



Multi-client study prospectus

The Sustainability Transition: Impacts to Agriculture

How will the sustainability movement affect agriculture from production through food retailing?

How will the impacts vary by commodity, and region of the world?

How are national and international companies already adapting to changes?

What drivers will be the most significant to shaping the future of agriculture?

What are the most significant changes on the horizon?

What are the implications for the affordability and availability of food?

What new opportunities are emerging?

Introduction

Sustainability has become a very popular term in the corporate and political world. Many firms now devote a part of their web sites, annual reports, etc. to describe their sustainability policies and initiatives. For some industries, sustainability is largely a public relations issue, but for agriculture it's becoming a strategic issue and one that is increasingly going to influence financial performance.

There are several reasons why sustainability is becoming such a strategic issue:

1. More of the earth's resources are devoted to agriculture than any other human activity and the competition for those resources is intensifying as a growing global population consumes more land, more water and more energy for cities and towns to expand.
2. Concerns about climate change are creating new demands on agriculture to expand beyond its traditional role as a supplier of food, feed and fiber to include feedstocks for energy production and to act as a carbon sink.
3. The entire food value chain is being scrutinized by groups outside of agriculture regarding the industry's structure and competitiveness, how it should operate, and the externalities it generates.

In short, agriculture is being subjected to a host of outside economic, social and environmental forces beyond those with which it has traditionally had to contend.

At Context we've been tracking these developments for some time to understand how the agricultural business environment is evolving and to identify emerging opportunities and threats. We see five major drivers propelling the agricultural sustainability movement:

1. Growing demand for food worldwide
2. Resource constraints, especially on water and land
3. NGO pressures on government to regulate agricultural practices and externalities
4. Consumer concerns about health and food safety
5. Distribution chain requirements to modify agricultural practices to seek greater profit or favor with consumers

The effect these drivers have on agriculture will vary by region of the world and by type of food. Current regional issues include those such as in the EU, where farm payments are being restructured to tie an increasing percentage of aid-to-farmers to utilization of approved sustainable farming practices.

Introduction (con't.)

Protecting the environment appears to be among the highest priorities of the Common Agricultural Policy (CAP). In the U.S. the 2008 farm bill included more programs and more funding to incentivize various conservation practices such as buffer strips and protection of wetlands. The priority in this case is maintaining farmers' income. In China the government is beginning to regulate and fine farmers who use an excessive amount of pesticides and is spending large sums of money trying to reclaim spent farm land and improve soil fertility. China's number one priority is to feed its people. It seems clear that different dimensions of sustainability are receiving differing amounts of emphasis across different regions of the world.

The effect the sustainability drivers have on agriculture also varies significantly for different types of food. Directly consumed foods such as fruits, vegetables and meat are most affected. Changes include the growth of the organic food segment where the use of pesticides and chemical fertilizers are minimized or eliminated, the growing preference for locally produced food, and the popularity of free range chicken and cattle raised primarily on grass. Grains have been less affected to date because they are either primarily used as animal feed (in the case of corn) or are further processed.

New sustainability related regulations are already emerging and may come from unexpected places. In the U.S. and the EU sustainability requirements have been written into biofuels regulations. These regulations include the entire value chain and extend to the feedstocks used to make biofuels. The regulations are meant to ensure that biofuels have lower lifecycle greenhouse gases and that necessarily includes all the inputs that go into producing the feedstocks. Important agronomic crops such as corn, wheat, soybeans and rapeseed are all significantly affected since an appreciable portion of those crops are used in biofuels production.

Voluntary sustainability standards also have the potential to affect agriculture. USDA's certified organic standards have helped the organic market to grow in the U.S. A sustainability standard being developed under the auspices of the American National Standards Institute (ANSI) could have more far-reaching effects. It's been in development since 2006 and has resulted in a great deal of controversy involving the company developing the standard, environmental NGO's, farming organizations, agribusiness and the federal government. The draft version of the standard released in 2007 would have effectively meant that only non-GMO, organically grown crops could be certified as sustainable. Lawsuits ensued and the draft standard has been rescinded. Work on a new sustainability standard continues with a goal of publishing the standard by 2011-2012.

Introduction (con't.)

