

From Data to Decisions: Understanding the Business Case for Private Sector Engagement in Food Security Data

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Introduction

Global food systems face growing volatility from climate change, geopolitics, tariffs, violent conflict, and other shocks.¹ Meanwhile, many public and donor-supported data systems that underpin agricultural production, weather, markets, and food security are being scaled back or eliminated.² As these systems become more fragmented and vulnerable,³ policymakers are increasingly looking to investment, trade, and private sector engagement to fill gaps and drive development outcomes.^{4,5} The case for such engagement, however, is less persuasive in fragile and climate vulnerable settings where market-based constraints remain significant.⁶ Sustained private sector engagement thus will depend on a clear business case that delivers tangible benefits through reduced operational risk, stronger supply chains, new market opportunities, improved farmer relationships, and more competitive products and services.

This moment presents an opportunity to rethink how governments, businesses, researchers, and humanitarian organizations together can develop more resilient, data-driven approaches that strengthen both anticipatory action and long-term food system resilience. RF Catalytic Capital, the public charity affiliate of The Rockefeller Foundation, convened a series of dialogues in the summer of 2026 with leaders from the technology, philanthropic, and research communities to explore the future of food security data systems and anticipatory action. In August 2026, the Chicago Council on Global Affairs hosted a convening with 19 leaders to broaden the dialogue and bring agribusinesses and food companies to the table. This paper highlights the practical realities raised in those discussions and explores the role that the private sector can play in contributing to effective, inclusive, and sustainable data systems that serve as a global public good.

Identifying Opportunities and Understanding Market Supply and Demand

Private sector engagement is essential for any long-term development strategy given its role in creating jobs, mobilizing investments, strengthening markets, and delivering innovation and scale needed for sustainable growth.⁷ Opportunities for shared investment in data, technology, and risk infrastructure should be grounded in market supply and demand, including datasets that underpin market development such as production, prices, trade, land use, consumer demand, and nutrition. Farmers respond to market signals and are unlikely to make long-term investments without viable demand, particularly because land often faces competing demands for food, fiber, and fuel.⁸ Getting them on board requires looking across the entire value chain, from farmgate to consumer, to identify how information can help farmers and agricultural businesses scale resilient opportunities while managing geopolitical, market, and abiotic and biotic challenges. National statistical agencies remain critical public infrastructure, but their information needs to be timely, granular, accessible, and relevant to local farmers, extension agents, and advisory services to be effective. Valuable private sector data on markets, prices, supply chains, and production should also be evaluated for potential pre-competitive or public good use while protecting legitimate intellectual property.

Food system vulnerabilities vary by region, production system, market structure, and risk profile, meaning resilience cannot be built through a single approach.⁹ Private sector engagement is equally context-dependent, as incentives and business cases that drive investment in advanced economies substantially differ from those in developing countries, particularly fragile and conflict-affected settings. Understanding these distinctions helps identify where markets can deliver outcomes independently, where public-private collaboration is needed, and where public investment remains foundational. Addressing these varied needs requires a complementary portfolio of tools and interventions tailored to local conditions. Solutions will need to account for complexities and be adapted across geographies and scales, with multiple touchpoints where farmers, businesses, governments, financiers, researchers, and consumers can engage and contribute. Because failed interventions can erode trust and discourage future engagement, maintaining confidence among farmers and private-sector participants is critical. A successful strategy will combine innovation in data and information systems with practical implementation to deliver tangible business value, strengthen resilience, and foster lasting partnerships for sustainable food systems.

Food security discussions must also increasingly incorporate nutrition security and recognize that food availability alone does not ensure health and well-being. Greater understanding of the links between diet, health, and disease creates new opportunities to align agricultural production with nutrition and public health goals. Building this

understanding requires expanding the focus beyond staple crop production alone to include nutrient-dense and high-value crops such as fruits, vegetables, legumes, nuts, coffee, and cocoa that can improve diets, raise farmer income, and expand market opportunity. Local change in consumer demand remains an underexplored driver of food-system change, making great transparency and engagement with the “eater” essential.

The changing development landscape should be reframed as an opportunity rather than a constraint. As traditional aid declines,¹⁰ there is an opportunity to rethink how government, philanthropy, sovereign wealth funds, and private capital can work in tandem as true partners, using scarcer public resources strategically to create conditions for sustainable market participation.

