

Operationalizing Sustainability in Value Chains

Chapter 1. Why we need Metrics and why Metrics are Dangerous

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All learning involves assessment. Unless a person, group, or organization can gauge how they are doing relative to an aim, no learning is possible. Such assessment often is aided by quantitative measurement, especially when many people and even many different organizations are involved. But the goal is the learning, the improvement in outcomes achieved and building capacity for further improvement, not the measurement itself. Confusing ends and means leads to the naïve belief that metrics alone produce change, can lead to disappointing results from serious effort to improve metrics and can even make matters worse, such as when people spend time and resources improving metrics at the expense of confronting underlying problems and building healthier systems, or equally problematic, making important decisions based on sophisticated metrics but insufficient or inaccurate information.

Genuine concerns for the sustainability of value chains and the need for fundamental innovation are leading to more and more work to develop metrics, indices and certifications so that consumers can gauge which products are more “sustainable,” retailers can judge among the competing claims of different vendors, and upstream suppliers can direct investments toward meaningful improvements in products, processes, and business models. The purpose of this introductory article is to place these efforts in a context of sound thinking about what metrics can and cannot do, and how to go about innovation in systems of measurement more likely to lead to significant and ongoing learning - improvement in economic, social and ecological well being within value chains and building capacity for further improvement.

This paper serves also as in introduction to our collaboration on the promise and perils of operationalizing sustainability in value chains, which centers on a variety of core questions, field pilot projects, and building a community of committed innovators in business, civil society, government and academia working together to learn and share their learning. The next stage will present what we see as basic dimensions of a common framework for sustainable value chains, based on the experiences of leading businesses and NGOs, and a plan for a variety of case analyses to show how this framework relates to current practices of these innovators.

We believe that confronting the unsustainability in current value chains will further bring hitherto marginalized concerns into the mainstream of management practice in ways that will not happen otherwise. For example, “Corporate Social Responsibility” and similar movements can easily become little more than PR and re-branding strategies. On the other hand, as a businessperson, your value chain *is* your business. If it is not sustainable, you do not have a

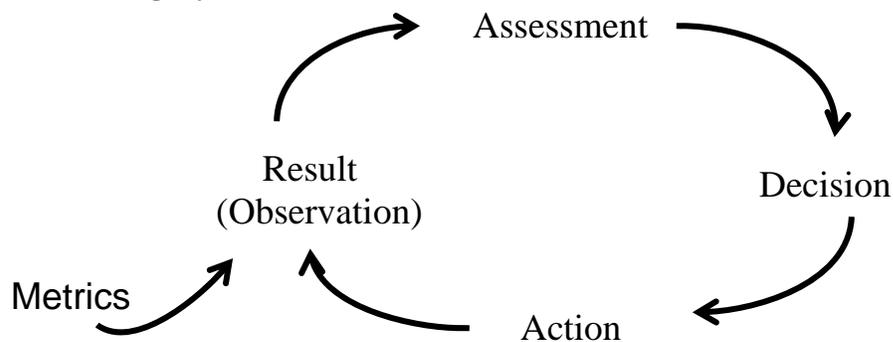
viable business. The notion that poverty in upstream suppliers' communities, or poor labor conditions, or the unavailability of water and other ecological stresses are someone else's problem has brought many large corporations up short in recent years. The common strategy to simply shift sources of supply when current sources are no longer able to meet buyers' requirements not only leads to externalizing social and environmental costs, it also assumes that there will always be another source where these problems do not exist. This assumption is becoming less tenable as there are fewer untapped sources of supply and as NGOs help raise consumers' and key decision makers' awareness of the consequences of business-as-usual practices.

Today, innovation towards truly healthy value chains is becoming a strategic imperative for a small but growing number of leading businesses, often working together with NGOs and governmental organizations. We believe that innovation in metrics and related information quality and availability can play a part in this, but only insofar as better measurement is pursued wisely to support deep and ongoing learning.

Measurement, Assessment and Learning

All learning involves ongoing iteration between thinking and acting. There are many forms of representing this basic "learning cycle," one of which is below. Key to all theories of learning are the "connective" processes that intervene between thinking and acting: how we *observe* the consequences of actions and make sense of what is working and not working (*assess* our efforts), and how this sense-making or interpretation translates into new *decisions* and *actions*.

Figure 1: **The Basic Learning Cycle**



In principle, quantitative measurement is not essential for learning to occur; but observation and assessment is. A baby learning to walk does not need to have a metric of "steps successfully taken," but she does need to be able to recognize the difference between taking a few and falling and taking enough so as to reach her goal of the table on the other side of the room.

In social systems, however, systems of quantitative measurement are often essential in order to make observations more consistent, reliable and communicable, and in fostering agreement among different parties with different goals, priorities and mental models. To enable improvement and learning, diverse actors need to be able to foster consensus on current performance. Metrics can also help diverse parties consense in their assessments regarding what

is working and what is not and help allocate resources for improvement, whether these decisions are taken in a tightly or loosely coordinated manner.¹ But it is important to recognize that this assessing and decision-taking is distinct from the measurement itself. Measurements do not take action. People do – but agreement on common metrics can help in developing learning communities and effective collective action.

Two other feedback loops that come into play in building these learning communities and achieving larger scale results. As people see that learning is occurring and it is leading to (what they regard as) improved results, there is more commitment. This leads to: (1) more players (individuals, organizations, networks) drawn to get involved, and (2) more work to test and improve the metrics.