Context has already undertaken several engagements for clients wanting to understand various aspects of the agricultural sustainability movement and has published several articles and proprietary reports on the topic. We are undertaking this multi-client study to bring an up-to-date, holistic look at what we see as a far-reaching set of issues to a broader group of clients. The study will:

- Provide a strategic overview of a broad and poorly defined term, describing agricultural sustainability within the context of resource constraints.
- Review how prevalent sustainability has become within agribusiness and sort through what's most important for firms operating at different points within the food value chain.
- Highlight and explain the most significant sustainability issues.
- Describe the drivers behind the sustainability movement, whether they will be felt primarily as market, environmental or regulatory forces, and project how it will affect agribusiness over the next 20 years.
- Outline potential opportunities and risks.
- Help organizations to adapt to changes related to sustainability issues.

The firms that understand how the sustainability movement will affect the global economy, their industry and their individual companies are the ones which will prosper. Increasing demand for food that meets consumers' expectations for health, nutrition, convenience, environmental sustainability and social equity will drive market prices up and open up new opportunities.

About the Study

The study will consist of four parts.

In Part 1, **Background**, Context will provide readers with a strategic overview of the sustainability movement tracing its origins from the environmental movement to its current role as an umbrella for a host of ecological, health and social causes and initiatives. It will compare and contrast differing definitions and understandings of what sustainability encompasses and the issues that are most important to its proponents. The four chapters of Part 1 will give readers a thorough grounding in the underlying concepts and vocabulary of the sustainability movement.

About the Study (con't.)

Part 2, **A Current View of Sustainable Agriculture** is a detailed analysis of the environmental, market and regulatory forces that are shaping the sustainability movement and the organizations that are the most influential inside and outside the movement. It will provide an assessment of which practices are being adopted and how broadly they have been adopted in different regions of the world. It will analyze the impacts of the sustainability movement, exploring its environmental, economic and social dimension and how its effects will differ for various agricultural commodities.

Part 3, **Adoption & Adaptation in Agribusiness** provides an analysis of the adoption and adaptation along the food value chain, highlighting where the sustainability movement has had the greatest impact. It also includes a review of the specific sustainability strategies and actions that major players in the agricultural industry are already implementing.

Part 4, **Sustainable Agriculture in 2030** provides a view of how the sustainability movement will have changed agriculture by 2030. It looks at the prospects for various types of change and whether change is more likely to come from market forces or regulatory forces. A future view is provided, broken down by agriculture sector (commodity group) and region of the world. Opportunities and risks are identified and a summary of key findings and recommendations are provided.

Information for the study will be developed through an extensive literature review, interviews of key persons from academia, government, industry and NGO's, and Context analysis.

Study Outline

Part 1 - Background

- I. Introduction and Purpose of this Report
- II. Defining Sustainability
 - A. A goal, a set of practices or a movement
 - B. Comparison to Conventional Agriculture, Permaculture, Agroecology and Organic Farming
 - C. Shades of sustainability

Study Outline (con't.)

- III. History of the Sustainability Movement
 - A. The Rise of Monoculture Farming
 - B. The Green Revolution
 - C. Earth Day
 - D. The Rio Declaration
 - E. Environmentalism (Silent Spring, The Omnivore's Dilemma)
 - F. Food Prices Spike of 2008

- IV. Review of the Major Sustainability Issues
 - A. Food Security - Yield
 - B. Climate Change
 - C. Biotechnology (GMO's & Antibiotics)
 - D. The Organic Movement
 - E. Anti-Meat
 - F. Food, Feed, Fiber and Energy
 - G. Competition for limited resources
 - H. Consumer attitudes & understanding of sustainable agriculture

Part 2 - A Current View of Sustainable Agriculture

- V. Players & Drivers
 - A. Major Players & their Agendas/Positions (Academia, Agribusiness, Consumers, Governments and NGO's)
 - B. Drivers (Market Factors, Regulatory & Standards, Environmental Changes)

- VI. Current Status
 - A. Comparison of production costs
 - B. Adoption Trends (by practice and area of farmland)
 - C. Differences by geographic region (U.S., Brazil, EU, India, China)

- VII. Impacts to Date
 - A. Environmental (water, air, land, biodiversity)
 - B. Economic – farmers' income
 - C. Social – farm workers & rural communities (Fair Trade, etc.)

