Key Considerations for Sustainability Frameworks:

A limited review of 20 sustainability frameworks relevant to dairy agriculture

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Summary

This report reviewed 20 different sustainability frameworks and highlights key considerations for developing sustainability frameworks for the dairy industry. These frameworks were aimed at measuring farm and business operations. Five frameworks were developed for use mostly by non-farm businesses. Fifteen frameworks were developed for farms, including dairy farms.

KEY CONSIDERATIONS:

Accreditation: Accreditation is a process by which a sustainability framework is certified for competency, authority, and/or credibility. It can be a long, contentious process and usually requires input or comment from an array of stakeholders. None of the 20 frameworks were accredited.

Framework Goals: Over 50% of the frameworks had goals to improve performance or promote good practices or be useful for measurement and assessment. Other goals included creating a decision making tool, a system for communication or reporting, adding market value, capacity building around sustainability issues, auditing and/or verification of sustainability claims, and harmonization with other frameworks.

Process Goals: Social process goals are goals aimed at ensuring a process that will contribute to creating a successful framework. Although each framework had a process, 40% of the frameworks did not report goals for managing their process for a framework. Important process goals addressed the issues of stakeholder participation, technical expertise involvement, and transparency.

Indicator selection criteria: Indicator selection criteria are used to select indicators for selected for a framework. Only one-half of the frameworks specified their criteria for selecting indicators. The two most common criteria were that indicators needed to be relevant to farmers and/or managers and practical to measure. Other criteria were that indicators needed to be relevant to stakeholders, have the ability to be benchmarked, be triple bottom line, science-based, outcome-based, sensitive to change, scalable (across farm types and/or supply chains), and technology neutral.

Key Themes: The most frequently cited sustainability themes were economic performance, supply chains, working conditions, community contributions, water, wildlife and biodiversity, soils, and product manufacturing/assembly.

Framework Hierarchical Structure: A framework hierarchical structure can be used to organize indicators and metrics into a systematic, well thought out, coherent package. It can ensure that (1) the appropriate number and breadth of relevant topics have been included, (2) the best metrics have been selected, and (3) the a balance between completeness with economy. The 20 frameworks typically had three levels: a topic level, an indicator level, and a metric level.

Framework Purpose: Most (70%) frameworks were used as tools and most created a standard for measuring sustainability. Roughly one-third of the frameworks each set standards for what to measure (e.g., Field to Market), how to manage (e.g., BMPs), and performance goals (e.g., certification systems).

Stakeholder Involvement: Diverse stakeholder involvement can enhance a framework's legitimacy but may do little to improve its technical quality and require greater care to manage and integrate diverse viewpoints. All frameworks involved stakeholders, including economic stakeholder groups such as company representatives, farmers, and academics, social stakeholder groups such as NGO staff, government staff, farmer, academics, labor representative, consumer groups, and animal welfare; and environmental groups such as academics ENGO staff, ecological agriculture NGO staff, land use planners, and government staff.

Implementation Stage: The frameworks were at different stages of implementation. About one-third of the frameworks still are developing indicators. Almost one-half of the frameworks were piloting indicators. One quarter of the frameworks have indicators in routine use.

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Introduction

This report reviews 20 different sustainability frameworks and highlights some key considerations for developing sustainability frameworks for the dairy industry (Table 1). The purpose of this report is to provide background information about sustainability frameworks relevant to the dairy industry. These 20 frameworks were selected because they were relevant to different portions of the supply chain and covered a wide range of indicators. These frameworks are aimed at measuring farm and business operations and not product sustainability.

Table 1. A list of sustainability frameworks reviewed in this report including their lead organizations, scope, and key references.

Sustainability Framework	Lead Organization	Scope	Key References
1. B-Corp	B-Corp	Manufacturing Farm	B Lab, Inc (2010), B Lab, Inc (2011)
2. Eco Index (beta)	Outdoor Industry Association & European Outdoor Group	Apparel Supply Chain	The Outdoor Industry Association and European Outdoor Group (2010)
3. G3.1 Guidelines for Food Processors	Global Reporting Initiative (GRI)	Corporate	Global Reporting Initiative (2010)
4. Manomet Business Sustainability Tool	Manomet & Maine Businesses for Sustainability	Mid-sized Businesses	Beane (2011)
5. WWF Better Sugar Cane Initiative (Bonsucro Production Standard)	World Wildlife Fund	Ag. Supply Chain	Better Sugar Cane Initiative (2011)
6. Field to Market	Keystone Institute	Farm	
7. Healthy Farm Index	University of Nebraska	Farm	Quinn et al. (2009)
8. MOTIFS: A monitoring tool for integrated farm sustainability	Institute for Agricultural and Fisheries Research (Belgium)	Farm	Meul et al. (2008)
9. RISE – Response-Inducing Sustainability Evaluation	Bern University of Applied Sciences (Switzerland)	Farm	Hani et al. (2003), Hani et al. (2007)
10. Stewardship Index for Specialty Crops	Natural Resources Defense Council	Farm	Gunders (2010), Malin (2011), McIntyre (2010), Rotkin-Ellman (2009), Siegal (2011a), Siegal (2011b), Siegal (2011c)
11. Whole Farm/Ranch Inspection Tool	Food Alliance	Farm	Food Alliance (2008)
12. Caring Dairy	Ben & Jerry's Homemade, Inc.	Dairy farm	van Calker et al. 2006
13. Dairy Farm Indicator Project	University of Laval	Dairy farm	Belanger et al. (2009), Parent et al. (2011)
14. Dairy Stewardship Alliance	Agriculture at the University of Vermont, St. Alban's Cooperative Creamery, Ben & Jerry's Homemade, Inc.	Dairy farm	Dairy Stewardship Alliance (2005)
15. Guide to Good Dairy Farming Practice	Food and Agriculture Organization	Dairy farm	Food and Agriculture Organization (2004)
16. Northwest Sustainable Dairies	OR Dairy Farmers Association, WA State Dairy Federation	Dairy farm	Northwest Sustainable Dairies (2009)
17. SAI Platform – Working Group on Dairy	SAI Platform	Dairy farm	SAI Platform (2010)
18. Sustainability of Dutch Dairy Farming Systems	Wageningen University (The Netherlands)	Dairy farm	van Calker (2005)
19. Sustainable Development Assessment of Dairy Farms in Bulgaria	Agricultural University – Plovdiv (Bulgaria)	Dairy farm	Atanasov (2008)
20. Vital Capital Index for Dairy Agriculture	Manomet	Dairy farm	Whitman and Clark (2010)

Description of Information Reviewed

This review of frameworks focused on variables that capture key elements of sustainability frameworks including scope, goals, types of indicators, uses of the framework, stakeholder participation, and implementations (Table 2).

Table 2. Name and description of sustainability framework information.

Variable Name	Variable Description
Name	Name of Sustainability Framework
Scope	Level of the supply chain (farm = FARM, business = BUS)
Framework Goals	Goals of framework
Process Goals	Goals for how the framework process would be managed (if any were stated)
Indicator Selection Criteria	Criteria used to select indicators
Economic Indicators	Where economic indicators selected (Y/N)?
Social Indicators	Where social indicators selected (Y/N)?
Environmental Indicators	Where environmental indicators selected (Y/N)?
Economic Topics	A list of economic topics covered by framework (if any).
Social Topics	A list of social topics covered by framework (if any).
Environmental Topics	A list of environmental topics covered by framework (if any).
Framework Levels	A list of levels in the framework down to metric
Sustainability Tool?	Was this a tool for assessing sustainability (Y/N)?
Standard of Measurement?	Did this framework primarily describe a standard for measuring sustainability (Y/N)?
Standard of Management?	Did this framework primarily describe a standard for managing sustainability (Y/N)?
Standard of Performance?	Did this framework primarily describe a standard of performance or behavior (Y/N)?
Economic Stakeholders	A list of Economic Stakeholders
Social Stakeholders	A list of Social Stakeholders
Environmental Stakeholders	A list of Environmental Stakeholders
Implementation Stage	BEGIN– have selected few or no indicators. EARLY – many indicators selected but not tested in the field or lack data. PILOT – indicators have been applied to processors or farms or they have reported values using existing sources of data but are not widely used, ADV – advanced, in widespread use.

Findings

Scope

The 20 reviewed frameworks varied tremendously in scope (Table 1). Five frameworks were developed for use mostly by non-farm businesses (Table 1) ranging in size from small (e.g., Manomet Businesses Sustainability Tool) to large (e.g., GRI; Table 2.). Each framework had to address tradeoffs between scope, indicator relevance, and rigor. For example, the Manomet Business Sustainability Tool used simple practice-based indicators that are manageable for small and mid-sized businesses. In contrast, GRI has many practice-based and outcome-based indicators that would be expensive to monitor and may only be affordable for large business. These five frameworks also address supply chain sustainability issues to varying degrees as well (e.g., ethical sourcing, other supply chain impacts, etc.). Supply chain indicators may be challenging to develop because they must work in a variety of settings from farms to processing plants.