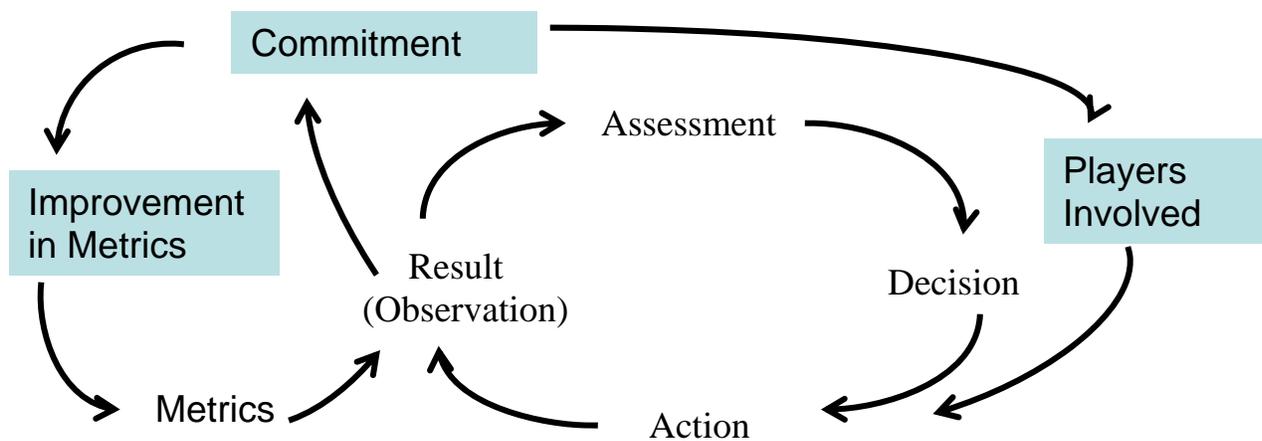


Figure 2: **Learning to Improve Learning**

The first of these additional loops—result-commitment-involvement-action—represents the “buzz” of an exciting endeavor that attracts people and resources to generate more value. For example, once a few (mostly Japanese) companies were able to demonstrate that “SPC” (statistical process control) metrics could be implemented with highly-trained front-line workers and supervisors and that this led to reduction in variation in assembly lines, and eventually to lower costs, better quality, and new customer value, other companies wanted to join in. The result was the quality movement that revolutionized manufacturing industries around the world.

The second additional loop represents the leverage that comes when commitment to common learning processes leads more people to work together to also improve the metrics themselves. For example, in the early days of the quality movement in Japan, the Japanese Union of

¹ We use the term “consensus” here not as synonymous with unanimity but in the root meaning of the word, “to come to some common sense” of what is happening. “Consensus” for us suggests both some commonality in seeing present reality and also an acceptance of differing views. A healthy balance of sufficient agreement with respect for difference, in our experience, is often essential for real change. In this spirit, it is useful to note the Oxford Dictionary gives “solidarity,” not unanimous agreement, as the first definition of “consensus.”

Scientists and Engineers (the “JUSEs”) became a neutral “pre-competitive” convening body for study and improvement among many different companies regarding their improvement activities. Eventually similar roles were played by various professional Statistics and Manufacturing Societies in other countries. Today, successful measurement and assessment systems like the LEED rating system of the U.S. Green Building Council USGBC are effective precisely because they incorporate continual improvement of the rating system itself in a transparent and accountable manner, institutionalized through the LEED research committee.

Focus on Metrics-in-use, not Metrics

All too often management tries to implement new systems of measurement and performance management without clear thinking and commitment as to how the measures will be used and by whom. Along with this goes lack of recognition of the formal and informal rewards systems, norms, traditions, and power structures that have shaped decisions for long before the new management system is implemented. The consequences are a series of classic problems that often plague efforts to implement new metrics.

1. New improved metrics are not used or their uptake is extremely slow.

In the mid-1990’s an action research study asked why, a decade after it was widely recognized as a “revolution” in managerial accounting, activity based-costing (ABC) had achieved only spotty implementation. Hailed in 1997 as one of the seminal books of the past seventy five years by Harvard Business Review, Kaplan and Johnson’s 1985 book, “Relevance Lost: the Rise and Fall of Managerial Accounting,” documented the decline in managerial accounting as a key tool for operating management, and its replacement by financial accounting. The later, originally a means for external investors to assess their returns, offers a distorted lens for assessing the complexities of current business operations, much like a manager of a baseball team making decisions just by looking at the scoreboard rather than what is happening on the field of play. In particular the authors critiqued management’s narrow focus on aggregate financial indicators like return on capital and showed how alternative ways of allocating overhead costs based on understanding key processes or activities could give a more valid picture of sources of profitability. Literally overnight, many business units regarded by management as profitable became unprofitable and vice versa. Within a few years, ABC was taught in most all business schools and advocated by all major accounting firms.

Yet many businesses slow to implement what was as a recognized superior system of accounting, and many remain so today. Why? Beyond the expected delays in re-training traditionally trained accountants were a variety of unanticipated problems: the information required was not being collected, there were no systems to gather and validate the new data needed, those who collected traditional data had build fiefdoms of control that they were reticent to surrender, and some managers found their business units threatened. “When you got down to the real problems, we had complex political and social systems based on unquestioned mental models and long-standing traditions regarding how profits were calculated,” says former Chrysler controller David Meador, now CFO of DTE Energy. “There was very little incentive for these people to challenge their well honed ways of doing things. It took over a decade after they all espoused doing so for the auto companies to start achieving wide spread implementation. I would say that, today, these problems persist in many companies.”

2. Metrics get used but in ways that end up never having much positive impact or being counter-productive

It is common for management to use new metrics to “drive change.” But often this is done without serious effort to engage the understanding and commitment of people who will have to be the real front-line change leaders. Not only does this delay implementation, it can lead to adverse outcomes that range from never achieving intended improvement to things actually making matters worse.

For example, the Bush administration gained considerable national acclaim in some circles for their “No Child Left Behind” program to revitalize public schools in America through “high stakes” standardized testing to drive accountability and improvement. Before long, not only were all children being tested regularly on standardized tests, but the results for different schools and school systems become public information, published on websites and in local newspapers. The aim to use metrics to create inter-school competition led to many adverse outcomes. Suddenly, teachers and principals felt under enormous pressure to perform, often in ways they believed were counterproductive to real learning. Many teachers left schools, especially many younger and mid-career teachers with other employment options. Time spent teaching students “test taking skills” crowded out important subject matter. Within a few years, common estimates were that schools were taking up to an extra month worth of time per year to simply drill students to perform better on tests. Many schools canceled recess to make space for test training. Eventually studies showed that many schools took an even more direct path to improve average student test performance: they simply allowed lower performing students to drop out of school.

Indeed average test scores on most standardized tests have improved over the past decade, but have our school systems? Today, America’s secondary schools rank lower in graduation rates, academic achievement, and in percentage of entrants who complete any form of post-secondary education, compared with other industrial nations, than they did a decade ago.

This is a sad example of a somber warning by W. Edwards Deming, world famous as a pioneer of the quality management revolution and a statistician by training: “If management sets targets and forces people to meet them at the possible risk of embarrassment, demotion or losing their jobs, they will find a way to meet the targets – and they will destroy the business to do it.” Forcing people to change through meeting new metrics that they have little say in shaping achieves at best short-term improvement and can have significant negative unintended side effects.

3. Large gaps persist between high performing organizations and mediocre ones despite everyone using the same metrics

Toyota is the most studied manufacturing business in the world. Yet, despite countless books and almost universal efforts to copy the famous “Toyota manufacturing system,” Toyota’s overall long-term financial performance is far superior to virtually any other large auto company. The market value of Toyota has exceeded the combined value of the Detroit “Big Three,” General Motors, Ford and Chrysler, for almost a quarter century. How can a company everyone studies continue to be able to perform in ways that far surpass it’s competitors’?