Similarly, emerging technologies and digital platforms create an opportunity to think creatively and reimagine how the global food system connects producers, consumers, and markets. Digital platforms are enabling farmers to bypass traditional intermediaries, leapfrog legacy systems, and connect more directly with markets services and other resources.^{11,12} These innovations are also creating new pathways for employment, entrepreneurship, and economic opportunity, particularly for younger generations entering agriculture.

Understanding Risks via Data: Making Emerging Risks Quantifiable and Actionable

Strengthening food system resilience requires understanding how risks differ in normal conditions and crises. To do so, the risk lens must be broadened to encompass pests and disease, extreme heat, rainfall variability, water stress, conflict and political violence, trade restrictions, export bans, energy and fertilizer costs, supply-chain disruptions, and shifting geopolitical relationships. A key priority is identifying leading indicators of risk before they escalate into crises, including political, market, and social signals often not captured through conventional data systems, satellites, or drones. At the same time, stakeholders need to recognize that uncertainty is increasingly the norm, with climate volatility increasingly interacting with conflict, geopolitics, and trade disruptions in ways that make historical data alone an insufficient guide to future risks.¹³ The “new normal” will be defined by unpredictable risks, where shocks will be harder to anticipate in terms of timing, severity, and frequency.

Ground-truthing and local knowledge remain essential. Farmer observations, extension networks, field-level sensors, pest traps, and other local data provide the foundation for validating models and ensuring relevance. In an increasingly volatile world, the hyperlocal picture becomes ever more important to feed artificial intelligence (AI) models and

guide precise targeted investments in resilience and crisis preparedness. Risk information therefore needs to be linked to action, triggering decisions on farm practices, financing, insurance, humanitarian response, procurement, and public policy. Better data and predictive analytics can further make risks more insurable and financeable by making previously difficult-to-price risks more legible to underwriters, reinsurers, and investors in the private and public sectors, thereby reducing volatility and enabling capital stacks that pool capital across risk layers.

Effective risk management also requires strong governance around predictive information and tools. Public sentiment and other predictive signals can be manipulated.¹⁴ As AI and predictive markets become more influential, there will need to be mechanisms for ensuring transparency, safeguards, and accountability to prevent the spread of misinformation or unintended harms.

Information and Technology: Turning Data into Decisions

A central challenge for both the public and private sectors is bridging the translation gap between the vast quantities of available data and the capacity to convert such information into trusted, timely, and locally relevant decisions.¹⁵ Doing so requires broadening the definition of data to include farmer observations, qualitative information, and visual evidence such as images of pests, diseases, and crop conditions that provide critical ground truth. AI will only deliver value if designed for real-world conditions, including local dialects, agricultural terminology, and diverse user needs. To realize the potential of data and AI,¹⁶ models will need to be trained for local linguistic, cultural, and agricultural contexts, from women's voices and local crop varieties to pest and chemical names and imperfect field images. The payoff for targeted, context-specific information is its ability to support farmer-focused services, improve decision-making, and strengthen supply chain reliability. This raises questions of who pays for these local investments and whether private sector incentives are sufficient. In many higher-risk, lower-income, or conflict-affected markets, the business case for investment in data systems remains weak despite the potential public benefits. As geopolitical, climate, and operational risks increase, private companies may become less willing to invest in exactly those regions where improved data, early warning, and risk visibility are most needed. This creates a strong rationale for public, philanthropic, and blended-finance approaches that can help bridge market gaps and crowd in private participation over time.

Shared infrastructure can enable collaboration while respecting data ownership, using common identifiers, models, and data commons that allow for information sharing without requiring open access to all underlying data. Such participation should be based on

appropriate incentives, clear governance, and consent-based data-sharing arrangements. Lessons from open-source technology, digital public infrastructure, insurance, financial markets, carbon monitoring, reporting, and verification (MRV) systems, and predictive deforestation monitoring illustrate how shared infrastructure can translate information into action. Solutions will also need to be designed for scale and renewal, be large enough to create meaningful learning, and demonstrate lasting value while progressing toward commercially viable, self-sustaining models.

Data Collaboration and Integration: Turning Data Into Shared Value

Companies contribute market intelligence, supply chain data, technology, distribution networks, risk management, and capital that can strengthen the broader data ecosystem. These private sector actors are most likely to engage when collaboration generates shared value and improves resilience. Building more resilient food systems requires coalitions across agribusinesses, farmers, governments, humanitarian organizations, public health actors, technology companies, insurers, financial institutions, philanthropy, sovereign wealth funds, and development institutions. Each stakeholder brings distinct capabilities, and the opportunity lies in connecting and combining diverse data sources to generate actionable insights. For instance, market intelligence from commodity futures can be overlaid with satellite and geospatial datasets to provide a fuller picture of agricultural and market conditions.