Fourteen frameworks were developed for farms and nine of these were specifically developed for dairy farms (Table 1). Their complexity ranged from relatively simple (e.g., SAI Platform) to very complex (e.g., Caring Dairy). The Guide to Good Dairy Farming Practice and Northwest Sustainable Dairies both used general practice-based indicators (best management practices [BMPs]).

Accreditation

Accreditation is a process by which a sustainability framework is certified for competency, authority, and/or credibility. It can bolster the framework credibility framework because it requires adhering to a set of public standards developed by the accreditation body and this can assure the customers and consumers that a framework is credible. This can lead to competitive advantage over similar frameworks and programs that are not accredited. Accreditation can be a long, contentious process and usually requires input or comment from an array of stakeholders. None of the 20 frameworks were accredited, though Bonsucro Production Standard (for sugar) is an associate member of International Social and Environmental Accreditation and Labeling (ISEAL) Alliance, a membership organization composed of certification and accrediting organizations.

Framework Goals

A framework goal a broad, conceptual statement that answers the question, "What will a framework accomplish once created?" Frameworks had an average of two goals with between one and six goals (Appendix A). Well-established goals ensure that framework development stays on track, yet provides the basis for evaluating competing approaches when developing a framework.

The 20 frameworks had a variety of goals with eight goals being the most common (Table 3). Over 50% of the frameworks had goals to improve performance or promote good practices or be useful for measurement and assessment. Other goals included creating a decision making tool, a system for communication or reporting, adding market value, capacity building around sustainability issues, auditing and/or verification of sustainability claims, and harmonization with existing sustainability frameworks.

Table 3. Percentage of sustainability frameworks with eight common framework goals.

Types of Goals	Percent of Frameworks
Improve performance / promote good practices	60
Useful for measurement / assessment	55
Aid in decision making	30
Useful for communication / reporting	25
Add market value	15
Build capacity	10
Auditing or verification functions	5
Harmonization with other frameworks	5

Social Process Goals

A framework process is the social process by which participants are selected, organized, and work together to create a sustainability framework. Social process goals are goals aimed at ensuring a process that will contribute to creating a successful framework. Having goals for the social process behind a framework can help ensure high quality process and increases the transparency of the framework development.

Although each framework presumably had a process, 40% of the frameworks did not report goals for managing their process for developing a framework (Table B1 [Appendix B]; Table 4). About one-third of the frameworks had being inclusive or using a stakeholder process as a goal. One-quarter of the frameworks reported the involvement of experts, technical expertise, and/or scientists as a goal. Only 2 of the 20 frameworks reported that transparency was a goal for their process. Generally, frameworks did not well describe their social process goals for developing a framework.

Table 4. Percentage of sustainability frameworks with different of social process goals.

Process Goals	Percent of Frameworks
Stakeholder participation	35
Technical expertise involvement	25
Transparency	10
None Listed	40

Indicator Selection Criteria

Indicator selection criteria are the criteria by which indicators are selected for a framework. Having criteria allows for a higher level of methodical rigor when selecting indicators and can increase the transparency of the framework development.

Only one-half of the frameworks specified their criteria for selecting indicators (Table 5, Table A3 [Appendix A]). The two most common criteria for selecting indicators were that indicators needed to be relevant to farmers and/or managers and practical to measure. Other criteria were that indicators needed to be relevant to stakeholders, have the ability to be benchmarked, be triple bottom line, science-based, outcome-based, sensitive to change, scalable (across farm types and/or supply chains), and technology neutral. In forestry, indicator frameworks are not implemented unless the indicators are practical and useful to land managers (Hagan and Whitman 2006, 2007).

Table 5. Percentage of sustainability frameworks that used different of indicator selection criteria.

Indicator Section Criteria	Percent of Frameworks
Relevant to farmers /managers	40
Practical to measure	35
Relevant to Stakeholders	20
Ability to be benchmarked	20
Triple-bottom Line	15
Science-based	10
Outcome-based	10
Sensitivity to changes in management	10
Scalable	5
Technology neutral	5
Lacked Selection Criteria	50

Triple-bottom Line Indicators

There may be as many definitions of sustainability as there are groups trying to define it. Most definitions include the notion that the economy, society, and environment and interconnected are essential to long-term sustainability of any system. All twenty frameworks have identified environmental indicators and all frameworks have or are planning to identify social indicators. Three of the frameworks did not include economic indicators because it was not the goal of these efforts to address economic sustainability: the Eco Index, the Guide to Good Dairy Farming Practice, and Northwest Sustainable Dairies.

Table 6. A list of key economic topics (n=25) included in the 20 sustainability frameworks.

Major Themes	% of frameworks	Framework Topics
Economic performance	35	Economic Performance, Economic Sustainability, Financial Stability, Farm Financials, Financial Performance & Management, Production and Processing Efficiencies to Enhance Sustainability, Continuously Improve Key Areas of The Business
Supply Chain	30	Farm Economics/Value Chain, Chain Of Custody Requirements, Manage Input, Sourcing, Fair Price/Incentives, Green Procurement
Other Indirect Impacts	15	Indirect Economic Impacts, Impact on Local Economy, Local Economy,
Market Circumstances	10	Market Presence, Market
Miscellaneous	35	Sustainable Farming System, Safety, Quality and Transparency, Diversification, Continual Improvement, Successional Transfer, Obey the Law

Economic Indicator Topics

The 20 frameworks identified 25 different topics about the economic aspects of sustainability for which indicators were selected (Table 6). These fell into five major themes: economic performance, supply chains, other indirect impacts, market circumstances, and miscellaneous. Economic performance and supply chains were most frequently cited.

Social Indicator Topics

The 20 frameworks identified 38 different topics about the social aspects of sustainability for which indicators were selected (Table 7). These were organized into four major themes: Employee considerations, community benefits, products, and miscellaneous. Topics for two themes, employee considerations and community benefits, were by far the most frequently cited. Employee considerations had four sub-themes: Working conditions, legal considerations, workplace equality, and employee training. Overall, working conditions and community contributions were the most frequently cited by frameworks.

Environmental Indicator Topics

The 20 frameworks listed 67 topics for addressing the environmental aspects of sustainability for which indicators were selected (Table 8). Some of the same topics being were listed by different frameworks. The four major themes were environmental impacts, processing impacts, animal care, and miscellaneous. Common sub-themes under the theme of environmental impacts were water, wildlife and biodiversity, and soils which were the most cited framework themes. Product manufacturing and assembly was another sub-theme frequently cited by frameworks.

Table 7. A list of major social themes, sub-themes, and framework social topics (n=38) included in the 20 sustainability frameworks.

Major Themes Sub-themes	% of frameworks	Framework Topics
Employee Considerations	55	
Working conditions	55	Worker health & safety, Safe & fair working conditions, Safety, Worker health & safety, Occupational Health and Safety, Farm Employees, Health, Working conditions, Labor/Management Relations, Labor Practices & Decent Work: Employment, Freedom of Association & Collective Bargaining
Legal considerations	30	Corruption, Forced and Compulsory Labor, Human Rights: Investment and Procurement Practices, Respect Human Rights & Labor Standards, Child Labor
Workplace equality	15	Diversity & Equal Opportunity, Non-discrimination, Equal Remuneration for Women & Men.
Employee training	15	Training, Training and Education, Social/human capital
Community Contributions	40	Community Relations & Activities, Community, Community (local sourcing / hiring), Local Communities, Local economy, Community health, Agricultural Heritage and Resource Conservation, Recreational Access
Products	25	Food Safety and Quality, Healthy and Affordable Food, Product & Service Labeling, Product Responsibility: Customer Health & Safety, Marketing Communications
Miscellaneous	10	Dairy Producer Quality of Life, Public Policy

Table 8. A list of major environmental themes, sub-themes, and framework social topics (n=67) from 20 sustainability frameworks.

Major Themes Sub-themes	% of frameworks	Framework Topics
Environmental Impacts	55	
Water	55	Water (3), Water Quality (3), Water Use (2), Protect Water Resources, Water Management, Irrigation water
Wildlife and Biodiversity	40	Biodiversity (4), Wildlife and Biodiversity, Biodiversity and Ecosystems, Provide Wildlife Habitat, Actively Manage Biodiversity and Ecosystem Services
Soils	35	Soil Health (2), Soil Loss (2), Protect & Enhance Soil Resources, Soils, Soil Fertility/Health
Pest Management	25	Pest Management (3), Pesticides, Reducing Pesticide Use & Toxicity
Climate change	20	Greenhouse Gas Emissions (2), Climate change, Climate
Air quality	15	Air, Air quality (2)
Land management	15	Nutrient Management (2), Nutrients, Crop Management, Grazing Management, Land use
Processing Impacts	45	
Product manufacturing & assembly	45	Products and Services, Product Manufacturing & Assembly, Manage input, Materials (2) (feedstock, raw materials, processing), Production and Processing Efficiencies to Enhance Sustainability, End of life, Transportation, Packaging
Waste	20	Waste (2), Waste Management; Emissions, Effluents, and Waste
Energy	15	Energy (2), Energy use
Animal Care	40	Animal husbandry (2), Animal Welfare (2), Ensure Animal Health and Humane Treatment, Ethical Animal Care, Handling and Slaughter, Hormone/Antibiotic Supplements
Miscellaneous	10	GMO Crops/Livestock, Use, Additional Mandatory Requirement for Biofuels.

