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Sustainability and Strategy in U.S. Agri-Food Firms: An Assessment of Current Practices

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Abstract

Increasingly, many major U.S. agri-food firms are joining their European counterparts in incorporating sustainability initiatives into their business operations. This paper provides a content analysis of the sustainability initiatives reported by select U.S. agri-food firms throughout the supply chain in their corporate social responsibility (CSR) reports. Among the results of our analysis, we find that many U.S agri-food firms continue to engage in a "hodgepodge" approach to sustainability without a clear link to their business strategy. Furthermore, these firms have transitioned their sustainability initiatives to focus on internal initiatives to address environmental and supply chain issues over time.

Keywords: sustainability, corporate social responsibility, firm strategy, value chain, content analysis

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Introduction

Increasingly, many major U.S. agri-food firms are joining their European counterparts in incorporating sustainability initiatives into their overall global supply chains. Individual initiatives may take many different forms ranging from waste reduction and energy conservation to charitable donations and corporate governance. These initiatives, however, are generally included in a firm's operations as part of a larger portfolio of corporate social responsibility activities. As an emerging business function in agri-food firms, sustainability[1] "addresses how companies manage their economic, social, and environmental impacts, as well as their relationships in all key spheres of influence: the workplace, the marketplace, the supply chain, the community, and the public policy realm" (Harvard Kennedy School 2008).

The motivations, challenges and initiatives of U.S. agri-food firms to engage in this new business function continue to change rapidly. As noted by Rankin et al. (2011), agri-food companies are motivated to adopt such strategic efforts for numerous reasons, ranging from responding to internal and external pressures to achieve cost savings and waste reduction to self-fulfillment. However, a survey of top management executives indicated that risk management and brand protection objectives are viewed as the key reasons for adopting sustainability initiatives (McKinsey & Company 2009). Specific initiatives that may be implemented to meet these objectives include the following: preempting the threat of mandatory regulations, shaping future regulations, securing technical assistance and/or financial subsidies that lower the cost of abatement of emissions, and developing better relations with stakeholders, including governments, customers and investors (Khanna 2001). Under these scenarios, firms implicitly conduct a cost-benefit analysis which weighs the costs of implementing various sustainability initiatives with the penalties of unfavorable regulations, environmental damage remediation, and food safety recalls or the benefits from premium pricing. In contrast to these strategies, U.S. agri-food companies may also view sustainability initiatives as an opportunity to create a competitive advantage through value chain innovation or by creating 'shared value' (Ortitzky, Siegel and Waldman 2011, Porter and Kramer 2006).

The purpose of this paper is to review the corporate social responsibility (CSR) strategies of select U.S. companies in various sectors of the agri-food supply chain. We provide an assessment of the sustainability initiatives implemented by these companies using the growing CSR-performance literature to frame potential motives and common approaches. Our assessment uses frequency of adoption of practices to identify what appear to be general trends and from which strong hypotheses for testing can be developed. Throughout the paper, we also provide explicit examples of different types of agri-food sustainability initiatives. Furthermore, we suggest potential managerial implications of these initiatives for company and supply chain performance.

[1]The term "sustainability" is often used interchangeably with corporate social responsibility, corporate responsibility, corporate citizenship, social enterprise, sustainable development, triple-bottom line, corporate ethics, and in some cases corporate governance (Harvard Kennedy School 2008).

The rest of the paper is organized into four sections. First, some of the drivers behind the implementation of sustainability initiatives are presented and discussed. These drivers include both supply-side and demand-side competitive pressures as well as non-market ethical orientations of organizational leaders. The second section provides a review of the literature on CSR with a particular focus on the strategic uses of sustainability initiatives and their effect on firm performance. In the third section, a content analysis of the sustainability initiatives adopted by U.S. agri-food firms at two time periods is presented. To support this analysis, this section also highlights several initiatives to provide specific examples of the types of initiatives that have been implemented by these firms in their supply chains. The content analysis utilizes information included in the sustainability reports published by fourteen leading agri-food firms, consisting of two firms in each of the following sectors: retail (Walmart, Kroger), food service (McDonalds, Starbucks), food manufacturing (ConAgra, Kraft), beverage manufacturing (Coca-Cola, PepsiCo), livestock processing (Smithfield, Tyson), first handler/agricultural processing (Cargill, Archer Daniels Midland), and input supply (Monsanto, Deere) sectors. Finally, we offer directions for future research in this area. In particular, we aim to assess the challenges of estimating costs and benefits for participants and the difficulties associated with identifying their locations and effects in the supply chain. The paper argues that the success and endurance of agri-food supply chains that purport to pursue sustainability objectives may depend critically on the distribution of the associated costs and benefits of implementing those objectives. Where these costs and benefits of sustainability initiatives are perceived to be unfairly distributed, supply chain problems such as opportunism and moral hazard may arise. This paper calls on supply chain leaders to give careful consideration to the distribution of net benefits across the chain to ensure these problems are minimized.

Drivers of Sustainability Initiatives

Food companies face several incentives to engage in sustainability initiatives, which include both a growing pressure to respond to various stakeholder groups (Freeman 2010) and a desire to exploit the link between CSR and competitive advantage (Ambec and Lanoie 2008, Porter and Kramer 2006, Porter and Van der Linde 1995). In the former case, the rapid adoption of information technology, social media, and globalization have each increased the ability of special interest groups to promote their interests and to hold firms accountable in the public domain. As such, these groups have been increasingly active in exercising their authority to grant a "freedom to operate"[2] to agri-food companies (Shaw et al. 2010). Furthermore, their approval (or disapproval) of company activities has become a significant factor in the determination of the reputation and brand values of such companies. For companies whose value is largely tied up in the value of their brand[3], managing the interests of stakeholder groups and responding to their demands for environmentally-friendly production processes and socially acceptable management practices has become a high priority. According to a survey of corporate financial officers and investment professionals, maintaining a good corporate reputation and/or brand equity is the number one way sustainability programs can improve a company's financial performance (McKinsey & Company 2009).

[2] "Freedom to operate" or "license to operate" is a common term in the sustainability literature to describe the growing power of stakeholders and special interest groups to limit a firm's ability to operate (or sell products).
[3] Upwards of 60% of the value of many food companies is attributable to their brand (Sporleder and Louiso 2004)

Companies also recognize that there are also both supply-side and demand-side drivers for implementing sustainability initiatives. On the supply-side, the introduction of "green" practices is seen as both an important source of immediate and long-term cost savings and a differentiating factor in the marketplace (Hauschildt and Schulze-Ehlers 2014). In a report by Pulse Canada (2009), the top 50 food companies' the most cited initiatives were those that reduce energy and water usage, as well as packaging, and transportation resources. These reduction goals have the dual advantage of reducing resource usage and environmental impact and significantly reducing the costs of inputs and marketing. Ambec and Lanoie (2008) note that these gains contribute to the attractiveness of the product and promote market access opportunities. Far less prevalent initiatives have been sustainability initiatives focused on the "people" dimension or on the social environment (Pfeffer 2010, Bitsch 2010). These types of initiatives may provide an untapped opportunity for U.S. agri-food companies.