The value of integrated data systems extends beyond situational awareness. By combining market intelligence, satellite imagery, weather forecasts, and supply chain data, stakeholders can create a food system “digital twin”¹⁷: a simulation tool that models real-world conditions, anticipates disruptions, tests response options before a crisis unfolds, and supports more proactive decision-making. By providing a shared picture of emerging challenges and opportunities, digital twins can also align incentives to influence behavior and enable coordinated action by farmers, agribusinesses, governments, humanitarian organizations, and investors. The value of data is not merely in generating insights but in reducing uncertainty and enabling collective action.

An effective partnership model requires distinguishing between competitive and pre-competitive activities. Companies may be willing to share data, models, standards, or infrastructure when collaboration addresses common challenges and does not compromise proprietary advantages. Industry coalitions, shared data infrastructure, and pooled funding can spread costs and benefits while strengthening the broader system. The key question is determining what information should be shared to ensure markets function effectively and what should remain proprietary to preserve incentives

for innovation. As AI and digital technologies enable greater access to information, the balance may shift toward proprietary data becoming more widely available. Investment in a shared digital public infrastructure, such as Open Source, will thus become increasingly important to support innovation on top of a shared information base.

Successful partnerships are built around complementary capabilities, shared standards, and credible operating models. For example, in carbon MRV systems,^{18,19} third-party validation builds confidence in the data and methodology, allowing the model to be scaled more broadly and attract broader farmer participation. Similarly, food security data partnerships could include farmers providing ground truth information and local knowledge; technology companies developing tools and platforms; researchers validating models and generating evidence; governments enabling policies and public infrastructure; insurers converting risk information into financial protection; consumers creating and businesses responding to market demand; and investors supplying the capital necessary to scale solutions. Value emerges from connecting these capabilities and improving the flow of information, goods, services, and capital.



David Zalubowski / AP

Innovative Finance and Business Models: Aligning Incentives for Data

Data is an asset that creates value but also incurs costs for collection, validation, maintenance, protection, and stewardship. Sustainable information systems therefore require clear ownership, financing, and benefit-sharing models. Because farmers provide essential observations of field conditions, production practices, and local realities that underpin these models, early-warning systems, insurance products, and market intelligence, they should capture a fair share of the value they create. Such compensation could be offered through direct payments, data-sharing incentives, cooperative ownership structures, or revenue-sharing mechanisms. Funding for these data systems should come from those who benefit, which may include agribusinesses, insurers, lenders, governments, humanitarian organizations, technology companies, consumers, and philanthropic or blended-finance vehicles, with the appropriate funding model dependent on whether the benefits are primarily private, public, or a combination of both.

Farmers may value this type of information but lack the resources to pay for it directly. As a result, downstream actors, such as insurers, lenders, input providers, processors, or governments, may need to fund information services through mechanisms such as agricultural value-chain financing or contract farming.²⁰ Sustainable models will need to demonstrate how financing farmer data generates a clear return on investment, whether through lower insurance losses, more accurate credit decisions, improved yields, reduced input costs, or more efficient supply chains.

In high-risk or immature markets, hybrid approaches such as blended finance, insurance pools, and cooperative structures can help bridge the gap between public good investments and market-based models. Government or philanthropic capital can be used to strategically address market failures, absorb early-stage or tail risk, establish common infrastructure, and demonstrate viability. The goal is not a long-term subsidy, but to create a pathway for private capital to enter, scale, and eventually sustain information systems that generate both public and private value.

Creating Pathways for Farmer Participation

Cooperative models can strengthen farmer participation by leveraging trusted farmer networks and peer-to-peer relationships to build confidence in new technologies, practices, and information systems. By aggregating data through cooperatives or other trusted entities, farmers can increase their bargaining power and capture more of the value created from their data.

Trust in data governance is as important as compensation. Farmers need transparency regarding what information is collected, who uses it, how it creates value, and whether they retain ownership and control over their data.^{21,22} Financial incentives alone will be insufficient if information systems are perceived as primarily extracting value from farmers or communities. Building political and social credibility therefore requires framing data and technology around better livelihoods, more farmer agency, greater resilience, expanded economic opportunity, and improved outcomes for the communities served.

