THE SUSTAINABILITY CONSORTIUM™

How to Get Sustainability Data Flowing in Agriculture Supply Chains

A Preliminary Report

June 2016

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Acknowledgments

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Sustainable Agriculture Systems and TSC Involvement

With global population increasing to 11 billion by 2100, the demand on the world's food systems to provide adequate nourishment is unprecedented. Climate change and other environmental and social conditions are already affecting our ability to produce enough food to meet global demand. The need to improve agricultural systems to be not only efficient but also sustainable in the long-term is paramount to meeting the global demand for food into the future, while also minimizing adverse impacts on the environment and society. Today, however, there is very little visibility of the sustainability impacts throughout food value chains, making it challenging to identify and drive improvement. Gaining transparency through measurement and reporting across the value chain is a critical step in the path toward improving the sustainability of food systems.

The Sustainability Consortium (TSC) is uniquely positioned to provide sustainability measurement and reporting for food systems. TSC was founded by academics, corporations, non-profits and government organizations with the goal of making consumer goods more sustainable through the use of science-based metrics and tools. The strength of TSC's theory of change is that, by focusing on the business interaction between a retailer and supplier at the front of the supply chain, it provides a market signal both for information and for more sustainable practices, which serves as a strong incentive for improvement across the supply chain. By creating this downstream demand for sustainable food systems and true performance-based measurement, the value chain responds by putting systems in place to gain visibility into supply chains, collect data from all parts of the system, and drive better decision-making that leads to improved conditions on the ground. TSC's tools are already being used by some of the world's largest consumer goods companies to track and measure performance.

Results of TSC 2016 Impact Report Analysis

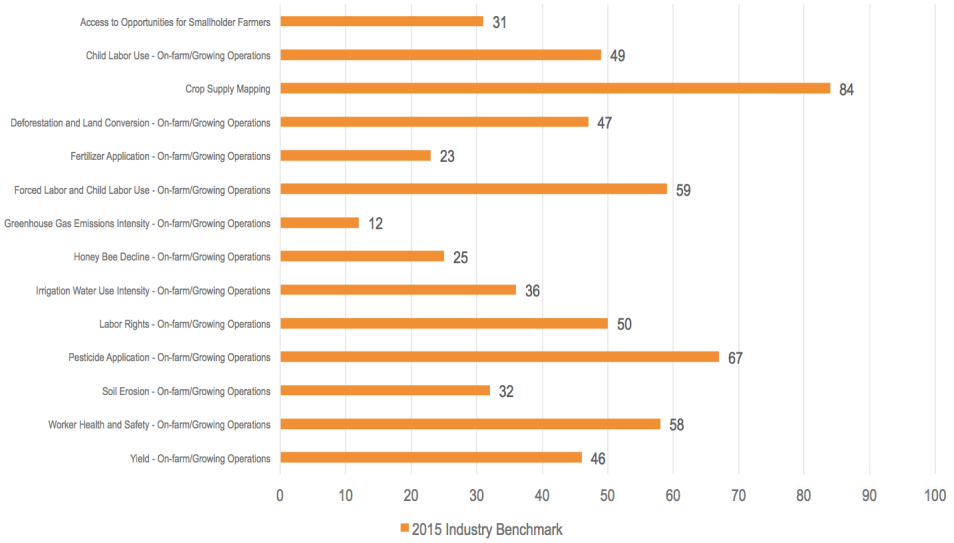
TSC launched its first Impact Report in spring of 2016. This report is the culmination of analyses from retail product sustainability performance data. In general, food companies are able to report greater action around social issues than environmental issues. Food and agriculture products have the highest share of impacts far upstream (typically on-farm) where visibility is extremely low. For example, only 20 percent of respondents collect data on fertilizer usage, greenhouse gas emissions, and soil erosion. This represents a significant potential risk, but also an equally large opportunity to improve both cost and sustainability. In contrast, approximately half of respondents tracked labor rights, community rights, and forced and child labor in their agricultural supply chain.