Food companies are also responding to the increasing consumer demand for sustainably produced products. According to a Natural Marketing Institute (2009) consumer segmentation study, LOHAS (Lifestyles of Health and Sustainability) consumers make up 17% of the U.S. general population. These consumers are those that are active stewards of the environment and are willing to pay a premium for green and socially responsible products. In a similar study, 54% of shoppers considered sustainability to be one of their decision-making factors and are "Leaning Green" (Bearse et al. 2009). Furthermore, "green" characteristics were found to be more important for consumable products such as food than for durable merchandise (Bearse et al. 2009). A consequence of this increased demand for sustainably produced products has been the growth of green or social advertising, and the practice of "greenwashing" (Bazillier et al. 2013). Greenwashing occurs when firms actively mislead consumers regarding their environmental practices or the environmental benefits of their product or service. Consumers have thus become increasing skeptical of green claims and Furlow (2010) has postulated that even firm's with legitimate sustainability initiatives will lose any competitive edge they might have gained because of this consumer skepticism. Some companies have even taken steps to withhold their positive environmental initiatives (Zmuda and Parekh 2008).

Another important driver of sustainability initiatives has been corporate leadership's belief in the "rightness" of embarking on sustainability initiatives. A case in point is Coca-Cola Corporation's CEO, Muktar Kent, who bills himself as Chief Sustainability Officer. On the appointment of an executive responsible for sustainability: "I have not appointed another one and never will. That's me." (Shapiro 2010). Similar sentiments have been seen in many other organizations, where a senior executive has believed so strongly in the strategy as to persuade the whole company to come along. This belief is not frequently misplaced because it is couched within the context of helping the company profitably enhance its market share and secure its competitiveness.

Sustainability Initiatives and Firm Performance

Given the incentives to adopt sustainability initiatives, there has been significant scholarly interest in studying the effect of sustainability initiatives on firm performance. In general, the sustainability-performance literature can be broadly categorized into short and long run research studies. Short-run research studies have mostly employed the event study methodology. The idea here has been to estimate stock market reactions to sustainability related events. In the finance and management literature, many studies have analyzed the impact of events that signal a firm's level of sustainability, such as environmental performance (Jacobs, Singhal, and Subramaniam 2010), food safety performance (Mazzocchi, Ragona, and Fritz 2009, Thomsen and McKenzie 2001, Wang, Qiu, and Kong 2011), organizational performance (Eccles, Ioannou, and Serafeim 2013, Hubbard 2009), and addition or deletion from a reputed sustainability index (Cheung 2010, Detre and Gunderson 2011).

Negative sustainability performance such as product recall, fines and violations, were found to have a severe adverse impact on the financial performance of concerned firms (Thomsen and McKenzie 2001, Henson and Mazzocchi 2002). On the other hand, positive performance was found not to result in positive gains (Detre and Gunderson 2011, Jacobs, Singhal, and Subramaniam 2010). In fact, Detre and Gunderson (2011) found that the share value of publicly traded U.S. agribusiness firms reacts negatively when the announcement is made that the firm is added to the Dow Jones Sustainability Index. Sustainability managers, however, are reminded that short-term analyses of sustainability and performance only capture the immediate impacts of negative or positive events. Such studies often fail to account for the complete sustainability-performance picture. In particular, they fail to capture how firm's organizational capabilities adjust to these initiatives over the long-term. One can argue that firms with strong sustainability performance have the ability to bounce back more quickly from sustainability related risks. For example, firms that are able to efficiently trace food safety issues back to their source are more likely to minimize food recalls. Such firm specific attributes as resilience, responsiveness, supply chain traceability and other organizational capabilities that result from sustainability initiatives are not typically included in short-term studies. Furthermore, since the short-run studies rely on investors (via stock markets) to measure the financial performance of companies, they neglect the performance responses from other significant stakeholders like consumers, government, societal organizations and knowledge institutions that may be able to interpret information about corporate social responsibility more accurately (Orlitzky 2013). Long-run studies, therefore, become necessary to allow for a full adjustment process that reflects both changes in organizational capabilities and effects on multiple stakeholders.

Long-run studies are often richer than short-run studies[4]with respect to the choice of variables concerning financial and sustainability performance. In the long-run corporate sustainability-financial performance literature, much attention has been paid to the relationship between the implementation of sustainability initiatives and economic performance, focusing primarily on the assumed cost and benefit tradeoff of adopting "green" practices (De Bakker, Groenewegen, and Den Hond 2005, Siegel and Vitaliano 2007, Orlitzky, Schmidt, and Rynes 2003, Moore 2001, Klein and Dawar 2004, McWilliams and Siegel 2000, McGuire, Sundgren, and Schneeweis 1988, Luo and Bhattacharya 2006, Orlitzky 2001, Ambec and Lanoie 2008, Hart and Ahuja 1996, Carter 2005, Klassen and McLaughlin 1996, Goll and Rasheed 2004, Stanwick and

[4] Long-run studies often look at annual financial and sustainability performance indicators, while short-run studies primarily analyze daily stock returns to capture response of investors to CSR related events.

Stanwick 1998). In their meta-analysis of CSR-financial performance studies across multiple industries and contexts, Orlitzky et al. (2003) found a significant positive correlation between CSR and financial performance though the effect size was small (mean observed correlation = 0.18). In a similar study, Peloza (2009) found that out of 128 studies that examined the CSR-financial performance relationship, 59% found a positive relationship, 27% a mixed or neutral relationship, and 14% a negative relationship. Studies specific to the agriculture and food sector are limited. One exception is a study of corporate social and financial performance in the UK Supermarket Industry, in which the authors observed a negative relationship between these two performance variables (Moore 2001). However, it should be noted that this study was limited to eight firms and the results were only descriptive in nature.

Given these long-term results, management scholars have come to view sustainability as a potential source of competitive advantage for those firms that choose to adopt such initiatives (Ambec and Lanoie 2008, Porter and Kramer 2006, Porter and van der Linde 1995). In their work, Ambec and Lanoie (2008) highlight seven ways in which sustainability initiatives can increase corporate performance (Figure 1). They argue that expanding market access and reducing raw material and capital costs may improve firm performance. The firm may also benefit from lower energy costs even as they build better relationships with their external stakeholders. This positions stakeholders to become advocates for the company and the company is able to benefit from the stakeholders' network to expand their markets (Freeman 2010). Most importantly, the potential benefits of strategic sustainability efforts are often amplified across performance variables over time (Ambec and Lanoie 2008).

Figure 1. Positive Links between Environmental and Economic Performance
Source. Reproduced from Ambec and Lanoie, 2008 (Figure 1).

Overview of Sustainability Initiatives in U.S. Agri-Food Firms

According to a Pulse Canada report (2009), over 80% of the top 50 food companies have made a public commitment to sustainability with many of those same companies having created an office of CSR within their organizations. To meet these commitments, food and agribusiness companies have initiated various sustainability programs, both independently and collectively with other food companies, non-government organizations and regional governments. Although many of these initiatives focus on resource and cost reduction programs, criteria for participating in the supply chain, and charitable donations, other initiatives have used sustainability initiatives to capture competitive advantage through innovation (Genier, Stamp, and Pfitzer 2008, Porter and Kramer 2006). These latter initiatives tend to focus on establishing alliances with supply chain partners to share information and risk, while aligning supply chain activities to meet sustainability objectives.

