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Sustainable Agriculture in the United States: A Critical Examination of a Contested Process

Douglas H. Constance

Department of Sociology, Campus Box 2446; Sam Houston State University, Huntsville, TX, 77341-2446, USA; E-Mail: soc_dhc@shsu.edu; Tel.: +1-936-294-1514; Fax: +1-936-294-3573.

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Abstract: This paper investigates the political economy of the development of sustainable agriculture programs and initiatives in the United States. Sustainable agriculture emerged as part of a growing critique of the negative environmental consequences of unquestioned modern farming methods. The USDA/Sustainable Agriculture Research Education Program created in 1990 and the National Organics Program created in 2002 are the current government-sponsored programs in support of sustainable agriculture. Recently, private approaches to develop a national sustainable agriculture standard for the U.S. have emerged. The events of the cases developed in the paper reveal that because the concept of sustainability is deeply contested, agribusiness is able to exploit the ambiguity surrounding the definition of sustainable and exercise power in attempts to frame sustainable agriculture in their favor. Most recently, this contested process has focused on whether genetically-modified organisms (GMOs) will be included as part of the national sustainable agriculture standard.

Keywords: sustainable agriculture; USDA; organics; GMOs

1. Introduction

At the 10th Anniversary of the United States Department of Agriculture Sustainable Agriculture Research Education (USDA/SARE) Conference in Austin, Texas in 1998, one of the keynote speakers was Jim Hightower, once the Agriculture Commissioner in Texas and co-founder of the Agribusiness Accountability Project. Hightower [1,2] is famous for his scathing critique of agribusiness power and the cooption of the USDA and Land Grant Universities, the handmaidens of corporate agriculture. At the 20th Anniversary SARE Conference in Kansas City, Missouri in 2008, one of the keynote speakers

was Undersecretary of Agriculture Dr. Gale Buchanan, a weed scientist. In tone with the times, his talk centered on biofuels as the new focus of sustainability.

A lot had changed in those 10 years. One of the recurring themes at the 20th Anniversary Conference was that it was time to diffuse SARE's numerous accomplishments to the "whole of American agriculture." Commenting on this theme, a longtime advocate of sustainable agriculture, John Ikerd [3,4], remarked to me in the hall at the conference, "The camel has got his nose in the tent." At about the same time, we began hearing about two initiatives to create national sustainable standards and metrics for agri-products: the Leonardo Academy/American National Standards Institute (ANSI) project and the Keystone Center initiative—Field to Market: The Alliance for Sustainable Agricultural Outcomes. After a closer look at these two projects, it appears that the proverbial camel has more than his nose in the tent.

The interest in sustainability issues increased after the term "sustainable development" was coined in the 1987 report "Our Common Future" published by the United Nations World Commission on Environment and Development [5]. Corporations, governments, and organizations of all sorts are going green, and the word sustainable is a key component of the rhetoric. Both nationally and internationally, private and public mechanisms to certify forms of sustainable agriculture are proliferating [6-9]. This paper investigates the development and creation of sustainable agriculture programs in the United States. The contested creation and development of sustainable agriculture programs such as United States Department of Agriculture Sustainable Agriculture Research Education program (USDA/SARE), the United States Department of Agriculture National Organics Program (USDA/NOP), the Leonardo Academy/ANSI project and the Keystone Center initiative provide fertile research grounds for investigating the political economy of alternative agriculture in general, and sustainable agriculture in particular. The cases of sustainable agriculture initiatives developed in this paper reveal that because the concept of sustainability is debated and contested, agribusiness interests are able to exploit these ambiguities and exercise power to attempt to frame the definition of sustainable agriculture in their favor.

The paper is divided into two content parts. The first part begins with an overview of the history of the USDA/SARE program to provide a context for the ecological critique of conventional agriculture and the resulting national-level legislation. This section includes a short description of the Southern SARE program to illustrate how the term "sustainable" is operationalized at the regional level. The first part ends with an overview of the National Organic Program as a form of sustainable agriculture underpinned by a nationally-managed certification and labeling system. In both SARE and the NOP, the advocates of conventional agriculture challenged the definition of sustainability.

The second part of the paper documents the Leonardo Academy/ANSI and Keystone Center initiatives designed to create sustainability metrics and a common national standard. The Leonardo Academy/ANSI project is being challenged by conventional agricultural interests and the USDA as being too narrowly focused on organic agriculture, as well as excluding significant representatives in the agrifood industries from participating in the process. The Keystone Center project is an industry-based initiative to expand the definition of sustainable to include "all-available technologies."

The discussion and analysis section employs an agrifood governance power framework [10] to interpret the data presented in the paper. The conclusions discuss the implications of the contested definition of sustainable agriculture in the U.S. for agricultural sustainability in the world.

2. The Development and Crisis of Modern Agriculture

For much of history, traditional agriculture was characterized by animal traction and diversified farming operations that included crop and livestock components in a symbiotic and sustainable relationship. The agricultural revolutions and rapid adoption of modern farming broke this symbiotic relationship and replaced holistic systems with reductionist components. This process culminates today wherein biotechnology replaces nature as the focus of agricultural innovations [11].

The creation of modern farming in the U.S. dates to the mid-1800s. The USDA (1862), Land Grant Universities (LGUs; 1862/1890), Agricultural Experiment Stations (1887), and Cooperative Extension Service (1914) created a system whereby the agricultural innovations developed through research at the Experiment Stations were taught to the agriculture students at the LGUs and diffused to the farmers through the Extension Service. The USDA coordinated this process of research, teaching, and extension at the national level. The research conducted at the Experiment Stations followed a narrow, reductionist approach that assumed that farming systems could be studied as component parts. Extension agents encouraged innovative farmers to adopt the new technologies via a top-down technology delivery system. Reductionist science based on disciplinary research supported the development of specialization and monoculture at the farm level. Diversified farms were steadily replaced by specialized animal and row crop operations that concentrated on just a few agricultural commodities. At the same time, farm size increased as farm numbers decreased [11,12].

The Dust Bowl in the 1930s illustrated the negative environmental effects of plow-based modern agriculture. The Soil Conservation Service was the first government program to address these externalities. *Silent Spring* [13] exposed the complex web of environmental impacts linked to chemical-intensive agriculture and challenged the dominant belief that pesticides were harmless to the environment. Mounting evidence of pesticide resistance, bionic bugs, banned pesticides, farmworker poisoning, ground and surface water contamination, dead zones in the Gulf of Mexico, and the farm/debt crisis of the 1980s called attention to the negative externalities of modern agriculture [11,12].

