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Sustaining Agriculture: An Examination of Current Legislation Promoting Sustainable Agriculture as an Alternative to Conventional Farming Practices

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I. Introduction

Agriculture is the single largest contributor to the water pollution problem in the United States.[1] Each year, billions of tons of soil carrying pesticides, manure, and other chemicals erode from agricultural land and between twenty-five and forty percent of this soil is likely to reach the nation's waterways each year.[2] Agricultural degradation of the environment extends beyond water pollution into habitat loss and degradation, air pollution, and soil erosion.[3] The clearest evidence of the intense effect agriculture has on the environment is an area the size of New Jersey in the Gulf of Mexico at the foot of the Mississippi River called the "hypoxic" zone.[4] Every year the "hypoxic" zone becomes depleted of oxygen, a result of the heavy flow of agricultural runoff carrying nitrogen and other nutrients down the Mississippi River.[5]

1. Clinton Administration Clean Water Action Plan (February 1998) [hereinafter Clean Water Action Plan] (stating that the "[l]eading causes of water quality impairments reported by states include siltation, nutrients, bacteria, oxygen-depleting substances, metals, habitat alteration, pesticides, and organic toxic chemicals. The majority of this pollution results from polluted runoff. Nationally, agriculture is the most extensive source of water pollution, affecting seventy percent of impaired rivers and streams and forty-nine percent of impaired lake acres), *available at* http://cleanwater.gov/action/toc.html (last visited Jan. 23, 2004).

2. John H. Davidson, *The Federal Farm Bill and the Environment*, NATURAL RESOURCES AND ENVIRONMENT, Summer 2003, at 3.

3. J.B. Ruhl, *Farms, Their Environmental Harms, and Environmental Law*, 27 ECOLOGY L.Q. 263, 263 (2000).

4. Davidson, *supra* note 2, at 3 (stating "[p]erhaps the most dramatic physical evidence of this intense agricultural activity is the development of a large "hypoxic" zone in the Gulf of Mexico. An area of the Gulf sometimes equal in size to New Jersey becomes depleted of oxygen every year because of the heavy flow of nitrogen and other nutrients down the Mississippi River. The Gulf's so-called dead zone can only be corrected, according to some government reports, by reducing fertilizer use by twenty percent and restoring five million acres of wetlands").

5. *Id.*

Currently, there is no widely accepted solution to the negative effects current agricultural systems have on the environment.

Increasingly, society is recognizing the adverse effects of conventional agricultural methods on the environment.[6] As concerns for the effects of conventional agricultural practices on the environment increase, sustainable agriculture has emerged as a possible solution. Sustainable agriculture is concerned with lessening the impact of farming on the environment while maintaining or increasing the profitability of farming.

States throughout the country currently fund research into developing sustainable agriculture practices for large-scale use as alternatives to environmentally harmful conventional agriculture practices.[7] In addition, the federal government funds similar research, while working with states, to implement programs that educate the farming community about the prospects of sustainable agriculture.[8]

Many commentators feel that the development of sustainable agricultural practices is the best remedy for the farming industry's poor environmental record.[9] These commentators feel that once sustainable farming practices have been demonstrated as environmentally and

6. James Stephen Carpenter, *Farm Chemicals, Soil Erosion, and Sustainable Agriculture*, 13 STAN. ENVIRON. L.J. 190, 191 (1994).

7. State legislation relating to sustainable agriculture focuses heavily on funding research into the development of sustainable practices and providing grants to farmers practicing sustainable agriculture. *See e.g.*, WASH. REV. CODE ANN. § 15.92.010 (2004), VT. STAT. ANN. tit. 6, § 4701 (2004), MONT. CODE ANN. § 20-25-233 (2004), MASS. GEN. LAWS CH. 29 § 2III (2004), MINN. STAT. ANN. § 17.114 (2004), ME. REV. STAT. ANN. tit. 7 § 241 (2004), KAN. STAT. ANN. § 76-4, 103 (2004), 505 ILL. COMP. STAT. 135/1 (2004), CAL. FOOD & AGRIC. CODE § 550 (2004), 3 PA. CONS. STAT. ANN. § 2101 (2004), IA. CODE ANN. § 266.39B (2004).