One reason is that companies attempt to transplant Toyota practices within their own culture, a bit like planting an orange tree in Vermont. For example, H. Thomas Johnson, co-inventor of ABC, has shown that Toyota has no centralized system of cost management, a stark contrast to most competitors. That is, it has no “information factory” that gathers and aggregates detailed cost figures from individual processes, units, and divisions for reporting to top management. This means that it is not possible for a vice president in Toyota to set a target for a certain percentage reduction in overall costs, since there is no data to compare actual performance to that target

Such a practice would seem heretical in a company, like US auto companies, where cost is regarded as a top executive responsibility. Why does Toyota not aggregate cost statistics? Because the Toyota philosophy holds that sustainable improvement must be led by people with deep knowledge of the processes they are trying to improve. Consequently, as Johnson shows in his book Profit Beyond Measure, (2000), Toyota’s highly sophisticated systems of cost management are implemented mostly at the local levels, including target costing and other advanced methods driven by front-line workers, supervisors, and plant management. In turn, this approach, which has been in development for decades, depends on the knowledge and skills of front-line workers, which means continuous investment in capacity building. From Toyota’s point of view, it is highly unlikely that senior managers will have this depth of understanding of the *sources* of cost performance, so their direct intervention in cost management is regarded as problematic.

Put differently, Toyota’s superior long-term financial performance is a good example of a company who focuses on *who* measures *what* to achieve *what* aims, and based upon what capacities. Failure to appreciate this important connection between innovation in metrics and local capacity building is another reason for failure in many new measurement systems.

4. Organizations “lock in” on an initial set of metrics and fail to continually improve.

This can be a classic trap of early innovators, and seems to be happening today for some of the early leaders in building more sustainable value chains. Many companies in industries that have put early efforts into metrics development (e.g., electronics) are pushing to have their existing systems adopted as the standard forever and always. Because often good data has not been available to date, these systems may not to be very sophisticated— often they are based on checklists of current best practices—and pose a very real risk of locking in “solutions” that already could be improved upon. From this standpoint, the most innovative industries may end up being the most likely to stultify innovation over the long haul.

5. Inadequate data stifles engagement and learning through doing

It is common for organizations threatened by change or industries that are the least progressive to argue that innovation in metrics is meaningless because underlying data are inadequate. This easily becomes a self-fulfilling prophecy leading to little investment in improving either metrics or data. Today, as a few companies lead in operationalizing sustainability in value chains, others (such as in particular segments of the food industry) stand on the sidelines asserting lack of good scientific data as a rationale for their nonengagement. But, little is likely to change when little effort is expended. As in all domains of basic innovation, before a compelling “business case” based on experience exists for a majority of businesses, innovators focus on fundamental needs and opportunities and find ways to achieve changes that have practical benefits, thereby starting

the learning cycle that eventually will make that case even to laggards. We believe that the basic need for innovation toward healthier value chains is more than evident today and we will continually seek ways to engage more industries and businesses through showing that better metrics and better data are being achieved in concrete settings, and making participation in this ‘pre-competitive’ learning community attractive to experts and practitioners alike.

Building Cultures of Leadership and Learning

For us, one overarching lesson from considering the impacts and pitfalls of innovation in metrics is the imperative to continually develop a learning-oriented culture. Used well, metrics reveal shortfalls between current performance and aims, as well as specific places where focused improvement efforts. But is it safe to reveal these shortfalls? Can people talk openly about “poor performance?” Can they ask for help and do they offer one another help? Do they have the time and support to talk about concerns and to analyze and understand how current processes and systems are functioning? Do they have the skills to do so effectively? Who takes responsibility for building an environment where people are continually asking these questions, and acting on the answers? Who takes responsibility for investing in capacity building at the ‘front line,’ where actual improvements must be implemented? Can people challenge the status quo, especially those who are new or come from outside established circles of decision-making authority? Is there support and safety for prototyping and studying alternatives?

Such questions - over and above “What new metrics are needed?” - will shape the outcomes of efforts to innovate in measurement and assessment for sustainability.

It is important that building such a culture be seen as an ongoing, never-ending responsibility of management at all levels. In the context of the cross-boundary, cross-institutional realities of complex value chains, building such a culture means building trust, shared knowledge, and sense of mutuality among very different stakeholders, including diverse businesses, NGOs and governmental actors. This is an immense challenge – again, one that goes far beyond just “implementing new metrics.” In many ways it will redefine key management practices and competencies.

For example, how do you move beyond mere compliance to new metrics to foster commitment to innovation? Studies (Locke, et. al.) have shown that performance differs significantly among suppliers in the apparel industries between those who regard labor regulations from a compliance viewpoint versus settings in which vendors and customers work together to build genuine commitment to improving labor conditions and workforce development as a key to longer term value creation.

Similarly, how do you foster collaboration across complex value chains in order “to see the larger systems?” For example, in food systems, buyers traditionally buy product from suppliers with little knowledge of the farming communities and farming ecologies that both ultimately depend upon. Seeing the whole of the system can lead to better metrics and ultimately better management practices that assure ongoing quality supply. For example, in one case (Jay, et. al. 2008) collaboration between a wholesaler and farming cooperative had led to setting aside a small reserve for a payment assurance fund. This meant that farmers would get paid on time regardless of short-term market fluctuations. Even a few percent set aside in this stabilization

fund made a big difference in the abilities of these farming communities to invest continually in technical education for farmers and schools for children, creating social stability on the one hand and better crop rotation and crop diversification on the other, making them ultimately better suppliers.

Fostering Progress Within Industries and Across Entire Supply Chains

The learning communities needed must extend across value chains and connect diverse players in whole industries. As mentioned above, the existence of larger pre-competitive learning collaborations have been key in the past to fostering improvement in measurement and assessment practices in whole industries, as illustrated by the role of the Japanese JUSEs in the quality movement and the USGBC, which developed the LEED certification system out of almost a decade of meetings and trial tests involving architects, builders, engineers, and building owners and operators seeking an operational consensus for what constituted a “green building.” (see Senge et. al. 2008)

This is especially needed today for value chains in diverse industries. Growing public awareness regarding social and environmental stresses has led to an explosion of independent certifiers and “eco-labels.” Some three hundred such labels are now in use around the world. This proliferation of diverse and often competing certification schemes creates confusion among consumers (including, paradoxically accusations of new forms of greenwashing) and businesses, and can lead to significant new costs that often get passed upstream to producers, with the unintended consequence that many who are most vulnerable (like small farmers) suffer most in trying to bear these costs. There must be a better way.