3. The Emergence of Sustainable Agriculture

The United States Environmental Protection Agency (EPA) was created in response to citizens' demands to be protected from air and water pollution. The EPA policies included stricter regulations regarding agricultural chemical use. Several reports published in the 1980s documented the negative environmental and social impacts of modern agriculture and suggested increased support for alternative and/or organic agriculture [14-16]. The *USDA Report and Recommendations on Organic Farming* [14] provided scientific evidence of yield, net returns, and established principles of organic agriculture. This report was rejected by the incoming Reagan Administration, which also abolished the Organic Resources Coordinator position in USDA. The combination of these reports provided evidence in support of the need to develop USDA programs in sustainable agriculture research and education that made agriculture safer for humans and the environment and more productive for future generations. Critics warned that organic agriculture was not profitable and that it could not feed the world's growing population. To avoid some of these formidable critics, advocates of organic

agriculture began supporting the term “sustainable agriculture” as the proposed alternative to the dominant form of chemical-intensive agriculture. This strategy was successful [11].

4. The First Legislation: LISA (Low Input Sustainable Agriculture)

Due to extensive lobbying by advocates of alternative agriculture, the 1985 Food Security Act included provisions to support the development of sustainable agriculture. In 1988 the Low-Input Sustainable Agriculture Program (USDA/LISA) was created. The goal of the LISA competitive grants program was to develop and promote widespread adoption of more sustainable agricultural systems that would meet the food and fiber needs of the present while enhancing the ability of future generations to meet their needs and promoting the quality of life for rural people and all of society. An innovative provision of LISA was that farmers must be heavily involved in the program [11].

The organizational structure of LISA was created to accommodate regional practices and research needs. The structure included a national director, four regional coordinators, and in each region an Administrative Council (AC) to set program goals and oversee grants programs and a Technical Review Committee (TRC) to review the grant proposals for scientific merit. The AC was to consist of a broad mix of farmers, LGU scientists, USDA/government agency representatives, agribusiness representatives, and non-governmental organization (NGO) representatives [11,17].

Congress expected LISA to approach agricultural research from a non-conventional perspective and not replicate the existing USDA programs. LISA was designed to be a science-based grass-roots problem-solving program with major involvement of farmers and NGOs, as well as LGUs, in the management of the program. It was to be a significant departure from the standard or “business as usual” single-discipline, reductionist studies focusing on a small component of the overall farming system. LISA was to support the work of interdisciplinary teams in developing and adopting farming methods and systems that are economically profitable, environmentally sound, and socially acceptable [11]. These three components are referred to as the three legs of the sustainable agriculture stool.

5. Resistance to LISA and Sustainable Agriculture

Sustainable agriculture in general and LISA in particular quickly attracted criticism from conventional agriculture. Although Congress authorized LISA in 1985, the USDA did not fund it until 1988, and only when Congress demanded it. The agrichemical companies argued that low-input meant low yield, low income, mass starvation, and the destruction of agricultural industries. The Fertilizer Institute criticized LISA for advocating one farming system over another with no facts to back up the support. The chemical industry mounted a campaign to ridicule and discredit LISA with a barrage of anti-LISA articles and editorials in the farm press. The LGU system saw LISA as critical of its long-standing support for conventional agriculture. In some cases, LGU administrators did not distribute the LISA call for proposals to their researchers. Often the LGUs criticized LISA and sustainable agriculture based on inappropriate comparisons of fields with no agronomic treatments with fields with chemical treatments. There were also LGU efforts to inhibit NGO representation on regional ACs because the NGOs were often critical of conventional agriculture [17,18].

6. The Tension between the “Reductionist” and “Holistic” Research Approaches

From the beginning of LISA there was a structural tension between the TRC and the AC regarding the kind of grants that were funded. The TRC is made up of LGU disciplinary scientists trained in reductionist science dealing with narrow agricultural components. The AC has broader representation including sustainable farmers and NGO representatives, but is dependent on TRC reviews biased to reductionist science. Additionally, the AC is mandated by Congress to be holistic and not “business as usual.” The philosophical tension between the AC and the TRC also existed within the AC. While the LGU and USDA members of the AC tended to be more supportive of component research, the sustainable farmers and NGO members often pushed for whole farm approaches to sustainable agriculture. The solution was to fund a mixture of component research and whole farm/integrated systems research [17,18].

7. From LISA to SARE

Although Congress lauded LISA’s innovative work and increased the funding the following year, to deflect criticisms from the chemical industries regarding low-inputs, the FACT Act of 1990 (Food, Agricultural, Conservation, and Trade Act of 1990) changed the name of the program from LISA to SARE, the USDA Sustainable Agriculture Research and Education Program. Sustainable agriculture was defined as an integrated system of plant and animal production practices having site-specific application that will over the long term: (1) satisfy human food and fiber needs; (2) enhance environmental quality and the natural resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls; (3) sustain the economic viability of farm operations; and (4) enhance the quality of life for farmers and society as whole [17,18]. As opposed to the top down technology delivery system associated with conventional agriculture and the traditional Extension Service, SARE is built on a participatory research model that values producers’ knowledge. SARE strives to view farming from a whole-systems approach as compared to the reductionist view of traditional agricultural disciplines. SARE strongly encourages multi-disciplinary and multi-institution research that generates research to enhance environmental quality, economic profitability, and social quality of life [17].

In the same year, the EPA created the ACE (Agriculture in Concert with the Environment) Program. From 1991 through 2001 SARE and ACE funded projects were jointly administered through SARE. SARE budget monies are divided into two competitive grants programs. The Research and Education Program is dedicated to the development of sustainable agriculture innovations/practices. The Professional Development Program is dedicated to “train the trainer” projects with the goal to diffuse the sustainable agriculture innovations/practices from farmers to agricultural educators [18]. A total of more than 3000 projects have been funded since 1988 [19]. The budget has increased from the original level of \$3.9M in 1988 to almost \$19M in 2008, but is still less than one percent of the total research budget in USDA of about \$2.3B.

While there are officially three legs of the sustainability stool, most of SARE’s projects have addressed environmental quality [19,20]. SARE’s focus on environmental issues to the neglect of social and economic equity issues keep it in safer political territory. For some, SARE is only

mildly-reformist, too influenced by conventional agriculture through the USDA and the LGUs to be a driver of social change towards substantive forms of sustainable agriculture [21].

8. The SARE System of Sustainable Agriculture: The Example of the Southern SARE

The SARE regional structure allows variation regarding program priorities and types of proposals funded; in other words, “sustainable agriculture” can be operationalized differently across the regions. While the SARE official definition of sustainable agriculture does not preclude any technologies, because of regional autonomy, in some cases there is a preference for smaller-scale, organics, local/regional food systems, as opposed to “band-aids” to moderate the externalities of conventional agriculture.