In this section, we provide a brief overview of the CSR strategies of select U.S. firms across various sectors of the agri-food supply chain. For this purpose we conduct summative content analysis. This type of content analysis is a widely used qualitative research technique and is particularly useful to generate meaningful insights and identify general trends with respect to the unit of analysis (Hsieh and Shannon 2005). Our analysis further classifies and codes sustainability initiatives according to seven categories of initiatives that were deducted from the analysis. These initiatives[5] are broken down by the sustainability category that they address: 1) environment, 2) food safety, 3) sourcing and supply chain relationships, 4) corporate governance, 5) labor, 6) sustainable products and practices, and 7) community development. A description of each sustainability category is provided in Table 2. Furthermore, we also classify each initiative by type of program: a) internal activities such as goal setting, technology adoption, promotion programs, and restructuring; b) standard and code programs; c) community or charitable donation programs; d) product innovations; and e) value chain innovation programs, including stakeholder partnerships.

The data for this study were collected from the CSR reports of fourteen selected U.S. agri-food firms at various stages of the supply chain during two time-periods: 2007-09 and 2009-11. Only the latest CSR report in each period was used. Within the sample, it is common practice not to publish CSR reports every year. The firms selected for this study include agri-food firms in the following sectors: retail (Walmart and Kroger), beverage manufacturing and distribution (Coca-Cola and PepsiCo), meat processing (Tyson and Smithfield), agro-processing (Archer Daniels Midland and Cargill), food service (McDonalds, Starbucks), food manufacturing (ConAgra, Kraft) and input supply (Monsanto, Deere & Company). Table 1 provides a description of each of the selected companies. These companies were selected on the basis of the size of their operations (i.e., market capitalization) and their experience with designing and implementing sustainability programs and initiatives. They do not represent an exhaustive set of leading sustainable agri-food companies. Given that sustainability is an emerging business function, there is also little consensus among stakeholder groups regarding the meaning and usage of sustainability-related terminology. For this reason, the use of qualitative data analysis software and/or algorithmic-based word searches would be problematic; instead the CSR reports were

[5]An expanded list of company initiatives can be obtained through request to the corresponding author.

manually coded and analyzed. The limited sample size in this study is a constraint and precludes further statistical analysis. This approach is common in qualitative review studies such as the one presented here (Hsieh and Shannon 2005).

Table 1. Sustainability reporting categories in global reporting initiative

Category of Sustainability Initiatives	Category Related Programs
Environment	Waste reduction, water conservation, energy conservation, emission reduction, renewable energy, environmental stewardship, land conservation
Food Safety	Food Safety
Sourcing & Supply Chain Relationship	Vendor standards, responsible sourcing, supplier benefits, supply chain relationships
Corporate Governance	Corporate Governance
Labor	Diversity, employee safety, employee benefits
Sustainable Products/services	Wellness, animal welfare
Community Development	Community projects, donations

Table 2. Description of selected agri-food companies (2012 values).

Firm	SIC	Market Value (USD Millions)	Sales (USD Millions)	Employees (Thousands)	Profitability (ROA)	Brand Value** (USD Millions)
Kroger	5411	13,329	90,374	339	0.03	-
Walmart	5411	209,728	444,948	2,200	0.08	36,220
McDonalds***	5812	102,477	27,006	420	0.17	35,593
Starbucks***	5812	27,774	11,700	149	0.17	3,663
Kraft	2000	66,049	54,366	126	0.04	4,644
ConAgra***	2000	10,251	13,263	26	0.11	3,115
PepsiCo***	2080	103,771	66,504	297	0.09	14,590
Coca Cola***	2080	158,342	46,565	146	0.11	71,861
Smithfield***	2011	3,299	13,094	46	0.05	-
Tyson***	2011	6,420	32,266	115	0.07	-
Cargill*	2046					
ADM	2070	20,381	80,676	31	0.05	-
Monsanto***	100	36,898	11,822	26	0.08	-
John Deere	3523	30,821	31,629	61	0.06	3,651

Sources. Compustat (North America, Annual) and Brand Finance, http://brandirectory.com/league_tables/table/global-500-2012. *Cargill in a privately-held company, financial data is not available. ** blanks indicate companies not listed in the Top 500 Brands by Brand Finance in 2012. *** Company's latest CSR report follows GRI Sustainability Reporting Guidelines.

Company Sustainability Initiatives by Category

Table 2 provides a description of the categories that were identified by the content analysis. These categories are consistent with the guidelines of the Global Reporting Initiative (GRI) and sustainability indices such as the Dow Jones Sustainability Index and KLD-DLS400. We describe each of these important initiatives and indices in further detail below.

Global Reporting Initiative (GRI)

The Global Reporting Initiative (GRI) is a "network-based organization that produces a comprehensive sustainability reporting framework that is widely used around the world." (The Coca-Cola Company 2011). GRI defines sustainability reporting as the practice of measuring, disclosing, and being accountable to internal and external stakeholders for organizational performance towards the goal of sustainable development. (Global Reporting Initiative 2013) Sustainability reports that are prepared following the guidelines of the GRI reporting framework disclose the outcomes and results that occurred within the reporting period in the context of organization's commitments, strategy, and management approach to sustainability initiatives. The most recent version of the reporting framework, GRI-3.1, was launched in March 2011 and claims to be the most comprehensive sustainability reporting guidance available today (Global Reporting Initiative 2013).

The GRI-3.1 guidelines have two broad sustainability components: general initiatives and sector-specific initiatives. For example, the GRI launched specific sustainability reporting guidelines for the food processing sector, which include sourcing and animal welfare, percentage of work time lost due to industrial disputes, production of healthy and affordable food, among others.

As of the 2010 reporting year, 180 U.S. organizations had issued GRI reports, a 28% increase from the previous year (Global Reporting Initiative 2013). Based on the most recently available sustainability reports, all the agri-food firms in this study except Kraft, Deere, Cargill and ADM utilize the GRI framework. Table 3 uses the seven GRI-3.1 sustainability categories mentioned above to present the number of sustainability initiatives found in each of the fourteen CSR reports of the selected agri-food companies (See appendix for Table 3).

Sustainability Indices

Following the growing acceptance of socially responsible investing (SRI) within corporate and investment communities, several sustainability indices have been launched (Fowler and Hope 2007). These indices are used to signal to investors the performance of companies on a variety of environmental, social, and economic issues. Among the most widely used sustainability indices include the Domini Social 400 (DS400) and the Dow Jones Sustainability Index (DJSI); both assess the sustainability performance of large firms based on their market value.

The DS400 was the world's first sustainability index and launched in 1990. This index integrates environmental, social and governance (ESG) factors in its rating of the sustainability performance of companies included in the largest 3,000 U.S. equities. It uses the following seven key issue areas to evaluate companies: (1) community relations (charitable giving, support of

education, etc.); (2) corporate governance (compensation, ownership, transparency, etc.); (3) diversity (employment of disabled, women and minority contracting, etc.); (4) employee relations (health and safety, employee involvement etc.); (5) environment (clean energy, recycling, management systems, etc.); (6) human rights (labor rights, relation with natives, etc.); and (7) product (quality, innovations, etc.)

