

## The Unanticipated Promise of Sustainable Agricultural Supply Chains

Mary L. Shelman\* and Damien P. McLoughlin\*\*

*\*Mary Shelman Group, \*\* Anthony C. Cunningham Professor of Marketing, UCD Michael Smurfit Graduate Business School, Ireland*

[mary@maryshelmingroup.com](mailto:mary@maryshelmingroup.com), [Damien.McLoughlin@UCD.ie](mailto:Damien.McLoughlin@UCD.ie)

The current focus on sustainability in food production has had the unintended benefit of solving the biggest problems in the agri-food system. Stretching from input providers through farmers and retailers to the final consumer, the agricultural supply chain throughout time has been plagued by twin problems of information and investment. Information from the market has not flowed from the primary producer due to fragmentation, poor cooperation, and transactional – and often adversarial – relationships between farmers, processors and retailers. Financial incentives and investment capital have also failed to move through the chain as actors compete to reduce costs for retailers, who have sold consumers on the idea that lowest price equals highest value.

Things are different now and change is accelerating. Simply, it appears to us that sustainable supply chain initiatives have acted to drive market and customer information up and down the supply chain with velocity while, at the same time, the scale and urgency of change required by the consumer has forced investment down the chain to enable an effective response. We think this works at market and firm levels.

At the market level, new customers and buying behaviours are introduced into the market, thus increasing the size of the market through innovation and higher prices. For example, myriad concerns including environmental footprint and animal welfare have put pressure on the consumption of animal protein, particularly beef. Sector-wide programs, such as the Roundtable for Sustainable Beef, have been created by a broad coalition of industry players to address consumer needs. At the same time, investors have backed the development of new plant-based proteins and cultured meats, which are positioned as superior on environmental and welfare dimensions. The net effect is to (potentially) increase the size and profitability of the protein market through an increase in total consumption of protein at a higher price point as consumers pay for innovation in processes and products.

At the firm level, processors are subject to retailer or food service audits which include sustainability objectives and metrics based on consumer and regulatory demands. The same retailers and food service buyers are also auditing primary producers and other supply chain actors, ultimately aligning all of the actors in the chain. The willingness of retailers and food service providers to only do business with those adopting sustainability measures means that, at a minimum, sales increase for aligned firms and the ultimately closer relationships lead to higher margins.

This paper considers what has followed from the introduction of sustainable supply chain initiatives. Approaches to achieving sustainable supply vary by firm. New practices have emerged, particularly with respect to information exchange and financial incentives. Characterizing these approaches offers a lens

through which we can gain insight into the future. **Figure 1** outlines the trajectories along which the food system is becoming more sustainable.

**Figure 1 - Current Scenarios in Food System Sustainability**

<b>Information Exchange</b>	<b>DEVELOP</b>	<b>DEFY</b>
	<p><b>Ambition: ‘Lead and protect the category’</b></p> <p><b>Example: Danone, Origin Green</b></p> <p><b>Outcome: Solve system-wide problems and improve performance through partnerships. Supply chain becomes the brand</b></p>	<p><b>Ambition: ‘Change the food and ag industry’</b></p> <p><b>Example: Oatly, Impossible Foods</b></p> <p><b>Outcome: Create new supply chain without reference to existing systems. Expand both businesses through innovation in product, process and business model</b></p>
<b>Low</b>	<b>DEFEND</b>	<b>DISRUPT</b>
	<p><b>Ambition: ‘Stay in the game’</b></p> <p><b>Example: McDonald’s/Roundtable on Sustainable Beef</b></p> <p><b>Outcome: Align the supply chain to address problems of existing one. Maintain market presence through meeting minimum customer/consumer requirements</b></p>	<p><b>Ambition: ‘Transform food production’</b></p> <p><b>Example: Perfect Day, Mosa Meat</b></p> <p><b>Outcome: Eliminate land-based supply chain for valuable components or categories. Permanently shift basis of competition.</b></p>
	<b>Low</b>	<b>Financial Incentive</b>

**1. Defend**

In bottom-left quadrant, firms strive to defend their position and “stay in the game” by adopting broad sustainability initiatives within the existing supply chain. Information exchange and financial incentives (in the form of higher prices and/or investment capital) are both relatively low. As we see it, the intention here is to try to improve sustainability by aligning the chain in order to meet the requirements of customers such as food service or retailers and the final consumer. Problems arise on an ongoing basis and the intention of players is to anticipate these requirements and to solve them before they become a crisis.

