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SUSTAINABLE AGRICULTURE AND THE SOCIAL SCIENCES: GETTING BEYOND BEST MANAGEMENT PRACTICES AND INTO FOOD SYSTEMS*

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ABSTRACT

This paper introduces the special issue of *Southern Rural Sociology* and lays the groundwork for the rest of the papers. The genesis of this special issue flows from the efforts of the Southern Region Sustainable Agriculture Research and Education (S-SARE) program to bring more social science research into its portfolio of projects. Our concern is that by providing best management practices (Band-Aids) to a fundamentally unsustainable agricultural system, the sustainable agriculture movement (and SARE's granting program) favors the environmental component at the expense of economic and social "legs" of the sustainable stool. While focusing on the history and work of the SARE program, we provided a social science perspective on sustainable agriculture.

Introduction

One of the three main pillars of sustainable agriculture is the enhancement of the quality of life for farmers and rural communities. There are two distinct strands of research in sustainable agriculture. One looks at production issues (and to a lesser extent marketing issues) and examines best management practices (BMPs) using sustainable techniques (usually substituting on-farm inputs for off-farm uses of agricultural chemicals and pesticides). While this area of research (normally conducted by plant and animal scientists at Land Grant Universities [LGU]) is helpful in reducing the adverse environmental effects of conventional agriculture, it leaves in place the present agricultural system.

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The other strand of research explores the barriers and opportunities to transforming agriculture based on sustainable principles. It is this latter strand that this special issue of *Southern Rural Sociology* (*SRS)* addresses. Broadly, this type of work includes research related to: (1) the development of local/regional food systems that incorporate production, processing, and marketing; (2) the development of links between two or more different subsystems of the supply chain: production, processing, distribution, marketing, consumption; (3) the barriers and opportunities for the development of production and marketing cooperatives for alternative food products; and (4) similar topics that link issues of sustainable agriculture to community well-being. This *SRS* special issue flows from the efforts of the Southern Region Sustainable Agriculture Research and Education (S-SARE) program's efforts over the last few years to bring more social science research into the SARE portfolio of projects. We are concerned with the direction of sustainable agriculture research (both in the SARE program–regionally and nationwide–and in the sustainable agriculture movement overall) in providing best management practices (Band-Aids) to a fundamentally unsustainable system that needs to be reexamined.

This introductory paper begins with a brief description of the SARE Program, including its funding patterns, its relationship to quality of life issues, and recent initiatives by the Southern SARE program to encourage social science research on quality of life issues. The middle sections of the paper cover material that helps us understand how we have arrived at the present situation in sustainable agriculture whereby the environmental component is favored to the detriment of the economic and social "legs of the stool." Here we provide an overview of the crisis of modern agriculture that led to the emergence of sustainable agriculture initiatives. Next the history of the SARE program is presented, focusing on the example of Southern SARE. A social science perspective on sustainable agriculture is covered in the next section. The paper concludes with an outline of the contribution of the papers that follow in this special volume of *SRS*.

The SARE Program

SARE is a national grants program, but it is administered regionally to recognize the differences and diversity of American agriculture. The U.S. Department of Agriculture funds about $17 million per year through the four SARE regions (Northeast, North Central, Western, and Southern). Since its inception in 1988, SARE has funded more than 3,000 projects related to sustainable agriculture.

SARE is participatory. Farmers are involved in all facets of SARE as advisors, evaluators and cooperators, and in designing and conducting on-farm research. SARE is inclusive. This means that SARE addresses the needs of limited-resource farmers and farmers of small holdings who are often overlooked in traditional grants programs. Also, SARE encourages a systems-research approach based on ecosystem principles. Systems research is problem focused and takes into account the dynamic nature of agriculture: no part of a farm or agricultural enterprise exists in isolation.

SARE was authorized by Congress in the 1985 Farm Bill to promote research that expands knowledge about agricultural practices that are: economically viable, environmentally sound, and socially acceptable. This translates into agricultural that is good for the farm family, their natural resources, and their community. Local food systems are a big part of the sustainable agriculture movement. While officially built upon the three-legged stool of environmental stewardship, economic profitability, and social quality of life, sustainable agriculture programs, and research overall, and in the South in particular (see Tanaka and Bhavsar this issue), has focused on the environmental leg of the stool. Research and education on sustainable agriculture has centered on the introduction and adoption of BMPs designed to enhance environmental quality.

In the first 10 years of SARE the largest category of funded projects in the South was in crop production (17%), followed by pest management (15%), animal production (14%), and education (13%). As a comparison, at the ten-year point of the program, 18% of all nationally-funded projects were in animal production as well as pest management. Crop production made up 13% of the National SARE portfolio, and education and horticulture made up 10% each. Compared with the 10-year figure, the Southern Region invested in proportionately more crop production, education and economics/marketing projects than nationally, but less in the animal production and pest management areas.

For the period 1998-2002, more than 55% of funding went to environmental projects, followed by limited-resource farm projects. Between 2003 and 2006, 40% of the funded research and education projects were in the environmental area, followed by 29% in organics, 14% in marketing and economics, 10% in the limited-resource farm area and 5% in policy. While we laud the significant accomplishments of these efforts, we argue that for the development of truly sustainable agriculture there is a distinct and growing need to get beyond BMP-Band-Aid projects and into the economic and social arenas of sustainability.