- Majority of respondents reported "unable to determine at this time" for farm-level environmental indicators

- Transparency from farm to retail is lacking
- Opportunities to improve farm level data reporting

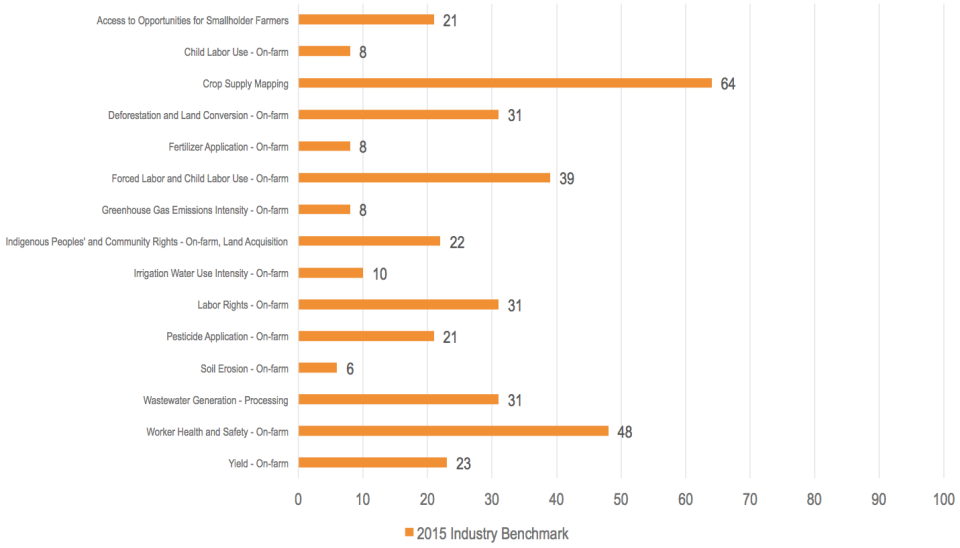
Figures 1 and 2. Overall the average commodity crop scores for on-farm metrics were lower than specialty crops. This is most likely due to a lack of reporting systems and transparency into long, commodity-based supply chains.

Figure 1: Average KPI Scores Specialty Crops



Note: Based on 2015 PSN results for Apples, Bananas, Beans Lentils and Peas, Berries, Citrus, Coffee, Cucumbers, Leafy Vegetables (Lettuce), Nuts, Potatoes, Prepared Salads, Table Grapes, Tea (Non-herbal), and Tomatoes. Scores are on a scale from 0-100 where the score given is the average response across the categories listed above.

Figure 2: Average KPI Scores Commodity Crops



Note: Based on 2015 PSN results for Cocoa, Grains-based products (Bread, Packaged Cereal, and Pasta), and Sugar. Scores are on a scale from 0-100 where the score given is the average response across the categories listed above.

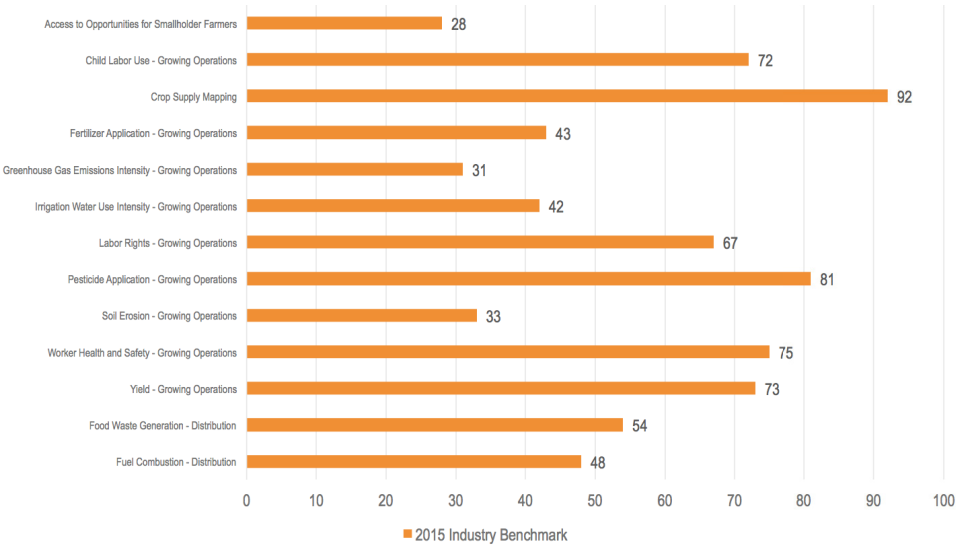
Table 1. The biggest opportunities for improvement across commodity and specialty crop supply chains, when averaged separately, include primarily environmental issues. However, other opportunities exist when each category is analyzed separately.