As a case study, we think the McDonald's is a great example. For decades, McDonald's has anticipated future problems in securing supply for its key ingredients and has also anticipated objections from the market. Working with its suppliers, it has learned about these issues, put in place long term principles to guarantee its supply and to resolve as practically as is possible the concerns of consumers. In the case of beef, McDonald’s has taken an industry-wide approach—catalyzing the creation of the US Roundtable for Sustainable Beef—because if consumers broadly decide beef is not sustainable, they lose substantial sales.

## 2. Develop

Firms in the top-left quadrant strive to “lead and protect” their category/sector by heavily emphasizing the provision and exchange of information from the market and best-practice science. Initiatives such as Danone's regenerative agriculture project and the Bord Bia's (Irish Food Board) Origin Green seek to resolve systemic issues of sustainability in agricultural supply chains by improving two-way communications between producers and markets. In each case, the systemic leader uses information flows to align production with emerging demand. The reward for participants is most readily seen as an increased size of business and security of pricing rather than in increased margins. At the ultimate, the supply chain becomes the brand.<sup>1</sup>

## 3. Defy

Firms in the top-right quadrant are on a mission to defy traditional food identities and “change the food and agriculture industry” by replacing legacy supply chains with more sustainable products. Companies such as Impossible Foods and Beyond Meat (plant-based protein) and Oatly (plant-based milk) are establishing new technologies, suppliers, routes to market and consumer acceptance for their products with the objectives principally of changing the industry rather than maximizing their own return. Information sharing is high as firms spread news of their intellectual property and growing consumer demand to increase the pace of change, and financial incentives are high from both investors backing novel firms and processors paying premiums to suppliers to encourage expanded production.

## 4. Disrupt

Firms in the lower-left quadrant are poised to disrupt the agricultural economy and “transform food production” through innovation. Their goal is to eliminate land-based supply chains. We see little market changing information sharing; instead, the emphasis is placed on scientific input to the production of food. However, the appeal of not using existing environmentally challenging land and water resources has made activities in this box extremely to financial and impact investors, including sovereign wealth funds such as Temasek and high net worth individuals such as Bill Gates and Jeff Bezos. For example, Temasek is an investor in Memphis Meats (cell-based meats) and Perfect Day (dairy proteins through fermentation). Google co-founder Sergey Brin is an investor in Mosa Meat, the tissue culture beef business led by Dutch scientist and entrepreneur Mark Post. Mark and his colleagues are not fixing any existing problems in the agricultural supply chain, instead they source sustainability in the science lab. Such an approach is potentially deeply disruptive to existing agricultural supply chains, with the potential to dramatically reduce the demand for commodities such as feed grains and change farmland values.

Through this analysis, we see that sustainability has unleashed financial and information incentives in agricultural supply chains, solving the key problems that have characterized them since the Second World War at least. Taking these four food system sustainability approaches outlined in this paper, several questions arise for leaders in the agri-food industry today:

1. Which box are you participating in, if any? Or is the sustainability dynamic which appears to be driving so much change passing you by?
2. Is one or a combination of the activities in these boxes impacting your business today or likely to impact it tomorrow?
3. Has your firm made the investment across each of these boxes that is needed both to sustain your existing business, learn new practices required for the future and create the future of your business?

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<sup>1</sup> Shelman, M., McLoughlin, D., and Pagell, M. (2016) “Origin Green: When Your Brand Is Your Supply Chain,” *Organizing Supply Chain Processes for Sustainable Innovation in the Agri-Food Industry (Organizing for Sustainable Effectiveness, Vol. 5)*, Emerald Group Publishing Limited, pp. 205-233.