The DJSI, which was launched in 1999, has adopted a positive screening approach to construct its index. The index includes a subset of Dow Jones-listed companies that score highest on a comprehensive list of sustainability criteria. The DJSI's assessment is based on three distinct sections covering (1) economic (corporate governance, code of conduct, customer relationship management, risk management, etc.); (2) environment (reporting, performance and management systems); and (3) social (philanthropy, labor practices, talent attraction, supplier standards, etc.) management practices (RobecoSAM 2014). Table 4 provides membership information for the selected fourteen agri-food industries on these two indices during the years, 2009-2011.

Table 4. Membership in sustainability indices by selected agri-food firms (2009-2011).

	2009		**2010**		**2011**	
Firm	DJSI	DS400	DJSI	DS400	DJSI	DS400
Kroger						
Walmart						
McDonald's	✓	✓	✓	✓	✓	✓
Starbucks	✓	✓	✓	✓	✓	✓
Kraft	✓	✓	✓	✓	✓	✓
ConAgra					✓	
PepsiCo	✓	✓	✓	✓	✓	✓
Coca Cola	✓		✓			
Smithfield						
Tyson						
ADM						
Cargill						
Monsanto						
John Deere		✓		✓		✓

Note. ✓Indicates membership in the Sustainability Index

Company Sustainability Initiatives by Type

In this section, we provide a brief review of different types of sustainability initiatives and provide examples of each type of sustainability initiative from the selected agri-food firms. This section serves as an important link between the data generated through the content analysis and actual sustainability practices. The specific examples provided for each of the different types of initiatives are used to establish the validity of results that are discussed in the next section.

Table 5. Sustainability initiatives reported in the CSR reports of selected agri-food firms by initiative type (2009-11).

Firm	Internal Activities	Codes and Standards	Community Support and Donations	Product Innovation		Other	Total
Kroger	13	6	4	3	5	0	31
Walmart	5	0	2	1	5	0	13
Starbucks	4	1	1	1	6	3	16
MacDonald's	11	2	3	5	1	1	23
Kraft	13	4	1	8	5	2	33
ConAgra	15	1	1	5	0	3	25
PepsiCo	9	0	0	3	4	1	17
Coca Cola	7	2	1	2	4	1	17
Smithfield	10	0	2	0	0	3	15
Tyson	10	0	2	1	5	0	18
Cargill	8	2	4	1	3	4	22
ADM	17	1	3	0	0	1	22
Monsanto	4	2	2	4	0	1	13
John Deere	8	0	3	0	1	1	13
Total	**134**	**21**	**29**	**34**	**39**	**21**	**278**

Internal Resource and Cost Reduction Programs

All companies report programs to reduce natural resource consumption and minimize environmental impact from their operating functions. This finding is consistent with a 2009 Pulse Canada report of sustainability initiatives adopted by the top 50 food companies. The initiatives reviewed in this study generally fall into four categories: 1) waste reduction, 2) water conservation, 3) energy conservation and 4) emission reduction. Energy conservation initiatives are particularly prevalent throughout the upstream supply chain and waste reduction more prevalent with downstream players. To achieve these objectives, most companies rely on the adoption of new technology. It is also worthwhile to note that for the companies in this study, performance evaluation appears to be most extensive for these types of initiatives. Examples of the types of initiatives that were included as internal resources and cost reduction programs are as follows:

- Cargill – 100% of all Cargill-owned sows at company facilities will be moved from individual pens to group housing by the end of 2015, and all U.S. contract farms raising Cargill-owned sows will convert to group housing by the end of 2017 (Cargill 2014).
- Kroger – divert 70% of waste away from landfills and incinerators across 2,600 stores by 2015 (Kroger 2014).
- John Deere – established 2018 Eco-Efficiency Goals including: reduce energy consumptions and greenhouse gas emissions by 15% per ton of production; reduce water consumption by 15% per ton of production; and recycle 75% of total waste (Deere & Company 2014).

Standards and Codes

The standard and codes approach has been widely used throughout the agri-food supply chain and is typically implemented by downstream players to provide incentives for upstream players to adopt specific management practices. These incentives may take one of two forms; price premiums and/or exclusion/restriction of non-compliant suppliers from the supply chain. In this way, standards and codes tend to serve to redistribute the risks of sustainability initiatives and impose greater costs on upstream supply chain partners. Thus, Genier et al. (2008) have described this approach as a defensive approach to sustainability. Standards and codes are typically implemented through audits, certification and training programs.

In general, the criteria for various standards and codes programs cover four specific sets of management practices: environmental, labor and social conditions, economic viability, and food safety management practices. Furthermore, the set of standards and codes implemented by food companies maybe proprietary as in the case of the Rainforest Alliance's Certification program, utilize government regulations such as Walmart's Global Sourcing Initiative, or they maybe a result of collective industry action (e.g. SAI Platform, Roundtable on Sustainable Palm Oil, etc.). Genier et al. (2008) provides a review of various standards and codes programs (See appendix for Table 6). Of note, there are few programs that are comprehensive and fully cover the full multi-dimensionality of the sustainability construct.

In addition to the standards and codes programs mentioned above, below are examples of such programs that are used or have been initiated by U.S. agri-food firms as indicated in their CSR reports:

- Starbucks – "In 2008 we set a goal that all of our coffee would meet out standards for ethical sourcing by 2015, through C.A.F.E. Practices, Fairtrade and/or other externally verified or certified programs…since 2005 we have worked with the Ethical Tea Partnership to collaborate with others in the tea industry, and to make sure that our tea is grown in a socially responsible way" (Starbucks 2014: 5-6)

Charitable Donations

Agri-food companies commonly reported donations to charities and community organizations as sustainability initiatives as well. These donations may take many forms, including the donation of money and food. Furthermore, related activities such as fundraising and volunteerism were also included in this type of sustainability initiative. Specific examples of this type of sustainability initiative are as follows:

- Archer Daniel Midland – "Among our most notable contributions and developments [are]: the ADM Institute for the Prevention of Postharvest Loss at the University of Illinois, founded with a US$10 million ADM Cares grant, [which] continues to work with smallholder farmers in the developing world to help preserve some of the millions of metric tons of grains and oilseeds lost each year to disease, pests and handing." (Archer Daniel Midland 2013: 2)

- ConAgra – created the Child Hunger Ends Here® campaign that invites consumers to take action by entering codes found on specially marked packages. For every code found

on specially marked ConAgra Foods and P&G products and entered at childhungerendshere.com or facebook.com/childhungerendshere from March-September 2014, ConAgra or P&G will donate the monetary equivalent of a meal up to a maximum of seven million meals to Feed America (ConAgra 2014: 65).