COMMODITIES	
KPI	**AVERAGE SCORE**
SOIL EROSION	6
CHILD LABOR USE	8
FERTILIZER APPLICATION	8
GREENHOUSE GAS EMISSIONS INTENSITY	8
IRRIGATION WATER USE INTENSITY	10
SPECIALTY CROPS	
GREENHOUSE GAS EMISSIONS INTENSITY	12

Note: KPIs were considered opportunities for improvement if the average score was less than 15. Scores are on a scale from 0-100 where the score given is the average response across the categories listed in Figures 1 and 2 respectively.

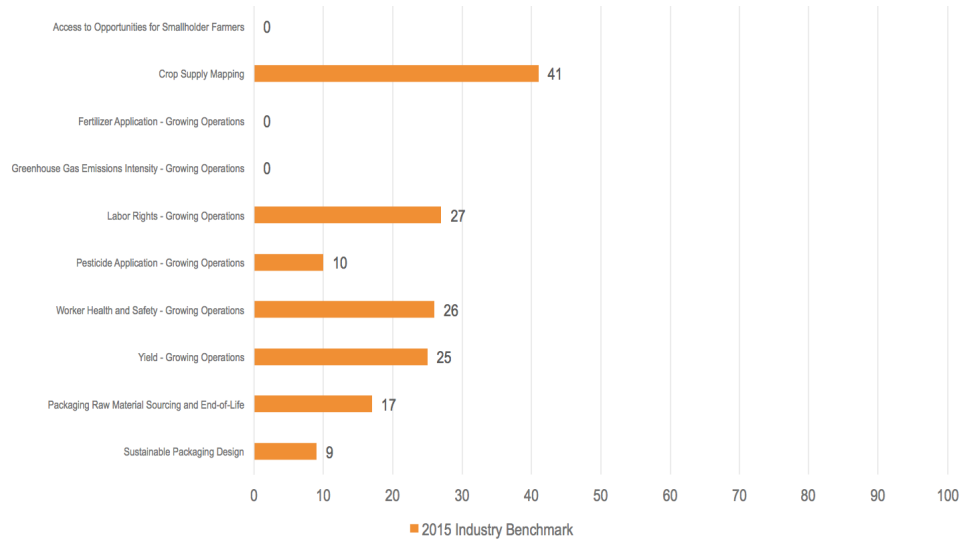
Figures 3 and 4. The highest and lowest scores in specialty crops. There were no differences in high and low scores for commodity crops.

