

WORKSHOP SUMMARY

USING MARKET-BASED MECHANISMS TO REDUCE POLLUTION FROM GREAT LAKES AGRICULTURAL WATERSHEDS

Workshop to Explore How Supply Chain Standards May Drive Change in Performance at the
Field Scale

October 1, 2012

Kellogg Center, Michigan State University, East Lansing, MI

Hosted by The Nature Conservancy, Michigan State University, and Limnotech under the
Great Lakes Watershed Ecological Sustainability Strategy (GLWESS) Project, Phase II,
funded by the Great Lakes Protection Fund

The GLWESS project aims to promote on-farm conservation soil and water conservation practices that can protect Great Lakes waters, combining sophisticated watershed modeling with field trial of arrangements to encourage conservation on a pay-for-performance basis. As part of the larger project, the project team wrote a literature review to examine the scope for using product certification and supply chain standards as a market-based arrangement to promote adoption of conservation practices. The October 1, 2012 workshop brought together food industry and farm sector representatives along with GLWESS project researchers and advisory panel members to discuss the scope for the use of certification and supply chain standards for this purpose.

Brief summary of the idea of standards and certification

Phosphorus runoff is believed to be an important source of pollutants that have greatly raised the incidence of algal blooms in Lake Erie in recent years. Phosphorus is an important component of agricultural fertilizer, and generally speaking farmers have the right to apply it to their fields for the purpose of raising their crop yields. As a result it is very difficult to regulate the input of phosphorus into the Great Lakes. This is the rationale behind government-financed incentive programs to encourage farmers to adopt conservation practices. Such programs are not sufficient to protect the lakes, however, so there is a search for alternate avenues.

The use of product certification and supply chain standards is one such avenue. Although these terms are used in different contexts with a variety of meanings, here we refer to supply chain standards as mandatory requirements that businesses impose on their clients to deliver products with certain characteristics or produced in a certain way, and certification as labels sponsored by organizations outside the supply chain that can be placed on products to signal to consumers that they have been produced in a certain way. In short, standards and certifications are two arrangements by which to affect change within the supply chain, focusing on such changes as safer food, better treatment of workers, greater animal welfare and environmental sustainability. Supply chain standards can be imposed for any number of product characteristics and are an essential component of quality control. In this way they protect against various forms of

business risk. A firm might be interested in imposing environmental protection standards to protect against input risk (the risk that inputs will not be available due to environmental degradation), reputation risk (the risk that the firm's reputation is tarnished due to negative environmental outcomes associated with its production practices), and regulation risk (the risk that government will intervene if it does not act preemptively).

In contrast, whereas supply chain standards essentially bar unfavorable practices, certification aims to reward favorable practices through access to niche markets and price premiums. Certification labels are aimed at consumer preference and issues of public concern. Also, while supply chain standards can succeed in protecting environmental resources if all or virtually all private sector buyers demand it, certification labels can succeed if all retail purchasers are willing to pay a little extra for the certified product.

Our workshop investigated the prospects for standards and certification to promote farm-level conservation practices, specifically to target nonpoint source pollution and improve the ecological health of the Great Lakes. Can standards and certification be an alternative to direct subsidies to promote conservation or government regulation to impose it? We begin by describing the desirable characteristics that a useful standard or certification scheme would require, then discuss the obstacles to implementing it.

Desirable characteristics of a standard or certification program

To truly protect Great Lakes water quality a supply chain standard or certification program would require near-universal coverage. For that reason, in the workshop discussion **there was unanimous agreement that business-to-business supply chain standards are preferable to business-to-consumer certification**, which hinges on consumers' willingness to consistently pay more for a certified product. With a focus on supply chain standards, workshop participants raised a number of suggestions that would make an environmental standard more productive, manageable, and cost-effective.

1. Precompetitive Standards: Universal coverage implies that all buyers of corn and soybean produced in the Great Lakes Basin agree to purchase only crops purchased with conservation practices in place. The business language used during the workshop discussion is that conservation-oriented production would be the "table stakes" that any producer must meet in order to enter the market. Business representatives described such standards as "precompetitive": something that all buyers agree to so that no buyer can seek a competitive advantage by purchasing lower priced corn that was not produced to the same environmental standard. If a standard is universally agreed upon it will minimize the transaction costs of participating in a standard: it becomes a part of doing business rather than something that participants constantly must assess and determine how it is affecting their competitiveness.
2. Scale Matters to Business: Business representatives commented that a successful standard cannot focus merely on protecting water quality in the Great Lakes. First, firms source their product from a wide geographic range; in fact the Great Lakes Basin is only a marginal producer of corn and soybean so a standard for environmental protection

focusing on this small geographic area would not make sense for them. It might even steer buyers to source their grain from other regions unburdened by the environmental standard.