The Southern Region SARE is made up of 13 states and is unique due to its dual system of 1862 and 1890 LGU participation [22]. As in the other regions, the TRC is selected and organized by the Southern SARE regional coordinator. As noted above, the TRC consists of disciplinary scientists, mostly based at the LGUs, whose role is to evaluate the proposals based on scientific merit. Sometimes, a proposal ranked scientifically sound by the TRC is not funded because the AC determines it does not meet the “sustainable” criteria.

The Research and Education Grants are the center piece of the SARE Program. Each year the Call for Proposals is reviewed and adjusted based on the priority areas identified by the AC. The current priority areas in the Southern Region SARE are: (1) environmentally sound practices/agricultural ecosystems, (2) minority/limited resource farmers, (3) marketing/economic development, (4) organic farming systems, (5) policy/program evaluation/quality of life, and (6) women in sustainable agriculture [23]. The “women in sustainable agriculture” and “minority/limited resource farmers” priority areas are examples of variation in regional SARE programs. In recent years, the Southern SARE AC decided to delete the component research priority area that focused on Best Management Practices (BMPs) designed to moderate negative environmental externalities (“band-aids”). At the same time it enhanced the systems priority area that incorporates environmental, economic and social dimensions at the pre- and post-production stages [19]. These actions are notable examples of the flexibility allowed by the regional structure of the program.

9. The National Organics Program

In the U.S., modern organic agriculture began in California in the 1960s as part of the counter-culture movement that rejected industrial values [24,25]. Consumer concerns related to pesticide contamination and other philosophical issues drove rising demand. In 1973 the first third-party certifying organization, California Certified Organic Farmers, was created to increase consumer confidence and limit fraud. The California Organic Foods Act of 1990 established a legal definition of organics, including an acceptable materials list and a “certified organic” label based on third-party certifications schemes. The California system became the model for other states’ organic certification regulations and the national certified organic label [25,26].

The combination of increasing demand and the certified organic label prompted agribusiness firms to enter the market to capture the price premiums, producing a “conventionalization” of

organics [25,27,28]. Because the certified organic standards in California emphasized the regulation of inputs over processes (an acceptable materials list), agribusiness firms employed input substitution practices that met the organic standards but otherwise avoided the more costly agronomic practices associated with organic production. At the same time, the costs associated with certification created entry barriers that were more easily overcome by more capitalized firms. Researchers predicted that the adoption of the National Organic Program (NOP) standards would have a similar effect on the whole country as many firms were waiting for a system of national standards before moving into the organic market [26,27,29-31]. The result would be an erosion of “deep organic” practices in favor of less sustainable “organic lite” approaches [32]. As conventionalization proceeds in organics, sustainability recedes.

Growing demand and social movement activity resulted in the passage of the Organic Foods Production Act in 1990, which included a mandate to establish the National Organic Standards Board under USDA to develop national regulations to govern the production and handling of certified organic foods. The regulations recommended to USDA in 1994 were generally ignored in the drafting of the NOP Proposed Rule released in 1997. The USDA version focused on allowable inputs rather than agro-ecological processes or socio-economic dimensions of sustainable agriculture [26,27,31-33]. Not only did the Proposed Rule ignore the accepted organic practices recommended by NOSB, but it included the Big 3: genetically modified organisms (GMOs), biosolids, and irradiation. After the public outrage over the Big 3 during the comment period, the USDA withdrew them from the Final Rule that became effective in October 2002. The NOP Final Rule purposefully framed “certified organic” as a market label based on consumer preference with no claims to health benefits or environmental superiority included in the objective meaning of the label [35].

USDA data provides some support for the predicted effect of the NOP on agribusiness entry. The U.S. had under a million acres of organic cropland when Congress passed the Organic Foods Production Act in 1990. By 2002, when the certified label was adopted, certified organic farmland had doubled, and then doubled again by 2005. The organic livestock sector grew even faster [36]. Although the number of organic operations did continue to grow in the 2002–2005 period, the rate of increase was lower than the previous two periods. This lowered rate of adoption was partially due to the market-based focus of the NOP which did not provide sufficient incentives and subsidies to ameliorate the perceived risks of organic conversion [37].

While over the past 20 years U.S. organic production has increased significantly, consumer demand has increased at an even faster pace [38]. This gap between domestic production and consumption is mostly due to a lack of government support for conversion to organics, including support payments during the conversion period and institutional research. Unlike in Europe where government-sponsored organic conversion and production supports began in the late 1980s based on explicit recognition of the environmental and surplus reduction benefits of organics, there was no official USDA program that explicitly encouraged conversion [37]. As a result, organic food and food supplies that meet the USDA regulations are increasingly being imported to meet the growing demand in the U.S. In an attempt close the gap between domestic production and consumption, the Food, Conservation, and Energy Act of 2008 (2008 Farm Act) included several new provisions to increase organic adoption rates [38].

Organic food is the fastest growing segments of food sales. In recent years the organic food sector has experienced double-digit growth while conventional foods have experienced a more moderate 2

to 3 percent growth rate [36,39,40]. Once considered a niche-market, organic products are now sold in the mainstream supermarkets as the majority of U.S. consumers buy some organic products [41]. As supermarkets have increased their market share, agrifood TNCs have bought up numerous organic operations and/or developed their own product lines to supply the supermarkets [42]. Research from the UK reports that the conventionalization and consolidation of organics have increased the cost-price squeeze and shrunk premiums for producers [43]. As a result, the trend in organics is towards diminished sustainability, what Guthman [32] refers to as “organic lite.”

10. The Leonardo Academy/American National Standards Institution Initiative

On April 13, 2007 the Leonardo Academy, acting as an agent of American National Standards Institution (ANSI), posted the draft of “Sustainable Agriculture Practice Standard for Food, Fiber, and Biofuel Crop Producers and Agricultural Product Handlers and Processors” (LEO SCS-001-200x) in the ANSI *Standards Action* [44]. The Leonardo Academy had been approached in early 2007 by the California-based firm, Scientific Certification Systems, to propose a draft standard for trial use (DTSU) on sustainable agriculture for adoption by ANSI [45]. This DTSU was to be used as a reference document in the development of the final document. Leonardo Academy, an ANSI-accredited standards development organization, is providing the process administration to develop a national sustainable agriculture standard through ANSI. ANSI is an established and internationally recognized standards accreditation organization. According to the Leonardo Academy, “A large and growing segment of consumers in the U.S. are actively seeking to support companies whose agricultural products are grown and handled sustainably; however, there is little agreement about what sustainability means” [46]. As part of the announcement, the Leonardo Academy [47] invited “all stakeholders” to help shape the U.S. standard through the ANSI process.