Figure 3: Average KPI Scores Tomatoes

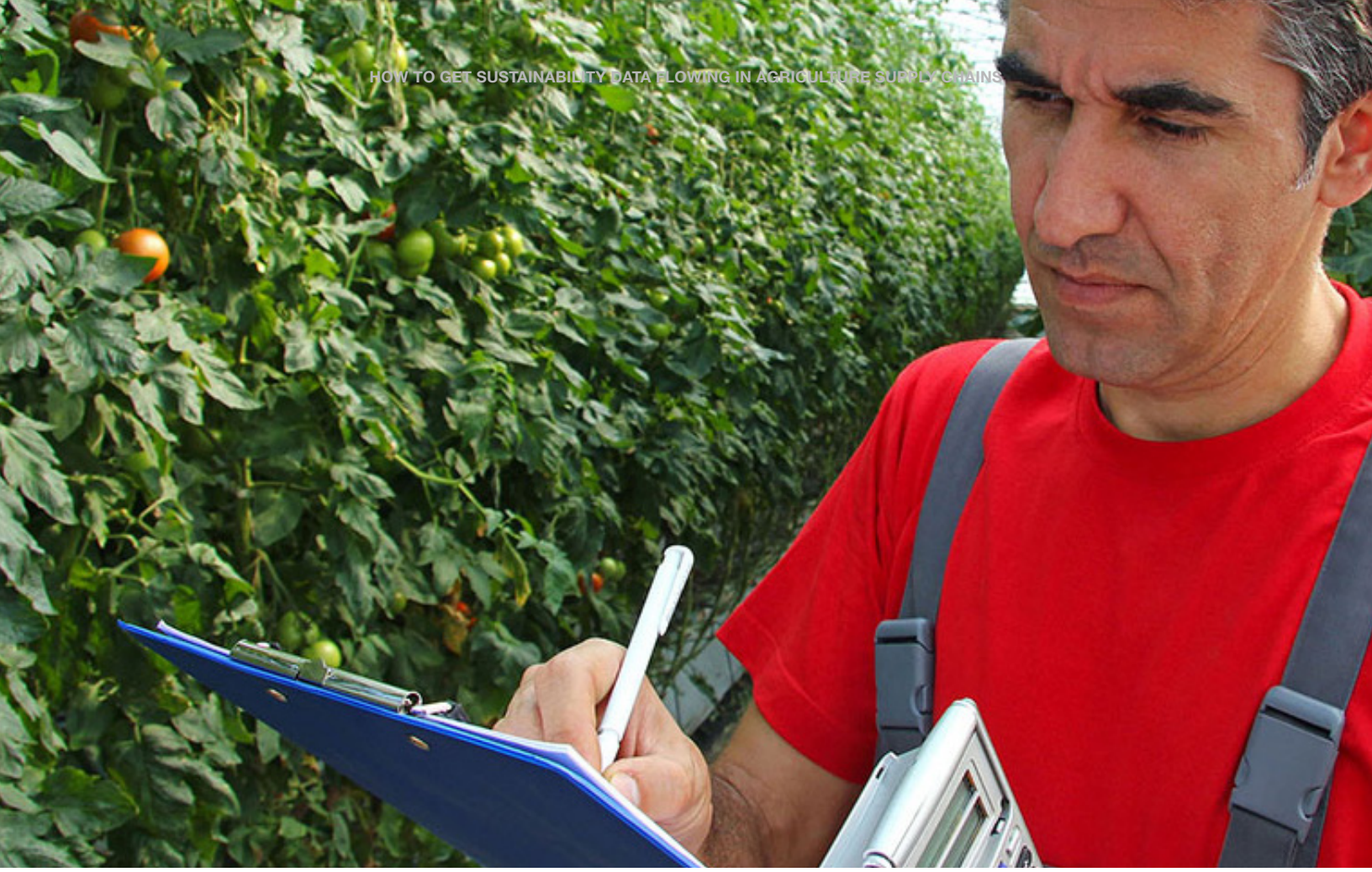


Note: Based on 2015 PSN results for Tomatoes. Scores are on a scale from 0-100 where the average score is given.

Figure 4: Average KPI Scores Prepared Salads



Note: Based on 2015 PSN results for Prepared Salads. Scores are on a scale from 0-100 where the average score is given.