Table 9. Examples of framework hierarchical structure with two, three, and five levels. Metrics with units of measurement are used to measure sustainability are at the lowest level (e.g., gallons of cleaning water / gallon of milk). Higher levels organize metrics and indicators in topical groups (e.g., water, working conditions, etc.)

Healthy Farm Index (Quinn et al. 2009)	WWF Better Sugar Cane Init. (Bonsucro Production Std.) (Better Sugar Cane Initiative 2011)	GRI Guidelines (including Food Processing (Global Reporting Initiative 2010)	MOTIFS: A monitoring tool for integrated farm sustainability (Meul et al. 2008)
Category ⇩ Indicators (metrics)	Principles ⇩ Criteria ⇩ Indicators (metrics)	Principles ⇩ Performance indicators ⇩ Aspects (metrics)	Themes (3-Ps) ⇩ Level 1 ⇩ Level 2 ⇩ Level 3 ⇩ Indicators (metrics)

Framework Hierarchical Structure

A framework hierarchical structure is a structure with one or more conceptual levels for organizing sustainability topics, relevant indicators, and metrics which measure the indicators and address key topics (USDA Forest Service 2002; Table 9). Metrics with units of measurement are at the lowest level and are used to measure sustainability (e.g., gallons of cleaning water / gallon of milk). Higher levels organize metrics and indicators in topic groups (e.g., water, working conditions, etc.). Although abstract, framework hierarchical structure is like a filing system: it can be used to organize indicators and metrics into a systematic, well thought out, coherent package. It can ensure that (1) the appropriate number and breadth of relevant topics have been included, (2) the best metrics have been selected, and (3) the a balance between completeness with economy.

The 20 frameworks typically had three levels: a topic level, an indicator level, and a metric level. One framework had one level (a list of indicators) and one framework had five levels.

Framework Uses

The 20 frameworks had four major uses. Most (70%) frameworks were used as tools and most created a standard for measuring sustainability. Roughly one-third of the frameworks are set standards for measurement, managing sustainability, and/or performance.

Frameworks that…	Percent
…are used as measurement tool (e.g., *Field to Market, RISE*)	70
…set a standard of how to measure sustainability (e.g., *G3.1 Guidelines for Food Processors* [GRI])	30
…set a standard of how to manage for sustainability (e.g., BMPs or management guidelines like *Guide to Good Dairy Farming Practice* (FAO)	25
…set performance goals or targets for sustainability (e.g., *Food Alliance, Caring Dairy*)	37

Table 11. Percent of frameworks (n=20) with participation of fifteen different stakeholder groups.

Stakeholder Groups	Percent
Economic Stakeholders	90
Company reps.	65
Farmer	70
Academics	20
Social Stakeholders	85
Academics	75
NGOs	30
Government staff	30
Farmers	20
Labor reps.	5
Consumer Groups	5
Animal Welfare Groups	5
Environmental Stakeholders	80
Academics	35
ENGO staff	30
Ecological agriculture NGO staff	20
Land use planners	5
Government staff	5

Stakeholder Participation

Stakeholders are people who are potential beneficiaries or risk-bears of a company or region (Post 2002). The legitimacy of a framework may depend in part on its ability to meet the expectations of different stakeholders who might contribute to its existence and success. Stakeholder involvement has tradeoffs. Diverse stakeholder involvement can enhance a framework's legitimacy but may do little to improve its technical quality and may require more care to manage and integrate diverse viewpoints.

All frameworks involved stakeholders to varying degrees (Table 11). Ninety percent of frameworks had participation from economic stakeholder groups, which included company representatives, farmers, and academics. Company representatives and famers commonly participated in two-thirds of the frameworks.

Eighty-five percent frameworks had participation from social stakeholder groups, which included NGO staff, government staff, farmer, academics, labor representative, consumer groups, and animal welfare (Table 11). Frameworks averaged participation of representatives from two of these groups. Academics were the group most frequently selected to represent social stakeholders.

Eighty percent frameworks had participation from environmental stakeholders (Table 11). Academics ENGO staff, ecological agriculture NGO staff, land use planners, and government staff participated as environmental stakeholders. On average, frameworks had participation from representatives from one of these groups. Academics and ENGO staff were the groups most frequently selected to represent environmental stakeholders.

Implementation Stage

The 20 frameworks were at different stages of implementation. About one-third of the frameworks still have indicators under development, without field testing or application. Almost one-half of the frameworks have reached a phase of piloting. One quarter of the frameworks are routinely use.

Table 12. Percent of frameworks (n=20) with different stages of implementation.

Stage of Implementation	Percent
Beginning (few indicators selected)	15
Early (selected indicators untested)	15
Pilot (limited use in pilot studies)	45
Advanced (widespread use)	25

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Appendix A: Framework Goals

Table A1. A summary of frameworks' scope, goals, and key goals.

Name	Goals	Communication or Reporting	Improve Performance & Promote Good Practices	Capacity Building	Measurement & Assessment	Auditing & Verification	Harmonization	Add Market Value	Decision Making Tool	Number of Goals
Business Only										
Eco Index (beta) (Outdoor Industry Association & European Outdoor Group)	Leveraging global partners and established resources to speed the implementation of best business practices; Achieving accessibility and ease of use for companies of all sizes; Showing companies the business case for implementation; Harmonizing with existing standards/tools by referencing and/or building upon them; Starting small and building 'deeper and broader' over time; Providing sufficient value in the marketplace to sustain itself.		X				X	X		6
Manomet Business Sustainability Program	To significantly increase small and mid-size business financial resiliency and profitability, and have a positive impact on local communities by reducing the environmental impact of many businesses.		X					X		4
	Business Total		2				1	2		
Supply Chain										
B-Corp	to create a new sector of the economy which uses the power of business to solve social and environmental problems. This sector will be comprised of a new type of corporation - the B Corporation - that meets rigorous and independent standards of social and environmental performance, accountability, and transparency.		X	X						3
GRI (G3.1 Guidelines with Food Processing Sector Supplement)	The mainstreaming of disclosure on environmental, social and governance performance. To provide sector-specific content in reporting, improve the sustainability performance of organizations, and increase the number and quality of reports.	X	X							4
Field to Market	To create opportunities across the agricultural supply chain for continuous improvements in productivity, environmental quality, and human well-being.		X		X					3
Stewardship Index for Specialty Crops	To develop a system for measuring sustainable performance throughout the specialty crop supply chain.				X					1

Name	Goals	Communication or Reporting	Improve Performance & Promote Good Practices	Capacity Building	Measurement & Assessment	Auditing & Verification	Harmonization	Add Market Value	Decision Making Tool	Number of Goals
WWF Better Sugar Cane Initiative (Bonsucro Production Standard)	To establish principles and criteria applied in the sugar growing regions of the world through regionally specific strategies and tools. To reduce farm and other sugar processing impacts through the encouragement of BMPs. to promote measureable standards in key environmental and social impacts of sugarcane production and primary processing while recognizing the need for economic viability.		X		X			X		3
	Supply Chain Total	1	4	1	3			1		
Farms										
Food Alliance - Whole Farm/Ranch Inspection Tool	To provide comprehensive third-party certification for social and environmental responsibility in agriculture and the food industry. Also, provide a self-assessment tool for producers to compare their practices with those in FA's certification standards.				X	X			X	2
Healthy Farm Index	a tool that enhances the ability of decision makers to evaluate the tradeoffs between alternate ecosystem management regimes.				X				X	1
MOTIFS: A monitoring tool for integrated farm sustainability	The aims are: Develop and work out indicators of different themes of the monitoring tool; Refine or adapt indicators of the monitoring tool; Identify new themes of sustainability for the monitoring tool.				X				X	2
RISE – Response-Inducing Sustainability Evaluation	is a contribution to the holistic improvement of sustainability in agricultural production		X							1
	Farm Total		1		3	1			3	
Dairy Farms										
Ben & Jerry's Caring Dairy	A collaborative project undertaken by B&J's to help farmers continuously improve practices on their farms against 11 sustainability indicators based on the principles of Unilever's Sustainable Agriculture program. Caring Dairy - US picks up where the Dairy Stewardship Alliance left off when it ended.		X							2
Dairy Farm Indicator Project - Laval University	to develop indicators for the three aspects to assess dairy farm sustainability in a complete diagnosis tool at the farm-level				X				X	1

