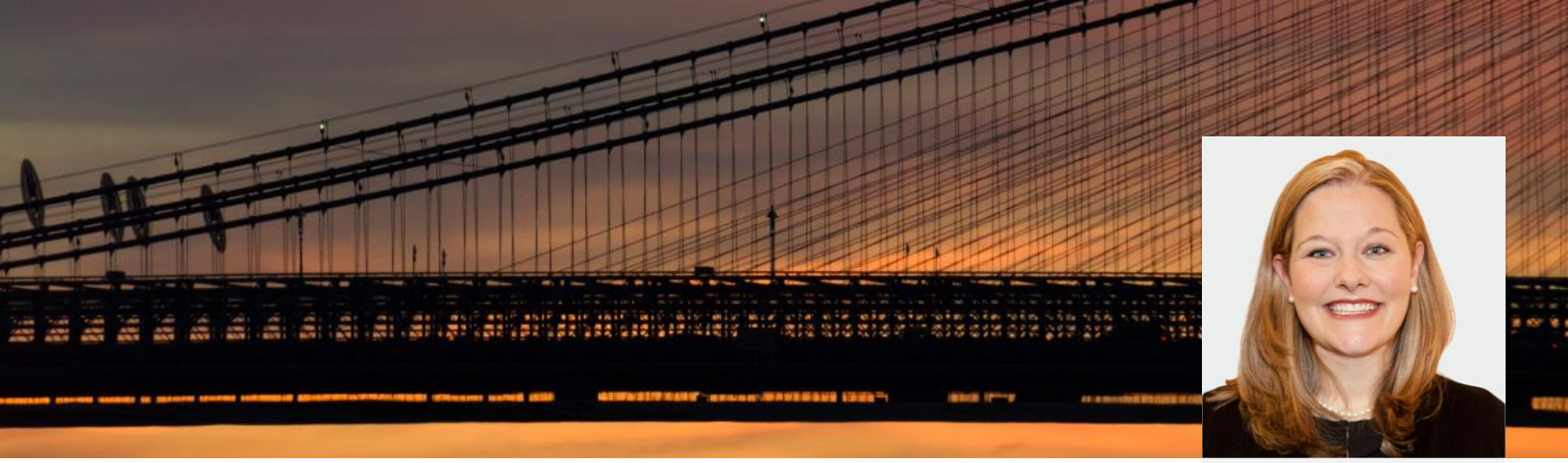

Bridging the Gaps: Finding Common Ground to Advance Agriculture for All

By: Brook Cunningham

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Introduction

Agribusiness is undergoing a period of transformational change. Technology, data analytics and digital connectivity are being harnessed in unprecedented ways to increase the efficiency and sustainability of global food production, which will transform the farm and strategic landscape over time.

However, there is an asymmetry of priorities, cultures and other fundamentals between the key constituents of the agriculture ecosystem. This is hindering implementation of new technologies at the scale needed to materially accelerate the pace of progress.