If we can develop a broad consensus that leverage lies in the intelligent use of metrics to improve the economic, social, and environmental health and resilience of complex value chains, not in the metrics themselves, then perhaps a similar pre-competitive collaboration can develop for key industries like food, apparel, electronics, and so on. Working together within existing cooperatives such as the Sustainable Food Lab and the Sustainability Consortium jointly led by the University of Arkansas and Arizona State University, which already engage many key manufacturers, retailers, wholesalers, producers, and NGOs (including certifiers), we can study sustainability metrics in use among leading business-NGO value chain partnerships. We expect that this will reveal that a consensual view regarding needed changes for substantial and healthy improvements in value chains already exists to a considerable degree among lead practitioners. This view needs to be articulated and tested. It even could be that a single, common, agreed-upon and operational framework —akin to LEED in the building industry— that promotes continual innovation and is itself continually reviewed and improved is achievable for more industries— if we can get enough of the key parties working together toward this goal.

While such a goal is daunting, there is no doubt that a common framework shared by all, along with a transparent governance infrastructure to promote, administer, review and improve the framework in practice, could lead to a quantum leap in our abilities to manage complex value chains for long-term health.

This short article is a first step in establishing basic ideas to undergird such a broad learning partnership. As mentioned at the outset, the next step will be to articulate the basic dimensions of such a common framework and use it collaboratively to study leading innovations in practice.

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Chapter 2. Food and Agriculture Sustainability Metrics

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In food and agriculture over the past five years sustainability has shifted from the periphery to core strategy for most brand manufacturers and retail companies in Europe and the United States. Much of the rest of the world is trailing,² but the growth in social responsibility is clear. The reasons are diverse: risk to supply, customer interests, public expectations and the “license to operate.” When sixty top Unilever executives undertook a strategic plan in 2008 with the core question, “What will ensure our competitiveness in emerging markets in 2015?” a demonstrated track record in sustainability was part of the answer.

This chapter addresses two key aspects of Unilever’s and other business leaders’ needs to demonstrate a track record in sustainability: 1) agreeing on the most important, pragmatic and measurable goals for the organization; and 2) integrating these sustainability goals with existing business goals.

Although sustainability issues are specific to each supply chain and business, the framework of sustainability must be shared across the industry and respond to the concerns of key stakeholders. NGOs advocate for environmental or social goals. Governments have obligations to citizens to protect public goods like clean water. Businesses can compete on their sustainability performance, but much of the work on goals, metrics, and tools is most efficiently done within pre-competitive arenas[, in which standards and protocols of measurement and reporting are agreed upon.]

The industry is beginning to agree broadly on the most important sustainability issues, with the largest spheres of agreement on environmental issues. Within each business, sustainability is beginning to be delineated with quantifiable commitments, although these commitments are often poorly integrated with other, sometimes conflicting, business commitments and needs.

Growing pressures (from Rusillo & Pinter 2009)

- World population to exceed 9 billion by 2050
- World demand for food to increase 70% to 80% by 2050
- Food production estimated to be short of demand by up to 25% in 2050
- 73% of the world’s poorest live agricultural areas of developing countries
- 2.5 billion people living in water-stressed or water-scarce conditions
- 25% of population food insecure due to land degradation
- Prosperity driving increases in meat and livestock product consumption
- Agriculture single largest global user of fresh water, accounting for 70% of withdrawals
- Use of water for agriculture expected to double by 2050
- More than 60% of ecosystem services degraded or in decline
- Top-10 fished species fully fished or overexploited

Sources: Millennium Ecosystem Assessment (2005); United Nations Food and Agriculture Organization (FAO, 2006); Natural Value Initiative (n.d.); Worldwatch Institute (2006; 2009); WorldBank (2007); Häni, Verschuur & Goodlass (2005); Nellemann (2009).

² According to customer interviews by senior executives at Cargill, reported in a personal conversation.

Leading companies are not only engaging in setting goals and establishing systems of metrics, they are piloting healthy value chains and learning by doing. The core methodology includes engaging not only transactional players in the value chain but also external stakeholders, assessing impacts, often with the help of NGO experts, innovating where the needs are greatest, and assessing the impacts of innovations to fuel continuous improvement.³ Where most successful these value chain pilots cascade within organizations and among organizations.

Beginnings of a Common Framework

From concerns to focusing on high impact

The current situation is confusing, however, with dozens of standards, certifications and indicator initiatives in use across the industry. This confuses consumers and forces businesses to debate which type of certification(s) or system to pursue rather than how to improve sustainability performance. Too many businesses end up focusing where they have the most control rather than where they have the most impact. We are reminded of the old story of the man groping around under a streetlight. When asked what he is looking for, he responds that he's looking for his keys. When asked where he dropped them, he replies that he dropped his keys a distance away, near the door to his house. "Why, then, are you looking here rather than over there, near the door?" "Because here I can see. Over there it's dark." Looking for sustainability actions where a business has the most control (under the light) rather than where they have the most impact (where the keys were lost) is a common and understandable first step.

For example, most of the industry is not yet focused on the biggest impacts precisely because those impacts lie upstream of their operations, making them hard to measure and even harder to affect. At a Sustainable Food Lab meeting in the General Mills board room a couple of years ago, VP Gene Kahn described where their biggest water and carbon impacts were—at the farm—and contrasted it with where they were most active in sustainability projects—packaging and operations. More recently Kahn suggested to his colleagues at General Mills and in other companies that leading industry players take responsibility for impacts through the whole chain, particularly where many of the impacts are greatest, in agriculture.

When asked what the food and agriculture industry needs most, Jason Clay of WWF and Rand Waddoups of Wal-Mart give the same answer, "Agree on the most important goals and focus on those."

The need to focus on high impact areas stretches individual companies beyond what they directly control and into collaborative strategies with other businesses and between business and NGOs. This is why larger and more collaborative networks have been forming over the past decade. In some cases, networks are themselves joining other networks. For example, the comments by Clay and Waddoups were made at a large joint meeting, "Growing a 21st Century Agriculture Revolution," hosted by the Sustainable Food Lab, SAI (Sustainable Agriculture Initiative) Platform, and The Keystone Field to Market Initiative – three large cooperative networks.