Name	Goals	Communication or Reporting	Improve Performance & Promote Good Practices	Capacity Building	Measurement & Assessment	Auditing & Verification	Harmonization	Add Market Value	Decision Making Tool	Number of Goals
Dairy Stewardship Alliance	A 3-yr pilot study to provide an on-farm assessment tool, educate and communicate sustainable dairy farming practices, and create a foundation for ongoing work in sustainable agriculture.	X	X		X					2
Guide to Good Dairy Farming Practice	To provide a farmer-orientated guide to practices that are achievable all over the world covering those areas that are essential to manage.		X							1
Manomet Vital Capital Index for Dairy Ag.	To provide a practical tool to help dairy farmers identify opportunities for improving agricultural stewardship and to communicate their stewardship to their stakeholders and supply chain.	X	X		X				X	2
Northwest Sustainable Dairies	Aims to encourage and promote consistent practices and communication between different interest groups both within and separated from the Northwest dairy industry.	X	X							2
SAI Platform - Working Group on Dairy	To support the development of sustainable ag worldwide through capacity building and communication/info dissemination.	X		X						2
Sustainability of Dutch Dairy Farming Systems	Quantify sustainability at farm level and to gain insight into the effects of management measures and farming systems on all aspects of sustainability in dairy farming using farm-level modeling.				X				X	2
Sustainable Development Assessment of Dairy Farms in Bulgaria	to analyze the possibilities for sustainable development of the [dairy agriculture] sector				X					1
	Dairy Farm Total	4	5	1	5				3	

Table A2. A summary of frameworks' process goals.

Name	Process Goals	Stakeholder participation	Technical expertise involvement	Transparency
Business Only				
Eco Index (beta) (Outdoor Industry Association & European Outdoor Group)	Collaboration, Open-source information; Transparency; Scalability; Global reach.	X		X
Manomet Business Sustainability Program	N/A			
Supply Chains				
B-Corp	N/A			
GRI (G3.1 Guidelines)	GRI's due process standards and quality expectations: high technical quality, accuracy and development according to an inclusive multi-stakeholder consensus-seeking process. (The Supplement was developed in a 2-yr process by a multi-stakeholder, geographically diverse Working Group through a consensus seeking process that included two opportunities for public comment.)	X	X	X
WWF Better Sugar Cane Initiative (Bonsucro Production Standard)	Public consultation (conformance with ISEAL) and stakeholder input to advise Technical Working Groups (Social and Labor, Processing and Milling, and Agriculture) in moving from Version 1 to Version 2, then final.	X		
Field to Market	Create a collaborative stakeholder group of producers, agribusinesses, food and retail companies, and conservation organizations focused on defining and measuring the sustainability of food and fiber production through the development of outcomes-based metrics.	X		
Farms				
Food Alliance - Whole Farm Inspection Tool	N/A			
Healthy Farm Index	to follow a content-based framework to communicate specific objectives and establish quantitative indicators			
MOTIFS: A monitoring tool for integrated farm sustainability	review of the scientific literature and "consulted stakeholders (including experts) to select or design relevant indicators, again taking into account the pre-defined quality criteria."	X	X	

Name	Process Goals	Stakeholder participation	Technical expertise involvement	Transparency
RISE – Response-Inducing Sustainability Evaluation	N/A			
Stewardship Index for Specialty Crops	To offer a suite of outcomes-based metrics to enable operators at any point along the supply chain to benchmark, compare, and communicate their own performance.			
Dairy Farms				
Ben & Jerry's Caring Dairy	N/A			
Dairy Farm Indicator Project - Laval University	described as "bottom-up" with "anonymity" with experts including farmers	X	X	
Dairy Stewardship Alliance	N/A			
Guide to Good Dairy Farming Practice	N/A			
Manomet Vital Capital Index for Dairy Ag.	Tool had to be relevant to all U.S. dairy farms regardless of region, herd size, or practices (e.g., organic or conventional); be useful for producers; be science-based; speak to diverse values, including those of dairy farmers; focus on continuous improvement, not targets. Indicators selected via stakeholder meetings, field testing (on 31 diverse farms across the US), then winnowing to short list.	X	X	
Northwest Sustainable Dairies	N/A			
SAI Platform - Working Group on Dairy	Identify indicators that allow farmers to monitor and report about progress in sustainable ag and allow the sector to communicate about progress towards sustainability. Metric selection principles: Geographical appropriateness, Avoidance of partiality, Appropriateness to audience, Feasibility of measurement.		X	
	Total	7	5	2

Table A3. A summary of criteria used to select indicators used by 20 different sustainability frameworks.

Name	Indicator Selection Criteria	NONE	Relevant to Farmers /Mgt.	Practical to measure	Socially Relevant	Benchmarks Available	Triple-bottom Line	Science-based	Outcome-based	Sensitivity	Scalable	Technology Neutral
Eco Index (beta) (Outdoor Industry Association & European Outdoor Group)	N/A	X										
Manomet Business Sustainability Program	Reflect the triple bottom line, rigorous, and applicable to mid-sized and small businesses.		X				X	X				
B-Corp	N/A	X										
GRI (G3.1 Guidelines)	N/A	X										
WWF Better Sugar Cane Initiative (Bonsucro Production Standard)	Principles & criteria must incorporate economic, financial, environmental and social dimensions and reflect good industry practices for the sugarcane sector.		X				X					
Field to Market	Outcomes based; Practice/technology neutral; Transparent and credible science; Measures on-farm production outcomes within a grower's control.		X	X				X	X			X
Food Alliance - Whole Farm/Ranch Inspection Tool	N/A	X										
Healthy Farm Index	flexible enough to fit the location of the farm and the resources and labor that are available		X	X							X	
MOTIFS: A monitoring tool for integrated farm sustainability	Relevant: there is a link between the indicator and the situation; Sensitive: a change in the situation (e.g. after an action) reflects in a difference of the indicator value; Repeatable: the indicator is determined by a well-defined method; Practical: limited costs (inclusive time) to determine the indicator; Assessable: lower and upper limits of the indicator value can be determined; Understandable: the indicator is understandable for farm advisers and farmers.		X	X	X					X		
RISE – Response-Inducing Sustainability Evaluation	N/A	X										
Stewardship Index for Specialty Crops	N/A					X			X			

Name	Indicator Selection Criteria	NONE	Relevant to Farmers /Mgt.	Practical to measure	Socially Relevant	Benchmarks Available	Triple-bottom Line	Science-based	Outcome-based	Sensitivity	Scalable	Technology Neutral
Ben & Jerry's Caring Dairy	N/A	X										
Dairy Farm Indicator Project - Laval University	The framework for the selection of indicators in this project consisted of five steps: (1) define the concept of dairying sustainability at the farm-level, (2) identify goals and principles to achieve in the assessment, (3) select components for each aspect of sustainability, (4) select indicators for each component and (5) establish threshold values to compare indicators results.					X	X					
Dairy Stewardship Alliance	N/A	X				X						
Guide to Good Dairy Farming Practice	N/A	X										
Manomet Vital Capital Index for Dairy Ag.	Breadth (ability to indicate other elements of the farm system), scientific merit (support from scientific literature), utility (usefulness of the indicator to farmers), practicality (ease with which the indicator can be measured), and social relevance.		X	X	X	X		X				
Northwest Sustainable Dairies	N/A	X		X								
SAI Platform - Working Group on Dairy	Specific, measurable, achievable, realistic, tangible and intelligent		X	X	X							
Sustainability of Dutch Dairy Farming Systems	(1) the relative importance of these attributes, as determined by stakeholders (Van Calker et al., 2004); (2) the possibility to quantify these attributes in an objective way; (3) the possibility of farming systems and/or farm management measures to affect the level of these attributes, i.e. sensitivity.		X	X	X					X		
Sustainable Development Assessment of Dairy Farms in Bulgaria	N/A	X										
	Percent of Total	50	40	35	20	20	15	15	10	10	5	5

Appendix B: Data from 21 Sustainability Efforts

This appendix provides case study information for 21 sustainability efforts relevant to dairy agriculture (see Table 2 for detailed information).