In October 2007 the Leonardo Academy hosted the “Information/Kick-Off” meeting where a review of the DTSU was presented by the company, Scientific Certification Systems. The DTSU was patterned after the successful ANSI-developed VeriFlora sustainable standard for cut flowers and potted plants. The stated purpose of the draft standard is to [48]:

Establish a comprehensive framework and common set of environmental, social, and quality requirements by which to demonstrate that an agricultural product has been produced and handled in a sustainable manner, from soil preparation and seed planting through production, harvest, post-harvest handling, and distribution for sale.

The standard is intended for food, fiber, floral, and fuel crops, but not livestock, dairy or wild crops. The DTSU contains three dimensions of sustainability: environmental sustainability, social/economic responsibility, and product integrity. Within these dimensions, the scope of the project is designed to establish practices that (1) build a healthy agro-ecosystem, (2) preferentially employ biological, mechanical, and cultural methods of pest and disease control, (3) phase out the use of agrochemicals that pose acute or chronic health risks, moving toward organic practices, (4) yield practices with high nutritional value and meet national organic standards for purity in terms of pesticide residues/contaminants, (5) protect the surrounding ecology, (6) minimize packaging, (7) optimize energy efficiency in growing, transport, and handling, (8) maximize carbon storage while maintaining

yield, (9) establish a safe, equitable workplace, and establish productive engagement with the surrounding community. The overall goal of the project is to provide a uniform standard and assessment matrix for evaluating sustainability performance across several dimensions [48].

In early 2008 the Biotechnology Industry Association and major commodity trade associations [49] expressed concerns about the ANSI standard that they felt would exclude biotech crops and high-production agriculture [46]. In a letter to ANSI, they stated that the Leonardo Academy did not follow the ANSI process and that this “may have already led to irremediable defects” that will negate an acceptable outcome [50]. The letter criticizes the DTSU on several counts; the following two apply most directly:

- (1) Equating organic practices with best management practices, a conclusion that would be soundly rejected by many in the scientific community
- (2) Rejecting outright the use of biotechnology, perpetuating scientifically unsound and overly precautionary approaches that have been rejected by many governments, including our own, and which have provoked significant trade concerns.

The letter also asserted that the Leonardo Academy did not notify “materially affected stakeholders” prior to the adoption of the draft standard and has not done so adequately since its announcement. They criticized the standard for being too closely tied to organic agriculture and ignoring the definition of sustainable agriculture set forth in the 1990 Farm Bill. Finally, they expressed concern that because the Leonardo Academy had little knowledge and experience in sustainable agriculture and the process did not include a broad enough range of stakeholders, especially government experts, the final outcome would not be credible [50]. Conventional agriculture viewed the initiative as “a stalking horse” for the organic industry [45].

On February 25, 2008 the Leonardo Academy replied to the “procedural complaint” detailed in the above letter [51]. President of the Academy, Mr. Michael Arny stated that the Leonardo Academy had followed ANSI protocols and that the DTSU is a “placeholder document;” everything in the standard is “on the table” to be addressed by the Standards Committee in preparation of the final approved standard. Furthermore, he detailed the timeline and instances that the standard had been advertised, participation solicited, presentations made, and meetings held. Finally, he noted that contrary to the points made by the Biotechnology Industry Association and associates, the Leonardo Academy had a long history of experience in sustainability issues and standards development and that the Standards Committee is open to all interested parties, including government officials, academic experts, industry stakeholders, and environmental and labor NGOs. The Leonardo Academy requested for the industry group to review the responses and hoped that the complaints could be handled informally, if not, a formal appeal process is included in the standards development protocol [51].

At the February 28, 2008 first stakeholder dialogue meeting to explain the protocol for participating in the standards development process, three panelists from mainstream agriculture made presentations on agricultural biotechnology, integrated pest management, and sustainable biofuels [47]. On May 20, 2008 Charles F. Conner, Deputy Secretary of Agriculture, sent a letter to Mr. Arny expressing the USDA’s “serious concerns” regarding the process and nominated three USDA employees to serve as observers to the Standards Committee in order to allow for “the development of an appropriate and meaningful standard through a robust, inclusive, and transparent process” [52]. The three USDA

representatives were: R. Charles Martin, Deputy Associate Administrator, Agricultural Marketing Service; Michael Schectman, Biotechnology Coordinator for the Office of the Secretary; and Kirsten Jaglo, Office of Scientific and Technical Affairs, Foreign Agricultural Service. Mr. Conner noted that a separate letter would be forthcoming to describe the serious concerns [52].

The letter of June 6, 2008 from Deputy Secretary Conner to Mr. Arny detailed the serious concerns. The main issue is what USDA perceived to be a very narrow interpretation of sustainable agriculture. He notes that the USDA definition in the 1990 Farm Bill is purposefully broad to recognize that sustainability can be achieved through various methods and does not exclude particular technologies [53]. He argued that the standards developed for U.S. agriculture need to be consistent with U.S. laws and policies. He criticized the Leonardo Academy for adopting a narrow definition of sustainable agriculture, a subset of the certified organic practices as defined in the NOP, which would not allow producers to use tools such as “modern biotechnology, synthetics fertilizers, or other technologies” that “are well within sustainable agriculture as defined by the law [53]. Deputy Secretary Conner stated that there is no sound evidence that these technologies are inherently unsustainable and that prohibiting the use of modern technologies at a time when global food prices are at record levels “can hardly be considered sustainable” [53]. The other major concern expressed in the letter was the issue of inclusiveness. Deputy Secretary Conner maintained that stakeholders representing a major portion of U.S. agriculture (1.4 B acres of crop, forest, and grazing lands) are not included in the process, nor are they voting members of pertinent committees. Because of these flaws, Deputy Secretary Conner concluded that the process is biased and the Draft did not provide an adequate basis to move forward toward a consensus standard [53].

In his June 24, 2008 response letter to Deputy Secretary Conner, Mr. Arny disagreed with the USDA positions regarding inclusiveness and definitions of sustainability and encouraged the USDA and associated stakeholders to continue to participate in the process. He again stated that the DTSU was to be used as a working document and that the focus on organics in the draft is amendable by the Standards Committee. Similarly, while the prohibition of genetically-engineered planting materials “reflects a precautionary approach that permeates many other sustainability labeling standards around the world,” this criteria is also amendable by the Standards Committee [54]. Mr. Arny also explained that the Leonardo Academy was not a material participant in the process, but only a neutral facilitator whose role is guarantor of an open, transparent process inclusive of all stakeholders. ANSI protocols state that government representatives are welcome to participate as equal members, but are not allowed to “dominate” the process. Mr. Arny provided a timeline of past and future activities and noted that the three USDA nominees to serve as observers to the Standards Committee are welcome, but as non-participating observers would not be involved in committee meetings. He encouraged the USDA to nominate one or more representatives to serve on the Standards Committee or supporting subcommittees. Mr. Arny concluded that it was inappropriate for the USDA to call for the draft to be abandoned; rather, it should follow federal government policy to support and participate in development of voluntary, consensual standards [54].