³ See case studies and lessons at <http://www.sustainablefoodlab.org/toolbox/>

Most attempts at shared goals and metrics have begun within specific commodity systems. The Marine Stewardship Council and Forest Stewardship Council each launched path-breaking initiatives to develop standards and certification schemes in commodity systems, and subsequently roundtables have emerged for palm oil, soy, sugar, cotton, aquaculture, and other commodities. Each roundtable involves diverse stakeholders and each aims for shared standards to ensure improvement on the most important impact goals.

Complementing these commodity-specific roundtables, a few multi-stakeholder metrics initiatives in recent years have developed common impact indicators for particular sectors (specialty crops or US bulk commodities, for example), certification systems themselves, or sustainability projects.⁴

In the United States, this includes a dairy industry effort coordinated by Dairy Management Incorporated, the ANSI sustainability standard initiative, the Keystone Field to Market Alliance, and the Stewardship Index for Specialty Crops. Each has distinctive features, and each involves broad collaborations of players in their sector. The dairy initiative began with a carbon life cycle analysis for milk, led by members of the Sustainability Consortium, which fueled a large conference and the incubation of pilot projects, and now is evolving into data collection for a more comprehensive set of sustainability indicators. The ANSI sustainability standard process, led by the Leonardo Academy, began with a “straw man” standard based on the organic standard, which stimulated so much negative reaction that the whole process has re-booted and is now aimed at a broader performance-based standard. The Keystone Alliance brings together large mainstream agriculture businesses aiming at US food value chains that “use resources more efficiently, continue to increase overall productivity, and maintain and improve food quality and environmental health.” The Stewardship Index for Specialty Crops has featured participatory development of performance metrics applicable for individual producers or other businesses along the supply chain, and the first few metrics will be piloted during 2010.

In the past two years, growing retailer and consumer concerns have stimulated an explosion of interest in life cycle analysis, leading to the formation of a new Sustainability Consortium headquartered at the University of Arkansas and Arizona State University, involving major consumer goods businesses, NGOs and universities around the world. In the U.S. the recent LCA for milk has been used by the dairy industry to coordinate projects and quantify climate impacts in order to achieve an overall GHG (greenhouse gas) reduction goal of 25% by 2020.

Drawing from experience in these collaborative efforts, many companies are getting on with setting goals, piloting better practices, measuring the impacts of those practices, and applying lessons across multiple value chains. Unilever, who co-founded the Marine Stewardship Council, began their sustainable agriculture program with supply chains for peas, tomatoes and tea; Unilever is now headed toward assessing the performance of all of their agricultural supply chains against a common set of sustainability indicators. Costco began their formal sustainability work with one green bean supply chain from Guatemala and has expanded into multiple commodity chains from several different continents.

⁴ See: Stewardship Index for Specialty Crops, Field to Market, ISEAL Impact Code, and State of Sustainability Initiatives.

Basic dimensions of agreement

From these diverse efforts at practical value chain improvement and engaging multiple stakeholders, we believe a common framework for sustainability is now emerging.

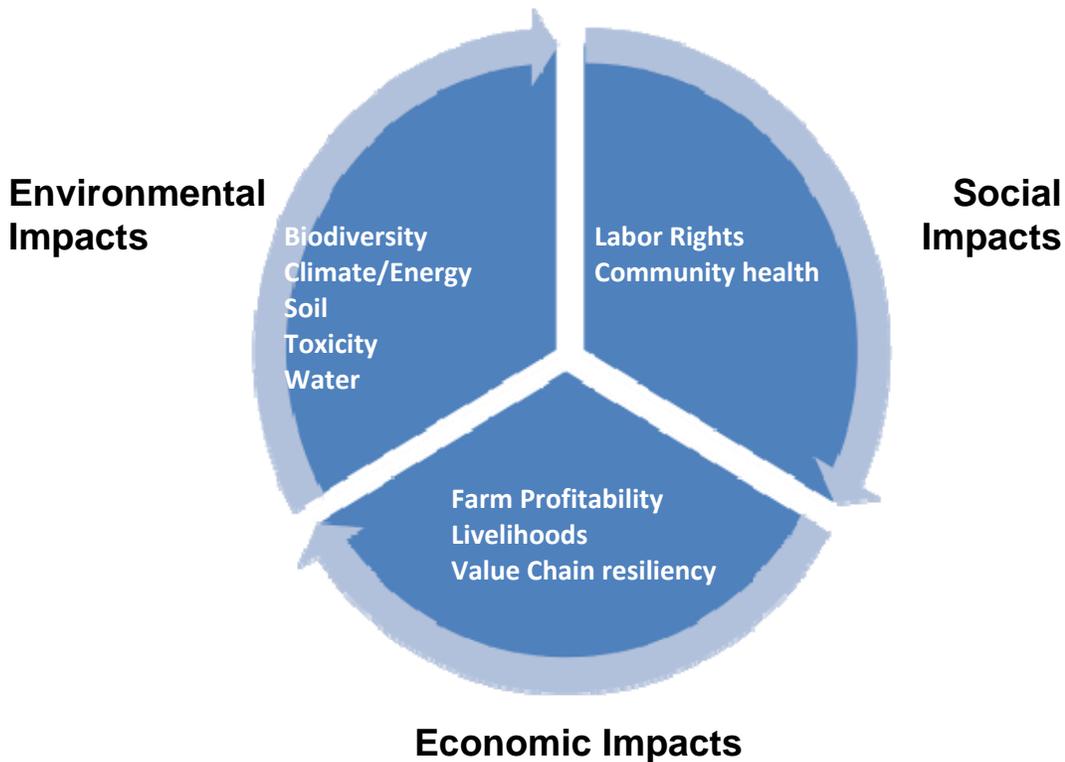
This framework begins with definitions. The most well known definition of sustainability is the Brundtland formulation from the 1980s: “Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own.” This definition has become increasingly quantifiable as natural scientists develop the capacity to model the “footprint” of human activities within the biophysical limits of the earth.⁵ Though this still begs the question of “how big a footprint is too big for future generations?” footprint metrics are starting to enable agreement on the direction of improvement - that is what it takes to reduce one’s footprint.

Among the many different companies and collaborations defining standards of excellence for sustainability practices, common themes are emerging. Indicator sets are most advanced for the environmental dimension of sustainability. Agreement on social and economic dimensions is slower because of a greater diversity of priorities and values within that dimension and less agreement on underlying science. Most companies and multi-stakeholder initiatives aspire to benefit labor, communities, farmers, and other value chain partners alongside traditional business stakeholders, but these aspirations tend to be unique to different situations, making common indicators elusive. We expect that shared indicators will need to arise from practical value chain innovations and more shared learning over the next few years; only then will quantifiable metrics for social indicators be able to be incorporated into life cycle analyses, consumer facing indices, and management tools.

