accelerating emergency support for disaster-hit farmers. The European Investment Bank plans to use the analysis to guide future agricultural support, including increased funding for water-related projects and irrigation infrastructure.
3. <https://www.reuters.com/sustainability/sustainable-finance-reporting/food-brands-investors-scramble-stave-off-risk-stranded-assets-2024-08-22/> - The food industry faces significant risks due to climate change, and it significantly contributes to methane emissions. The Smith School for Enterprise and the Environment at Oxford University warned a decade ago about agricultural facilities' risk of becoming stranded assets. The risks include physical impacts like drought, heatwaves, and flooding, and transition risks like stricter regulations and changing consumer tastes. The livestock sector, a key methane emitter, is highly susceptible to volatile feed prices and emerging plant-based meat alternatives, with up to half of the largest companies potentially running at a loss by 2030. Companies and investors are currently struggling to address these challenges due to a gap in understanding and complacency, as noted by experts like Isobel Rosen from FAIRR and Nusa Urbancic from Changing Markets Foundation. However, some companies, like Mars, are proactively mitigating these risks through sustainable sourcing and emission reduction commitments. The potential for new regulations and frameworks, like the EU Deforestation Regulation and Sustainable Markets Initiative's blended finance framework, could drive more significant change. Investors show interest in technological advancements, although more comprehensive measures are needed to address the systemic volatility induced by climate change.
4. <https://time.com/7010929/climate-disaster-food-cost-essay/> - Climate disasters are increasingly affecting global food supply chains, causing significant price hikes in essential food items. For example, severe droughts in the Mediterranean have reduced olive harvests in Spain, increasing olive oil prices by 27% for American consumers. Similarly, extreme weather affecting cocoa farmers in Ghana and Ivory Coast has driven chocolate prices in Australia up by 200%, with similar trends expected in the U.S. Wheat production has also been severely impacted by droughts in Argentina, further exacerbated by the Russia-Ukraine conflict, leading to notable volatility in wheat prices. This impacts consumer budgets, especially in low-income households worldwide, forcing shifts to cheaper and less nutritious food options. Addressing this issue requires a global cooperative effort to build resilience in food supply chains. Proposals include launching supply chain climate adaptation plans (S-CAPs) led by multilateral organizations, governments, and private sector companies, focused on identifying vulnerable supply chains and developing strategies to mitigate risks. International collaboration and investment in such initiatives can yield high returns and help stabilize food prices, ensuring food security in the face of climate change.
5. <https://www.lemonde.fr/en/opinion/article/2024/11/11/cop29-adaptation-finance-for-small-scale-producers-is-an-investment-in-the-future-of-affordable-food-for-the-entire-planet_6732415_23.html> - In 2024, several essential food items experienced significant price spikes due to climate change-induced extreme weather, exacerbating food inflation. Projections indicate that food inflation could increase by up to 50% by 2035 and reach as high as 200% by 2060 without urgent action. The impact is particularly severe on smallholder farmers in developing countries, who are crucial for global food security but lack sufficient resources and protection against climate shocks. These farmers, responsible for 35% of global food production, face potential crop yield declines of up to 80% in some regions. Current climate finance for small-scale agriculture is inadequate, with only $5 billion annually, less than 1% of the global total. To address these issues, COP29 in Azerbaijan is seen as a critical opportunity to set an ambitious goal for adaptation finance, with an estimated need for an additional $75 billion yearly in investments for small-scale farmers. Enhancing national adaptation plans and attracting private investments through innovative risk mitigation instruments are essential steps. Adaptation finance for small-scale food producers is vital for ensuring future global food security.
6. <https://www.lemonde.fr/en/environment/article/2024/10/18/2024-a-year-of-agricultural-calamities-driven-by-climate-change_6729802_114.html> - 2024 has been a challenging year for global agriculture, with climate change intensifying extreme weather events. Jérôme Genty, a farmer in France, has faced unprecedented rainfall that has led to a 30-40% reduction in winter crop production. Across France, similar issues are prevalent, resulting in significant drops in yields for wheat, vineyards, and apricots. The phenomenon is not unique to France as countries like Brazil, Niger, and the US have experienced severe weather disrupting agricultural production. The unpredictable weather patterns and increased climate variability are creating difficulties for crop management and quality. Climate change is impacting water resources, raising concerns about future agricultural productivity. Diversification and adaptive strategies are vital to mitigate the effects, but these require considerable technical skill and adjustments in traditional farming practices. The urgency of addressing climate change is particularly evident for vulnerable regions in the Global South, where livelihoods are already at risk. According to the UN, one-third of major food crisis hotspots are now driven by climate extremes, affecting millions of people.
7. <https://www.ft.com/content/125e89c0-308a-492f-ae8e-6834847d1186> - The article discusses the impact of climate change on global food prices and the rising concerns among central banks about sustained inflationary pressures. Agricultural yields are decreasing, and input costs are rising due to changing weather patterns, leading to historically high prices for commodities such as olives, wheat, palm oil, and coffee. Climate change is causing frequent extreme weather events, such as heatwaves, droughts, and floods, which further exacerbate the situation by damaging crops and increasing production costs. This persistent inflationary trend challenges traditional monetary policy approaches, which often exclude volatile food and energy prices from core inflation measures. The consequence is heightened inflation, particularly in developing economies where food constitutes a large share of household expenditure. The article calls for central banks and governments to reconsider their responses to food price shocks, possibly incorporating measures like price controls, subsidies, and stricter market regulations to mitigate the broader economic impact.