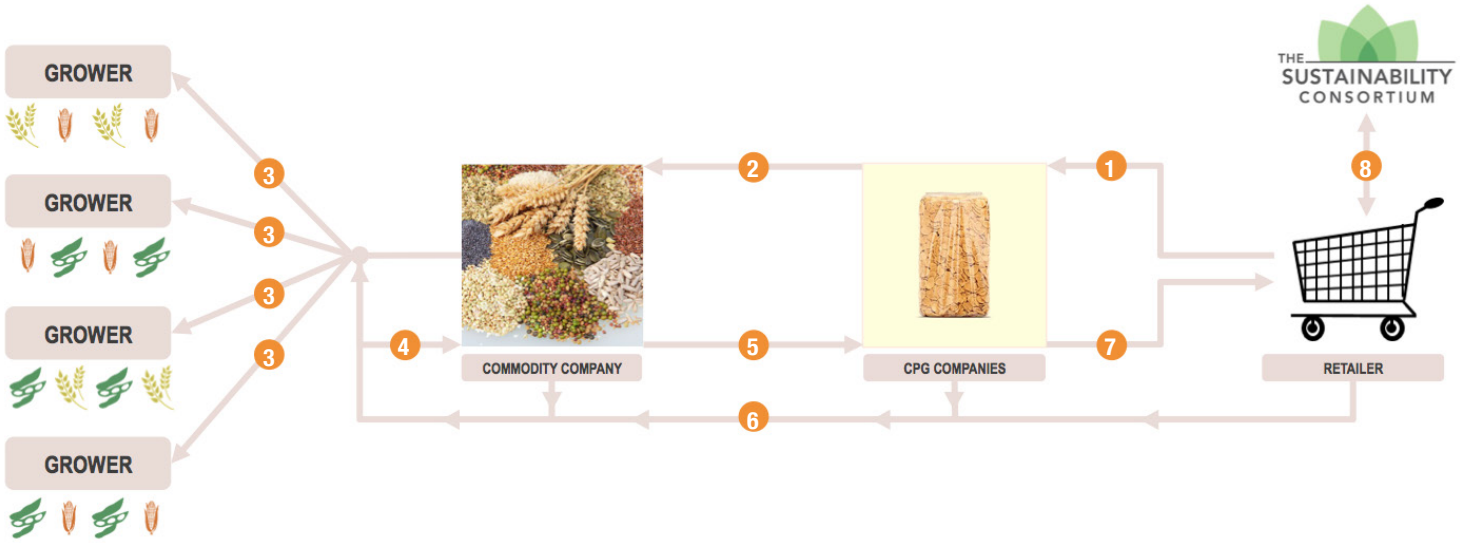


Current Understanding of How Sustainability Data in Agriculture Flows

Global supply chains are being challenged not only to report sustainability data but to improve on-farm practices where needed. In order for this to occur it's important that we understand the current structure of how data are or conceivably flow across the supply chain. Interviews with companies and leading farm tool developers led to the following diagrams of how data may flow in a retail driven scenario. Other examples not depicted in this diagram include when CPG companies and agribusinesses use farm data calculators in field projects with growers to fulfill their own corporate sustainability goals. Grower organizations also use farm data calculators to assess and educate farmers on sustainable production of their crops and report against their own sustainability goals. Universities also use farm data calculators in Extension outreach and education.

Figure 5. An example of data flow when a retailer requests farm data in commodity crops systems. The commodity companies may play a key role in training and advising the grower on management practices, inputting the data into farm calculators, and working with the grower on operational improvements. The commodity company may also play a key role in aggregating and reporting data to Consumer Packaged Goods (CPG) customers. Some CPG companies host grower workshops to review farm sustainability data and discuss sustainability issues in farming, but this may not always occur. The retailer, and often the CPG company, has no direct contact with the grower to communicate sustainability performance improvements or incentives, so the message the grower receives comes only from the commodity company or, in some cases, from CPG company workshops.