- VIII. Impact by Sector
 - A. Livestock
 - B. Grains & Oilseeds
 - C. Fruits & Vegetables

Part 3 - Adoption & Adaptation in Agribusiness

- IX. Analysis of Adoption & Adaptation along the Food Value Chain
 - A. Producers
 - B. Crop Input & Equipment Suppliers
 - C. Processors
 - D. Food Manufacturers
 - E. Retailers

Study Outline (con't.)

- X. Company Sustainability Strategies
 - A. Plant Science companies
 - B. Agri-processors
 - C. Food Manufacturers
 - D. Food Retailers

Part 4 - Sustainable Agriculture in 2030

- XI. Prospects for the Adoption of Sustainable Agriculture
 - A. Critical Variables (population growth, income growth, resource availability, agricultural productivity)
 - B. Voluntary – Market Driven
 - C. Mandated – Regulatory Driven
- XII. Projected Changes
 - A. Changes in Production Agriculture by Sector
 - B. Changes by Region of the World
- XIII. Opportunities and Risks
- XIV. Summary: Key Finding & Recommendations

Why This Study?

At Context, we see a confluence of events falling within the scope of agricultural sustainability that is likely to impact agriculture in some very profound ways within the next ten to twenty years. Examples include changes in requirements by major food retailers, increasing constraints on irrigation, possible climate change legislation, development of an ANSI standard for sustainable agriculture practices and potential regulation of the amount of nitrogen and phosphorus in effluent discharged to the Chesapeake Bay and Gulf of Mexico.

While the topic of sustainable agriculture has been extensively covered, it has not been comprehensively analyzed from the viewpoint of organizations in agriculture. Most articles and reports have been developed by organizations outside of agriculture and have tended to drift off into esoteric and philosophic aspects of sustainability without looking at the subject in a thorough, analytical way. A major shortcoming is that both proponents and opponents of sustainable agriculture tend to view the subject in fairly black-and-white terms, equating it to organic farming, and as an all-or-nothing proposition.

This study will address the limits of previous reports and will provide a clear view of the range of impacts and just how different sustainable agriculture is likely to look by commodity and region of the world.

Who Should Subscribe?

All organizations throughout the food value chain and all who provide goods and service to agriculture will benefit from this study including input providers, biotechnology companies, agri-processors, food manufacturers, food wholesalers and retailers, commodity trade associations, equipment suppliers and financial institutions.

This report will be useful for senior executives and strategy and business development departments who are planning the future of companies involved in agriculture.

Project Schedule and Deliverables

This project will commence in the Spring of 2010 and will be completed in early 2011.

Context will deliver the final report in an electronic document, organized per the study outline on CD, DVD or flash drive. Hard copies are available upon request.

Project Team & Advisory Board

As with all multi-client studies from The Context Network, this study will be completed by a team of individuals who know the specific industry and topics that they are researching. Contributors to the study will come from a cross section of agricultural sectors (commodities), points within the food value chain and geographic regions. Selected members of our advisory board for this study are:

Ernesto Brovelli Ph.D., Senior Manager, Sustainable Agriculture, The Coca-Cola Company - Atlanta, Georgia

Dr. Ernesto Brovelli is the Senior Manager of Sustainable Agriculture in the Environment & Water Resources Department at The Coca-Cola Company (TCCC). In this role, Dr. Brovelli spearheads a number of sustainable agriculture initiatives within the Company, including the development of a sustainable sourcing strategy and the establishment of international pilot projects. He is also an active player in TCCC's global partnership with World Wildlife Fund.

Dr. Brovelli holds five patents related to the industrial use of plants and has been awarded two corporate creativity recognitions. He has authored more than 30 publications and is a frequent presenter at conferences and symposia. Ernesto has a Bachelor of Science in Agronomy from the University of Rosario in Argentina, a Master of Science in horticulture

Project Team & Advisory Board (con't.)

with a minor in food science from the University of Nebraska, and holds a doctorate in horticulture with a minor in food science from the University of Florida. He is a Rotary Foundation and a Japan International Cooperation Agency scholar. Ernesto also serves on the Sustainable Agriculture Initiative's executive committee and as courtesy professor at the University of Florida's Department of Horticultural Sciences.