On September 11, 2008, Lloyd C. Day, Administrator for the USDA/Agricultural Marketing Service (USDA/AMS), sent a letter to Ms. Anne Caldas of ANSI formally requesting that the Leonardo Academy’s accreditation as a ANSI standards certifying organization be revoked [55]. Mr. Day presented nine appeal issues based mostly on previous communication between USDA and

the Leonardo Academy detailing how the Academy had failed to operate following official ANSI protocol. As in previous letters from USDA to the Leonardo Academy, the appeals focused on the issues of the definition of sustainability and inclusiveness of mainstream stakeholders. The sustainability appeal noted the bias regarding organics, the exclusion of modern technologies such as genetic engineering, and the problems associated with enforcing Fair Labor Standards across industries. The non-inclusiveness appeal centered on the lack of publicity regarding the draft, lack of broad-based representation, and bias in favor of organic agriculture advocates. In the conclusion, Mr. Day requested that ANSI's Executive Standards Council withdraw the accreditation of the Leonardo Academy and withdraw the DTSU as the basis for the American National Standard [55].

On the following day, September 12, Dr. Belinda L. Collins, Director of Technology Services in the Department of Commerce sent a letter to Ms. Caldas of ANSI in support of the USDA/AMS letter of appeals to decertify the Leonardo Academy [56]. Dr. Collins noted that it was her agency that has responsibility for coordinating voluntary consensus-based standards with federal agency standards so that the resulting standards will be most likely to meet both public and private goals. Dr. Collins concluded that because the Leonardo Academy had violated several provisions of the *ANSI Essential Requirements* for due process, ANSI should conduct a stringent investigation of the Academy to ensure the integrity of the ANSI development process [56].

In the letter dated October 3, 2008 from Mr. Army to Ms. Caldes, the Leonardo Academy responded to the request from the USDA/AMS to ANSI to remove the Academy from the process [57]. In that letter Mr. Army stated that the USDA/AMS request was "without foundation" and asked that the ANSI Executive Standards Council deny the request. In the document the Academy provided a point by point challenge to the USDA/AMS appeals. The Academy noted that after receiving applications for participation from over 200 stakeholders, the first meeting of the "diverse and experienced" members of the Standards Committee took place on September 25–26, 2008. Furthermore, these committee members who possess "immense expertise and a wide range of perspectives" are ready for the complex task of working together to develop a national standard for sustainable agriculture. They reached consensus on specific steps to move the process forward, in line with ANSI procedures. The letter also noted that the Academy had worked diligently to include USDA representatives in the process. This included USDA participation in public outreach meetings, conference calls, and Academy encouragement for USDA to participate on the Standards Development Committee, subcommittees, or as observers. While several USDA officials did submit applications to serve on the Standards Committee, these candidates withdrew their applications but five USDA representatives did participate as observers of the first Standards Committee meeting. Mr. Army concluded that the Leonardo Academy remained open to working with the USDA at any time [57].

On December 17, 2008 the USDA and the Leonardo Academy presented their cases to the ANSI Executive Standards Committee [58]. On January 13, 2009 the ANSI Executive Standards Committee denied the USDA/AMS appeal [59]. Although denying the appeal, the ANSI Executive Standards Committee noted that the USDA had raised a number of questions regarding the Leonardo Academy's practices and processes related to the standard development that should be addressed and corrected if necessary. In particular, ANSI warned the Academy against "dominance" in the standard-setting process by Scientific Certification Systems, the organization that sponsored the original draft based on its own organic certification program, and has provided substantial funding support for the

development of the final standard. After the ANSI decision was announced, an industry reporter commented, “USDA fails to derail ANSI sustainable agriculture standards” [58].

11. Field to Market: The Keystone Alliance for Sustainable Agriculture

In September 2006 the Keystone Center [60] brought together a diverse group of people representing different aspects of the agriculture and food supply chain to discuss the utility of defining and motivating more sustainable production and supporting the use of more sustainable measures. Growers, environmental organizations, commodity associations and major agribusiness companies were represented [62]. Building upon the assumption that continued agricultural intensification is required to meet growing food demand, the primary objectives of the effort are to (1) identify criteria for sustainable agriculture that are open to a diversity of technologies and (2) to support the implementation of production systems that lead to broad performance improvements against these criteria. The process is designed to focus on science-based outcomes that can be achieved through optimizing the “full range of agricultural technology choices” available to conventional agriculture to improve the “sustainability footprint” all along the supply chain [63]. The overall goal of the Field to Market project is to identify practices for increasing agriculture’s sustainability with a focus on results, and thereby meet the growing demand for food while at the same time improving environmental quality [61]. To accomplish this goal, all actors along the supply chain need to work together.

In January 2009 at the annual meeting of the American Farm Bureau Federation in San Antonio, Texas, the Keystone Center released the first report documenting some of the environmental indicators of sustainability for selected crops [64]. The report evaluated national-scale metrics for land use, water use, energy use, soil loss and climate impact for corn, soy, cotton, and wheat over the past 20 years. Findings indicate that production agriculture is becoming more efficient on all attributes. The methodology followed a peer-review process that included seventeen experts from universities, government, and other institutions. Future reports will evaluate other environmental variables, as well as socio-economic and health factors, in support of developing agreed upon metrics of sustainability. Industry observers note that the Keystone Center project has emerged as a rival to the Leonardo Academy/ANSI project [58,65].

12. Discussion and Analysis

Based on the data presented above, the issue of GMOs is a recurring theme in the contested definition of sustainability in U.S. agriculture. Compared to organics, the LISA and SARE programs were palatable to conventional agriculture as GMOs were not prohibited. Conventional agriculture and its allies tried to include GMOs as part of the definition of certified-organic, but public protest purged the BIG 3 from the NOP standards, thereby locking GMOs out of the lucrative organics market. The Leonardo Academy/ANSI national draft standard grounded in organic agriculture principles was challenged forcefully by the GMO industry, and allied U.S. government agencies. The Keystone Alliance project has emerged as an alternative to the Leonardo Academy/ANSI project, an alternative that supports the use of all available technologies to sustainably feed the world. The discussion and analysis section proceeds in two parts. The first part provides an overview of the development of

GMOs to better situate the U.S. case within trends in the global agrifood system. The second part applies a global agrifood governance analytical frame [10] to the events of the case.