The following framework⁶ reflects an emerging consensus on key issues. (To a large extent these issues are also pertinent to any other natural resource-based industry including forest products, fishing and mining.)

⁵ See, for example, Rockstrom, J., et al. 2009. [A safe operating space for humanity. *Nature*, 461:472-475.](#)

⁶ The framework began as preparation to the March 2009 [Agriculture](#) Revolution conference; Sustainable Food Lab staff consulted leading sustainable agriculture initiatives worldwide to draft a framework of key impacts of agricultural supply chains. The initiatives reviewed to develop the Framework were the principles of the SAI Platform, Keystone Center Field to Market, ISEAL Alliance Impact Studies, Stewardship Index for Specialty Crops, Sustainable Commodity Roundtables, Global Reporting Initiative G3, Unilever Sustainability Indicators, Rainforest Alliance Global Impact Indicators, Starbucks C.A.F.E. and Cocoa Practices and the draft SCS001 Sustainable Agriculture Standard.



Specific indicators lie behind each issue area, although there is much overlap between social, economic and environmental impacts. The ISEAL Impact code reminds us that, “These dimensions are interlinked and a holistic approach to defining the key meta-issues is necessary. As an example, sustainable livelihoods affects biodiversity, which in turn affects sustainable livelihoods. The poor, especially in rural areas, depend on biodiversity for food, fuel, shelter, medicines and livelihoods. The concentration of the rural poor on marginal land leads to resource over-exploitation and land degradation.”

Environmental Impacts

Environmental impacts of agricultural production, processing and trade are commonly characterized through the core dimensions of biological diversity, climate change and energy use, soil, toxicity of inputs, and water. The following indicators are illustrative.

Biodiversity impacts can be measured by the amount of high conservation value land that is preserved or managed within the boundaries of the farm. Some indicators quantify vegetative cover and native plants. Biodiversity is one example of an issue that ultimately requires a landscape focus because farm-level data only tells a part of the story one would want to hear in order to understand the impacts of a farming system on nature.

Climate and energy are most easily quantified on specific operations, with measures like net carbon balance of a crop, soil carbon, nitrous oxide emissions; and GHG emissions embedded in inputs like fertilizers and pesticides, and generated by machinery fuel and

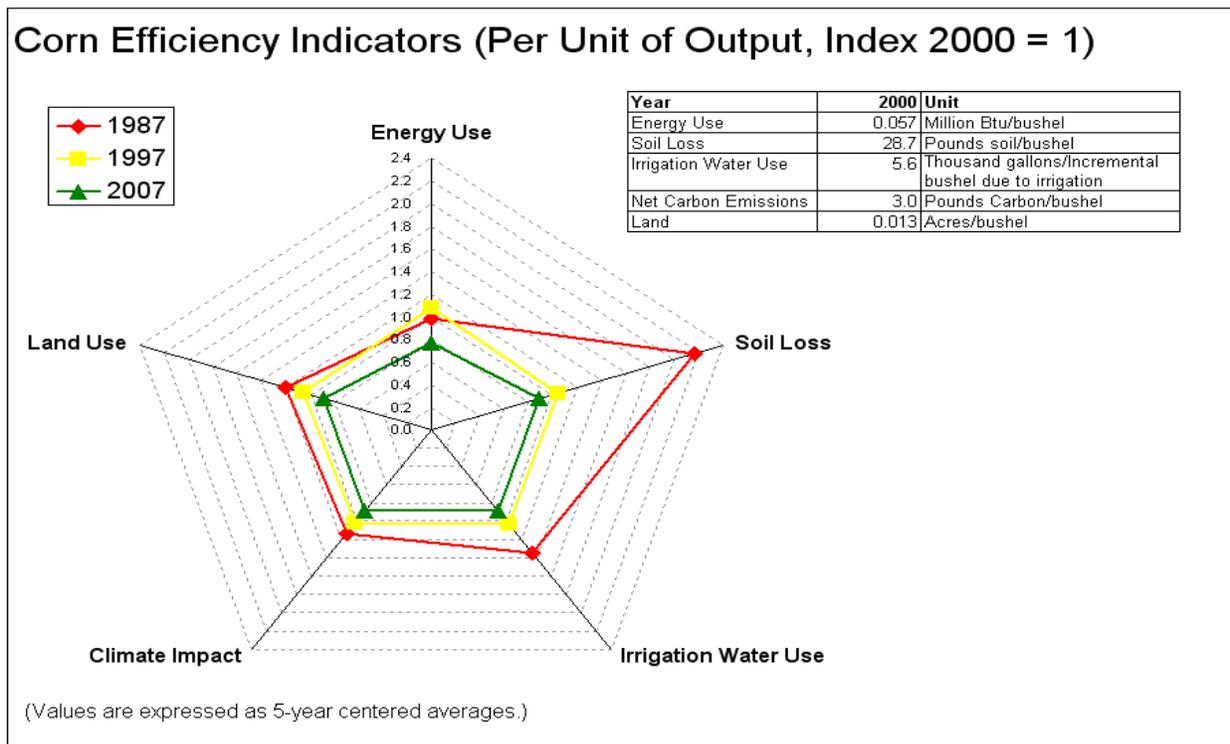
electricity use.

Soil indicators quantify erosion, nutrient balance, and organic matter.

Toxicity tends to be measured by practices rather than actual impacts. Unilever, for example, delineates toxicity of pesticides by World Health Organization classification.

Water indicators include frequency of detection of a contaminant, aquatic life measures, and irrigation in relation to yield. On a landscape scale, water use has to be divided by water source regeneration.

For example, The Keystone Field to Market Alliance has put a few environmental key indicators on spider graphs that represent trends over time. Their data is national aggregate data, and a new farm level calculator will enable individual farmers to benchmark themselves and identify where improvements are most needed.



Socio-Economic Impacts

Some indicator sets divide social and economic dimensions, whereas many leading initiatives combine social and economic impacts. This is because the economic health of individuals in a supply chain is directly correlated to the health of their communities. Critical social impacts of supply chains include labor rights of workers and the health of communities, whether that is in access to or affordability of food, cultural integrity or consultation processes to allow for community involvement in issues that impact them. Critical economic impacts are the profitability of farms, and the viable livelihoods for supply chain members, as well as the

sustainability of the overall value chain.

Labor indicators can include working conditions (safety, working hours), wages and benefits, child labor, and freedom of association.

Community indicators include education, health, sanitation, stakeholder engagement, local hiring and purchasing, cultural heritage, and opportunities for disadvantaged groups.