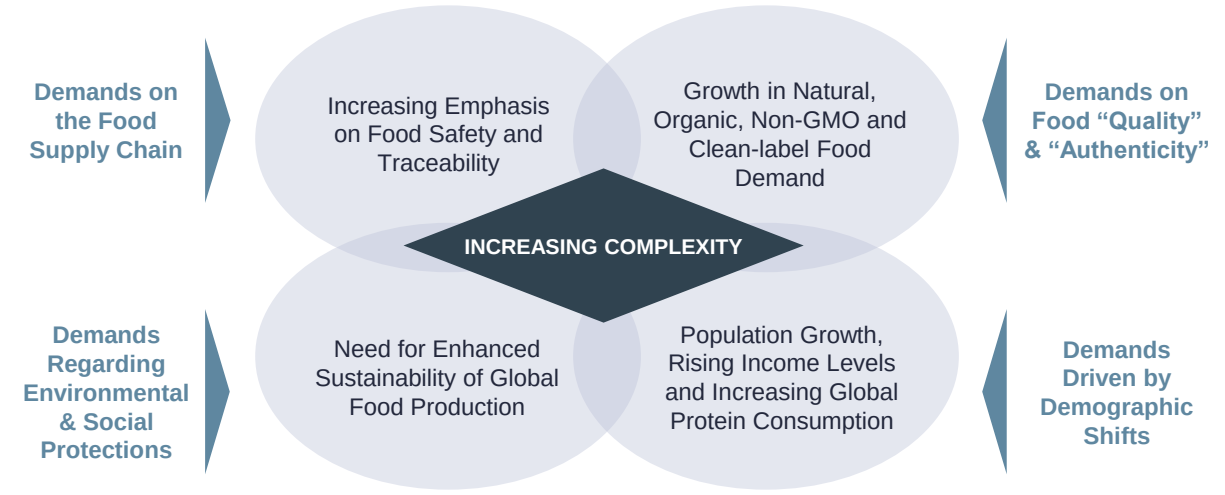
- **Consumers** are demanding changes in the food supply chain to deliver enhanced food quality, authenticity and sustainability. However, many do not appreciate the complexity and cost of effecting such changes in mass scale, nor is it clear they are willing to bear their share of the cost of such transformation.
- **Farmers** need integrated outcome-based solutions of products, services and data-driven tools to increase the efficiency and profitability of their operations, while reducing complexity and risk. Yet the quantity of new Ag Tech remains overwhelming, and farmers remain skeptical about the unproven value proposition of many products and the risks associated with sharing their data.
- **Many large agribusiness corporations** need an infusion of innovation. However, this requires transformation of long-standing and often sleepy corporate cultures while concurrently delivering near-term financial returns, which can be inconsistent with investing in riskier projects with more long-term benefits.
- **Many new Ag Tech innovators** need the capital, experience, infrastructure and relationships of agribusiness corporations to deliver new technologies to the market in mass scale. However, many still fail to tell their story in the language of risk-adjusted financial returns that strategic investors require.

Consumers, farmers, agribusiness corporations and Ag Tech innovators are traveling in the same general direction pertaining to the advancement of agriculture. However, they are on separate and often winding paths, which is slowing the journey.

Jumpstarting the transformation of our global food system requires us to find common ground through:

- Greater understanding of the priorities and pressures of each constituency;
- Greater willingness by all to bear reasonable risks and costs; and
- Creative solutions to bridge the gaps in expectations.

Increasing Consumer and Other Demands on the Global Food System



Source: Lazard.

Consumers are the Driving Engine of Change

Consumers are demanding change in the global food system, yet most do not appreciate the complexity and cost of implementing such changes in the agriculture supply chain.

Over the last several years, we have seen intensifying focus by consumers in developed countries on the contents, origins and "healthiness" of their food. The markets for natural, organic, non-GMO and clean-label products, among others, are rapidly growing as customers seek food with higher perceived levels of quality, authenticity and sustainability.

- **Quality** is largely associated with foods with higher nutritional content and other health benefits, as well as lower levels of chemicals, artificial ingredients, antibiotics or other "undesirable" substances.
- **Authenticity** generally describes foods that offer transparency of growing practices and ingredients, enhanced supply chain traceability and "wholeness" (i.e., as close as possible to their natural form).
- **Sustainability**, which is perhaps the most amorphous term, translates into food with reduced environmental impact, more humane conditions for workers and animals and positive long-term effects on agricultural communities.

This movement has been driven, in part, by greater availability of information and focus on health and wellness in developed countries, as well as heightened concerns around climate change and the need to feed up to 3 billion more people by 2050 with declining arable land. However, it has also come from a cultural shift in how diet—whether it be paleo, low-carb, plant-based, organic or another—is viewed as an element of people's personal brand and story, particularly with increased cultural emphasis on ethical and sustainable living.

These trends are catalyzing dramatic and rapid shifts in how and what developed-market consumers eat, which will have meaningful implications to the food supply and demand equation over time.

However, most consumers do not appreciate that our global food system is not yet equipped to meet the demand for organic, non-GMO, sustainably sourced and other "non-traditional" products in mass scale, and that the conversion process will be complex and costly.

As an example, organic row crops remain a relatively small percentage of global agricultural production. This is due, in part, to time required, switching costs and risk to farmers.

To become a certified organic farm can take three or more years due to the need to "transition" land away from the use of prohibited substances (e.g., chemicals) and to align operations with all USDA National Organic Program (NOP) rules and regulations. During this transition period, the farmer often incurs higher costs—including those associated with organic inputs, planning and certifications, labeling, marketing and distribution, among others—but cannot realize a premium "organic" price for their crop. The financial challenges of this timing delay can be significant.