Name of Effort:	B-Corp
Short Narrative:	This growing independent effort is re-focusing business models on bulding societal and evirnmental solutions. It has participating businesses in about ½ of the states in the U.S.
Level of the supply chain:	FARM & BUS
Framework Goals:	to create a new sector of the economy which uses the power of business to solve social and environmental problems. This sector will be comprised of a new type of corporation - the B Corporation - that meets rigorous and independent standards of social and environmental performance, accountability, and transparency.
Framework Process Goals:	N/A
Indicator Selection Criteria:	None listed
Economic Indicators (Y/N):	Y
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	Accountability
Social components:	Consumers, Community, Governance
Env'l Components:	Facilities, Energy Usage, Supply Chain, Manufacturing,
Framework Levels:	Section>>Sub-sections>>Questions [indicators]
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	
Management Standard (X):	
Performance Standard (X):	X
List of Economic Stakeholders:	Business, "Green" business groups, "green" investors
List of Social Stakeholders:	N/A
List of Env'l Stakeholders:	N/A
Implementation Stage:	ADV
Website:	http://www.bcorporation.net/
Notes:	

Name of Effort:	Ben & Jerry's Caring Dairy (Caring Dairy - US [VT] and Caring Dairy [Netherlands])
Short Narrative:	This efforts has its origins beginng in 2000 with the work of University of Michigan business interns. It evolved out of the Dairy Stewrdhsip Allinace Program (see below). It takeas a practivce based approach and is aimed at activeity improving farm management.
Level of the supply chain:	FARM
Framework Goals:	A collaborative project undertaken by B&J's to help farmers continuously improve practices on their farms against 11 sustainability indicators based on the principles of Unilever's Sustainable Agriculture program. Caring Dairy - US picks up where the Dairy Stewardship Alliance left off when it ended.
Framework Process Goals:	N/A
Indicator Selection Criteria:	N/A
Economic Indicators (Y/N):	Y
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	Farm economics/value chain; energy; impact on local economy
Social components:	Social/human capital
Env'l Components:	Soil fertility/health; soil loss; animal welfare; nutrients; pest mgt; biodiversity; water
Framework Levels:	Indicators>>parameters
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	
Management Standard (X):	
Performance Standard (X):	X (perf measurement)
List of Economic Stakeholders:	550 dairy farmers (for CONO cheesemakers)
List of Social Stakeholders:	Wageningen University
List of Env'l Stakeholders:	WWF; The Netherlands Society for Nature
Implementation Stage:	ADV
Website:	http://www.benjerry.co.uk/caringdairy/
Notes:	1. Very confusing - info not presented well, dispersed over a few different websites. Indicators were different depending on which website you viewed. Caringdairy.com website no longer functional even though the other sites direct viewers to it, so it's unclear which website holds the decisive info on the program. 2. Difference in terminology: What they called 'indicators' I put in 'components' column. What they called 'measurement parameters' I put in 'indicators' column.

Name of Effort:	Dairy Farm Indicator Project - Laval University
Short Narrative:	This a small program out of the dairy academic research program at Laval University (Quebec) aimed at the small to modest sized dary farms found in Quebec. It is unclear as to whether t will contnue or expand.
Level of the supply chain:	FARM
Framework Goals:	to develop indicators for the three aspects to assess dairy farm sustainability in a complete diagnosis tool at the farm-level
Framework Process Goals:	described as "bottom-up" with "anonymity" with experts including farmers
Indicator Selection Criteria:	The framework for the selection of indicators in this project consisted of five steps: (1) define the concept of dairying sustainability at the farm-level, (2) identify goals and principles to achieve in the assessment, (3) select components for each aspect of sustainability, (4) select indicators for each component and (5) establish threshold values to compare indicators results.
Economic Indicators (Y/N):	Y
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	Technical Management, Economic viability, Expense control, Labor efficiency, Self-sufficiency
Social components:	Quality of life, Social integration, Farm succession, Entrepreneurship
Env'l Components:	Soil quality, Cropping practices, Fertilization management, Farm land management
Framework Levels:	Aspects (3-P)>>Components>>Indicators (~metrics)
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	X
Management Standard (X):	
Performance Standard (X):	
List of Economic Stakeholders:	Farmers, Experts
List of Social Stakeholders:	Experts
List of Env'l Stakeholders:	Agriculture scientists from University of Laval
Implementation Stage:	PILOT
Website:	http://www.ifsa.boku.ac.at/cms/fileadmin/Proceeding2010/2010_WS2.1_Parent.pdf
Notes:	

Name of Effort:	Dairy Stewardship Alliance
Short Narrative:	This was originally the precursor to the Caryying Dary Program at Ben and Jerry's and was developed by University of Vermont. It took a practce-based approach and favored organic agriculture. Becuase Ben and Jerry's has renvented this program, it is not clear whether the Dairy Stewardship Alliance will continue.
Level of the supply chain:	FARM
Framework Goals:	A 3-yr pilot study to provide an on-farm assessment tool, educate and communicate sustainable dairy farming practices, and create a foundation for ongoing work in sustainable agriculture.
Framework Process Goals:	To align with B&J's Caring Dairy indicators. Of 520 farms in the dairy co-op, 52 will participate in the Dairy Stewardship Self Assessment and 40 (76%) of these will each improve at least two identified sustainable production practices in the areas of animal husbandry, biodiversity, community health, energy efficiency, farm financials, nutrient management, organic practices, pest management, soil health management, and water management.
Indicator Selection Criteria:	N/A
Economic Indicators (Y/N):	Y
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	Farm financials
Social components:	Community health
Env'l Components:	Animal husbandry; Nutrient mgt; Biodiversity; Pest mgt; Energy; Water mgt; Soil health.
Framework Levels:	Modules>>Indicators
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	
Management Standard (X):	
Performance Standard (X):	X
List of Economic Stakeholders:	Ben & Jerry's Homemade, Inc.; St. Albans Cooperative Creamery; VT dairy farmers.
List of Social Stakeholders:	Center for Sustainable Agriculture at the University of Vermont; UVM Extension; Farm Service Administration; Vermont Agency of Agriculture, Food and Markets.
List of Env'l Stakeholders:	None
Implementation Stage:	PILOT - done
Website:	http://www.uvm.edu/~susagctr/?Page=dsa.html
Notes:	Limited info on web - best doc found at: http://www.uvm.edu/sustainableagriculture/Documents/DSA2010.pdf.

Name of Effort:	Eco Index (beta) (Outdoor Industry Association & European Outdoor Group)
Short Narrative:	This effort started in 2006 aimed at creating a green idex for the outdoor appearel industry. It aimed to bring together environmental guidelines, environmental performance indicators, and environmental footprint metrics to assess the impacts within six product life cycle stages.
Level of the supply chain:	BUS
Framework Goals:	Leveraging global partners and established resources to speed the implementation of best business practices; Achieving accessibility and ease of use for companies of all sizes; Showing companies the business case for implementation; Harmonizing with existing standards/tools by referencing and/or building upon them; Starting small and building 'deeper and broader' over time; Providing sufficient value in the marketplace to sustain itself.
Framework Process Goals:	Collaboration, Open-source information; Transparency; Scalability; Global reach.
Indicator Selection Criteria:	N/A
Economic Indicators (Y/N):	N
Social Indicators (Y/N):	N
Env'l Indicators (Y/N):	Y
Economic components:	N/A
Social components:	N/A
Env'l Components:	Materials (feedstock, raw materials, processing); Packaging; Product manufacturing & assembly; Transportation; Use; End of life.
Framework Levels:	Guidelines>>indicators>>metrics
Sustainability Tool (Y/N):	N
Measurement Standard (X):	X
Management Standard (X):	X?
Performance Standard (X):	X
List of Economic Stakeholders:	>100 outdoor companies (Columbia, GoLite, Levi Strauss, Mountain Equipment Co-op, Nau, The North Face, Patagonia, Petzl, REI, Timberland); American Apparel and Footwear Association.
List of Social Stakeholders:	Portland Development Commission, academia.
List of Env'l Stakeholders:	Zero Waste Alliance (facilitator), CERES
Implementation Stage:	EARLY (in on-going testing and updating phase)
Website:	http://www.ecoindexbeta.org/
Notes:	Participation open to all stakeholders in the supply chain process. Tool can be used at different levels of engagement: guidelines (BMPs), indicators (scoring system), metrics (footprint measurement).

Name of Effort:	Field to Market
Short Narrative:	This is an effort supported by a borad-based of large national organizations aimed to devlop measure of agriculture sustinabiity for commodity crops. It focuses on multi-scale outcome-based metrics and has a Fieldprint calculator.
Level of the supply chain:	FARM & BUS
Framework Goals:	To create opportunities across the agricultural supply chain for continuous improvements in productivity, environmental quality, and human well-being.
Framework Process Goals:	Create a collaborative stakeholder group of producers, agribusinesses, food and retail companies, and conservation organizations focused on defining and measuring the sustainability of food and fiber production through the development of outcomes-based metrics.
Indicator Selection Criteria:	Outcomes based; Practice/technology neutral; Transparent and credible science; Measures on-farm production outcomes within a grower's control.
Economic Indicators (Y/N):	N (not yet)
Social Indicators (Y/N):	N (not yet)
Env'l Indicators (Y/N):	Y
Economic components:	Economic (in development)
Social components:	Social, Health and safety (in development)
Env'l Components:	Land use; Soil loss; Irrigation water; Water quality; Energy use; Climate.
Framework Levels:	Outcomes>Metrics
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	
Management Standard (X):	
Performance Standard (X):	X (perf-based metrics)
List of Economic Stakeholders:	American Farm Bureau Federation; American Farmland Trust; American Soybean Association; Bayer CropScience; Bunge; Cargill; Cotton Incorporated; CropLife America; CropLife International; Darden Restaurants, Inc; DuPont; Fleishman-Hillard; General Mills; Grocery Manufacturers of America; John Deere; Kellogg Company; Land O'Lakes; Mars, Inc.; Monsanto; National Association of Wheat Growers; National Corn Growers Association; National Cotton Council of America; National Potato Council; Penton Media; Syngenta Crop Protection; The Coca Cola Company; The Fertilizer Institute; United Soybean Board; USA Rice Federation.
List of Social Stakeholders:	Innovation Center for US Dairy; International Plant Nutrition Institute; National Association of Conservation Districts; Natural Resources Conservation Service (NRCS); The Irrigation Association; University of Arkansas Division of Agriculture; University of Wisconsin-Madison, College of Agricultural and Life Sciences.
List of Env'l Stakeholders:	Conservation International; Conservation Technology Information Center; Environmental Defense Fund; Manomet Center for Conservation Sciences; The Nature Conservancy; World Resources Institute; World Wildlife Fund.
Implementation Stage:	EARLY (has some indicators, but still developing other indicators and metrics)
Website:	http://www.fieldtomarket.org/
Notes:	Have developed only Environmental Resource Indicators so far; will continue to develop other components of a Sustainability Index.