Figure 5: How Crop Data Flows Commodity Crops

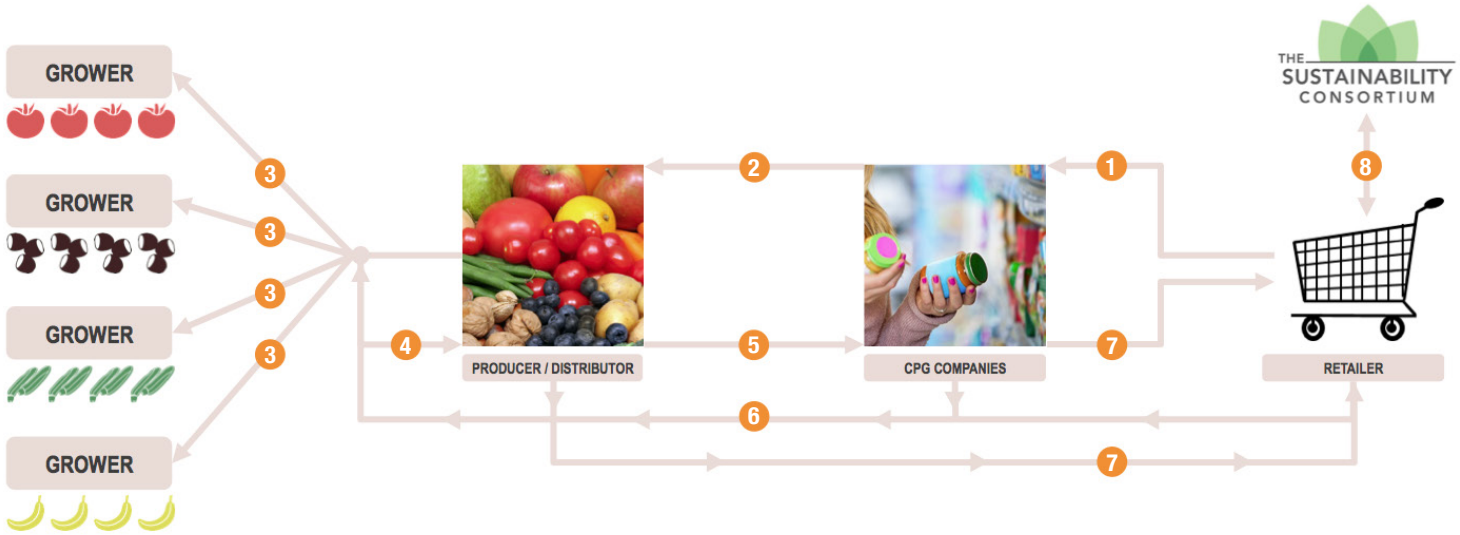


PROCESS

1. Retailer asks for farm-level data
2. CPG company requests farm-level crop data from commodity company
3. Trusted advisors train growers, enter data into farm data calculator, and advise on improvements
4. Farm-level data reported by the farm data calculator is aggregated
5. Commodity company reports communicates crop data (e.g., mass balance) to CPG company
6. Retailer, CPG company, and/or commodity company hosts grower meetings to discuss opportunities for improvement in their sustainability outcomes and sustainability goals
7. CPG company hires an agronomist to aggregate data to report to retailer
8. TSC get aggregated data from the retailer and uses the data anonymously to create industry benchmarks

Figure 6. An example of data flow when a retailer requests farm data in specialty crop systems. The processor or distributor may play a key role in training and advising the grower on management practices, inputting the data into farm calculators, and working with the grower on operational improvements. In other cases, a grower may work directly with a retailer or CPG company. A retailer or CPG company may have contact with the grower to communicate sustainability performance improvements or incentives directly, but this varies by crops, retailer and company.