Product Innovations

Agri-food companies also report product innovations as part of their sustainability initiatives. These innovations include reformulating products or adding new product attributes that increase the environmental friendliness or social acceptance of the product. In some cases, these innovations may be a form of "greenwashing" (Delmas and Burbano 2011). An example of a sustainability initiative classified as a product innovation includes the following:

- The Coca-Cola Company – introduced more than 400 new beverage products, 100 of which [were] reduced-, low- or no-calorie, and [continue] to increase the number of smaller size offerings…[and] innovate new sweeteners. In 2013, [the Coca-Cola Company] worked with [their] partner PureCircle to attain "Generally Recognized as Safe status in the U.S. for Rebaudioside M, or "Reb-M," a new stevia sweetener (The Coca-Cola Company 2014: 11-12)

Value Chain Innovations

- The final approach that agri-food companies have taken with regards to sustainability has been to set up formal strategic partnerships with their supply chain partners. These partnerships often include provisions to share both the benefits and costs of sustainability initiatives across the agri-food supply chain (Genier, Stamp, and Pfitzer 2008). In many cases, these types of initiatives take the form of downstream stream partners providing expertise and training as well as sharing market knowledge with upstream partners in return for a supply of sustainably produced inputs. This approach encourages learning on the part of both parties and creates opportunities for innovation and competitive advantage through the identification and measurement of value chain activities (Porter and Kramer 2006). Below is a description of a value chain innovation that a U.S. agri-food company has implemented as part of its sustainability initiatives.

- The Coca-Cola Company – created an initiative to distribute products through Manual Distribution Centers (MDC). These centers are micro distribution businesses that take advantage of the ability of Coca-Cola products to be distributed in a variety of formats. As part of this sustainability initiative, MDCs identify and engage independent entrepreneurs, many of whom are women, to distribute and sell Coca-Cola products in small, specific geographical areas where traditional delivery by trucks is not feasible and easily accessible. By using this distribution method, Coca-Cola is able to secure hard-to-reach markets while creating wealth and job growth in those areas. To date, there are 3,200 MDCs in Africa and these MDCs employ more than 19,000 people in local communities to distribute the Coca-Cola product, often by pushcart and bicycle (The Coca-Cola Company 2011). These MDCs have generated more than $950 million in revenues, primarily in high density urban areas throughout East Africa (The Coca-Cola Company 2011)

Collaborative Activities

Many agri-food companies also report different types of collaborative activities as part of their sustainability programs. These collaborative activities often take the form of working groups that consist of multiple agri-food stakeholders that engage to address a single, often wicked, problem such as sustainability (Dentoni, Hospes, and Ross 2012, Dentoni and Ross 2013). For example, Tyson Laboratory Services Group reports it has partnered with government, academia, trade associations, and other industry members to sponsor food safety research (Tyson 2007). To further foster food safety research and advancements, Tyson has committed to openly share this research and technology developments with their peers and colleagues. Among others, U.S. agri-food firms participate in the following multi-stakeholder engagement initiatives: the Sustainability Consortium, the Sustainable Food Laboratory, and Food Marketing Institute's Sustainability Summit. See Dentoni and Peterson (2011) for an extended discussion on multi-stakeholder engagements in the agri-food system.

Agri-food firms have also utilized direct collaborations with other firms across the agri-food chain to pursue their sustainability objectives. PepsiCo has partnered with leading academic institutions to develop healthier products for consumers (PepsiCo 2008). Cargill and McDonalds have created a partnership called Safe Supply of Affordable Food Everywhere (SSAFE) that focuses on fostering relationships between intergovernmental agencies and private industry (Cargill 2007). Their first initiative under this partnership was to address the threat of the virulent H5N1 strain of avian influenza on the poultry industry and human health. Moving beyond the traditional supplier audits and monitoring programs, Walmart and Coca Cola have developed training programs to assist their suppliers in acquiring the skills and good manufacturing practices that they need to efficiently and effectively manage their product and operating facilities (The Coca-Cola Company 2011, Walmart 2009).

Results and Discussion

Tables 3 and 5 provide a brief summary of the categories and types of the key sustainability initiatives that have been reported in recent CSR reports for the selected U.S. agri-food companies. There are several interesting features that result from this analysis. First, for the most part, the primary attention of these select agri-food companies has been directed towards environment concerns such as pollution-reduction, resource minimization, etc. (Table 3: 89 out of 282 reported initiatives across fourteen firms). Most of the environmental initiatives are directly tied to cost cutting, risk management, and regulatory compliance. Initiatives related to sourcing and supply chain relationships as well as employee issues (compensation, work environment and diversity) are also widely implemented (Table 3: 52 sourcing and supply chain initiatives and 48 labor related initiatives). Less prevalent have been initiatives directed towards corporate governance (3), food safety (21), and new products and wellness (29). It is interesting to note, however, that each company participates in at least four of the focus categories (Table 5), while most have implemented programs in five or more categories. It is also evident that many of the selected agri-food companies have relied heavily on internal resource and cost reduction activities to meet, at least in part, their sustainability objectives (Table 5: 134 out of 278 initiatives were internal resource and cost reduction activities).

An analysis of the sustainability initiatives of U.S. agri-food firms further reveals that the categories and types of initiatives can vary significantly between downstream firms (i.e. retailers and food service providers) and upstream players (i.e. input suppliers and agricultural processors). These differences are related to the specific sustainability issues faced by agri-food firms at different stages of the value chain. For instance, agricultural processing firms in the sample (Archer Daniels Midland and Cargill) have used overseas sourcing of raw materials in order to cut costs (Table 3: 12 initiatives). This has lead to sustainability problems such as deforestation, habitat under-conservation, and labor mistreatment. Beverage manufacturers face sustainability problems related to the perceived overuse of ground water resources in developing markets (Table 3: Coca Cola and Pepsi share seventeen environmental initiatives). The disposal of food and non-food waste, employee safety, and energy consumption in stores are significant sustainability problems faced by retailers.

As a result, the categories and types of sustainability initiatives reported by U.S. agri-food firms are typically aligned with their unique sector issues. With respect to environment-related initiatives, retailers and food service providers are more likely to focus attention on recycling, reducing or reusing packaging, constructing LEED certified buildings, and reducing (store) energy usage. The focus of the environmental efforts of agricultural processing firms includes reducing the greenhouse gas emissions, increasing use of renewable energy, fresh water conservation and reduction in volatile organic compounds (i.e., VOCs). Input suppliers have very similar environmental programs to agricultural processors, but place additional emphasis on land conservation. Differences can also be observed in relation to the sustainable products/wellness practices implemented by firms across the agri-food supply chain. Food manufacturers report product innovations aimed at reducing undesirable content in food (e.g., cholesterol, sugar and sodium) and enhancing desirable nutrients (e.g., whole grains). Agricultural processor and input suppliers, on the other hand, typically report process innovations related to issues such as the labeling of genetically modified foods (i.e., traceability programs) and access to safe and nutritious food.

The direct supply chain linkages between agri-food firms also influence the types of sustainability initiatives adopted. Since agricultural and livestock processing firms typically procure inputs from many independent suppliers, supply contracts with codes and standards have been used to implement sustainability initiatives in relation to animal welfare and labor standards. In some cases, processors and beverage manufacturers have provided credit facilities to their suppliers for reducing risk related to production and to ensure a consistent supply of quality-specific product. Retailers and food service providers, on the other hand, procure inputs primarily from large agribusiness and food manufacturing firms. Audits, supplier training and the collection of data on key performance indicators at supplier facilities are often used in these sectors to influence the sustainability orientation of their suppliers. Retailers and food service providers have also used various types of incentive schemes to influence the buying behavior of consumers. For example, consumers are given discounts if they bring reusable bags instead of using plastic bags. Food manufacturers have policies in relation to advertising certain products to children.