Name of Effort:	Food Alliance - Whole Farm/Ranch Inspection Tool
Short Narrative:	Begun in 1993, the Food Alliance is founded as an independent 501(c)3 nonprofit based in Portland, Oregon. It is an agriculture certiciation system that focuses on practices-based indicators of sustinability which are unfavorable to chemical use. It covers comodity and non-commodity crops as well as dairy farming.. It also has its own label.
Level of the supply chain:	FARM
Framework Goals:	To provide comprehensive third-party certification for social and environmental responsibility in agriculture and the food industry. Also, provide a self-assessment tool for producers to compare their practices with those in FA's certification standards.
Framework Process Goals:	N/A
Indicator Selection Criteria:	N/A
Economic Indicators (Y/N):	Y
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	Continual Improvement
Social components:	Safe & fair working conditions.
Env'l Components:	Ensure animal health and humane treatment; Hormone/antibiotic supplements; GMO crops/livestock; Reducing pesticide use & toxicity; Protect & enhance soil resources; Protect water resources; Provide wildlife habitat.
Framework Levels:	Standards>evaluation criteria
Sustainability Tool (Y/N):	N
Measurement Standard (X):	
Management Standard (X):	X
Performance Standard (X):	X
List of Economic Stakeholders:	Bon Appétit Management Company, Mercy Corps Northwest, NORPAC Foods, Inc., Karp Resources, Maxwell PR, Stoel Rives, LLP, Edelman
List of Social Stakeholders:	Oregon State University, Portland State University, Washington State University, Washington State Department of Agriculture
List of Env'l Stakeholders:	Leopold Center for Sustainable Agriculture
Implementation Stage:	ADV
Website:	http://foodalliance.org/certification/producer/WholeFarm.pdf
Notes:	Has a Stewardship Council to advise the development and refinement of certification standards. Current members listed above; has historically included university and agency researchers, advocates for consumer affairs, labor, animal welfare and the environment, and representatives of the food industry.

Name of Effort:	GRI (G3.1 Guidelines and Food Processing Sector Supplement)
Short Narrative:	GRO (Global Reporting Initiaitve) is the a leading global sustiability framework which used pracice-based incidators and outcome based indicators. It is probably the most widely used business sustinability framework. By 2009, more than 1,500 organizations from 60 countries use the GRI guidelines to produce their sustainability reports..
Level of the supply chain:	FARM & BUS
Framework Goals:	To provide sector-specific content in reporting, improve the sustainability performance of organizations in the sector, and increase the number and quality of reports.
Framework Process Goals:	GRI's due process standards and quality expectations: high technical quality, accuracy and development according to an inclusive multi-stakeholder consensus-seeking process. (The Supplement was developed in a 2-yr process by a multi-stakeholder, geographically diverse Working Group through a consensus seeking process that included two opportunities for public comment.)
Indicator Selection Criteria:	N/A
Economic Indicators (Y/N):	Y
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	CORE: Sourcing; Economic performance; Market Presence; Indirect Economic Impacts
Social components:	CORE: Labor Practices and Decent Work: Employment; Labor/Management Relations; Occupational Health and Safety; Training and Education; Diversity and Equal Opportunity. Human Rights: Investment and Procurement Practices; Non-discrimination; Freedom of Association and Collective Bargaining; Child Labor; Forced and Compulsory Labor. Society: Community; Healthy and Affordable Food; Corruption; Public Policy; Compliance. Product Responsibility: Customer Health and Safety; Product and Service Labeling; Marketing Communications; Compliance.
Env'l Components:	CORE: Environment: Materials; Energy; Water; Biodiversity; Emissions, Effluents, and Waste; Products and Services; Compliance. Animal Welfare: Breeding and Genetics; Animal Husbandry; Transportation, Handling, and Slaughter;
Framework Levels:	Performance Indicators>Aspects (Core & Additional)
Sustainability Tool (Y/N):	N
Measurement Standard (X):	X
Management Standard (X):	
Performance Standard (X):	
List of Economic Stakeholders:	Allianz Global Investors; Archer Daniels Midland; Bunge Brazil; Danisco; FNV Bondgenoten; Green Mountain Coffee Roasters; Interface Trading; International Federation of Agricultural Producers; Nestlé; Tyson Foods; Wilmar; Young's Seafood Limited/Findus Group.
List of Social Stakeholders:	Compassion in World Farming; International Fair Trade Association; New York University; Punjab Education Sector Reform Program; Société Générale de Surveillance.
List of Env'l Stakeholders:	International Union for Conservation of Nature; World Wildlife Fund for Nature.
Implementation Stage:	ADV
Website:	http://www.globalreporting.org/ReportingFramework/SectorSupplements/FoodProcessing/

Name of Effort:	Guide to Good Dairy Farming Practice
Short Narrative:	This guide was developed in 2004 by the International Dairy Federation and FAO Task Force on Good Dairy Farming Practices for dairy farmers. This effort provides a generic framework for individual on-farm quality assurance programs, focusing on both consumer safety and the image of the dairy sector.
Level of the supply chain:	FARM
Framework Goals:	to provide a farmer-orientated guide to practices that are achievable all over the world covering those areas that are essential to manage.
Framework Process Goals:	N/A
Indicator Selection Criteria:	N/A
Economic Indicators (Y/N):	N
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	ND
Social components:	Animal health, Milking hygiene, Animal feeding and water, Animal welfare
Env'l Components:	Environment (most manure and waste management)
Framework Levels:	Areas (e.g., Animal Health)>Good agricultural practice (GAP)>Objectives/Control measures
Sustainability Tool (Y/N):	N
Measurement Standard (X):	
Management Standard (X):	X
Performance Standard (X):	
List of Economic Stakeholders:	N/A
List of Social Stakeholders:	Agricultural Scientists
List of Env'l Stakeholders:	Agricultural Scientists
Implementation Stage:	BEGIN
Website:	http://www.fao.org/DOCREP/006/Y5224E/Y5224E00.HTM#Contents
Notes:	

Name of Effort:	Healthy Farm Index
Short Narrative:	This is an academic effort to develop an index predisposed to to less inetnsive agriculture in Nebraska.. Initially, it focused n biodiversity and now is taking more of an ecosystems service saporach to assessing sustinability. Many indicators are under development.
Level of the supply chain:	BUS
Framework Goals:	a tool that enhances the ability of decision makers to evaluate the tradeoffs between alternate ecosystem management regimes.
Framework Process Goals:	to follow a content-based framework to communicate specific objectives and establish quantitative indicators
Indicator Selection Criteria:	flexible enough to fit the location of the farm and the resources and labor that are available
Economic Indicators (Y/N):	N
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	ND
Social components:	Food production, Quality of life
Env'l Components:	Biodiversity, Environmental enhancement
Framework Levels:	Category>Indicators
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	X
Management Standard (X):	
Performance Standard (X):	X
List of Economic Stakeholders:	Farmers
List of Social Stakeholders:	University of Nebraska scientists
List of Env'l Stakeholders:	University of Nebraska scientists
Implementation Stage:	PILOT
Website:	http://hfi.unl.edu/hfi.shtml
Notes:	

Name of Effort:	Manomet Business Sustainability Program
Short Narrative:	Beginning in 2009, this is a collaboration of an Manomet and Maine Businesses for Sustainability to develop a sustainability tool and labeling system to encourage sustainable business practices in Maine. It is aimed at small and mid-sized businesses that are two small for GRI or B-Corp.
Level of the supply chain:	BUS
Framework Goals:	To significantly increase small and mid-size business financial resiliency and profitability, and have a positive impact on local communities by reducing the environmental impact of many businesses.
Framework Process Goals:	N/A
Indicator Selection Criteria:	Reflect the triple bottom line, rigorous, and applicable to mid-sized and small businesses.
Economic Indicators (Y/N):	Y
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	Business Management, Financial Records
Social components:	Employee Compensation, Local Sourcing, Community Giving
Env'l Components:	Water, Waste, GHG emissions, Air Emission, Recycling, Energy Conservation
Framework Levels:	None
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	X
Management Standard (X):	
Performance Standard (X):	X
List of Economic Stakeholders:	Maine Businesses for Sustainability, businesses interested in sustainability
List of Social Stakeholders:	N/A
List of Env'l Stakeholders:	Manomet Center for Conservation Sciences
Implementation Stage:	PILOT
Website:	www.mainebusinessesforsustainability.org/
Notes:	