Kelly Biensen, Founder, Eden Farms Berkshire Pork – State Center, Iowa

Kelly Biensen is a farmer and founder of Eden Farms Berkshire Pork. He started the business in 1988 when the commodity pork business suffered a drastic decline and many small pork producers exited the business. Biensen began this adventure by knocking on the doors of local Iowa restaurants, and eventually started supplying the nation's leading chefs with a product he truly believed in and stood behind.

Today Eden Farms is a coalition of independent family farmers and the largest American supplier of 100% pure heirloom Berkshire pork and the only farmer-owned company with national distribution. Eden Farms' producers raise their animals in a healthy (without antibiotic growth promoters), environmentally friendly manner, and have all committed themselves to a strict code of responsible and humane animal husbandry.

David Langlands, Independent Consultant and former Finance Director of British Sugar - United Kingdom

David Langlands joined the ABF Group from KPMG's London office in 1994. He has held many senior positions in ABF businesses, ranging from business development to sales and latterly finance. He was appointed Finance Director of British Sugar in June 2003, where he worked with the board to develop the business into one of the largest sugar companies in the world. This included leading the establishment of the biofuel joint venture between British Sugar and BP.

During his time with ABF, Langlands has been a strong advocate of strategic planning with a particular interest in sustainable development. He left British Sugar in March 2010 to form his own company, which specializes in this area.

Langlands is also a keen sportsman and has represented Great Britain as a track cyclist, winning a bronze medal at the 1998 World Master Track Championships.

Project Team & Advisory Board (con't.)

Frederick L. Kershenmann, Distinguished Fellow, The Leopold Center, Iowa State University and President, Stone Barns Center for Food and Agriculture – Ames, Iowa

Fred Kershenmann has served as a distinguished fellow of the Iowa-based Leopold Center for Sustainable Agriculture, a research and education center with programs to develop sustainable agricultural practices that are both profitable and conserve natural resources. since 2005. Prior to that, he served as the Center's director since 2000. He helped found the Farm Verified Organic, Inc., a private certification agency, and the Northern Plains Sustainable Agriculture Society and has served in numerous national and international appointments including USDA's National Organic Standards Board, the North Central Region's Sustainable Agriculture Research and Education (SARE) administrative council and the Henry A. Wallace Institute for Alternative Agriculture board of directors.

Kershenmann earned degrees from Yankton College in South Dakota, Hartford Theological Seminary in Connecticut, a Ph.D. in philosophy from the University of Chicago and has authored numerous articles and book chapters dealing with ethics and agriculture. In addition to his extensive work on sustainable agriculture, he also manages his family's 3,500-acre certified organic farm in south central North Dakota.

Peter-Erik Ywema, General Manager, SAI Platform – Utrecht, Netherlands

Peter-Erik Ywema is an analytical chemist by education and holds an MBA in strategic sustainability consultancy. He has been a consultant, researcher and interim manager since 1990 focusing on the implementation of pragmatic sustainability concepts in companies and policy for governmental institutions. In the early nineties he was amongst the researchers that developed life cycle assessment as a tool to better understand real and significant environmental impacts.

He has founded two successful consultancies, Core Management and Quintens, both based on the conviction that the only lasting and profitable businesses will be the ones where sustainability of people, planet and profit are equal elements of the core business.

Ywema has gathered experience from his work for several companies, intermediate organizations, governments and NGOs. He is currently the General Manager of the SAI Platform, an organization created by the food industry to communicate worldwide and to actively support the development of sustainable agriculture involving the different stakeholders of the food chain.

About Context

The Context Network provides business management consulting services to the world's leading agriculture, biotechnology and food companies, as well as government agencies. The firm is composed of a core of professional consultants, complemented by an extensive network of industry and subject area experts. Other multi-client reports offered by Context include:

- Plant Biotechnology Traits Commercialized
- Global Seed Market Database
- Seed Market Forecast
- Benchmarking Study for Crop Protection Manufacturers in North America

Investment

The purchase price of *The Sustainability Transition: Impacts to Agriculture* is \$14,500. One half of the purchase price will be invoiced upon receipt of this order form by The Context Network, with the second half to be invoiced upon delivery of the report. All invoices are due upon receipt. Invoice scheduling can be adjusted if needed to fit client budgeting requirements. Discounts are available for those who purchase more than one multi-client report from The Context Network.

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