Quality of Life Issues

Although most SARE-sponsored research has addressed the environment leg of the stool, two SARE objectives defined in the 1995 Farm Bill touched on the ways sustainable agriculture can address quality-of-life issues. The first was by enhancing the quality of life for farmers/ranchers and society as a whole, in part by increasing income and employment–especially profitable self-employment opportunities in agriculture and rural communities. Specifically, a major goal was to strengthen the family farm system of agriculture, a system characterized by small- and moderate-sized farms that are principally owner operated. The second way was by strengthening rural communities by creating economic conditions, including value-added products, that foster locally-owned business and employment opportunities.

Quality-of-life research can focus on individual families or an entire rural community or a combination of both. On an individual level, farmers often name reasons for farming that are not related to profit making. These include: living in open space; personal freedom; privacy; recreational opportunities; quality learning experiences for children; a nurturing atmosphere; opportunities for children to build self esteem; wholesome food for the farm family; a meaning and purpose to life that comes with caring for one's land; and, recognition/relationships within the community. Any research that aims to enhance such lifestyle characteristics would contribute to quality of life.

On a community level research can address structural changes in agriculture such as: economic concentration and increasing farm scale; issues regarding human and social capital; educational techniques for growers, consumers and agricultural agents; agriculturally linked rural economic development; family-based versus corporate farming structures; long-term farmer/consumer relationships; the dynamics of cooperatives; policy change that would reward the transition to sustainable agriculture; nuisance issues; farm/non-farm relationships, including urban sprawl conflicts; meeting the needs of niche populations (ethnic, youth, senior, poor or other) as consumers or growers.

The literature on quality-of-life issues in the rural social sciences can be grouped into two general areas: the Goldschmidt studies and social capital perspectives. The Goldschmidt studies proceed from Walter Goldschmidt's early studies in California on the relationship between the structure of agriculture and the quality of life in rural communities (see Goldschmidt 1978; Heffernan 2000; Lobao 1990). These critical studies often look at issues of large-scale versus family-farm systems and the relative power of the corporations versus the farmers related to market integration

and concentration. They conclude that a family-based system with a strong middle class generates a higher quality of life in rural communities than large-scale systems where a few large landowners hire farm workers. Similarly, with growing concentration in input and output markets combined with increases in contract farming, farmers find themselves marginalized in supply chains dominated by powerful agribusiness corporations.

The social capital perspective focuses on the variety of resources (capitals) within a community that enable it to address social change in a proactive way (see Coleman 1990; Flora and Flora 1993, 2004; Putnam 2000). From a social capital perspective, quality of life is enhanced when communities are characterized by trust, reciprocity, and networks that allow the members to work together to face social change and chart self-determined paths of development. For example, bridging social capital benefits from the diverse skills and knowledge of heterogeneous groups while bonding social capital provides a critical mass of support within a homogenous group that might allow strategic socio-political action toward a common goal.

Southern SARE Quality of Life Initiatives

In an attempt to address and rectify the documented imbalance in types of projects funded by SARE, in the most recent call for Research and Education proposals, the Southern SARE program encouraged social science projects that addressed possible quality-of-life issues in six focused areas:

1. Focus on research on the development of concepts related to civic agriculture. Civic agriculture can be defined as a locally-organized system of agriculture and food production characterized by networks of producers who are bound together and committed to sustainable agriculture principles. According to Lyson (2004), civic agriculture is embedded in the local community. Examples of civic agriculture include: farmers markets; direct marketing; community supported agriculture (CSA); community and school gardens linked to food banks and other efforts to provide food and nutrition information to low-income members of a community; local marketing systems; production networks; grower-controlled marketing cooperatives; agricultural districts around particular commodities; community kitchens; specialty produce and on-farm processors; and small-scale, off-farm, local processors;
2. Focus on the research on the development of local/regional food systems that incorporate production, processing, and marketing. Such projects might include

a focus on grass fed beef and/or pastured poultry production systems and their linkages to processing plants, local/regional grocery stores, or restaurants. Others may emphasize links involving organic produce, fruits, vegetables, grains, etc.;

3. Focus on research related to the development of linkages between two or more different subsystems of the supply chain such as production, processing, distribution, marketing, and consumption;
4. Focus on research related to the barriers and opportunities for the development of marketing cooperatives for alternative food products;
5. Focus on policy and program implementation issues, particularly as they affect small, limited-resource farmers and minority producers; and
6. Focus on community structure in relation to the structure and type of agricultural systems.

These focus areas were developed with an expressed agenda to encourage more research on local food systems. One important area that requires research, particularly social science research, is related to the long haul of food versus local food systems.

While many SARE grants directly address locally-grown food systems–they include more than 300 projects nationwide such as developing infrastructure for supplying college cafeterias with locally grown food or making it easier to purchase fresh local food with WIC vouchers or food stamps–most of these are in SARE's smaller Producer Grant and Community Innovation Grant areas, rather than the larger, systems oriented Research and Education program.