Figure 6: How Crop Data Flows Specialty Crops

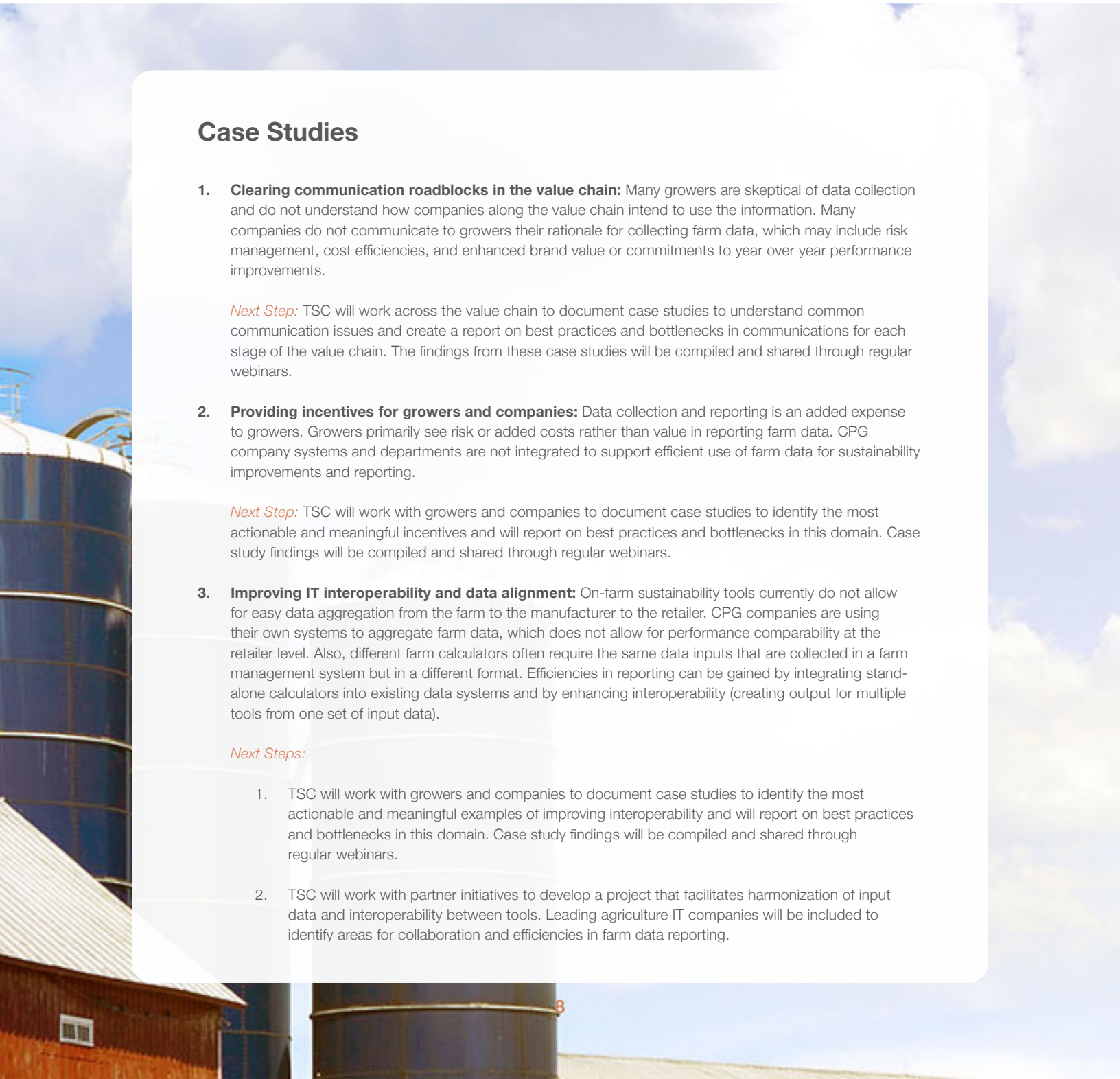


PROCESS

1. Retailer asks for farm-level data
2. CPG company requests farm-level crop data from commodity company
3. Trusted advisors train growers, enter data into farm data calculator, and advise on improvements
4. Farm-level data reported by the farm data calculator is aggregated
5. Producer/distributer reports communicates crop data (e.g., mass balance) to CPG company
6. Retailer, CPG company, and/or producer/distributer hosts grower meetings to discuss opportunities for improvement in their sustainability outcomes and sustainability goals
7. CPG company hires an agronomist to aggregate data to report to retailer
8. TSC get aggregated data from the retailer and uses the data anonymously to create industry benchmarks

Outcomes of 2016 Workshop and Resulting TSC Initiatives in Sustainable Agriculture

Several key themes emerged during the 2016 workshop that will help guide TSC's work in sustainable agriculture. TSC's sustainable food system projects will convene key members of the food value chain to specifically address:



Case Studies

1. **Clearing communication roadblocks in the value chain:** Many growers are skeptical of data collection and do not understand how companies along the value chain intend to use the information. Many companies do not communicate to growers their rationale for collecting farm data, which may include risk management, cost efficiencies, and enhanced brand value or commitments to year over year performance improvements.

   Next Step: TSC will work across the value chain to document case studies to understand common communication issues and create a report on best practices and bottlenecks in communications for each stage of the value chain. The findings from these case studies will be compiled and shared through regular webinars.

2. **Providing incentives for growers and companies:** Data collection and reporting is an added expense to growers. Growers primarily see risk or added costs rather than value in reporting farm data. CPG company systems and departments are not integrated to support efficient use of farm data for sustainability improvements and reporting.

   Next Step: TSC will work with growers and companies to document case studies to identify the most actionable and meaningful incentives and will report on best practices and bottlenecks in this domain. Case study findings will be compiled and shared through regular webinars.

3. **Improving IT interoperability and data alignment:** On-farm sustainability tools currently do not allow for easy data aggregation from the farm to the manufacturer to the retailer. CPG companies are using their own systems to aggregate farm data, which does not allow for performance comparability at the retailer level. Also, different farm calculators often require the same data inputs that are collected in a farm management system but in a different format. Efficiencies in reporting can be gained by integrating stand-alone calculators into existing data systems and by enhancing interoperability (creating output for multiple tools from one set of input data).

   Next Steps:

   1. TSC will work with growers and companies to document case studies to identify the most actionable and meaningful examples of improving interoperability and will report on best practices and bottlenecks in this domain. Case study findings will be compiled and shared through regular webinars.

   2. TSC will work with partner initiatives to develop a project that facilitates harmonization of input data and interoperability between tools. Leading agriculture IT companies will be included to identify areas for collaboration and efficiencies in farm data reporting.