Livelihood indicators include household and local business assets, the capacity of households and communities to meet basic needs (potable water, food, energy, shelter, health), and resilience to external shocks such as flooding, drought, and changing commodity prices.

Value chain issues are still primarily at the level of principles, including collaboration and shared goals, transparency, access to services, and inclusive innovations.

Community Wealth

One method to measure impacts on communities has been developed by Yellow Wood Associates and used by Ford Foundation supported projects in the United States in recent years. This method is based on the observation that wealth is a “stock” of capital, including the following community “assets:”

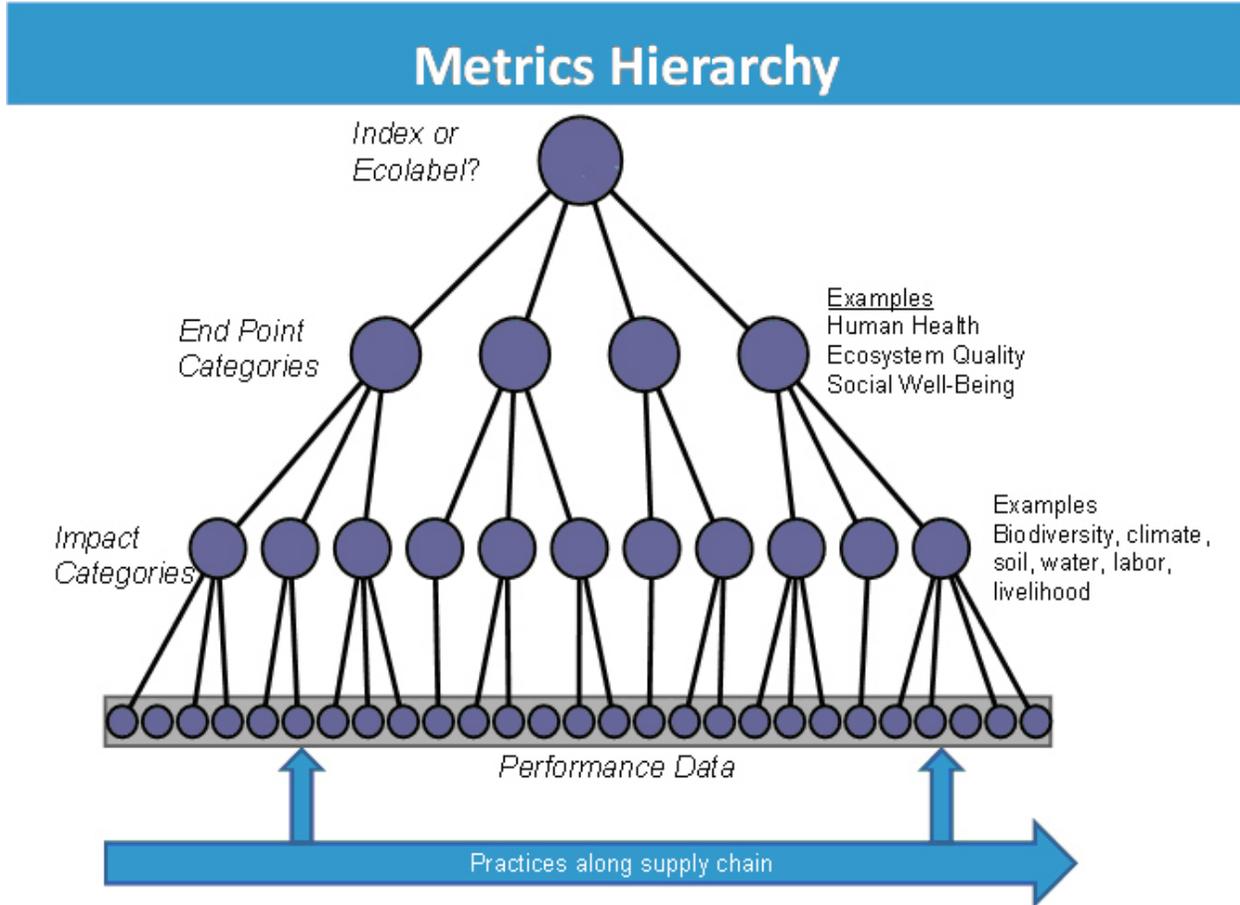
- Intellectual assets: new ideas
- Individual assets: skills and health
- Social assets: trust, relationships and networks
- Natural assets: unimpaired environmental assets
- Built assets: constructed infrastructure
- Financial assets: unencumbered monetary assets

Data that Rolls Up to Each Impact Indicator⁷

Impact indicators need to be “rolled up” or translated so that detailed issues can become part of management or ranking systems. The diagram below is a stylized depiction of how this can be done to assess “end point” categories like human health and social well being. In any metrics system seeking to develop comprehensive but interpretable and actionable indicators for decision makers, data is typically aggregated into successively more comprehensive performance dimensions. A sustainable soil metric, for instance, would incorporate data on erosion, nutrient balance, and organic matter, with each sub-dimension including its own data constituents. Soil could in turn be aggregated biodiversity, climate, toxicity, and water for an overall environmental health indicator. For each input, specific data sets will depend upon enterprise, geography and scale (“performance data” at the bottom of the slide below), and the

⁷ Case studies of developing and using indicators are found at:
[http://usmfiles.s3.amazonaws.com/phpvc5VjN/metrics%20in%20action%20report%20sms%20\(1\).pdf](http://usmfiles.s3.amazonaws.com/phpvc5VjN/metrics%20in%20action%20report%20sms%20(1).pdf)

quantification of impacts can be used for managers as well as for labels or indices.



Many firms develop complex aggregated impact indicators for their own operations and for supplier advice or scorecards. For example, Unilever has spent a decade working with environmental indicators and has gradually found that many can be dealt with through a few basic practices. For example, after many studies of biodiversity, they have concluded that a useful surrogate practice is setting aside a certain amount of land outside cultivation. This has come in part from recognizing the difficulty of comprehensive species measurement.