One such example comes from Kentucky. Partners for Family Farms is a nonprofit organization that started in Kentucky with a SARE grant to build relationships between producers, consumers and chefs. They produced food security workshops so people could meet each other in an educational setting. Chefs and farmers were paired at local farmers markets for cooking demonstrations. Not only did these events attract more customers, they also helped chefs learn about farmers' limitations and helped farmers learn what chefs need. Later, Partners for Family Farms joined with Heifer Project International to support pastured-poultry producers. Some project activities included developing a mobile small-livestock processing unit and working with state officials to get the unit and training approved so producers could legally sell on-farm processed poultry. Sometimes being able to add value to raw products can make the difference in whether a small farm makes a profit or goes out of business. In Kentucky the combined effect of

several Southern SARE projects facilitated state legislation that allows farmers to process crops into food items right in their home kitchens.

Two other examples are from Mississippi and North Carolina. Training in Value-Added Syrup Crops was an Alcorn State University project that used a portable Mill on Wheels to train sugar cane farmers to add value by making syrup. More than two million people attended demonstrations of syrup making at fairs and festivals, and 155 beginning and seasoned syrup processors were trained in value-added methods. Since 1999 value adding has quadrupled the price of Mississippi syrup. Gourmet pork raised in the wood lots and pastures of small farms was the subject of a project at North Carolina A&T State University. By the end of the project several producers were supplying pork through the Niman Ranch and directly to chefs along the eastern seaboard. Working with heirloom swine breeds for old-time flavor and tenderness; researchers continue to experiment with breeding and with diets such as persimmons, acorns and other natural forages to produce a unique pork product.

The final example is the Appalachian Sustainable Agriculture Project (ASAP). ASAP is a nonprofit organization in the mountains of Western North Carolina and the Southern Appalachians that supports farmers and rural communities by providing education, mentoring, promotion, and community and policy development. ASAP's goal is to create and expand regional community-based and integrated food systems that are locally owned and controlled, environmentally sound, economically viable and health promoting. ASAP's vision is a future food system throughout the mountains of North Carolina and the Southern Appalachians that provides a safe and nutritious food supply for all segments of society; produced, marketed and distributed in a way that enhances human and environmental health; and that adds economic and social value to rural and urban communities (ASAP 2008).

The Development and Crisis of Modern Agriculture [1]

Traditional agriculture was characterized by animal traction and diversified farming operations that included both crop and livestock components in a symbiotic and sustainable relationship. Crops provided food for the humans and feed for the animals and the animals provided food for the humans and fertilizer for the crops. The first agricultural revolution occurred in the late 1800s and early 1900s as

[1]These sections of the paper on the developments that led to the creation and current structure of SARE are informed and sourced primarily from the works of Patrick J. Madden, the first national director of the USDA/LISA/SARE program.

machine power replaced animals as the source of traction for plowing and harvesting. The second agricultural revolution occurred after World War II as synthetic fertilizers and pesticides replaced manure for fertilizers and crops rotations as pest prevention practices. The third agricultural revolution occurred in the 1950s and 1960s as hybrid seeds replaced the heritage or standard breeds. The fourth agricultural revolution began in the 1980s and continues today as biotechnology replaces nature as the focus of agricultural innovations. Round Up Ready soybeans, BT corn, and bovine growth hormone are among the recent biotechnological innovations developed by Monsanto and other agrochemical firms to move farming further from the field to the laboratory.

The structure of the modern agricultural system in the U.S. goes back to the mid-1800s. In 1862 both the United States Department of Agriculture (USDA) and the Land Grant University (LGU) system were created. The LGU system is a federally-subsidized program that supported the creation of an agricultural and mechanization university in each state. In 1887 the university experiment stations became the second leg of the LGU system and in 1914 the Cooperative Extension Service became the third leg. Modern agricultural innovations developed through research at the experiment stations were taught to the agriculture students at the LGU and also diffused to the farmers through the Cooperative Extension Service. The USDA coordinated this process at the national level. A fourth part of the system was the Homestead Act of 1862 that granted new immigrants and other settlers title to 160 acres of land if they would erect structures and farm the land. This system of modern agriculture provided low-cost food for the industrial workers in the cities, as well as agricultural commodities for exports.

The research conducted at the experiment stations was often divided along narrow disciplinary lines such as crop science, animal science, plant pathology, agricultural economics, and farm management. This "reductionist" approach to research assumed that farming systems could be studied scientifically by reducing them to the component parts. Discoveries and innovations gathered through this form of research were then "extended" to innovative farmers through the Cooperative Extension Service. The "adoption ladder" became standard protocol with its hierarchy of innovators, early adopters, late adopters, and laggards. This system was characterized by a "top-down" technology-delivery system whereby the agricultural scientists and extension agents were the experts and the farmers were expected to adopt the innovations automatically. Finally, the reductionist approach to science based on narrow disciplinary research supported the development of specialization and monoculture at the farm level. As a result, the traditional,

diversified crop/livestock farms declined in numbers and were replaced by specialized animal and row crop operations that concentrated on just a few agricultural commodities.