3. Too Many Certification Systems in Play: Second, business representatives indicated that in recent years they have been inundated with requests to consider selling products under numerous forms of certification with widely divergent objectives. They said that attempting to keep track of multiple, separate certifications would only add to the already existing confusion of both consumers and businesses surrounding these labels. For this reason they prefer a standard that is both holistic and global: it would address multiple objectives, without geographic limitation. For example, as opposed to a production standard for corn and soybean that protects Great Lakes water quality, they would prefer a standard that protects water quality more widely while also addressing carbon emissions. Field to Market (also known as the Keystone Alliance for Sustainable Agriculture) was given as an example of a holistic initiative that targets multiple sustainability issues.
4. Outcome-Based Standards Are Desired: Workshop participants stressed that a successful standard must be outcome-based and offer the opportunity for producers operating under the standard to show continuous improvement. By focusing on a specific endpoint, such as the health of in-stream fish populations, it forces changes to be made continuously until the goal is reached instead of stopping once a fixed number of conservation practices are adopted. Biophysical models that TNC and Limnotech are developing and applying under GLWESS Phase 2 aim to model desired biological endpoints and link them to the type and scope of conservation practices necessary to bring them about. Workshop participants stressed that this kind of information is essential to be able to develop a meaningful standard. Additionally, focusing on constant improvement towards specific environmental outcomes allows endpoints to be adjusted based on new information and technology and changing environmental needs. Field to Market and Bonsucro, an organization that promotes sustainable sugar production, are two examples of programs that incorporate continuous improvement into their standards (although they are not based upon environmental outcomes).
5. Engage the Producer in Developing the Standards: A key attribute of any effective standards program is its ability to partner with and be informed by its stakeholders. In a standard for environmentally sustainable corn and soybean production, farmers would be a key stakeholder group; they are the ones who would be asked to change their practices, with possible negative yield and income implications. A standard will be more easily adopted and implemented if farmers have access to information and an understanding of how water quality is affected by their management practices, and if they feel personally engaged with the issue.

Challenges to implementation of a successful standard or certification program

Standards for Commodities is a Tough Sell: Workshop participants concurred with the major conclusions of the literature review prepared for the workshop, which is that developing a precompetitive standard for environmental protection in corn and soybean production is not likely to be achievable. Many of the impediments are inherent in the structure of the commodity crop supply chain.

1. Supply chain standards tend to be successfully implemented under two sets of conditions: where the production standard is so important to all retailers developing and implementing it is something that they all desire, or that a single buyer or group of buyers interested in the standard have such strong market power that producers are willing to comply with their demand because it becomes a condition for market entry.
2. The market for corn and soybean is very diverse, with numerous outlets that make it impossible for a small number of firms to unilaterally demand improved environmental management by producers. For example, corn is sold for animal feed, corn syrup, ethanol, bioplastics, and other uses. A corn producer can sell to any one of a number of grain elevators, which in turn can sell to a number of buyers for different purposes. There is no dominant buyer that can demand a change in production practices. A buyer that does make such a demand likely will have to pay a premium for it, which will put that buyer at a competitive disadvantage unless there is a market for such a product. Even if a given set of buyers were able to impose a standard, it would only address a very small portion of land under production and thus do very little to tackling agricultural nonpoint source pollution.
3. Achieving universal or near universal demand by businesses for supply chain standards for environmental protection would require the perception of business risk associated with pollution of the Great Lakes. As mentioned, business risk arises where firms perceive a threat to their source of inputs, their reputation, or the possibility that government might impose regulations that are more restrictive than voluntary standards would be. However, forms of business risk that often create pressure and force businesses to impose standards also seem to be lacking within this supply chain. There is no near-term threat to the availability of inputs from agricultural nonpoint source pollution driven by corn and soybean, partly because pollution of the lakes does not affect production and partly because the region is such a small producer. Additionally, because corn and soybean tend to be processed beyond recognition by the time they reach the final product, consumers are often unaware of their consumption of these crops. This means that even if the GLWESS project and others are able to better establish the link between commodity crop production and nonpoint source pollution in the Great Lakes Basin, it will be difficult to establish consciousness among consumers that their consumption habits contribute to the problem. Such consciousness by consumers is a prerequisite for firms to be subject to reputation risk associated with pollution of Great Lakes waters. Lack of consumer consciousness also implies that certification would probably be ineffective. Lastly, until public outrage or an overt threat to human health

occurs, the government has no incentive to pass regulation affecting grower practices. (If anything, the prevailing discussion in the U.S. Congress focuses more on reducing the reach of water quality legislation rather than increasing it.) All of these factors combine to make it most unlikely that all of the diverse buyers of corn and soybean will come together to demand the imposition of a precompetitive standard to reduce nonpoint pollution from Great Lakes corn and soybean.