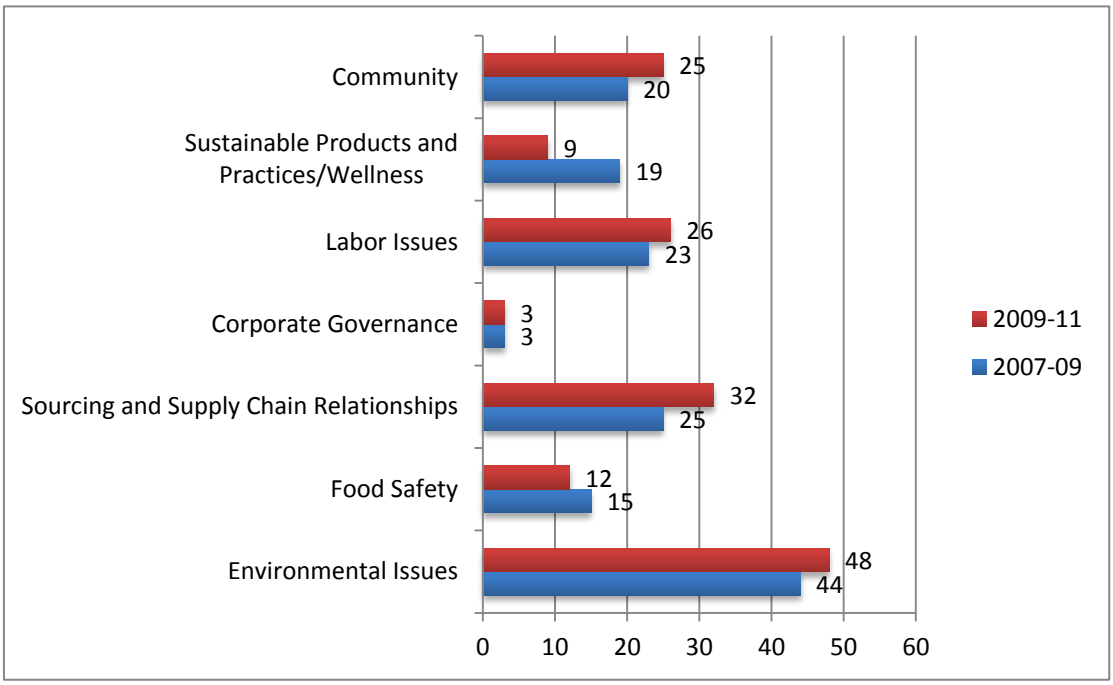

Figure 2. Comparison of sustainability initiatives reported by selected agri-food firms by category*:2007-09 vs 2009-11.

Note. Includes data from Kroger, Walmart, PepsiCo, The Coca-Cola Company, Tyson Foods, Smithfield, Cargill, and Archer Daniels Midland

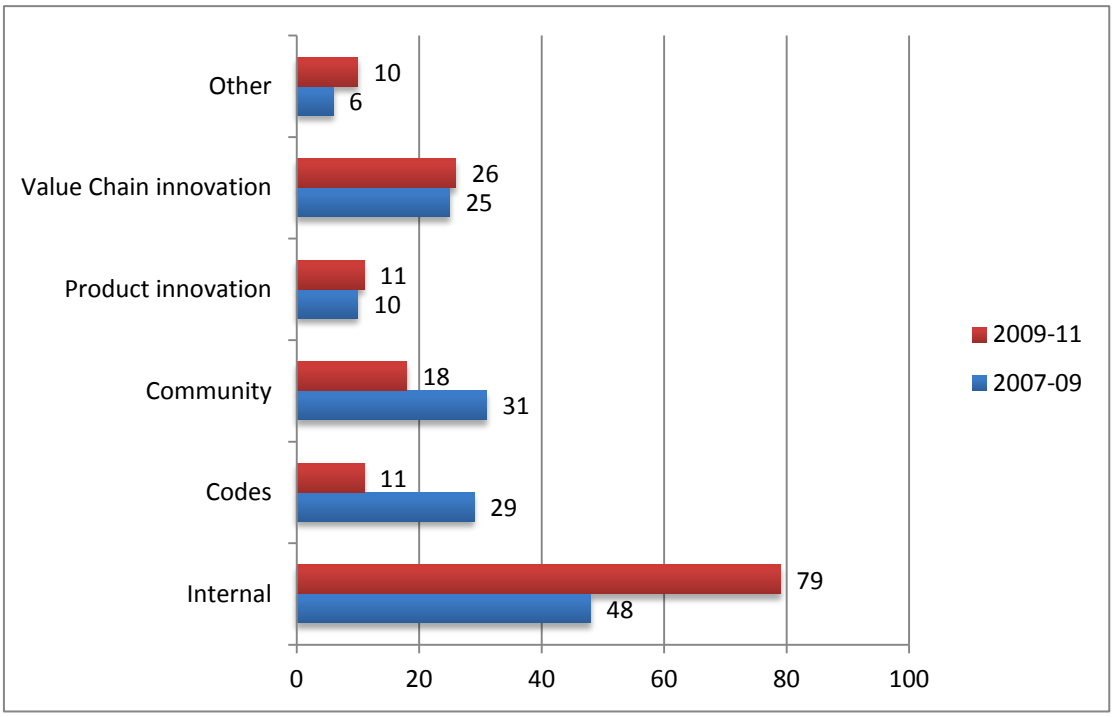

Figure 3. Comparison of sustainability initiatives reported by selected agri-food firms by type*:2007-09 vs 2009-11.

Note. Includes data from Kroger, Walmart, PepsiCo, The Coca-Cola Company, Tyson Foods, Smithfield, Cargill, and Archer Daniels Midland

While the discussion above is based on the sustainability initiatives reported by U.S. agri-food companies at a point in time, the data collected for this study also allows for a comparative analysis of these initiatives over time. Here, we find that the number of initiatives implemented during two time periods, 2007-09 and 2009-11, have been relatively stable (152 vs. 155, respectively). However, our analysis finds that there has been a significant change in the composition of those initiatives over time. Since the 2007-09 reporting period, the number of initiatives have increased for the following categories: environmental issues (Figure 2: 44 vs. 48), sourcing and supply chain relationships (Figure 2: 25 vs. 32), labor issues (Figure 2: 23 vs. 26), and community support issues (Figure 2: 20 vs. 25), while focus on issues related to sustainable products and practices (including wellness) and food safety have decreased (Figure 2: 19 vs. 9). Changes have also occurred by the type of initiative. When compared to the 2007-09 period, there have been increases in the following types of initiatives in the 2009-11 time period: internal resource and cost reduction activities (Figure 3: 48 vs. 79), marginal increase in product innovation (Figure 3: 11 vs. 10), and value chain innovations (Figure 3: 25 vs. 26), and other (Figure 3: 6 vs. 10). These increases were offset during this time period by reductions in the number of codes and standards and community (including donations) initiatives (Figure 3: 29 vs. 11). Taken together, the changes in the categories and types of sustainability suggests that U.S. agri-food companies have reduced their reliance on initiatives that either try to mitigate risk through the communication of sustainability attributes (i.e. promotion of sustainable/wellness products and practices) and community donations or shift risk to upstream supply chain partners through the issue of codes and standards (i.e. food safety issues).