From retail and consumer needs a few competing ratings systems are already emerging. The Good Guide, for example, ranks consumer products by health, environmental and social issues. People4Earth has similar aspirations. Walmart has garnered a great deal of attention in its drive to create product level metrics. The initial vision included a single “sustainability index” composed of four proposed sub-dimensions—energy & climate, material efficiency, nature and resources, and people and community—but the emerging system is evolving rapidly. The company has publicly announced that it would prefer to develop its ratings system in partnership with other retailers, consumer goods companies, NGOs, and others. Early activity has focused on developing a foundation grounded in life cycle assessment, although product attributes and

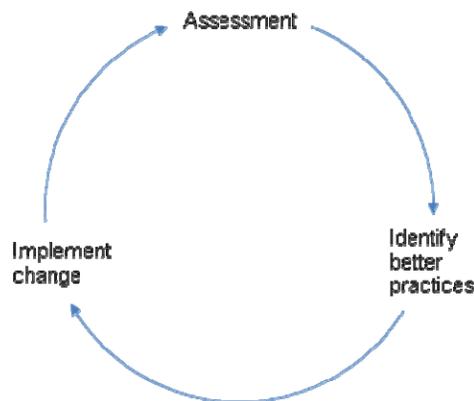
other data will likely play an important role as well. Irrespective of the system, our bias is toward transparency and open-source data sets for both buyer scorecards and consumer-facing labels.

Simplicity without Reductionism

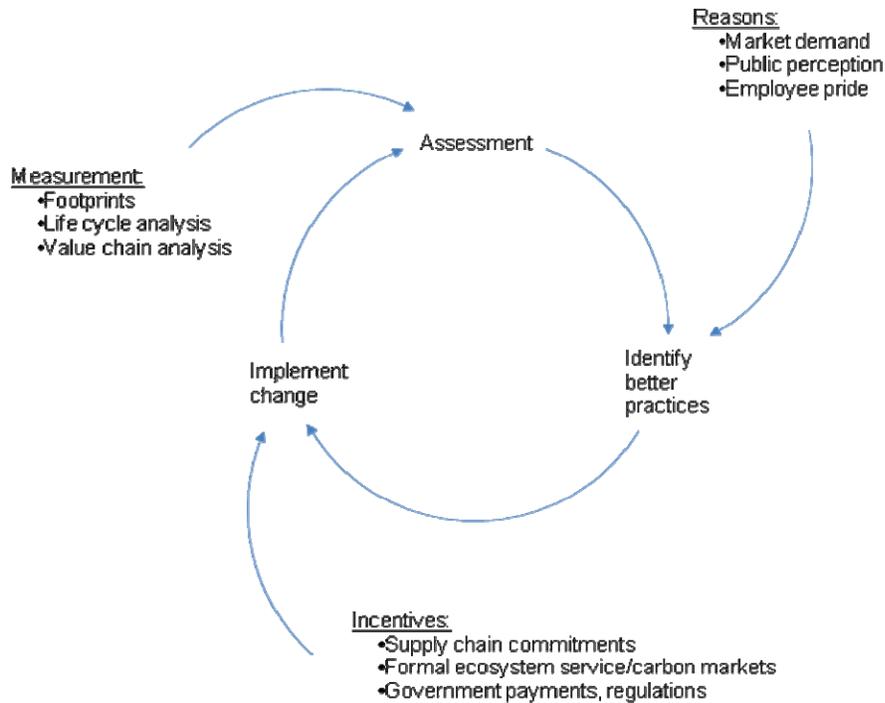
For those of us engaged in support to the operationalization of sustainability in food value chains, the primary purpose of impact metrics is to inform management decisions by farmers, manufacturers, and food service or retail buyers. To be useful and to be *used*, any common framework must be simple.

We cited above comments from Jason Clay and Rand Waddoups, two people who understand the complexity of global agriculture value chains, because they both urge a short set of key indicators. Most farmers and other small operators lack the time or resources to devote to exhaustive data collection and reporting. Chuck Benbrook, a leading scientist in the world of organic farming, is even more pointed in his recommendations to the Stewardship Index: “My experience leads me to urge this group to develop a set of metrics that will focus growers on the 2-3 most important areas of farm business management, where the greatest gains can be made for the least investment. I worry that a boatload of metrics will lead those asked to participate to say, in effect, we’ll get you the numbers, but after that leave us alone.”

Regardless of the number of issues and indicators any organization is motivated to use in management, actual improvement in performance of a value chain comes from improving practices through a basic learning cycle of assessing current impacts, identifying better practices, implementing change, and further assessment.



Change is motivated by markets, public perceptions, and both managers and employees’ own values. Incentives can come from the supply chain commitments, formal markets for carbon and other ecosystem services, and government payments or regulations. Impact metrics are used to assess the current baseline and progress over time; metrics include footprinting method, life cycle analysis, and value chain analysis. This is illustrated by adding these dynamics to the initial learning cycle:



While simplicity is crucial for practicality, it cannot be achieved at the expense of trivializing complex and interrelated issues. We must seek, in the words of Karl-Henrik Robert, architect of the famous Natural Step process in Sweden, “simplicity without reductionism.” One way to achieve this, we believe, is to embrace the overarching vision that sustained improvement along any one of the basic dimensions of environmental, social and economic well being is *not* possible without improvement along the other dimensions. Though tradeoffs invariably exist in the short run, longer-term improvement can only arise through embracing all three domains. This is akin to the paradigm change that fueled the quality management movement: it is possible to achieve lower costs and higher quality by improving underlying processes. For too long, businesses have sought enhanced economic while neglecting ecological and social value. The consequence has been increasing economic risk due to deteriorated social and natural capital. Regardless of the number of indicators implemented into any management system, they must embody an operationalizable vision of enhanced performance in all three dimensions, based on a shared conviction that anything less than this will ultimately put the value chain, and the businesses embedded in it, at risk.

At the beginning of this chapter we described two key steps for individual businesses:

- 1) agreeing on the most important, pragmatic and measurable goals for the organization; and
- 2) integrating these sustainability goals with existing business goals.

Virtually every major food company is now piloting healthier value chain practices. It is natural that working toward a common framework for sustainability should start in agriculture because the industry has perhaps the largest global environmental and social footprint of any human activity. Increasingly business leaders recognize their responsibility in regard to the size of that footprint. In June 2007 business leaders of the Sustainable Food Lab articulated the following

Call to Action: “We recognize that we influence the way one quarter of the world’s population earns a living, half the world’s habitable land is cared for, and two-thirds of the world’s fresh water is used. With such influence comes opportunity and responsibility. We commit ourselves to establish standards of excellence in social, economic and environmental responsibility.”

Even as global risks increase, opportunities for industry leadership are available at every stage in the supply chain. Collectively we now have opportunities to accelerate and deepen progress by agreeing on the most important issues, setting targets, sharing tools, improving leadership capacities, and indentifying pre-competitive collaborations to remove overall industry impediments and incentivize industry progress.

As agreement solidifies on key impact goals, which is now likely on environmental issues, industry leaders can progress from wondering about the definition of sustainability and get on with defining regionally and product appropriate metrics, setting targets, and improving practices.