12.1. Some Background on GMOs

The development and commercialization of GMOs is the fastest technological revolution that has ever occurred in agriculture [66]. GMO technology began in 1973 with the development of a recombinant DNA technique which enables foreign genes to be inserted into organisms [67]. The U.S. Supreme Court ruling in 1980 that allowed intellectual property rights for living organisms prompted rapid investment and growth of the industry. The first commercial GMO activity occurred in the U.S. with the production of canola, corn, cotton, soybeans, and tomatoes in the 1990s [68]. Chemical companies merged with agrifood (especially seed) and pharmaceutical firms, then relabeled themselves as life science companies to form a single integrated production process. Further mergers and acquisitions created an oligopolistic structure with a few dominant firms. In 2006, Monsanto accounted for more than 90% of global GMO acreage, followed by Syngenta, Bayer, and Dow/DuPont [69].

Although advocates of GMOs argue that it will soon be the dominant paradigm in agriculture, resistance to GMOs has substantially slowed its diffusion [66,68,70]. While aggregate global acreage has steadily increased at a rate of about 10 percent annually (from 114.3 Mha in 2007 to 125 Mha in 2008), in 2008 the geographic expansion was confined to 25 countries cultivating GMOs, with five countries (U.S. [62.5 Mha], Argentina [21.0 Mha], Brazil [15.8 Mha], India [7.6 Mha], and Canada [7.6 Mha]) dominating production. Similarly, the number of commercialized GMO crops has remained limited, with soybeans (53%), corn (30%), cotton (12%), and canola (5%) accounting for almost all of global production [71]. The vast majority of GMO crops are of two types: BT (*Bacillus thuringiensis*) crops (e.g., BT corn/BT cotton) with genetic coding for an insect toxin, and HR (herbicide resistant) with genetic coding for herbicide tolerance (e.g., Roundup Ready[®] soybeans) [72]. While other crops are being developed and produced (e.g., sugar beets, papaya, squash), the high cost of R&D and certification for each crop, combined with societal resistance to GMOs has limited the expansion of the technology into other crops.

Despite the initial success in the U.S., GMOs have encountered serious resistance in key markets and have been increasingly regulated around the world [66,70]. In general, opponents to GMOs point out the environmental, health, and community risks of GMOs, while supporters advance a frame that emphasizes economic efficiency, environmental sustainability, and food security [67,68,72,73]. Proponents view GMOs as the next in a long line of beneficial and safe agricultural technologies that can sustainably feed the world's growing population through intensive monoculture [70]. They frame GMOs as contributing to environmental sustainability through the more efficient use of resources such as reduced pesticide use, reduced water use, and increased yields. These eco-efficiencies lead to increased food security—feeding the world. GMO transnational corporations (TNCs) often use their industry associations such as the Council for Biotechnology Information, the Biotechnology Industry Organization, and CropLife International to advance their interests in public and private venues [68].

NGO-based opponents to GMOs invoke the precautionary principle as they frame GMOs as an insufficiently tested “frankenfood” technology with numerous environmental risks such as genetic

pollution and ecosystem degradation. GMOs support continued unsustainable, large-scale monocropping, instead of staple crops for local consumption [67]. Detractors argue that GMOs create a genetic treadmill of technological fixes to stay one step ahead of herbicide resistance [70]. Others note that GMO packages require expensive inputs that marginalize poor farmers who become dependent on the GMO cartel [74]. Many African countries fear that GMO contamination will compromise their exports targeted to Europe [75].

As a result of different political-economic contexts and social movement activities, GMOs are effectively banned for human food consumption in Europe, Japan, and South Korea [66,68,70,76]. Compared to more receptive consumers in the U.S. and Canada, consumers in these markets tend to view GMOs as a potential health risk. As a result, supermarkets in Europe and parts of Asia have voluntarily banned GMO products for sale in their stores. This decision reverberates upstream through the production chain and requires supplying companies and countries (in Africa and elsewhere) to practice careful supply chain management to maintain access to those consumer markets. While supermarkets took the initial lead in restricting GMO sales, governments in the key import markets of the EU, Japan, and South Korea have since placed stringent import regulations on GMOs, such as GMO labeling, as well as partial or total bans on GMO imports [66].

In another set back to the global diffusion of GMOs, in 2002 wheat farmers in the U.S. and Canada refused Monsanto's rollout of Roundup Ready[®] wheat out of fear of export market share loss in international markets (Europe, Japan, South Korea), the development of superweeds resistant to Roundup[®], and dependence on Monsanto's seeds. Similar concerns about being punished in export markets have been expressed by soybean farmers in China and rice farmers in India [66].

The GMO world is divided along a U.S./EU regulatory model. Unlike in Europe, the anti-GMO activists in the U.S. were unable to mobilize the public in support of GMO labeling [76]. Compared to GMO-accepting consumers in the U.S., European consumers embrace the precautionary principle, demanding greater government regulation and oversight of GMOs. Since 1998 the EU has not approved any new GMO products due to pressure from member countries not to do so until stringent labeling and traceability rules were enacted, which occurred in 2003 [77].

The contrasting outcomes for GMOs in Europe and the U.S. can be primarily attributed to the fact that the seed companies drive the commodity chain in the U.S., while the supermarkets do so in Europe [76]. Borrowing from Gereffi and Korzeniewisz [78], the U.S. has a producer driven GMO commodity chain in which the seed companies and allied upstream agribusiness TNCs in the U.S. have successfully avoided GMO labeling and do not fear the loss of customers. The EU has a buyer driven commodity chain where the supermarkets fear the loss of customer loyalty based on negative perceptions of GMOs. These commodity chains reach upstream into producing countries where the battles over GMO governance are reenacted [66,67,70,77,79].

In response to the GMO moratorium and closed markets in Europe, the U.S. (June 2003) and Canada (August 2003) filed trade dispute claims in the WTO arguing that the EU's precautionary-based evaluations of GMOs was an illegal trade barrier, in contrast to the U.S. science/risk-based evaluation. Even though the WTO ruled in favor of the U.S. in 2006, because of the strong position of supermarkets and consumers in the EU, it is unlikely that the regulations will change to accommodate the ruling [77].

Another indication of the global controversy over GMOs is the creation of the Cartagena Protocol on Biosafety in 2000. The Protocol is an international treaty to ensure that importing countries have the ability to conduct risk assessments on GMO imports and to impose precautionary import bans if necessary [80]. Following the precautionary approach, it governs the transboundary movement of GMOs and requires advance informed agreements for shipments of GMO seeds for planting, as well as notification to importers regarding commodities intended for food, feed, or processing that contain, or may contain, GMOs [81]. To date, 156 countries have signed on to the protocol [82]. Most of the major exporting countries, e.g., U.S., Argentina, and Canada, have not signed the Protocol. The Protocol has been described as an attempt to counter the hegemonic imposition of GMOs on the world by the U.S. [83]. The Cartagena Protocol is a tangible example of how the global agrifood system is split along GMO lines.