Today's sustainable agriculture policies and programs in the U.S. are a derivative of the concerns over soil loss in the 1930s. The "Dust Bowl" highlighted the fragile nature of the soil and illustrated the negative environmental and socioeconomic effects that modern plow-based agriculture could bring to fragile ecosystems and rural communities. In the 1950s the Soil Conservation Service was created to support farming practices that were less harmful to the soil and limited soil erosion into waterways. In the 1960s Rachel Carson's book *Silent Spring* (1962) exposed the complex web of negative externalities associated with chemical use in industrial agriculture. Carson showed how the increasing reliance on synthetic pesticides was linked to the demise of raptor birds due to decreased eggshell thickness. Her book provided the first definitive evidence of ecological damage of pesticides and thereby challenged the dominant belief that pesticides were harmless to the environment (Madden 1998a).

Pesticide resistance quickly became a problem requiring new and stronger chemicals. Stories of "bionic" bugs became common in the popular press. Once-trusted pesticides such as DDT were banned, casting doubt on the reliability of science to verify the safety of agricultural chemicals. Similarly, pesticide poisoning of farm workers highlighted other human health problems with chemical-intensive agriculture. Documentation of agricultural chemical contamination of water supplies and the emergence of "dead zones" in the Gulf of Mexico also drew attention to the negative externalities of modern agriculture.

During the 1980s the "farm/debt crisis" exposed the vulnerability of family farm agriculture to global economic changes. At this time numerous mergers and acquisitions in the agri-food sector supported the rise of large global agribusiness corporations and left farmers buying and selling in concentrated agricultural markets. The expansion of large-scale confined animal feeding operations as the dominant model of animal agriculture resulted in environmental degradation, community disruption, and animal welfare concerns. Most recently, the epidemic of obesity in the U.S. has brought increased attention to the relationship between the structure of the modern food system and the quality of food it produces. Finally, the emergence of biotechnology has spawned resistance movements that warn that "frankenfoods" and "animal cloning" are unacceptable methods of food production with unknown consequences for human and animal health (see Magdoff, Foster, and Buttel 2000).

The Emergence of Sustainable Agriculture

During this time there was a growing environmental movement in the U.S. that attracted increased attention as people became more concerned about the health effects of chemical contaminants overall, and also in the food system. The first Earth Day in 1970 highlighted these growing concerns. As the evidence documenting the negative impacts of industrial agriculture on the environment, farmers, and farm communities mounted, government resources were allocated to address the issue. In 1970 the United States Environmental Protection Agency (EPA) was created in response to citizens' growing demands to be protected from air and water pollution. The EPA was an extension of the conservation movement of the early 20th Century. With the creation of the EPA, the government's role changed from being a "conserver" to a "protector." EPA policies included stricter regulations regarding agricultural chemical use (Madden 1998a).

Several reports published in the 1980s documented the negative impacts of modern agriculture and suggested increased support for alternative and/or organic agriculture. The USDA *Report and Recommendations on Organic Farming* (1980) analyzed 69 organic farms in 23 states and provided scientific evidence of yields, net returns, and other performance indicators. It included recommendations regarding research, education, and public policy 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. In 1989 the book *Alternative Agriculture* (NRC 1989) by the National Academy of Sciences summarized the disciplinary scientific knowledge regarding alternative/organic agriculture including: tillage, biological insect control, legumes as source of nitrogen, etc. Based on 14 holistic case studies, it highlighted the inadequacy of reductionist knowledge in understanding the functioning of ecological farming systems and disproved the idea that sustainable agriculture equals low yields and low incomes. In 1990 the United States Government Accounting Office released the report *Alternative Agriculture* (USGAO 1990) that documented the health hazards of farmer exposure to agrochemical related to production and consumer exposure to chemical residues in food. It also reported the economic risks due to farmer dependence on chemicals and the non-point pollution due to soil sediments and fertilizers. The report concluded that there is a need for alternatives to ensure both long-term environmental quality and farm profitability.

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 of organic agriculture warned that it was not profitable and that it could not feed the world's growing population. To avoid some of these formidable criticisms, 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 (Madden 1998a).

The First Legislation: LISA (Low Input Sustainable Agriculture)

Thanks to extensive lobbying by the Rodale Institute and other influential advocates of alternative agriculture, the 1985 Food Security Act included provisions for a government program to support the development of sustainable agriculture. In 1988 the Low-Input Sustainable Agriculture Program (LISA) was created in the USDA. LISA was modeled after SAREP – the California Sustainable Agriculture and Research Education Program. In its first year LISA awarded $3.9 million in competitive grants programs to sponsor research and education designed to enhance the productivity and profitability of ecologically-sound agricultural production systems through practices such as integrated pest management (IPM) and best management practices (BMP). The expressed goal of LISA was to develop and promote widespread adoption of more sustainable farming and ranching 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 (Madden 1998a).