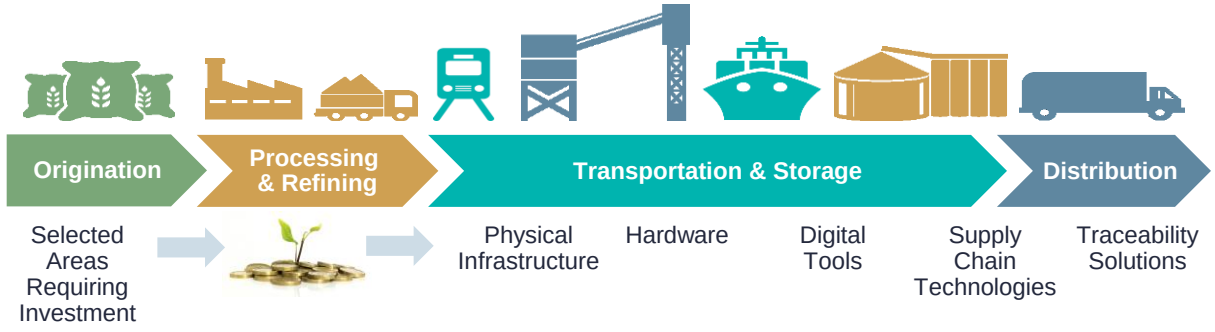
As a second example, the largest global grain traders (the "ABCDs") have massive global infrastructure platforms to move crops across the world from regions of surplus to regions of need, using elevators, ports and terminals, barges, railcars, trucks and ocean-going vessels.

The vast majority of this infrastructure was designed to handle mass-scale origination and transportation of grain, oilseeds and other "traditional" crops without intense discrimination between where and how such crops were produced.

The process to adapt this infrastructure to move scale quantities of "specialty" or "non-traditional" crops separately from "traditional" products will require adaptation of, and potentially substantial investments in, supply chain infrastructure.

Providing complete farm-to-table traceability and reporting of food quality, authenticity and sustainability will also require enhanced technology and supply chain data integration (e.g., Ag Blockchain). While progress is being made in this area via technology innovation and strategic partnerships, developing such solutions is complex and will likely take years.

Selected Areas for Investment in the Global Agriculture Supply Chain



Source: Lazard.

Nonetheless, food retailers like Wal-Mart and Costco are putting substantial pressure on their direct food supply chains to adapt faster. Some are requiring a myriad of new digital tracking and reporting requirements, installing on-premises sensors and cameras and imposing increasingly high standards for production and quality. And, in certain instances where suppliers have not met their needs, they have begun backward integration into certain production categories (e.g., poultry, milk) in order to guarantee the food supply, quality and traceability their customers require.

These retailers are sending a clear message to food suppliers—get on board or get out of the way.

Bridging the gap between consumer expectations and reality will require the industry to educate consumers on the time and capital investment required to transform underlying infrastructure.

 Source: United States Department of Agriculture.

Importantly, developed-market consumers need to appreciate they will bear their portion of the cost associated with industry transformation, whether it be via higher food prices, taxes, investment vehicles (e.g., lower return on investment for companies that need to meaningfully increase capex) or other forms.

At the same time, however, agribusiness companies must understand that the developed market's requirements are changing rapidly and that retailers will not wait long for suppliers to "catch up."

Areas of Increasing Complexity for Growers

Source: Lazard.

Blending the Best of the Old and New to Enable Farmer Success

Farmers need the benefits of new technology, but suppliers need to approach them differently.

Farmers face increasing pressures on all sides:

- **Changing consumer demands** are materially increasing the complexity of farming. Tracking and reporting requirements from customers are expanding. Public focus on water usage, carbon footprint, soil and water pollution and other byproducts of agricultural production is becoming more acute. Lenders and insurers are requesting more data in order to more accurately price risk.
- **Macro, geopolitical and other external headwinds** continue to squeeze farm profitability to the breaking point. Crop prices remain under sustained pressure, driven by ample global supply with few (if any) catalysts on the horizon for sustained improvement. Substantial fixed costs (e.g., equipment, insurance, land and/or land rent) have created a high baseline financial "cost to play," and capital requirements continue to expand, due to the need to invest in new infrastructure and technology.