Conclusion

A significant transformation is underway in how risks across the agricultural and food value chain are understood, managed, and financed, with profound implications for global food security. As public development resources decline and climate, geopolitical, and market risks intensify, there is an opportunity to move beyond retrospective data collection, regional ad hoc information gathering, and crisis response toward predictive intelligence that enables earlier action, reduces volatility, improves livelihoods, and unlocks private capital.

Realizing this opportunity will require three priorities: (1) investing in data infrastructure that enables harmonized sharing of public, private, and locally generated information, with private sector participation grounded in appropriate incentives and consent, to improve risk visibility and anticipatory action; (2) designing data systems around user needs while ensuring farmers and other contributors share in the value created through transparent governance and appropriate incentives; and (3) leveraging catalytic partnerships and innovative financing to build commercially viable models for data collection, analytics, and AI-enhanced delivery of user-responsive information services that attract long-term investment. The goal is not merely to access more data or technology, but to harness existing data to better understand and anticipate risk, enable action before crises occur, develop attractive markets and resilient business opportunities, and create a suite of sustainable solutions tailored to different geographies, crops, actors, and risk profiles. Through a combination of better data, stronger partnerships, and novel financing and insurance approaches, private-sector players can provide important tools for building long-term resilience across the food system that generates both public and private value while advancing global food security.

Key Recommendations for Building Sustainable Food Security Data Systems

1. Build demand-driven data systems

- Start with market and value-chain needs across different scales and geographies, while addressing data gaps often found in markets where commercial incentives are weakest.
- Expand data monitoring beyond staple crops to include nutrient-dense crops and consumer preferences.
- Use innovation to redesign information, finance, and market systems around today's realities, reducing friction and improving data access across the value chain.

2. Move from data to anticipatory action

- Recognize the new “normal” of uncertainty and design for resilience under stress.
- Expand the risk lens beyond biotic and abiotic factors to include market, political, and geopolitical risks that enable linking risk information with anticipatory action.
- Build local data collection and analytical capabilities in emerging markets and invest in local knowledge and early-warning lead indicators to account for real-world conditions.
- Engage financiers, insurers, procurers, and policymakers to identify and prioritize risk information needed to guide investment and translate data into action.

3. Create shared data infrastructure and trusted partnerships

- Distinguish between the types of information that should be the focus of pre-competitive collaboration from those needed to provide competitive advantage.
- Develop digital public infrastructure that enables a foundation for data collaboration and for trusted AI use in local models while protecting ownership and incentives.
- Leverage hyperlocal data and local expertise to build AI-enabled services responsive to real-world conditions and user needs, including appropriate safeguards against misuse.
- Build coalitions that align the interests of farmers, businesses, governments, researchers, and investors to their respective strengths.

4. Align incentives and financing

- Treat data as an asset with clear ownership, stewardship, and value-sharing arrangements, recognizing that key components of information should be in the public domain.
- Ensure farmers have the option to benefit from the value their data creates.
- Use catalytic public and philanthropic capital to crowd in private investment and scale sustainable models that address gaps in public information and infrastructure.