Some possible ways to consider going forward

Despite the general consensus that supply chain standards are not a realistic solution to the problem of declining Great Lakes water quality due to agricultural nonpoint source pollution, workshop participants did suggest a number of steps that can be pursued going forward.

1. Workshop participants supported the notion that protecting Great Lakes water quality requires precise information regarding the type, location, and extent of conservation practices needed. In this respect they strongly endorsed the objectives and activities of the GLWESS project. Using accurate biophysical models to draw a more quantitative link between the impacts of excessive phosphorus loading and its source is essential to designing effective measures to reduce agricultural nonpoint source pollution.

2. One important thread of discussion in the workshop stressed that leveraging existing programs and partnering with people and organizations that farmers trust will be important in addressing the the severity of the problem and its large geographic scope. The Michigan Agriculture Environmental Assurance Program (MAEAP) may offer a unique opportunity in that respect. MAEAP is a voluntary program administered by the State of Michigan in which farms undertake steps to become certified that they are pursuing environmentally favorable land management practices. Although it is not designed around environmental outcomes, MAEAP does provide an existing framework and infrastructure to monitor farm management practices, and it has the trust of Michigan farmers. Two potential shortcomings are that 1) similar programs do not exist in most other states, and 2) one of our project advisory board members commented during the workshop that if MAEAP's standards are not sufficiently strict, it could potentially make problems worse by providing farmers with regulation security in that they are not required to comply with TMDL limits if MAEAP certified. If this is the case then tightening the water quality standards under MAEAP is essential prior to depending on it as a framework for promoting environmental standards. This is an issue that requires additional investigation

3. Another suggestion in the workshop was that although the output market for corn and soybean is diverse and not easily amenable to coordination among buyers to call for better management practices, the market for agricultural inputs that farmers rely on is heavily concentrated and perhaps more subject to pressure. A small number of agricultural input retail companies control the input market, and already they are becoming sensitive to concerns that the products they sell contribute to environmental pollution. It was mentioned during the workshop that some agricultural retail firms are pursuing a strategy such that less of their income would come from input sales and more would come from management advice and assistances to farmers. Taking advantage of this interest on the part of agricultural retail companies, coupled with the highly concentrated nature of the industry, probably offers a much more realistic opportunity to

influence agricultural practices through the supply chain than by focusing on output markets. Of course, for farmers to wish to pay input firms for environmental management certification would require clearer incentives for farmers to seek certification.

4. Raising consumers' awareness of the link between commodity crops and Great Lakes water quality and getting them to feel that they have a role to play is a critically important step to promote change. If a direct connection could be established in people's minds between corn and soybean production and threats to public health and amenities such as water quality and commercial fishing, perhaps some progress could be made to increase public concern for the problem. One workshop representative suggested launching a "Green Slime" campaign (à la the recent case of media attention to pink slime focused at beef processors) to generate a visceral reaction from the public. Lawsuits were also suggested as a way to generate attention: if specific cases of nonpoint source pollution and its impacts can be publicized (perhaps with the help of the GLWESS watershed models), then perhaps parties directly negatively affected by the problem would be able to file lawsuits against the perpetrators and aid in generating public outrage and momentum in favor of change.

5. Although workshop participants acknowledged that stronger government regulation is in principle the most effective way to tackle a classic negative economic externality problem like water pollution, current political realities make it unlikely. On the other hand, a possible way forward is to seek regulatory support for banning the worst practices that contribute greatly to phosphorus loading in waterways while offering little to farm yields. Spreading manure on frozen ground was cited as such a practice because it leads to high nutrient runoff and very low uptake by plants. Banning fertilizer application in the fall, after the harvest, was also suggested as a possible area for regulation.