These pressures, in combination with demographic shifts in some markets, will ultimately lead to increased farm consolidation and the growth of larger, more sophisticated, "mega farm" enterprises with economies of scale and enhanced ability to weather market volatility. The small and mid-sized farms that remain will be those that excel at managing costs, risks and profitability through operational excellence.

Regardless of size, farms need more support from the agribusiness ecosystem to enhance profitability and manage a complex operating environment. Technology—and, in particular, data-driven decision making tools—will be a key component of bridging this gap.

However, while the mass proliferation of new Ag Tech in recent years has generated a number of promising data collection, machine learning and predictive analytic tools to help farmers make better informed decisions focused on maximizing profitability, adoption rates of Ag Tech remain low—*Why?*

Part of the issue stems from poor communication between Silicon Valley and the open prairie. In the midst of the excitement of bringing the digital age to agriculture, some Ag Tech companies and investors are missing key issues that are leading to longer sales cycles and lower than expected market penetration. For example:

- **The volume of new Ag Tech has become overwhelming for farmers**. They find themselves swimming in a sea of information without sufficient data to validate what, if anything, might work for them. Ironically, in an effort to reduce complexity for growers through technology, the inundation of growers with new tools has—at least temporarily—made decisions even more complex. This process must be streamlined to accelerate adoption.
- **Farmers are slow to trust.** They are wary of sharing information with outsiders. They are (rightfully) skeptical of promises of revolutionary technologies. Some early movers in Ag Tech scorched the earth by failing to deliver. As such, sales cycles for farm technology are often long, especially when products can only be tested on farms once or twice a year due to crop seasons. "Tech arrogance" makes farmers feel like companies don't understand the pressures and complexity of their business. Trust must be earned.
- **Farmers want data that proves any investment in Ag Tech products will have a measurable return on an acceptable timeline**—which, in today's challenged farm economic environment, often means that same growing season. In practice, most Ag Tech companies are still working to build the data sets needed to prove their ROIC proposition to growers. Furthermore, many predictive analytic tools take multiple seasons of data collection and analysis to provide meaningful value. It's not surprising that adoption rates have lagged expectations.
- **No one appreciates the insinuation that what they are doing is wrong.** For example, the mention of the need for more "sustainable farming" can elicit a visceral reaction from a grower whose livelihood is dependent on the health of the land, water systems and communities that support the farm. The intent behind the word is positive, but the delivery often misses the mark. Finding ways to overcome communication and cultural differences between consumers, sustainability advocates, innovators and farmers will be critical.

The Shift Toward Outcome-Based Solutions

The Legacy Model

Balancing multiple providers to purchase individual, unintegrated products and services focused on yield

The New Integrated Model

Integrated outcome-based solutions to reduce risk and complexity and maximize profitability

Source: Lazard.

To bridge the gap between farmer needs and a surplus of non-integrated offerings, the agribusiness ecosystem needs to work together more effectively to accelerate the delivery of integrated, value-added tools that help growers reduce risk, reduce effort/complexity and increase profitability. This will require the market to accelerate its shift toward a model of integrated systems of products and services designed to achieve certain profitability outcomes for growers—"outcome-based solutions".

These solutions must connect the best of the old with the new, including: (i) the wisdom of legacy agronomic expertise; (ii) the power of advanced seed, crop protection and crop nutrient technologies; and (iii) new data collection and predictive analytic tools of advanced Ag equipment, software, AI/machine learning platforms and other products. Collectively, these tools will enable growers to more effectively track, measure and analyze the economic value created (or destroyed) by agronomic decisions.

Importantly, these tools need to be delivered by trusted advisors to the farm in a way that is easily digestible and compatible with farm culture and risk tolerance.

Such advisors must be the aggregators and validators of products available to growers and be able to deliver informed advice. They need to understand the unique pressures, culture and risk tolerance of each customer and commit to delivering optimal solutions to meet their needs.

They need to be the bridge between the new and the old by positioning new data-driven tools as what they really are: *supplements to*—and not *replacements of*—traditional agronomy tools that have enabled growers to feed their families and the world for generations.

Empowering Companies to Lead the Way

Large global agribusiness companies should serve as the critical "connective tissue," but need infusions of innovation. They must be encouraged to lead.

The leading global retailers and cooperatives, chemical and seed majors, and grain, protein and dairy companies sit at the epicenter of the agribusiness ecosystem and have direct, long-standing relationships with farmers.