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Endnotes

- 1 FAO, IFAD, UNICEF, WFP, and WHO. 2026. The State of Food Security and Nutrition in the World 2026 – Understanding and addressing the high cost of a healthy diet. Rome. Available from: <https://doi.org/10.4060/cd8306en>
- 2 Worley, W. 2025. Humanitarian data drought: the deeper damage wrought by US aid cuts. The New Humanitarian. Available from: <https://www.thenewhumanitarian.org/analysis/2025/03/25/humanitarian-data-drought-deeper-damage-wrought-us-aid-cuts>
- 3 Gaupp, F. 2022. Global food systems – Understanding risk, transforming towards resilience. Available from: <https://www.undrr.org/media/85693/download?startDownload=20260915>
- 4 OECD. 2026. "Harnessing the private sector's contribution to climate adaptation", OECD Publishing, Paris. Available from: <https://doi.org/10.1787/43d93534-en>
- 5 UNDP. 2025. Unlocking private sector potential for climate-resilient agriculture. Available from: <https://climatepromise.undp.org/news-and-stories/unlocking-private-sector-potential-climate-resilient-agriculture>
- 6 Independent Evaluation Group. 2013. World Bank Group Assistance to Low-Income Fragile and Conflict-Affected States: An Independent Evaluation. Available from: https://ieg.worldbankgroup.org/sites/default/files/Data/reports/ieginights_psd.pdf
- 7 World Bank. 2026. Building Food Security, Creating Jobs: Policy Pathways for the Region. Middle East, North Africa, Afghanistan, and Pakistan Development Report. World Bank. Available from: <https://doi.org/10.1596/978-1-4648-2246-9>
- 8 Mbow, C., C. Rosenzweig, L.G. Barioni, T.G. Benton, M. Herrero, M. Krishnapillai, E. Liwenga, P. Pradhan, M.G. Rivera-Ferre, T. Sapkota, F.N. Tubiello, and Y. Xu, 2019: Food Security. In: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D.C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)]. Available from: <https://doi.org/10.1017/9781009157988.007>
- 9 National Academies of Sciences, Engineering, and Medicine. 2021. Building a More Sustainable, Resilient, Equitable, and Nourishing Food System: Proceedings of a Workshop. Washington, DC: The National Academies Press. Available from: <https://doi.org/10.17226/25832>
- 10 Hamann, S. 2026. Foreign Aid at a Crossroads: How Funding Cuts Reshape Global Development Cooperation. Global Policy, 17: 122-133. Available from: <https://doi.org/10.1111/1758-5899.70116>
- 11 Gong, C., G. Liu, J. Wang, and X. Liu. 2025. Digital Technology Usage and Family Farms' Uptake of Green Production Technologies—Evidence from Citrus Family Farms in Jiangxi Province. Sustainability, 17(22), 10334. Available from: <https://doi.org/10.3390/su172210334>
- 12 Li, Q, H. Zhao, F. Wang, G. Yang, and Y. Jiang. 2026. Digital technology adoption, agricultural production efficiency, and farmers' livelihood resilience. Front. Sustain. Food Syst. 10:1839388. Available from: <https://doi.org/10.3389/fsufs.2026.1839388>
- 13 World Economic Forum. 2026. The Global Risks Report 2026: 21st Edition. Available from: https://reports.weforum.org/docs/WEF_Global_Risks_Report_2026.pdf
- 14 Climate Resilient Food Systems Alliance. 2024. Accelerating comprehensive risk management in agrifood systems. Available from: <https://www.undrr.org/quick/90521>
- 15 Azlan, Z.H.Z., S.N. Junaini, A.S. Khan, W.Z. Mustafa. 2025. Data-Driven Agriculture: Unveiling the Power of Internet of Things and Data Analytics For Transformative Farming Practices, Journal of Sensors, 6205646, 38 pages. Available from: <https://doi.org/10.1155/js/6205646>
- 16 Chowdhury, K., M.A. Rahman, S.K. Mallik, L. Chowdhury, and N. Nova. 2025. Bridging the Global Digital Divide in Agriculture: The Role of AI in Equitable Technology Access. International Journal of Sustainable Development and Planning. 20:2469-2481. Available from: <https://doi.org/10.18280/ijstdp.200616>
- 17 Purcell, W. and T. Neubauer. 2023. Digital Twins in Agriculture: A State-of-the-art review, Smart Agricultural Technology, 3:100094. Available from: <https://doi.org/10.1016/j.atech.2022.100094>.
- 18 Vanderheyden, L., N. Gayot, and G. Van den Broeck. 2026. What monitoring, reporting & verification (MRV) systems can reduce costs and enhance scalability of carbon farming? J Environ Manage. Mar 1;401:128885. Available from: <https://doi.org/10.1016/j.jenvman.2026.128885>
- 19 World Bank. 2022. Digital Monitoring, Reporting, and Verification Systems and Their Application in Future Carbon Markets. World Bank, Washington, DC. Available from: <https://documents1.worldbank.org/curated/en/099605006272210909/pdf/IDUOca02ce8009a2404bb70bb6d0233b54ffad5e.pdf>
- 20 Villalba, R., T.E. Venus, and J. Sauer. 2023. The ecosystem approach to agricultural value chain finance: A framework for rural credit, World Development, 164:106177. Available from: <https://doi.org/10.1016/j.worlddev.2022.106177>
- 21 Dara, R., S.M. Hazrati Fard, and J. Kaur. 2022. Recommendations for ethical and responsible use of artificial intelligence in digital agriculture. Front Artif Intell. Jul 29;5:884192. Available from: <https://doi.org/10.3389/frai.2022.884192>
- 22 Kaur, J., S.M. Hazrati Fard, M. Amiri-Zarandi, and R. Dara. 2022. Protecting farmers' data privacy and confidentiality: Recommendations and considerations. Front. Sustain. Food Syst. 6:903230. Available from: <https://doi.org/10.3389/fsufs.2022.903230>



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