The organizational structure of LISA was created to accommodate regional variations in agricultural patterns, practices, and research needs. The structure included a national director who convened an ad hoc advisory committee of USDA personnel from the four national regions. This group then selected host institutions in each region and appointed a regional coordinator. Within each region an Administrative Council (AC) set the program goals and oversaw the grants program and the Technical Review Committee (TRC) reviewed the grant proposals for scientific merit. The AC was to consist of a broad representation of farmers, agricultural scientists, agribusiness representatives, and non-governmental organization (NGO) representatives (Madden 1998a; 1998c).

It was clear from the beginning of LISA that Congress expected it to approach agricultural research from a non-conventional perspective and not replicate the existing USDA programs. LISA was expected to be a science-based grass-roots, problem-solving program with major involvement of farmers and nonprofit groups, as well as LGUs, in the management. 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 (Madden 1998a).

Resistance to LISA and Sustainable Agriculture

Sustainable agriculture overall and LISA in particular quickly attracted criticism from the advocates of conventional agriculture. To begin with, although Congress authorized the development of LISA program in 1985, the USDA did not provide funds for the program until 1988, and only then when Congress demanded that funding be provided. The agrochemical company representatives argued that low-input meant low yield, low income, mass starvation, and the destruction of agricultural industries. The Fertilizer Institute criticized LISA and the USDA for advocating one farming system over another with no facts to back up the support. It argued that LISA was an unfounded indictment of the agricultural input sector and a blatant insult to the American farmer. Through farm newspapers and magazines, the chemical industry mounted a campaign to ridicule and discredit LISA through a barrage of anti-LISA articles and editorials (Madden 1998b).

Resistance to LISA also came from several LGUs that wanted to control the new program. They saw LISA as critical of their long-standing support for conventional (chemical-intensive) agriculture. Some LGUs also wanted to take credit for any success generated by the LISA program. Sometimes, LGU administrators did not distribute the LISA call for proposals to their research scientists. Often the LGUs criticized LISA and sustainable agriculture based on inappropriate comparisons of fields with no agronomic treatments with fields with fertilizer and pesticide treatments. There were also LGU efforts to inhibit non-governmental organization (NGO) representation on regional LISA administrative councils. The NGO representatives were often selected from the regional sustainable and/or organic agriculture organizations that were critical of conventional agriculture (Madden1998b; Madden 1998c).

The Tension between the "Reductionist" and "Holistic" Research Approaches

From the beginning of the LISA program there was a structural tension between the technical review committee (TRC) and the stakeholders (Administrative Council) regarding the kinds of grants funded. The TRC was made up of LGU disciplinary scientists trained in reductionist science grounded in

replicable experimental designs dealing with narrow agricultural components. The AC had broader representation including, sustainable farmers and NGO representatives, but was dependent on TRC reviews biased to reductionist science. Additionally, the AC was mandated by Congress to be holistic and not "business as usual." The solution was to fund a mixture of "component research" and "whole farm/integrated systems research" (Madden 1998c).

Holistic and systems research requires much greater involvement of farmers and ranchers. It functionally integrates the findings of many research studies with direct farmer experience into a whole-farm managerial system. It also explores and documents synergistic and conflicting relationships between various aspects of the farming operation, including crop/livestock systems. Finally, it includes an educational component to transfer practical information to farmers effectively, especially family-owned and operated farms (Madden 1998b).

From LISA to SARE

In the first year of the LISA competitive grants program 371 proposals were submitted from the four regions; 130 were rated as appropriate by the TRC, and 49 proposals funded by the AC. More projects would have been funded, but the budget was limited. In its evaluation of LISA's first year, Congress noted that it was impressed with the extent of farmer involvement, the diversity of types of funded projects, and the lack of standard or "business as usual" projects. Congress increased LISA's funding by 14% the following year (Madden 1998b).

The Food, Agriculture, Conservation and Trade (FACT) Act of 1990 changed the name of the program from LISA to SARE, the USDA Sustainable Agriculture Research and Education Program. In the same year, and because of the perceived environmental benefits of LISA-type projects, the EPA created the ACE (Agriculture in Concert with the Environment) Program. From 1992 through 2001 SARE and ACE funded projects jointly with SARE administration. A total of more than three thousand projects has been funded since 1988 and the budget has increased from the original level of $3.9M in 1988 to $17M in 2008. Budget monies for SARE are divided in Chapter 1 and Chapter 3 accounts; both are competitive grants programs. Chapter 1 monies, began in 1988, are designated as the Research and Education Program and are designed to support systems research and education to develop a sustainable agricultural system. Chapter 3 funding, began in 1994, is the Professional Development Program grants designed to support "train the trainer" projects with the goal to diffuse the sustainable agriculture innovations/practices from farmers to agricultural educators (Madden 1998b). See

Table 1 for an overview of the changes in funding levels for Chapter 1 and 3 programs from 1988 to 2006.

TABLE 1. OVERVIEW OF LISA/SARE FUNDING FOR CHAPTER 1 AND CHAPTER 3 PROGRAMS: 1988-2006 (IN MILLIONS US$)

YEAR	CHAPTER 1 FUNDS	CHAPTER 3 FUNDS	TOTAL FUNDS
1988.	3.90		3.90
1991.	6.74		6.74
1994.	7.40	2.97	10.37
1997.	8.00	3.31	11.31
2002.	12.50	4.75	17.25
2006.	12.28	4.03	16.31

Source: Auburn 2006.