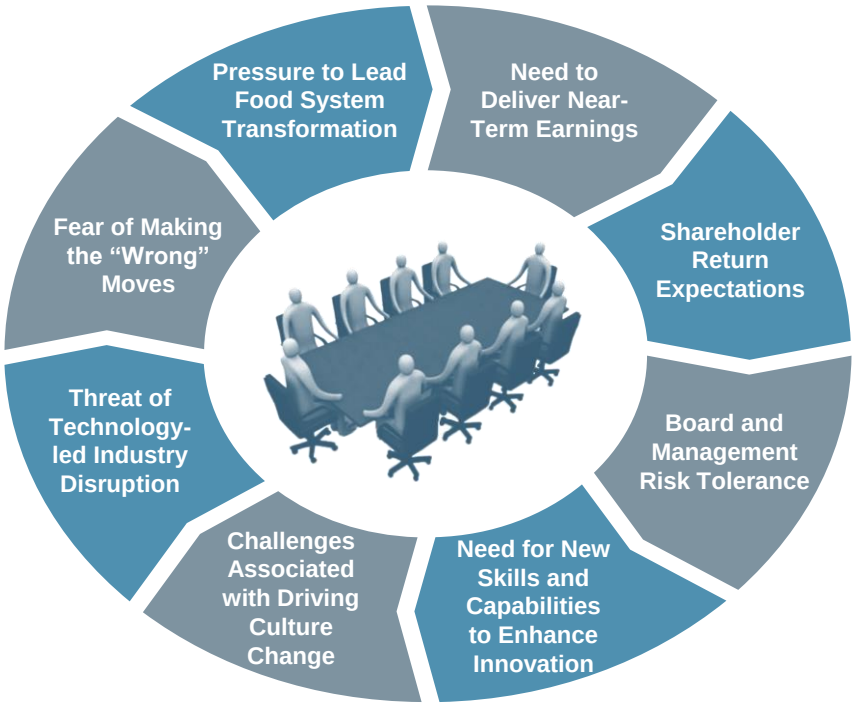
To advance our global food system, these companies, through their scale, resources, global connectivity and influence need to step up to be the "connective tissue" between consumers, farmers and the new innovation ecosystem.

They should be the aggregators, validators and integrators of products and services into outcome-based solutions. They should be providers of growth capital for promising start-ups as public equity market capacity for Ag Tech companies will likely be limited and take time to develop. They should leverage their massive distribution channels to accelerate the placement of the best new Ag Tech into farms. They should play a key role as trusted advisor to farmers to help them navigate an increasingly challenging environment.

However, these companies will need to be encouraged and empowered to lead. Many of them have to transition from siloed, commodity-centric organizations to innovative ecosystem connectors, which will require capital investment and management focus.

With the exception of the seed and chemicals subsector, which has long been R&D-centric, innovation has not been a core strength of agribusiness companies. Agriculture is the last major industry to digitize, which presents both tremendous opportunities for growth and advancement using data-driven tools as well as the threat of disruption to existing supply chains for which many companies are unprepared.

Competing Pressures and Priorities of Global Agribusiness Companies



Source: Lazard.

This threat has been pushing even the more reluctant companies to infuse innovation into their organizations. In most instances, large companies have begun "testing the waters" through a multi-pronged approach to engaging with the external new innovation ecosystem, as well as bolstering organic R&D efforts.

New partnerships—the lowest risk and least capital intensive strategy—are announced each week, particularly in terms of digital strategies, data sharing and analytics and joint product development. Small strategic investments into Ag Tech venture capital funds and direct minority investments into Ag Tech companies have increased over the last two years, as a gateway for companies to learn and gain confidence. M&A has been used more sparingly, although the industry has seen a few platform acquisitions of Ag Tech startups, including Monsanto/Climate, DuPont/Granular and Deere/Blue River.

Yet despite this activity, large companies remain hesitant to make truly substantial investments in areas like precision agriculture, e-commerce and omnichannel distribution platforms, and digital supply chain solutions, despite a clear demand from consumers and a need from farmers—*Why?*

The answer involves a combination of culture, risk tolerance and stakeholder pressures.

One of the most difficult elements of transforming an organization from a commodity-centric to innovation-centric strategy is culture change.