6. Lastly, it is possible that even the extensive implementation of best management practices will not be sufficient to address altered hydrology due to development and changing landscapes. This will require investment in big infrastructure, such as reconstructed floodplains and wetlands to increase water detention and infiltration, from the government independent of farmer action due to high implementation costs. This is especially true in the wake of extreme weather events and climate change that are contributing to the problems we are experiencing in western Lake Erie (e.g. the algal bloom of 2011).

Appendices

- 1. Executive summary of the literature review prepared for the workshop**
- 2. Workshop agenda**
- 3. Workshop participants list**

Prospects for using supply chain standards and certification to reduce water pollution by commodity crops in the Great Lakes Basin: a review

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Prepared for GLWESS Project Phase 2 workshop on “Using Market-based Mechanisms to Reduce Pollution from Great Lakes Agricultural Watersheds,” October 1, 2012

Executive Summary

Motivated by recent increases in water pollution in major agricultural watersheds in the United States and the shortcomings of regulatory approaches to control nonpoint source pollution, this paper examines the prospects for using supply chain standards and product certification as a means of promoting the adoption of agricultural practices that reduce runoff of nutrients into the water supply for corn and soybean production in the Great Lakes Basin.

Certification and supply chain standards have spread rapidly since the 1990s in response to consumer demand for safer food, better conditions for producers, and greater environmental sustainability. The logic of certification is to reward producers for favorable management practices rather than to prohibit or penalize unfavorable practices. Traditionally, certification involves placing labels on packages so that consumers know that the product is associated with favorable practices. However, lessons from successful certification schemes suggest that they are most likely to work under certain limited conditions and that often they cover only very small portions of the relevant market. There is an emerging consensus that consumer-oriented product certification cannot drive transformation of production practices towards greater environmental sustainability.

The logic of supply chain standards is that corporations demand that suppliers follow certain practices, so that market pressures support rather than hinder favorable production practices. Such standards become prerequisites for gaining market access even if they are not legal requirements. Typically their focus is business-to-business transactions, for example between a producer and a retailer, and they do not necessarily involve labels that inform consumers. Supply chain standards tend to be established with a profit motive in mind; they can raise production costs substantially and act to sharply constrain which producers are capable of being part of the supply chain. Their transferability to commodity crops is far from certain.

Large retail firms with market power drive the biggest and most effective supply chain standards. Their primary source of motivation is to reduce risk. Key forms of risk that businesses aim to reduce are input risk (for example if environmental destruction or political instability threatens a firm’s access to inputs), reputational risk, and regulatory risk. Consumer pressure can help drive the latter two sources of risk. Food safety is particularly important as firms can suffer irreparable

loss of reputation from the outbreak of food-borne illness. In fact, concerns about reputational risk associated with food safety have led to widespread adoption of standards by all major food retailers, such that effectively these standards are pre-competitive – they are part of the baseline of quality that all retailers offer, and competition among retailers is based on other attributes of what they offer to consumers. On the other hand, environmental sustainability and producer well-being tend to be of secondary interest relative to food safety, because fewer consumers tend to be as directly concerned about them. Compared to food safety, this makes it less likely that firms will impose strict standards for these attributes of production.

How the product is consumed is important to the prospects of sustainability standards. Corn and soybean are mainly consumed indirectly in the form of animal feed, inputs into processed foods, ethanol, and various industrial inputs. As a result, consumers may not even be aware that they are consuming corn and soybean and this makes it difficult to gain consumers interest in sustainable production practices. The fact that agriculture-driven water pollution does not directly affect most consumers' health makes it even more difficult.

How the product is produced also has an impact. Changing agricultural production processes may raise production costs, which will be imposed either on growers or passed on to consumers. Some sustainable production practices are invisible, making it costly to monitor and verify them, further raising production costs. Some certification schemes are based on geographic origin of production, but these tend to be almost exclusively for high value products such as champagne and certain European cheeses. Their geographic origin is associated with their quality, a situation that could scarcely be more different from that of commodity corn and soybean.

How the supply chain is structured is another important factor in determining the feasibility of supply chain standards and certification schemes. Corn and soybean tend to be aggregated into grains of uniform standard, regardless of the practices used in their production, although organic and non-GMO corn and soybean are exceptions. If sustainably produced corn and soybean had to be segregated from other grains costs would further rise, and it is not certain that consumers would be willing to pay. An alternative approach used in two certification programs that we know of is to use offsets, such that a consumer pays a premium for certain quantity of a product in exchange for a guarantee that that amount of the product is produced sustainably. However, the consumer is not guaranteed that the actual product that he or she purchases has been produced in that manner. This approach provides funds to pay for sustainable production but minimizes costs by avoiding those associated with segregation. On the other hand, of course most certification programs and supply chain standards do operate with product segregation in mind. This is particularly important for example for certified organic products that most consumers purchase specifically due to the belief that organic products are better for them.