The Current SARE System of Sustainable Agriculture

The SARE program is divided into four regions: Northeast, North Central, Southern, and Western. As noted above, the SARE program in each region is made up of a Technical Review Committee, the Administrative Council, and the SARE regional coordinator and staff. Scientists on the TRC evaluate the scientific merit of the proposed projects, and the AC identifies the research priorities for the regions, creates the call for proposals, arranges for the review of the proposals, and awards the grants. The AC is made up of federal and state government agency personnel, LGU representatives, NGO representatives, an agribusiness representative, farmers and ranchers, and a quality of life representative.

The two main SARE programs are the Research and Education (R&E) Program and the Professional Development Program (PDP). Both programs require farmer/rancher involvement in the creation, implementation, and dissemination phases of the projects. SARE acknowledges that often it is the farmers and ranchers who are the experts on production methods for their areas. The R&E program provides grant funds for research related to (1) ecological sound production practices with a focus on whole-farm system research, (2) economically viable alternative product development and marketing, and (3) innovative social organizational forms of agriculture such as farmers markets and community supported agriculture that enhance the quality of life in rural communities. The PDP Program provides funding for "train the trainer programs" where innovative farmers train agricultural educations in the techniques of sustainable agriculture. In the PDP Program, the sustainable agriculture farmers and ranchers are the experts and the agricultural educators are the students.

As opposed to the expert model and "top down" technology delivery system associated with the traditional Cooperative Extension Service system developed at the LGUs, the SARE system is built on a participatory research model that honors the indigenous knowledge of farmers and ranchers. Farmers are involved in all facets of SARE as advisors, evaluators and cooperators, as well as designing and conducting on-farm research and serving on the AC. SARE is inclusive as it addresses the needs of limited-resource farmers and farmers of small holdings, who are often overlooked in traditional grants programs.

Finally, the SARE model views farming from a whole-systems approach as compared with the reductionist view of traditional agricultural disciplines. SARE strongly encourages multi-disciplinary and multi-institution research that generates results to enhance environmental quality, economic profitability, and social quality of life. The SARE systems-research method is problem-focused and takes into account the complex and dynamic nature of agriculture (Rowland 2006).

The Example of the Southern SARE

The Southern SARE is made up of 13 states (Texas, Louisiana, Arkansas, Mississippi, North Carolina, South Carolina, Alabama, Florida, Tennessee, Kentucky, Virginia, Georgia, and Oklahoma) and Puerto Rico and the U.S. Virgin Islands (Rowland 2006). There are two sustainable agriculture coordinators in each state: one at the 1862 LGU and one at the 1890 LGU (the 1890 LGUs are the historically black colleges created in the U. S. in 1890 to serve the needs of African Americans). These coordinators develop programs and organize sustainable agriculture activities in each state. The Southern SARE has two host institutions: Ft. Valley State University in Georgia is the 1890 LGU and the University of Georgia is the 1862 LGU. The AC is made up of seven farmers, three NGO representatives, one quality of life representative, one agribusiness representative, four university representatives, one state agriculture department representative, and five federal agriculture agency representatives. The TRC is selected and organized by the Southern SARE regional coordinator.

Six grant programs are administered by the Southern SARE (Rowland 2006). The *R&E Grants* are systems-oriented, interdisciplinary, projects with farmer cooperators at every stage. They can be from 1-3 years in length and are funded up to $300K. The "train the trainer" *PDP Grants* can be funded from 1-2 years in length and up to $150K. *Graduate Student Grants* are for researchers working on a masters or doctorate in sustainable agriculture. Up to $10,000 per project is awarded directly to the university to cover project expenses such as supplies

including software, equipment for field or laboratory, special text books not readily available, and travel related to the project.

The *Producer Grants* take advantage of producers' experience and knowledge. The projects are designed and conducted by producers and are funded for up to $10,000 for individuals or $15,000 for a group of producers doing the research as a team. The *On-Farm Research Grants* allows up to $15,000 for extension agents and other agricultural professionals who work with producers to conduct their own research using cooperators' farms. The project must include at least one producer cooperator. The *Sustainable Community Innovation Grants* (SCI) are for individuals or organizations to conduct activities that link the farm to non-farm parts of a community for the benefit of both, particularly for economic development. These grants are administered jointly by Southern SARE and the Southern Rural Development Center. With a project maximum of $10,000, SCI grants have been used to start farmers markets, survey consumers about producer buying habits, provide education about local foods, produce agri-tourism map of area farms, launch a local food festival, and start community kitchens.

SARE also has a publishing house called the Sustainable Agriculture Network (SAN). The SAN offers a variety of full color bulletins, manuals, and books on specific sustainable agricultural topics. They are all listed on the web site (www.sare.org). The Southern Region SARE's newsletter *Common Ground*, published twice a year, keeps readers up to date on current projects and calls for proposals. The Southern SARE Annual Index of projects has phone number and email contacts for every current Southern Region project. Summaries of all SARE projects ever funded are available from the SARE national (www.sare.org) and regional (www.southernsare.org) web sites.