What remains unclear from these CSR reports is how these activities are linked to the corporate and business strategies of their respective companies. As a result, we cannot conclusively understand the drivers behind the change in CSR initiatives by category and type, as summarized in Tables 3 and 5 and Figures 2 and 3. Porter and Kramer (2006) indicate that the typical approach has been for companies to select sustainability initiatives in a 'hodgepodge' manner without consideration to the link to their company's competitive strategy. In other words, companies typically experiment with their sustainability initiatives, choosing to use a comprehensive approach to select their initiatives and the types of mechanisms they use to implement those initiatives. Although this approach may diversify away the risk associated with using one type of initiative, Porter and Kramer (2006) point out that such a disjointed and unfocused approach will often lead to companies that are unable to create (or reinforce) a competitive advantage from their sustainability activities. Ultimately, Porter and Kramer (2006) argue that the decision whether to implement these initiatives becomes a strict cost-benefit analysis with distinct trade-offs for firm performance. When this occurs, sustainability initiatives often become viewed as a necessary cost of doing business (i.e., license to operate, reputation protection) rather than win-win scenarios.

This 'hodgepodge' approach appears to be consistent with the programs that many of the selected U.S. agri-food companies CSR programs have implemented. Furthermore, this approach suggests that these companies have taken a defensive position towards sustainability to protect their reputation and licenses to operate. This is in contrast to the strategic approach proposed by Porter and Kramer (2006) and later by Genier et al. (2008) and Ambec and Lanoie (2008) to use sustainability initiatives as a mechanism to build competitive advantage and create wealth. Table 3 provides information on the orientation of agri-food firms towards sustainability as a business strategy. It can be argued that negative correlation between strategies that are categorized as

'Codes and Standards' and 'Value Creating' strategies (e.g., value chain innovation and product innovation) can be interpreted as a 'focused' approach towards sustainability, while the positive coefficient would suggest a 'hodgepodge' approach. In the small sample size of fourteen companies, the estimated correlation coefficient between code and standards and value creating strategies is 0.58 (significant at 1% confidence level). Although this finding indicates that U.S. agri-foods may used a 'hodgepodge' approach to sustainability initiative selection, we do not claim this result to be conclusive and suggest further research is needed to determine the link with firm strategy.

Another observation relates to the level at which the sustainability initiatives are implemented. As Epstein (2008) reports, successful sustainability programs are those that require a systemic search and implementation of sustainability activities. These types of activities would include supply chain initiatives where there is the potential to create 'shared value' among the chain partners (Porter and Kramer 2006). Judging from the selected company portfolios (see Table 5, in Appendix), there appears to be a lack of these types of initiatives with shared value potential. Instead the focus for many of the companies appears to be on initiatives that are implemented internally.

Most notably absent from most of these portfolios are activities directed to food safety; one area where systemic (i.e. supply chain) initiatives are likely to be most needed and where shared value is most likely to be created. One exception is Tyson (2010) which began pursuing Global Food Safety Initiative (GFSI) certification. GFSI is a partnership between food safety experts from retailer, manufacturer, and food service companies that focus on continual improvement of food safety management systems. Environmental issues could also be considered for supply chain initiatives; however, internal waste and cost reduction programs and the use of codes and standards seem to be the dominant approach here and it is unlikely requirement-type mechanisms will lead to anything other than the redistribution of risks and costs. Certainly, the creation of shared value solely through codes and standards seems unlikely.

Bell and Morse (2008) propose that measuring sustainability is an important step in successful sustainability programs and that a careful, systematic approach is needed for measuring sustainability indicators that focus on the social impact. This measurement approach is support by Porter and Kramer (2006) who suggest that many companies do not measure or report the outcomes of their activities but rather the time and effort they have put into the program (e.g., number of initiatives, voluntary hours, dollars spent, etc.). The focus on time and effort appears to be consistent with the CSR reports examined here. One exception appears to be ConAgra who have placed a strong emphasis on measuring performance in all the departments. They have set up robust systems to collect data internally, have set goals for 2015 and also report where they stand at the present time in accomplishing those goals (ConAgra 2011).

More appropriate sustainability metrics and measurement tools are needed throughout the industry to allow managers to create the business case for sustainability and to drive innovation in the sector (Hubbard 2009; Porter, et al. 2012). As Ernst & Young (2012) reports, metrics (e.g., ratings and rankings) bring key sustainability issues to the attention of corporate executives. Return on investment (i.e., ROI) predictions for sustainability projects can be used to make the business case to support investment allocation decisions. One such example of an initiative to develop sustainability metrics and tools is "The Sustainability Consortium" that was formed in

2009 under the leadership of Walmart. This multi-stakeholder engagement process has completed sustainability profiles for fifteen food, beverage and agriculture product categories (The Sustainability Consortium 2013). These profiles consist of a dossier of scientific knowledge about the product category and a hotspot analysis, a category sustainable profile (CSP) including a synthesis of product knowledge and sustainable improvement opportunities, and key performance indicators to measure and track performance. The goal of these profiles is to give category managers a means to quantify the returns to sustainability investments and to make the business case for sustainable innovation within their companies (see http://www.sustainabilityconsortium.org/ for further details).

The measurement and evaluation of sustainability initiatives is difficult. One specific challenge is how to define the unit of analysis, that is, a sustainability initiative. Based on our analysis of sustainability reports, how initiatives are evaluated is a significant challenge due to the lack of uniformity between each initiative. In addition to the types and categories identified above, initiatives also vary by:

(1) The dimensionality of the initiative. Most environmental efforts tend to have a uni-directional effect (e.g., waste reduction, water and air conservation programs), many supply chain related initiatives have multi-directional effects. For instance, Coca Cola's investments in MDCs have helped women in East Africa to augment their income (social dimension) as well as increased the market access to Coca Cola products (economic dimension).

(2) The geographic scope of the initiative. The costs and effort required to implement similar sustainability programs differs from region to region. Returns for each sustainability dimension are also likely to vary significantly between locations. Any study evaluating sustainability efforts must accommodate inter-regional differences.

(3) The reach of the sustainability program. There is significant variation in the operations level at which sustainability programs are implemented. Our analysis finds sustainability initiatives that are aimed at plant level operations (i.e., new technologies to reduce energy usage in a store), others at the regional level (i.e., water conservation), while others were aimed at global operations (i.e., global sourcing).

Questions, therefore, arise as to the appropriateness of treating each initiative equally, or whether more value should be placed on certain initiatives. Our analysis would suggest that the type of sustainability initiative that is implemented matters. Sustainability indices that rely on counts of sustainability initiatives or binary rating scales when used to measure corporate sustainability performance must therefore be used with caution. Future research should explore the mechanisms by which different initiatives create sustainability impact and how this impact differs by type of initiative (Aguinis and Glavas 2012). The Walmart Sustainability Index appears to be a step in this direction.