4. **Identify and act on most the effective improvement opportunities:** Measuring sustainability performance is only the first step. To improve on sustainability, it is key to implement the most effective practices given the specific conditions. Growers and companies need assistance in understanding the best practices for their growing regions. When reviewing their scores, companies need to learn what opportunities exist to improve sustainability in food systems and connect to NGOs, advisors and other partners on the ground to drive improvement in agriculture supply chains.

   Next Step: TSC will work with NGOs, growers and companies to document case studies to identify the most actionable and meaningful improvement opportunities and will report on best practices and bottlenecks. Case study findings will be compiled and shared through regular webinars.

Harmonization Project

5. **Harmonizing metrics and simplifying data collection:** Multiple tools exist for calculating sustainability indices. These tools are developed for different purposes and under different conditions, resulting in the use of different indices for the same hotspots. Different indices lead to extra work for growers with little added value and create confusion amongst companies investing in these efforts. Alignment of indices where possible could tremendously improve the scope and efficiency of sustainability reporting.

   Next Step: TSC will work with partner initiatives to develop a project to map potential alignment of sustainability indices and to create a roadmap for how to achieve this alignment.

About The Sustainability Consortium

The Sustainability Consortium® (TSC®) is a global nonprofit organization working to transform the consumer goods industry to deliver more sustainable products. TSC creates change through the implementation of its science-based and by convening its more than 100 members, including manufacturers, retailers, NGOs, civil society and corporations that work collaboratively on innovation for a new generation of products and supply networks. The Sustainability Consortium is jointly administered by Arizona State University and the University of Arkansas, with additional operations at Wageningen UR in the Netherlands and in Tianjin China.

Learn more at www.sustainabilityconsortium.org

Appendix A: KPIs with the biggest opportunity for improvement in commodity and specialty crops

KEY PERFORMANCE INDICATORS	
SOIL EROSION How much soil erosion was associated with the farming operations for your crop supply purchased in the last twelve months?	A. We are unable to determine at this time. (0.000) B. The following can be reported for our crop supply over the last twelve months: (0.000) B1. _____ metric tonnes of soil erosion per metric tonne of crop harvested. (0.000) B2. _____% of our crop supply, by mass purchased in the last twelve months, is represented by the number reported above. (1.000*%)
CHILD LABOR USE What are the outcomes of the risk assessments for the worst forms of child labor performed on your crop supply?	A. We are unable to determine at this time. (0.000) B. The following percentages, by mass purchased, represent the outcomes of our risk assessment(s) for the worst forms of child labor for our crop supply: (0.000) B1. _____% of our crop supply came from low risk countries with corrective actions taken for any known high risk sites. (1.000*%) B2. _____% of our crop supply came from high risk countries that have high risk sites for which we took corrective actions. (1.000*%) B3. _____% of our crop supply came from high risk countries, but an audit determined the site risk to be low. (1.000*%)
FERTILIZER APPLICATION What was the nitrogen use intensity and phosphorus surplus associated with fertilizer application on the fields where your grain was produced in the last twelve months?	A. We are unable to determine at this time. (0.000) B. The following can be reported for our grain supply over the last twelve months: (0.000) B1. _____ kg nitrogen per metric tonne of grain harvested. (0.000) B2. _____% of our grain supply, by mass purchased in the last twelve months, is represented by the number reported in B1. (0.500*%) B3. _____ kg phosphorus surplus per metric tonne of grain harvested. (0.000) B4. _____% of our grain supply, by mass purchased in the last twelve months, is represented by the number reported in B3. (0.500*%)
GREENHOUSE GAS EMISSIONS INTENSITY What was the greenhouse gas emissions intensity associated with the growing operations/farming operations/final processing for your crop supply purchased in the last twelve months?	A. We are unable to determine at this time. (0.000) B. Our greenhouse gas emissions intensity over the last twelve months was: (0.000) B1. _____ kg CO2e per metric tonne of crop harvested. (0.000) B2. _____% of our crop supply, by mass purchased in the last twelve months, is represented by the number reported above. (1.000*%)
IRRIGATION WATER USE INTENSITY What was the irrigation water use intensity associated with the farming operations for your grain supply purchased in the last twelve months?	A. We are unable to determine at this time. (0.000) B. The following can be reported for our grain supply over the last twelve months: (0.000) B1. _____ cubic meters of irrigation water use per metric tonne of grain harvested. (0.000) B2. _____% of our grain supply, by mass purchased in the last twelve months, is represented by the number reported above. (1.000*%)

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