It means waking often sleepy organizations that have become complacent with the status quo, and creating a sense of urgency in employees to tackle complex new issues. It requires investments in human capital to acquire new talent and skill sets, improve technology fluency and increase connectivity to the innovation ecosystem. It takes reorganization of go-to-market strategies and retraining customer-facing employees to sell integrated solutions instead of products.

Examples in other industries have shown that driving this kind of culture change at large agribusiness companies will be messy and take time (and likely a few wakeup calls). But in the meantime, Wal-Mart and Costco aren't waiting around, nor will new technology companies like Farmers Business Network curb their ambitions to disrupt.

Big corporations also face challenging stakeholder pressures, which are particularly acute for publicly traded companies.

Public organizations are under constant pressure to deliver near-term financial results that can discourage investing in projects with more long-term benefits ("near-termism"). Management compensation structures are often tied to near-term earnings, returns, share price and other metrics that can discourage risk taking. Effective capital allocation is under such intense scrutiny by shareholders—including the constant threat of shareholder activism—that companies struggle with how much capital to invest in innovation. They fear the risk of investing too soon in the cycle or into the wrong places. This fear stifles innovation.

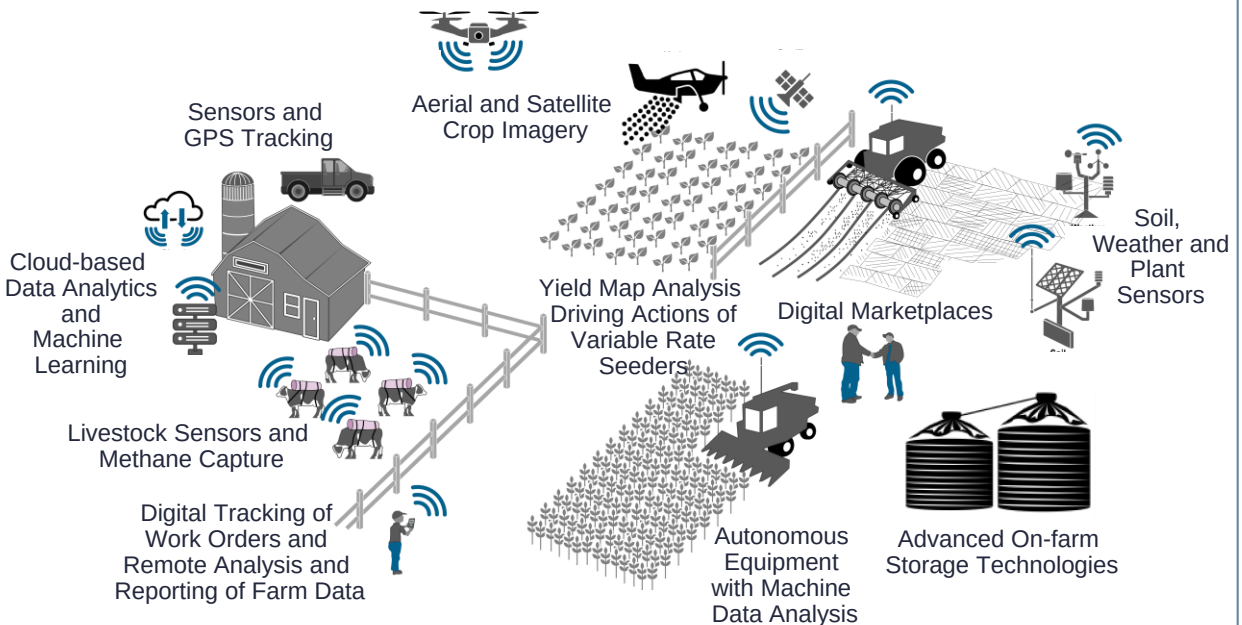
To bridge the gap between their current positioning and their potential as innovative ecosystem connectors, companies need to be encouraged by key stakeholders to increase their measured risks and invest more capital and mindshare into advancing our global food system.

As an industry, we need better definitions and concrete objectives for concepts like "sustainability" to give companies direction on what is expected, and give consumers and shareholders the guidelines to hold management teams and Boards accountable. We must find ways to broaden the calculations of "stakeholder returns" to include environmental, social and other externalities.

We need to embolden senior management teams to have vision and to make difficult decisions faster. This may necessitate further vertical and horizontal consolidation activity to enhance companies' capabilities and geographic reach, to make long-term capital investments financially easier, and to share the benefits of greater economies of scale with consumers and investors.