Finally, many of the sustainability initiatives described above require the participation and coordination of multiple supply chain players along the food supply chain to be successful. How this coordination is organized is a distinguishable feature of these programs and maybe a source of competitive advantage for agri-food companies. As detailed above, a dominant type of

initiative used by agri-food firms is to impose requirements on supply chain partners through standards and codes in contractual arrangements. In many cases, these requirements have the effect of shifting the costs and risks of the initiatives to less powerful supply chain players. Given the significant downstream consolidation of the agri-food sector, this typically means that risks and costs are shifted up the chain to those players that are least likely to be able to deal with these changes. These initiatives can have unintended sustainability consequences including the exclusion of smallholders from the supply chain, and incentives for suppliers to misrepresent their capabilities to meet sustainability standards and codes required to enter (or remain in) the supply chain[6]. A third consequence is the potential for under investment in capital and labor resources by suppliers that have already entered into contracts to provide sustainably produced inputs. If monitoring costs are high or monitoring is ineffective, then it may be advantageous for a supplier to under invest in new technologies aimed to improve food quality in order to mitigate the additional costs imposed on them by the sustainability initiative.

Conclusion

This paper provides an overview of the sustainability initiatives implemented by fourteen leading U.S. agri-food firms at various stages of the agri-food value chain. It also highlights relevant literature in the area of agri-food sustainability with particular reference to the sustainability-performance relationship. The results of our study indicate that the characteristics of the sustainability initiatives implemented by U.S. agri-food firms vary by supply chain sector and time.

The findings presented in this paper have several implications for agri-food managers and future research with respect to the effect of sustainability initiatives on firm performance and the sustainability of the agri-food system. Foremost, however, is that the results imply that the attributes of the sustainability initiative matter. The adoption of specific sustainability initiatives is context-dependent; particular types and categories of sustainability initiatives may be more appropriate for certain firms and not for others. For the sustainability manager of an agri-food firm, this might suggest that the decision-making processes needed to determine whether to adopt sustainable practices is more complex than determining how many resources to allocate to sustainability or how many practices to adopt. Furthermore, allocating resources equally across various initiatives (i.e., the hodgepodge approach) may secure the firm's license to operate, but it is unlikely to create value of the firm and enhance firm performance. The selection of sustainability initiatives should be purposeful and align with the context (e.g., supply chain position, location, etc.) in which the firm finds itself as well as with the overall strategy of the firm. Attention should also be paid to the implications for firm performance and the governance of the firm's agri-food supply chain that result from different sustainability initiatives. Internal activities such as implementing new operational procedures to reduce waste in a plant are likely to be more measureable, easier to evaluate, and easily captured by the firm. At the same time, the value created by this initiative may be limited to the firm with little positive spillover effect for the sustainability of the agri-food system as a whole. Value chain innovations, on the other hand, have the potential to have a greater impact on the sustainability of the agri-food system, but

[6] The cost of not misrepresenting capabilities (i.e., lost premiums, penalties, exclusion from the supply chain, etc.) may be greater than the risks of getting caught.

come at the cost of a greater need for value chain coordination and a potential reduction in the ability to capture returns from initiatives. The solution to this latter tradeoff is to adopt innovations that align the incentives of participants in the value chain by creating shared value (Porter and Kramer 2006 2011), and thereby, distributing the costs and benefits of innovations across the supply chain.

The findings of this study also imply that counts of initiatives are not likely to be adequate measures of the sustainability performance of a firm. If the performance (e.g., financial, environmental or social) effects of individual sustainability initiatives are not equal, studies or indices that use count data or binary rating scales in order to evaluate the sustainability performance of firms will not fully capture the nature of a firm's sustainability portfolio or its impact on firm or societal performance. Furthermore, if the effects of sustainability initiatives vary across firms by industry sectors, geographic location, etc., then it may not be appropriate to compare firms by sustainability performance without taking those differences into consideration. Future research is warranted in this area.

While this study provides a systematic review of sustainability initiatives adopted by some leading U.S. agri-food firms, we do not make the assertion that these results are generalizable to the sustainability initiatives adopted by agri-food firms outside the fourteen firms analyzed herein. Consistent with Aguinis and Glavas (2012), the goal of this study was to instead provide a framework that might be used to gain a greater understanding of the complex nature of company sustainability portfolios and their link to firm strategy and outcomes. Additional research is needed to further examine the characteristics of sustainability initiatives adopted by U.S. agri-food firms and their effect on firm and supply chain performance.

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Appendix

Table 3. Sustainability initiatives reported in the CSR reports of selected agri-food firms by category* (2009-11).

Table 3. Sustainability initiatives reported in the CSR reports of selected agri-food firms by category* (2009-11).

	Environment**	Food Safety**	Sourcing and Supply Chain**	Corporate Governance	Labor**	New Products and Wellness	Community	Total
Kroger	11	6	4	1	4	4	3	**33**
Walmart	4	0	4	0	3	0	2	**13**
PepsiCo	7	0	3	0	2	3	2	**17**
Coca Cola	10	0	3	0	1	1	2	**17**
Cargill	3	1	6	1	1	1	9	**22**
ADM	7	0	6	1	5	0	3	**22**
Smithfield	2	3	3	0	6	0	2	**16**
Tyson	4	5	3	0	4	0	2	**18**
Starbucks	8	0	4	0	1	0	3	**16**
McDonald's	4	0	6	0	3	8	2	**23**
Kraft	11	3	7	0	5	6	2	**34**
ConAgra	10	3	4	0	6	2	0	**25**
Monsanto	4	0	3	0	2	4	0	**13**
John Deere	4	0	0	0	5	0	4	**13**
Total	89	21	56	3	48	29	36	**282**

Notes. * Categories are consistent with the GRI. **indicates categories where there are significant laws and regulation

Table 6. Comparison of 14 independent standards and codes across the agri-food sector.

		Global GAP	Rainforest Alliance/SAN	SCS-001	Ethical Trading Initiative	Common Code for the Coffee Community	Marine Stewardship Council	Basel Criteria for Responsible Soy Production	Roundtable on Sustainable Palm Oil	SA8000	Fairtrade Standards	IDF/FAO Guide to Good Dairy Farming Practice	SAI Principles & Practice for Sustainable Production (Cereals)	EISA	Utz Certified
Environment	Ecosystems & Biodiversity	X	X	X		X	X	X	X		X		X	X	X
	Natural Resource Inputs	X	X	X		X		X	X		X		X		X
	Manmade Inputs	X	X	X		X		X			X		X		X
	Energy Use and GHG Emissions	X		X		X		X			X		X		X
	Waste Management	X	X	X			X	X	X		X	X	X	X	X
	Production Practices	X	X	X			X	X	X		X	X	X	X	X
Labor Conditions	Occupational Health & Safety	X	X	X	X	X		X	X	X	X		X	X	X
	Terms of Employment		X	X	X	X		X	X	X	X		X	X	X
	Human Rights in the Workplace		X	X	X	X		X	X	X	X		X		X
	General Employee/Family Welfare		X	X	X	X				X	X		X	X	X
Local Economic /Community Benefits	Producers' Economic Viability			X				X	X				X		
	Flow of Economic Benefits		X	X				X			X		X	X	
	Social/Economic Rights of Others		X	X		X	X	X	X						
	Business Ethics					X		X	X						
	Education & Role Modeling								X					X	
Food Safety and Quality	Traceability	X	X	X		X		X					X		X
	Hygienic Production & Handling	X	X	X				X				X	X	X	X
	Quality of Inputs	X						X				X	X		X
	Quality of Management Systems	X	X	X		X					X				X

Source. Reproduced from Genier et al. 2008 (Table 1).