In summary, key features of the GMO sector include: oligopolistic dominance of a few firms, expanded acreage but limited countries and crops, significant consumer and non-GMO producer country resistance, emerging national and international governance mechanisms, and alignment along a U.S./EU axis. The opposition to the spread of GMOs is greater than any agricultural technology [84]. GMO TNCs have developed corporate strategies to counter this substantial opposition [68].

The term “sustainable agriculture” has been appropriated by both supporters and opponents of GMOs. In general, supporters proceed from a neo-liberal view based on eco-efficient, high-yield intensification designed to feed the world, while opponents support environmental management (precautionary) and community (people) perspectives [70]. Private and public governance mechanisms mediate the contested process of defining and creating standards for sustainable agriculture. This is where the case of the definition of sustainable agriculture in the U.S. enters the picture. Proceeding from the U.S./EU-structured global GMO commodity chains, and in the face of growing resistance and significant market closures, GMO advocates in the U.S. must make sure that any national sustainable agriculture standard include GMOs.

12.2. The Global Agrifood Governance Analytical Framework

The globalization of the agrifood system dominated by TNCs raises important questions about the power of TNCs to influence the rules and standards designed to govern their actions [10,85]. This ability has implications for the sustainability of the global agrifood system, as competing groups use their resources to advance their definitions of agricultural sustainability [10,70,86]. Global governance mechanisms emerged to perform the state function of mediating between TNC capital accumulation strategies and the social-movement resistance to these strategies in the form of legitimation crises.

Due to the contested nature of the concept of sustainability, the governance of the global agrifood system has become the site of heated debates over how best to organize an agrifood system that promotes sustainability. In recent years, TNCs’ attempts to influence these debates have increased, especially as related to public concerns about food safety and GMOs [66,68,70,77,86]. The contested framing of the discourse over GMOs and sustainability is on the leading edge of competing worldviews regarding agrifood governance [10]. As shown above, the world is divided regarding agrifood GMOs with heated battles within and between countries.

Because there has been little academic work that examines how TNCs intervene on their behalf to shape the system of agrifood governance in general, and sustainability in particular, there is a need for more comprehensive analyses on this topic [10,86]. This research on the contested development of sustainable agriculture initiatives and standards in the U.S. addresses this need.

Building upon the business literature that focuses on the political role of corporations in global governance, Clapp and Fuchs [10] provide a tri-partite power schema designed to investigate the “complex relationship between the exercise of power and the use of the concept of sustainability in governance of the global food system.” The schema delineates instrumental, structural, and discursive dimensions of corporate power. Instrumental power focuses on such practices as corporate lobbying or political campaign financing whereby the direct influence of one actor over another results in a change in outcomes. Instrumental power includes actor-specific financial, organizational, and/or human resources that provide privileged access to decision-makers [10].

While the instrumental view focuses on a direct form of power, the structuralist view highlights the broader ability of TNCs to set agendas and support proposals that limit the range of opposing actors’ choices. This ability is a function of their material position within states and the global agrifood system. This view of power examines the structuring of governance contexts before the actual bargaining begins; structuring that then allows alternative positions to be more or less acceptable. As globalization has advanced, corporate actors have increasingly used their control of resources and networks to support, implement, and enforce privately set rules and standards that are not developed in the public sphere. ISO standards and voluntary “corporate social responsibility” (CSR) standards are two examples of these privatized standards generated outside the purview of national governments. Structural forms of power affect the input side of regulation making; it allows TNCs to determine the focus and content of rules [10].

A discursive approach to power analyses focuses on how particular policy decisions are often the result of contests over the framing of policies, and the linking of such policies to societal norms and values. More specifically, TNCs play important roles in framing issues in the public discourse. TNCs can pursue this action indirectly by using industry trade associations or allies within the government to advance these frames. The discursive view of power highlights how TNCs might use media and public relations efforts to socialize politicians and the public into accepting as truth their views on policy issues [10].

12.3. Applying the Frame to the Case

The events of the case provide numerous opportunities to employ the global governance framework. This analysis proceeds following the general chronological outline of the presentation of the case. An example of instrumental power occurs in the lead up to LISA and SARE. As the ecological critique of conventional agriculture was building, evidence in support of alternative agriculture was suppressed by the Reagan administration, and the Organic Resources Coordinator position was abolished. In an example of discursive power, in response to the counter framing activities by the “formidable” critics of organics, the less-volatile term sustainable agriculture was adopted as the basis of LISA and SARE.

The USDA stalled the implementation of LISA (instrumental power), while at the same time conventional agriculture industry associations launched a media campaign to disparage LISA, framing

it as a low-yield/mass starvation program. As a result of the chemical industry critique of low-input, LISA was abandoned for SARE, which defined sustainable agriculture in a way that did not exclude any particular technology. Similarly, the LGU actions to limit LISA's implementation can be read as a combination of all three aspects of power: the actions to (1) limit the distribution of the call for proposals (instrumental), (2) criticize LISA using inappropriate comparisons (discursive), and inhibit NGO representation on ACs (structural).

At the program level, the LISA (and SARE) organizational structure based on TRC proposal review by LGU disciplinary scientists provided potential instrumental and structural power checks on the actions of the more broad-based AC. Some projects might be rejected outright as non-scientific (instrumental), while others might be supported in an attempt to influence the final funded portfolio (structural). Recall, that the early accommodation to the competing frames was to fund a mixture of component and systems projects. The focus on environmental aspects of sustainability to the neglect of socio-economic aspects can be interpreted similarly.

This accommodation is somewhat countered by regional administration of the program that allows variation. The evidence from the Southern Region shows that the AC has chosen to move away from component research and towards systems research (structural power). Additionally, the philosophy and structure of SARE regarding holistic research, honoring farmer knowledge, participatory research, and multi-disciplinary involvement advances a competing frame to the traditional expert-systems model of disciplinary, reductionist conventional agriculture (discursive).

The contested creation of the NOP provides valuable examples of all three forms of power. The fact that the organic standards first developed in California focused on input substitution instead of more costly agronomic practices can be interpreted as the outcome of the use of both discursive and structural power in favor of agricultural industries. The fact that the USDA delayed creating the organics standard for 12 years, ignored the "deep organic" recommendations of the National Organics Standards Board, and included the BIG 3 in the Proposed Rule, can be read as a failed attempt at instrumental power. The public outcry against the BIG 3 is a prime example of the framing contest surrounding organics. In the end, the Final Rule was successfully framed and structured by USDA based on allowable inputs and market label structure, as opposed to the agro-ecological processes and socio-economic dimensions of sustainable. The result is increased conventionalization and decreased sustainability of organics.. Finally, the lack of official government support for organics, including monies to subsidize the costs of transition, can be read as the result of the use instrumental power to limit the adoption and diffusion of organics.