A number of key questions remain for the future. What are the best options for encouraging industry to agree to standards of corn and soybean production that limit pollution of Great Lakes waters? What are the most effective ways to generate interest by consumers in demanding such standards? What approaches can keep costs manageable?

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Kellogg Conference Center (Room 106)
Michigan State University
East Lansing, Michigan
October 1, 2012

AGENDA

8:00 – 8:30 am	CONTINENTAL BREAKFAST	
8:30 – 8:45 am	Welcome and Introductions	Helen Taylor, <i>The Nature Conservancy</i>
8:45 – 9:00 am	What is the Problem we are Trying to Solve? (Great Lakes Context)	Joe DePinto, <i>LimnoTech</i>
9:00 – 9:30 am	How are we Approaching the Problem? Workshop Objectives	Dennis McGrath, <i>The Nature Conservancy</i>
9:30 – 10:30 am	State of Supply Chain Management (Key Findings of Literature Review) Facilitated discussion	John Kerr, <i>Michigan State University</i>
10:30 – 10:45 am	BREAK	
10:45 – 12:00 am	Participant perspectives	Helen Taylor, Facilitator
12:00 – 1:00 pm	LUNCH (Corniche Room, 2 nd Floor)	
1:00 – 3:00 pm	Discussion of Key Questions	All workshop participants
3:00 – 3:15 pm	BREAK	
3:15 – 4:45 pm	Discussion of Key Questions	All workshop participants
4:45 pm	ADJOURN	

GLWESS OCTOBER 1ST WORKSHOP PARTICIPANT LIST

Workshop Participants	Title/Affiliation
Lisa Downes	Coordinator, North America Regional Initiative of the Alliance for Water Stewardship The Nature Conservancy, Wisconsin
Suzy Friedman <i>*Advisory Panel Member</i>	Director, Agricultural Sustainability Environmental Defense Fund
Brian Geerlings	Fertilizer Sales Manager Herbruck Poultry Ranch, Inc.
Catherine Kling <i>*Advisory Panel Member</i>	Professor, Economics Iowa State University
Denise Knight	Director of Sustainable Agriculture Environment and Water Resources Dept. The Coca-Cola Company
Fred Luckey <i>*Advisory Panel Member</i>	Chair, Field to Market The Keystone Alliance for Sustainable Agriculture
Tom Lyon	Dow Chair of Sustainable Science, Technology and Policy Ross School of Business School of Natural Resources and Environment University of Michigan
Steve Pueppke	Assistant Vice President for Research Director, Office of Biobased Technologies Michigan State University
Matthew Rekoweg	US Industry Relations & Food Chain Leader Dow Agrosiences
Mark Rey <i>*Advisory Panel Member</i>	Executive in Residence Michigan State University (former Under Secretary USDA)
Emily Ries <i>*Advisory Panel Member</i>	Agricultural Ecology Specialist Michigan Farm Bureau
Todd Sutphin	<i>Director of Operations</i> <i>Iowa Soybeanbean Association</i>
Nicolas Viart	Director Bonsucro (Better Sugarcane Initiative)
Tim Ziegler	Vice President Lean Center Of Excellence Kellogg's

GLWESS Project Team Members	Title/Affiliation
Lauren Bailey	Conservation Coordinator The Nature Conservancy

Rich Bowman	Director of Government Relations The Nature Conservancy
Lisa Camstra	Conservation Operations Manager The Nature Conservancy
Joe DePinto	Senior Scientist LimnoTech
Lauri Elbing	Policy Associate The Nature Conservancy
Katherine Groble	Doctoral Student Community, Agriculture, Recreation & Resource Studies Michigan State University
Leah Harris	Doctoral Student Agricultural, Food & Resource Economics Michigan State University
John Kerr	Associate Professor Community, Agriculture, Recreation & Resource Studies Michigan State University
Wendy Larson	Associate Vice President LimnoTech
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Scott Sowa	Director of Science The Nature Conservancy
Scott Swinton	Professor Agricultural, Food & Resource Economics Michigan State University
Helen Taylor	State Director The Nature Conservancy
Carrie Vollmer-Sanders	Project Director, Western Lake Erie Basin The Nature Conservancy
Kurt Waldman	Doctoral Student Community, Agriculture, Recreation & Resource Studies Michigan State University