Name of Effort:	Manomet Vital Capital Index for Dairy Ag.
Short Narrative:	This tool was developed through participatory work with dairy farmers and stakeholders in local communities, regional and national stakeholders. It is a mix of broad practice-based indicators and outcome indicators. It has been piloted on over 40 farms.
Level of the supply chain:	FARM
Framework Goals:	To provide a practical tool to help dairy farmers identify opportunities for improving agricultural stewardship and to communicate their stewardship to their stakeholders and supply chain.
Framework Process Goals:	Tool had to be relevant to all U.S. dairy farms regardless of region, herd size, or practices (e.g., organic or conventional); be useful for producers; be science-based; speak to diverse values, including those of dairy farmers; focus on continuous improvement, not targets. Indicators selected via stakeholder meetings, field testing (on 31 diverse farms across the US), then winnowing to short list.
Indicator Selection Criteria:	Breadth (ability to indicate other elements of the farm system), scientific merit (support from scientific literature), utility (usefulness of the indicator to farmers), practicality (ease with which the indicator can be measured), and social relevance.
Economic Indicators (Y/N):	Y
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	Financial Performance and Management, Successional Transfer, Energy Use, Local Economy
Social components:	Dairy Producer Quality of Life, Farm Employees, Food Safety and Quality, Community Relations and Activities, Agricultural Heritage and Resource Conservation, Recreational Access
Env'l Components:	Nutrient Management, Crop Management, Grazing Management, Soil Health, Pest Management, Wildlife and Biodiversity, Water Quality, Water Use, Air Quality, Greenhouse Gas Emissions, Waste Management, Ethical Animal Care
Framework Levels:	Component>indicator/metric
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	X
Management Standard (X):	
Performance Standard (X):	
List of Economic Stakeholders:	Producers, dairy industry.
List of Social Stakeholders:	Non-agriculture landowners, citizens, labor organizations, agriculture scientists, state agency staff, sociologists.
List of Env'l Stakeholders:	Agriculture land conservation organizations, land use planners, environmental organizations.
Implementation Stage:	PILOT
Website:	No official website yet. http://www.manomet.org (org website) and http://www.saiplatform.org/uploads/Library/Manomet%20Final%20Draft.pdf (for actual doc).
Notes:	

Name of Effort:	MOTIFS: A monitoring tool for integrated farm sustainability
Short Narrative:	This was a research effort in Belgium that used stakeholder participation and expert consulting to develop a user-friendly tool to measure progress towards integrated sustainable dairy farming systems. It was developed and field tested from 2007 to 2010 and is now being used in a project to imrpove farm practices through 2013.
Level of the supply chain:	FARM
Framework Goals:	The aims are: Develop and work out indicators of different themes of the monitoring tool; Refine or adapt indicators of the monitoring tool; Identify new themes of sustainability for the monitoring tool.
Framework Process Goals:	review of the scientific literature and "consulted stakeholders (including experts) to select or design relevant indicators, again taking into account the pre-defined quality criteria."
Indicator Selection Criteria:	Relevant: there is a link between the indicator and the situation; Sensitive: a change in the situation (e.g. after an action) reflects in a difference of the indicator value; Repeatable: the indicator is determined by a well-defined method; Practical: limited costs (inclusive time) to determine the indicator; Assessable: lower and upper limits of the indicator value can be determined; Understandable: the indicator is understandable for farm advisers and farmers.
Economic Indicators (Y/N):	Y
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	Labor Productivity, Capital Productivity, Land Productivity, Efficiency, Labor Profitability, Return on Equity, Return on Assets, Risk
Social components:	Professional Pride, Decision Latitude, Care (family and society), Animal Health and Welfare, Landscape Management, Social Services, Disposable Income, Entrepreneurship
Env'l Components:	Pesticides, Energy, Water Nutrients, Soil Quality, water Quality, Air Quality, genetic Diversity, Specie Diversity, habitat Diversity
Framework Levels:	Themes (3-Ps)>level 1>Level 2>Level 3> Indicators
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	X
Management Standard (X):	
Performance Standard (X):	
List of Economic Stakeholders:	Farmers, Experts
List of Social Stakeholders:	Experts
List of Env'l Stakeholders:	Agriculture scientists from Institute for Agricultural and Fisheries Research, (Belgium)
Implementation Stage:	PILOT
Website:	http://www.ilvo.vlaanderen.be/lenm/EN/Research/Integration/Ongoingprojects/Farm_sustainability_tool/tabid/923/Default.aspx
Notes:	

Name of Effort:	Northwest Sustainable Dairies
Short Narrative:	Northwest Sustainable Dairies is a partnership program with the Oregon Dairy Farmers Association and the Washington State Dairy Federation. It developed these guidelines as a resource to communicate about the standards and on-farm practices that dairy farmers uphold.
Level of the supply chain:	FARM
Framework Goals:	aims to encourage and promote consistent practices and communication between different interest groups both within and separated from the Northwest dairy industry.
Framework Process Goals:	N/A
Indicator Selection Criteria:	N/A
Economic Indicators (Y/N):	N
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	ND
Social components:	Facilities [sanitation], Sanitary Milk Collection, Milk Safety, Farm Labor Regulations, Communication [employee], Safety, Compensation
Env'l Components:	Manure Management Facilities, Manure Handling, Energy Management
Framework Levels:	Guiding Principle (e.g., animal health), Expectation.
Sustainability Tool (Y/N):	N
Measurement Standard (X):	
Management Standard (X):	X
Performance Standard (X):	
List of Economic Stakeholders:	Dairy Farmers, Dairy Professionals, University Professors, Extension Agents, Milk Processing Cooperatives,
List of Social Stakeholders:	Veterinarians, University Professors, Extension Agents
List of Env'l Stakeholders:	University professors, Extension Agents
Implementation Stage:	BEGIN
Website:	http://www.northwestsustainabledairies.com/
Notes:	

Name of Effort:	RISE – Response-Inducing Sustainability Evaluation
Short Narrative:	The RISE is a rapid, holistsic method for sustainability assessment of agricultural production at farm level. It begand as a research effort in Switzerland. Over 600 farms in 18 countries have been analysed using RISE. There are efforts to explore it usefulness for documenting sustainability in the context of supply chains.
Level of the supply chain:	FARM
Framework Goals:	is a contribution to the holistic improvement of sustainability in agricultural production
Framework Process Goals:	N/A
Indicator Selection Criteria:	N/A
Economic Indicators (Y/N):	Y
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	Economic stability, Economic efficiency, Local economy
Social components:	Working conditions, Social security
Env'l Components:	Energy, Water, Soil, Biodiversity, Emission potential (N&P), Plant protection, Waste
Framework Levels:	Dimension>Indicator>State Parameter>Driving Force Parameter
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	X
Management Standard (X):	
Performance Standard (X):	
List of Economic Stakeholders:	Farmers, Experts
List of Social Stakeholders:	Experts
List of Env'l Stakeholders:	Agriculture scientists from Swiss College of Agriculture, other experts
Implementation Stage:	PILOT
Website:	http://www.shl.bfh.ch/?id=249/
Notes:	

Name of Effort:	SAI Platform - Working Group on Dairy (Principles & Practices for Sustainable Dairy Farming v2009)
Short Narrative:	In 2002 Nestlé, Unilever and Danone created the Sustainable Agriculture Initiative (SAI) Platform, a non-profit organization to facilitate precompetitive sharing of knowledge and initiatives to support sustainable agriculture practices. The members of the Working Group on Dairy seek an active role in the development, recognition and implementation of sustainable practices for dairy agriculture.
Level of the supply chain:	FARM
Framework Goals:	To support the development of sustainable ag worldwide through capacity building and communication/info dissemination.
Framework Process Goals:	Identify indicators that allow farmers to monitor and report about progress in sustainable ag and allow the sector to communicate about progress towards sustainability. Metric selection principles: Geographical appropriateness, Avoidance of partiality, Appropriateness to audience, Feasibility of measurement.
Indicator Selection Criteria:	Specific, measurable, achievable, realistic, tangible and intelligent
Economic Indicators (Y/N):	N (not yet)
Social Indicators (Y/N):	N (not yet)
Env'l Indicators (Y/N):	N (not yet)
Economic components:	Sustainable Farming System; Economic Sustainability (Safety, Quality and transparency, Financial stability, Market, Diversification).
Social components:	Social Sustainability (Working conditions, Training, Local economy).
Env'l Components:	Environmental Sustainability (Soil, Water, Biodiversity, Air, Climate change, Energy, Waste).
Framework Levels:	Item>Principles>Recommended Practices
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	
Management Standard (X):	X
Performance Standard (X):	
List of Economic Stakeholders:	Dairy Working Group members: Cayuga Marketing, Delaval, Fonterra, Friesland Campina, General Mills, Groupe Danone, Kraft, McDonald's, Nestlé, Novus and Unilever. SAI Active Members: Agrarfrost, Agroterra, Aviko, CIO, Coca-Cola, Farm Frites, Heineken, Illy, Kellogg's, Kemin, LambWeston, McCain, Pepsico, SaraLee, Tchibo. SAI Affiliate Members: CIAA, DeLaval, Global Dairy Platform.
List of Social Stakeholders:	SAI Affiliate Members: European Initiative for Sustainable Development in Agriculture, Global Forum for Rural Advisory Services.
List of Env'l Stakeholders:	None.
Implementation Stage:	BEGIN
Website:	http://www.saiplatform.org/
Notes:	1. Has Principles & Practices for dairy, but still developing indicators & metrics.