The story of the Leonardo Academy/ANSI national standard for sustainable agriculture project also provides examples of all three forms of power. It is in this initiative that battle over GMOs comes to the fore as the crucial debate over the definition of sustainable agriculture. The attempt by Scientific Certification Systems to locate the DSTU firmly in organic principles, including worker and community dimensions, can be read as a pre-emptive strike (structural power) that would set the groundwork for the fully-developed standard. The framing contest that ensued, first led by the Biotechnology Association, as the lead for the major agricultural trade associations, and then followed by repeated challenges by government agencies (USDA, Commerce Department), questioned the Leonardo Academy's neutral facilitation on counts of technological biases, unscientific assumptions, and stakeholder exclusion and called for the termination of the project.

The Leonardo Academy responded that the DTSU was based on the widely-adopted precautionary principle, but was amenable to change based on actions of the standards committees, and contrary to the charge of exclusiveness, numerous opportunities had been extended for GMO supporters, both in government and industry, to be part of the standards development process. The framing contest escalated as the USDA and Commerce Department took their case directly to ANSI, asking that the Leonardo Academy be decertified. This is a good example of the attempted use of instrumental power as the GMO advocates used their allies in the government to mount a multi-pronged campaign to challenge the organics-grounding of the DTSU.

While ANSI decided against decertifying the Leonardo Academy, it did warn the Academy against any bias towards SCS and organics. As the industry reporter noted, USDA failed to derail the process, but at the same time, the GMO advocates were successful at restructuring the basis for the development of the national standard; the focus on organics was diminished, and GMOs could now be included. This outcome fits well with the concept of structural power.

At the same time the DTSU was under attack, GMO supporters had created their own venue for the creation of national standards for sustainable agriculture. The Keystone Alliance for Sustainable Agriculture proposed to use all available technologies to feed the world more sustainably, while at the same time being eco-efficient. As part of Keystone's framing activities, it pointed to its peer-reviewed, science-based outcomes approach that documented increased efficiency in the production of soybeans, corn, and cotton. The Keystone project is less open to public participation, making the exercise of structural power in setting the parameters of the standards creation process less contested. An examination of the trade associations, commodity groups, and GMO TNCs listed as members of the Keystone Alliance [62] supports the idea that it is the preferred model.

13. Conclusions: How Big is the Tent?

The case of the contested development of sustainable agriculture standards in the U.S. provides pertinent examples of how TNCs use power to shape the system of agrifood governance in general, and sustainability in particular [10,86]. The battles over the regulatory governance of sustainable agriculture in the U.S. began in the public sphere with LISA/SARE and the NOP, but now occur in private forums such as the Leonardo Academy/ANSI and Keystone Center projects, as well as the World Trade Organization. The data reveal that the GMO TNCs and their supporters supplement the rhetorical campaign to frame the issue in their favor with structural and instrumental actions to influence the outcome. These actions are resisted by GMO opponents. In summary, GMO TNC accumulation strategies create legitimation crises that are mediated by public (nation-state) and private governance entities.

This contest within the U.S. is linked to larger struggles over global governance of sustainable agriculture and GMOs. U.S. (GMO) and EU/ASIA (non-GMO) commodity chains structure a global agrifood system obsessed with supply chain management to prevent GMO contamination. The Cartagena Protocol has emerged as an attempt to regulate this process and thereby counter the hegemonic imposition of GMOs. In the U.S., the Leonardo Academy/ANSI and Keystone Center projects are examples of neoliberal forms of agrifood governance designed to operate outside the public venue of the nation-state. Although the U.S. government defined sustainable agriculture in 1990

with SARE, the creation of the national standard is occurring in a private venue. It will be interesting to see what impact the national standard has on the SARE definition.

Getting back to John Ikerd's comment at the 20th Anniversary SARE conference regarding the camel and the tent. Utilizing food security and eco-efficiency frames, GMO advocates worked persistently to get their camel into the sustainable agriculture tent. Advocates of sustainable agriculture countered with a precautionary frame focusing on the risks of GMOs. While the NOP explicitly bans GMOs, the regional focus and organizational structure of SARE implicitly limits support for GMOs, effectively keeping the camel out of those tents. Now, the Leonardo Academy/ANSI and Keystone Center projects are more welcoming to the camel.

This research shows that the camel has more than his nose in the sustainable agriculture tent. The case reveals the camel's name, his owners, where he lives in the U.S., and how his owners influence agrifood standards for sustainable agriculture. The name is Gene; Gene is owned by Monsanto mostly, but also Syngenta, Bayer, Dow/Dupont and a few friends that make up the GMO cartel. He lives in Washington, D.C. at the office of the Biotechnology Industry Association, is fed by the commodity associations (mostly soybean and corn), and spends a lot of time at the USDA and Commerce Departments. In the face of substantial resistance and closed global markets, Gene's owners and friends are working very hard to make sure he gets in the official U.S. sustainable agriculture tent.

The Leonardo Academy/ANSI project is the current front in the battle over GMOs in the U.S. The fact that the original draft standard grounded in organic principles has been successfully challenged is a victory for GMOs. Even if Gene fails to get in, the Keystone project is ready as the industry-favored venue to develop sustainable agriculture metrics and standards. The founding members in this tent include Gene's owners: Monsanto, Syngenta, Bayer Crop Science, Dupont, and CropLife International [62]. A victory in the U.S. can then be leveraged to secure similar standards around the world.

At the 20th Anniversary SARE conference, John Ikerd was not only worried about the camel, but also the size of the tent. He warned that the sustainable agriculture tent was not big enough for all of agriculture. How big is the tent? This question is at the center of the contested definition of sustainable agriculture, with the U.S. and EU representing different governance structures and worldviews of the GMO regime. This research reveals that because the concept of sustainability is deeply contested, agribusiness is able to exploit the ambiguity surrounding the definition of sustainable and exercise power in attempts to frame sustainable agriculture in their favor. Fred Buttel [72] remarked on conventional agriculture's considerable talent for sustaining the unsustainable; for example, GMOs are designed to sustain unsustainable large-scale monoculture. This research illustrates how GMO advocates used a variety of tactics to enlarge the tent to accommodate their definition of sustainable agriculture, a definition that, from Buttel's perspective, will sustain the unsustainable through the creation of a favorable U.S. national standard.

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