A Social Science Perspective and Sustainable Agriculture

German sociologist Ulrich Beck (1992) gives us the term "reflexive modernization" that can help us interpret the phenomenon of the crisis of modern agriculture and the advent of sustainable agriculture. With reflexive modernization, Beck argues that while science has employed technology to improve the quality of life for humans, there have also been numerous instances where the negative effects of certain scientific innovations have outweighed the positive effects. Beck uses the dangerous externalities of nuclear power to illustrate his point, but he also points to modern, chemical-intensive agriculture as another example. He argues that the modernist blind trust in science, here in better agriculture through chemicals and biotechnology, has produced an agricultural system that is neither good for the

environment nor the people. Still, with reflexive modernization we can think back on our agri-food system and change it to be less damaging and more sustainable. We can embrace an alternative and sustainable system more in harmony with the environment than focused on conquering the environment. We can create an agri-food system based on moderate-scale diversified farming operations that nurture community instead of systematically depopulate rural communities.

How can this discussion of sustainable agriculture be related to reflexive modernization? First, the bottom up approach in sustainable agriculture versus top down focus of scientific investigation in modern agriculture is one example. Second, the fact that sustainable agriculture honors farmer knowledge versus just expert knowledge is another. Third, the fact that participatory methods rather than laboratory methods alone are often used in sustainable agriculture is yet another example. Next, the holistic approach versus reductionist approach and the whole farms systems versus monoculture orientation of sustainable agriculture all resonate with reflexive modernization. Finally, the fact that the ideal form of sustainable agriculture addresses quality of life issues through its three-point focus on environmental, economic, and social factors broadens the traditional reductionist approach to include producer and community well-being.

In the U.S. rural sociologist Thomas Lyson (2004) gives us the term "Civic Agriculture" that can also help us see the future of sustainable agriculture (see also DeLind 2002). Civic Agriculture is an agriculture embedded in community. It is made up of local food systems such as farmers markets, community supported agriculture, and "farm to table" programs. It encourages direct marketing of food products. Civic Agriculture can help increase local and regional food security, decrease "food miles," and avoid dependence on the global food system. Lyson concludes that Civic Agriculture is the next logical step in the movement to a sustainable agri-food system. Civic Agriculture attempts to avoid the negative consequences of the structural constraints on qualify of life pointed out by the Goldschmidt perspective by supporting smaller-scale operations participating in direct markets while it simultaneously creates and draws on social capital developed through face-to-face relationships between producers and consumers.

Conclusions: From the Physical Sciences to the Social Sciences

In the U.S. sustainable agriculture has a three-part definition. First, it is environmentally sound as it protects the farm environment and natural resources. Second, it is economically viable as it provides more profitable farm income. Third, it is socially acceptable as it promotes stable, prosperous rural communities.

Historically, most sustainable agriculture and SARE research has focused on the production and environmental issues generating a "Band-Aid" approach with best management practices as the prescription. This pattern emerged not only because of the disciplinary aspects of the agricultural sciences, but also because of the politically controversial nature of sustainable agriculture; it called into question the sustainability of the dominant system.

From the beginning, sustainable agriculture faced substantial opposition from the vested interests of the dominant system. The organic agriculture developed in California was the basis of sustainable agriculture, but the word "organic" was too controversial; "sustainable" was more palatable, easier to sell. In 1990 LISA was replaced by SARE; "low input" was not popular with the inputs industries. SARE is less threatening than LISA, which is less threatening than organics. Within sustainable, the environment remained the focus to the detriment of economic and social concerns. SARE's focus on environmental issues and neglect of social and economic equity issues (i.e., farm structure and migrant labor) keep it in relatively safe political territory. For these reasons SARE has been seen as only mildly reformist and hobbled as a driver of substantive social change (see Allen 2004).
We need to remember that sustainable agriculture is more importantly based on relationships between people. More research is needed in the social science arena of sustainable agriculture. For example, we need more alternative marketing studies, more producer and marketing cooperatives research, and more studies on the barriers and opportunities to the development of local and regional food systems. These kinds of reflexive efforts can expand the sustainable dimension of sustainable agriculture from the environmental arena into the economic and social arenas.

The Papers in the Special Volume

The objective of this special volume of *Southern Rural Sociology* on Sustainable Agriculture and Quality of Life in Rural Communities is to produce a series of papers that help us to move beyond the BMP approach to sustainable agriculture. In this edition are ten papers that address sustainable agriculture and quality of life issues from social science viewpoints. Following this paper, Tanaka and Bhavsar continue this introductory section of the journal by further examining the role of S-SARE in enhancing the quality of life in rural communities. The authors analyze the S-SARE funded projects that used "quality-of-life measures" in their research. Tanaka and Bhavsar explain how a funding agency can play a key role in making scientific knowledge and policy. The authors note that their analysis of S-SARE

funding patterns finds that quality-of-life issues have not been fully integrated into systems-oriented sustainable agricultural research. They report that only 11 of 174 S-SARE funded projects explicitly address the quality of community life. Tanaka and Bhavsar conclude with suggestions on how social scientists can increase their contribution to sustainable agriculture.