Name of Effort:	Stewardship Index for Specialty Crops
Short Narrative:	The Stewardship Index for Specialty Crops is a multi-stakeholder initiative to develop a system for measuring sustainable performance throughout the specialty crop supply chain. The project seeks to offer a suite of outcomes-based metrics to enable operators at any point along the supply chain to benchmark, compare, and communicate their own performance. Volunteer technical committees made up of scientists, stakeholders, and farmers develop and select indicators.
Level of the supply chain:	FARM & BUS
Framework Goals:	To develop a system for measuring sustainable performance throughout the specialty crop supply chain.
Framework Process Goals:	To offer a suite of outcomes-based metrics to enable operators at any point along the supply chain to benchmark, compare, and communicate their own performance.
Indicator Selection Criteria:	N/A
Economic Indicators (Y/N):	Y (being tested)
Social Indicators (Y/N):	Y (being tested)
Env'l Indicators (Y/N):	Y (being tested)
Economic components:	Green procurement; Fair price/incentives.
Social components:	Human resources (worker health & safety, employment practices, etc.); Community (local sourcing / hiring, etc.)
Env'l Components:	Air quality; Biodiversity and ecosystems; Energy use; GHG emissions; Nutrients; Packaging; Pesticides; Soils; Waste; Water quality; Water use.
Framework Levels:	N/A
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	X
Management Standard (X):	
Performance Standard (X):	
List of Economic Stakeholders:	American Farmland Trust; Compass Group; DelCabo; Del Monte; Farm Fresh Direct; Food Georgia Fruit and Vegetable Association; Heinz; Marketing Institute; Markon Cooperative; National Potato Council; Produce Marketing Association; Sam's Club; Sodexo; SureHarvest; SYSCO; Torrey Farms; Unilever; United Fresh Produce Association; Wal-Mart; Washington Horticulture Association; Wegmans; Western Growers Association.
List of Social Stakeholders:	California Rural Legal Assistance; Community Alliance with Family Farmers; Sustainable Food Lab; University of Arkansas.
List of Env'l Stakeholders:	California Sustainable Winegrowing Alliance; Defenders of Wildlife; Environmental Defense Fund; Natural Resources Defense Council; The Organic Center; World Wildlife Fund.
Implementation Stage:	EARLY (still piloting and developing other metrics)
Website:	http://www.stewardshipindex.org/
Notes:	1. Stakeholders listed are on Coordinating Council. Specialty crop stakeholders and other experts too numerous to list serve on Metrics Review Committee Workgroups.

Name of Effort:	Sustainability of Dutch Dairy Farming Systems
Short Narrative:	This was a research effort in the Netherland to develop a triple bottom line, stakeholder-informed sustainability system for dairy farmers, The lead scientist has gone on to wok on developing the Carrying Dairy for Unilever.
Level of the supply chain:	FARM
Framework Goals:	quantify sustainability at farm level and to gain insight into the effects of management measures and farming systems on all aspects of sustainability in dairy farming using farm-level modeling.
Framework Process Goals:	N/A
Indicator Selection Criteria:	(1) the relative importance of these attributes, as determined by stakeholders (Van Calker et al., 2004); (2) the possibility to quantify these attributes in an objective way; (3) the possibility of farming systems and/or farm management measures to affect the level of these attributes, i.e. sensitivity.
Economic Indicators (Y/N):	Y
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	Profitability
Social components:	Working conditions, Food safety, Animal welfare, Animal health, Landscape quality
Env'l Components:	Eutrophication, Groundwater, Dehydration, Acidification, Global warming, Aquatic ecotoxicity, Terrestrial ecotoxicity
Framework Levels:	Attribute>Aspect>Unit (~metric)
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	X
Management Standard (X):	
Performance Standard (X):	
List of Economic Stakeholders:	University staff, research institute staff, bank staff, accounting agency staff
List of Social Stakeholders:	Conventional Farmers, Organic Farmers, Animal Welfare Organizations, Environmental Organizations, Consumer Organizations, Dairy Co-Operatives, Dairy Processing Companies, Retailers, Gov't Agency Staff (Ministry Of Agriculture And Ministry Of Environment), Regional Policy Makers
List of Env'l Stakeholders:	University Scientists, Research Institute Staff, Governmental Agency Staff
Implementation Stage:	PILOT
Website:	http://www.bec.wur.nl/UK/Research/Economics+of+sustainable+agriculture/
Notes:	

Name of Effort:	Sustainable Development Assessment of Dairy Farms in Bulgaria
Short Narrative:	This was a research effort in Bulgaria to help dairy farmers achieve higher levels of sustainability, particularly with increasing integration of Bulgaria with the European Union and its markets.
Level of the supply chain:	FARM
Framework Goals:	to analyze the possibilities for sustainable development of the [dairy agriculture] sector
Framework Process Goals:	N/A [scientific]
Indicator Selection Criteria:	N/A
Economic Indicators (Y/N):	Y
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	Productivity and Financial stability
Social components:	Standard Of Living, Animal Welfare, Quality Of Production
Env'l Components:	Energy, Biodiversity, Waste management.
Framework Levels:	Category>Sub-indicators>Score
Sustainability Tool (Y/N):	Y
Measurement Standard (X):	X
Management Standard (X):	
Performance Standard (X):	
List of Economic Stakeholders:	N/A
List of Social Stakeholders:	N/A
List of Env'l Stakeholders:	N/A
Implementation Stage:	PILOT
Website:	www.mace-events.org/greenweek2010/6363-MACE/.../Atanasov_feb.pdf
Notes:	

Name of Effort:	WWF Better Sugar Cane Initiative (Bonsucro Production Standard)
Short Narrative:	Bonsucro was born out of the Better Sugarcane Initiative, a global multi-stakeholder non-profit organization dedicated to reducing the environmental and social impacts of sugar cane production which links its name to a product, process or service that has been certified by an independent certification body as being in compliance with the Bonsucro standard. It is the first global metric standard for sugar cane.
Level of the supply chain:	FARM & BUS
Framework Goals:	To establish principles and criteria applied in the sugar growing regions of the world through regionally specific strategies and tools. To reduce farm and other sugar processing impacts through the encouragement of BMPs. to promote measureable standards in key environmental and social impacts of sugarcane production and primary processing while recognizing the need for economic viability.
Framework Process Goals:	Public consultation (conformance with ISEAL) and stakeholder input to advise Technical Working Groups (Social and Labor, Processing and Milling, and Agriculture) in moving from Version 1 to Version 2, then final.
Indicator Selection Criteria:	Principles & criteria must incorporate economic, financial, environmental and social dimensions and reflect good industry practices for the sugarcane sector.
Economic Indicators (Y/N):	Y
Social Indicators (Y/N):	Y
Env'l Indicators (Y/N):	Y
Economic components:	Obey the law; Manage input, production and processing efficiencies to enhance sustainability; Continuously improve key areas of the business; Chain of Custody Requirements.
Social components:	Respect Human Rights and Labor Standards.
Env'l Components:	Manage input, production and processing efficiencies to enhance sustainability; Actively manage biodiversity and ecosystem services; Continuously improve key areas of the business; Additional mandatory requirement for biofuels under the EU Renewable Energ
Framework Levels:	Principles>Criteria>Indicators
Sustainability Tool (Y/N):	N
Measurement Standard (X):	
Management Standard (X):	
Performance Standard (X):	X
List of Economic Stakeholders:	Producers, farmers, small scale growers, companies
List of Social Stakeholders:	Individuals, NGOs
List of Env'l Stakeholders:	WWF
Implementation Stage:	EARLY
Website:	http://www.bettersugarcane.org
Notes:	1. Standard is complete and available but not widely used yet; they anticipate that certified sugar will be available in April 2011. 2. Some of the tool's components included indicators that crossed categories (i.e., economic and environment), so they are listed in both columns. 3. Info in this table is for the Production Standard, but BSI also has a Chain of Custody Standard.