To bridge the gap, we need to empower these companies to lead.

The Proliferation of New Technology Across the Farm



Source: Lazard and Bain.

Translating the Language of Ag Tech Innovation to Farmers and Investors

Innovators need to communicate with farmers and large agribusiness corporations in more effective ways.

There has been massive investment in AgriFood Tech over the last 10 years, with $20.6 billion of funding raised by upstream Ag Tech companies from 2014 – 2018 alone. An increasingly diverse set of investors is providing capital, including those seeking economic exposure to strong long-term global food demand trends as well as those focused on the sustainability of global food production. In addition to traditional venture capital and private equity sources, sovereign wealth funds, pension funds, family offices and other "alternative" pools of capital are putting capital to work. This has resulted in a proliferation of innovative new Ag Tech startups with groundbreaking ideas.

Yet, as stated above, adoption rates of Ag Tech on the farm and across the supply chain remain relatively low, and corporations remain hesitant to deploy meaningful capital despite having the balance sheet, experience, infrastructure and relationships to deliver the best new technologies to the market in mass scale.

Part of the disconnect is that many new innovators are speaking the language of technology, concepts and revolutionary ideas, which need to be put into a language farmers and corporations can understand—that of capital requirements, investment risk, data-backed financial returns and required infrastructure.

Farmers want data-backed support for the return proposition of new technologies, based on case studies from other farms and/or field analysis. While strong technology, well designed sales strategies (aligned with farm culture) and informative product demonstrations are important, ROIC datasets are becoming table stakes to advance adoption.

Similarly, the Ag Tech innovators that will be most successful in striking partnerships or achieving investments and acquisitions by corporations will be those that can clearly communicate their investment thesis with farm ROIC and other data in ways strategic investors can underwrite with confidence. This requires not only a well considered and analytically supportable standalone plan for the Ag Tech company, but also thoughtful analysis of the quantitative and other strategic synergies of what the organizations can do together to drive enhanced financial returns.

Innovators should also appreciate that most large companies will want to "date" via partnerships before they "marry" via acquisitions in order to:

Source: *AgFunder.*

(i) delay material capital investment; (ii) better understand the value proposition and avoid overpaying for the target; and (iii) get comfortable with cultural compatibility, as the right "fit" with both customers and business partners will ultimately be key to success.

In the meantime, Ag Tech companies are likely to stay independent for longer in order to execute on their standalone management plans and prove their technology and value proposition to growers, potential acquirors, and, in select instances, public equity markets.

Conclusion

Bridging the gaps between key constituents in the global agriculture ecosystem will require a concerted and proactive effort to find common ground on all sides.

Each party needs to develop a greater appreciation for the differences in priorities, culture, risk tolerance and stakeholder pressures facing the others, and take steps to communicate and collaborate more effectively. Overall, the industry needs to:

- Educate consumers about the complexities and costs of transforming the global food supply chain—without delaying the drive for greater food quality, authenticity and sustainability;
- Serve farmers with integrated outcome-based solutions, delivered by trusted advisors who understand their unique needs and pressures;
- Enable large agribusiness corporations to take risks and make long-term investments in innovation so they can serve as the vital "connective tissue" between consumers, farmers and innovators; and
- Help innovative Ag Tech companies learn to speak the language of farmers and corporations: that of capital requirements, investment risk, data-backed financial returns and required infrastructure.

Together, we can accelerate development of innovative solutions to transform our global food system to better meet the needs of a growing, evolving market.

About Lazard

Lazard, one of the world's preeminent financial advisory and asset management firms, operates from 43 cities across 27 countries in North America, Europe, Asia, Australia, Central and South America. With origins dating to 1848, the firm provides advice on mergers and acquisitions, strategic matters, restructuring and capital structure, capital raising and corporate finance, as well as asset management services to corporations, partnerships, institutions, governments and individuals.

For more information, please visit www.lazard.com

Brook Cunningham is a Managing Director of Lazard. She leads the Firm's Chicago-based Agribusiness and Nutrition practice, and coordinates Lazard's efforts in the industry on a global basis. Ms. Cunningham will be moderating the Global Leaders Debate on March 21, 2019 at the World Agri-Tech Innovation Summit.

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