The second section of the issue includes four papers that examine various aspects of local food systems, from farmers market to community supported agriculture (CSAs). Gasteyer, Hultine, Cooperband and Curry combine a community capitals framework with convention theory to examine the community characteristics that can create successful farmers' markets. Using surveys and case studies, the authors link the success of farmers markets to understanding the current shopping behavior of consumers. One interesting note here is that while urban areas seem able to sustain successful local *farmers markets*, rural areas can probably produce successful *local food systems* better.

McIlvaine-Newsad, Merrett, Maakstad and McLaughlin use a case study of a rural Midwestern farming community to examine how direct marketing strategies such as CSAs may offer a "slow food" alternative to the "fast foods" resulting from the conventional agricultural system. Brehm and Eisenhauer also examine the CSA movement from a community attachment and social capital perspective. Their paper identifies the perceived benefits of CSA involvement and the effects of CSAs on community social capital. Although community social capital is not considered a reason for people to either join a CSA nor an important benefit of membership, the authors suggest that increased community attachment can result from CSA involvement.

The final paper in this section, by Andreatta, Rhyne and Dery examines the CSA issue from the perspective of low-income and food insecure households. While CSAs are often dismissed as elitist, Andreatta et al. report on lessons learned from a project whose intention was to connect small-scale farmers with low-income households in central North Carolina. This paper tells a fascinating story of the development of a social food network to include the poor and hungry. Through funds provided by the North Carolina Department of Agriculture Food Policy Council, CSA farmers were paid for shares that were then distributed to low-income households. Although the CSA arrangement did not end food insecurity, that was not expected from the beginning. This paper is an example of how social scientists can both use their expertise to produce research results as well as provide assistance to communities and individuals.

The next set of papers more explicitly explores the policy arena. Kleiner and Green, focusing on minority and limited resource farmers, explore policies that expand access to agricultural markets and create incentives for sustainable production. The paper uses a community-based research framework, building on various participatory approaches to address quality of life issues. This includes involving people at the grassroots levels in collecting and analyzing data to inform policy changes. Through focus groups, Kleiner and Green highlight challenges that minority and limited-resource farmers face in dealing with market regulations, as well as problems of access to capital, technical information and marketing education.

Food safety regulation in the specialty red meat sector is the focus of a paper by Worosz, Knight, Harris and Conner. The authors highlight an important problem facing farmers trying to take advantage of niche marketing opportunities: accumulated regulations that create barriers to entry for small producers. The paper uses Michigan as a case study to explore whether or not food safety policy restricts producers' ability to engage in the alternative red meat sector. Worosz et al. note that rules governing the safety of red meat are rooted in the larger conventional system that both eliminate barriers for large-scale producers and processors while erecting barriers for small farmers.

The third policy paper by Constance, Choi and Lyke-Ho-Gland looks at certified and non-certified organic farming in Texas. The authors are particularly interested in determining whether organic producers in Texas have taken on the characteristics of mainstream industrial agriculture and have adopted a dual-structure of small and large producers. This paper goes to the heart of the issues that are of concern in this *SRS* volume—does sustainable agriculture simply make conventional agriculture less environmentally damaging or does it represent a systemic change in how food is produced and marketed? In many ways Constance, Choi and Lyke-Ho-Gland cast doubt on the transformative ability of sustainable agriculture to alter industrial agriculture. The paper is particularly interested in whether national certified organic labeling has contributed to the conventionalization and bifurcation of Texas organic farming by comparing "certified" and "non-certified" organic producers. The paper provides mixed support for the conventionalization theses.

The final paper in this volume provides an overall theoretical context to all the papers presented. Each paper in this volume in some manner use Goldschmidt's findings on the dilemma of scale. The paper by Parker extends this discussion to civic agriculture. Using conservation as an indicator of quality of life, Parker

examines the relationships among the structural and social variables of farm size, enterprise type and intergenerational farm success to determine their influence on land tenure.

Taken together, the papers in this volume represent a first attempt to more clearly connect sustainable agriculture with the quality of life in rural communities. Our purpose for this special volume is to focus on how we can move sustainable agriculture from its foundation "in the soil" to its impacts on people and communities. In the end, it is through social science research that we ultimately can judge whether sustainable agriculture represents a systemic change in the present system or is only a (needed) Band-Aid.

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Not only is the agricultural sector expected to produce adequate food, fiber, and feed, and contribute to biofuels to meet the needs of a rising global population, it is expected to do so under increasingly scarce natural resources and climate change. Growing awareness of the unintended impacts associated with some agricultural production practices has led to heightened societal expectations for improved environmental, community, labor, and animal welfare standards in agriculture.Â It also explores how those lessons learned could be applied to agriculture in different regional and international settings, with an emphasis on sub-Saharan Africa.Â National Research Council. 2010. Toward Sustainable Agricultural Systems in the 21st Century. Sustainable agriculture is farming in sustainable ways, which means meeting society's present food and textile needs, without compromising the ability for current or future generations to meet their needs. It can be based on an understanding of ecosystem services. There are many methods to increase the sustainability of agriculture. When developing agriculture within sustainable food systems, it is important to develop flexible business process and farming practices.