8. *See* 7 U.S.C. § 5801 (2000) ("[i]t is the purpose of this subchapter to encourage research designed to increase our knowledge concerning agricultural production systems that (1) maintain and enhance the quality and productivity of the soil; (2) conserve soil, water, energy, natural resources, and fish and wildlife habitat; (3) maintain and enhance the quality of surface and ground water; (4) protect the health and safety of persons involved in the food and farm system; (5) promote the well being of animals; and (6) increase employment opportunities in agriculture"). *See also* 7 U.S.C. § 3101 (2000) ("[t]he purpose of federally supported agricultural research, extension, and education are to . . . (2) increase the long-term productivity of the United States agriculture and food industry while maintaining and enhancing the natural resource base on which rural American and the United States agricultural economy depend").

9. Neil. D. Hamilton, *Sustainable Agriculture: The Role of the Attorney*, 20 Environ. L. Rep. 10021, 2-3 (1990) (discussing the promises of sustainable agriculture and its role in the development of U.S. agricultural policy. Further, stating for "those who decry the ills of modern chemical-intensive farming practices and advocate a return to more traditional practices, sustainable agriculture offers the nation a chance, perhaps its last, to develop a land ethic that integrates concern for people, the land, and how we produce our food").

economically feasible they can be implemented on a large scale.[10] While states began funding research into sustainable agriculture in 1986, the implementation of sustainable practices has not moved beyond the research phase.[11] Legislation promoting sustainable agriculture is ambitious in its goals regarding the potential of sustainable agriculture but has proven insufficient in moving sustainable agriculture beyond the research stage into widespread implementation of sustainable practices.

The remainder of this comment will focus on how the farming industry is able to negatively impact the environment in spite of the stiff federal regulations faced by other industries. In addition, this comment will look at state and federal legislation that is working toward developing methods of agriculture that will be able to replace environmentally harmful conventional agriculture practices. This comment will examine the legislation to see what the potential for success is considering the presence of a fairly rigid definition of sustainable agriculture that may, in effect, set sustainable agriculture up for failure.

II. Background

A. The Farming Industry

A farm is defined by the USDA Census of Agriculture as "a place which produced and sold, or normally would have produced and sold, $1,000 or more of agricultural products during 1997."[12] In 2002, over two million farms fit this definition covering over 930 million acres and totaling roughly forty-five percent of the American land mass.[13] When forested land is added to the total farmed acreage, the total amount of land involved in the farming industry rises to seventy-five percent of the nation's overall land mass.[14]

While there is tremendous diversity among farms across the

10. *Id*.

11. CAL FOOD & AGRIC. CODE § 550 (2004).

12. USDA Census of Agriculture (2002), available at http://www.nass.usda.gov /census/. ("The United States Census of Agriculture is required by law under the Census of Agriculture Act of 1997, Public Law 105-113 (Title 7, United States Code, Section 2204g)). The law directs the Secretary of Agriculture to conduct a census of agriculture in 1998 and in every fifth year after, covering the prior year. The census of agriculture includes each State, Puerto Rico, Guam, the U.S. Virgin Islands, and the Commonwealth of Northern Mariana Islands." *Id*. The first Census of Agriculture was conducted by the U.S. Department of Commerce, Bureau of the Census in 1840. In 1997, the appropriations Act transferred the census responsibility to the U.S. Department of Agriculture, National Agriculture Statistics Service. *Id*. [hereinafter Census].

13. Census, *supra* note 12.

14. Census, *supra* note 12.

country, together they form an industry with a substantial effect on the American economy.[15] This industry does not work in isolation; instead there is a highly symbiotic relationship between the farming industry and many other industries in the United States. In 2002 farms owned an estimated $110 billion in machinery and equipment, spent a total of over $6 billion on gasoline and other fuels, expended over $18 billion on chemical fertilizers, crop control chemicals, and other agricultural chemicals combined, and purchased over $2.75 billion in electricity.[16] The payroll for farms in 1997 was over $14 billion for hired farm labor and over $2.9 billion for contract labor.[17]

Over the last seventy-five years, the landscape of the farming industry has changed dramatically. The number of farms in the country has decreased while the productivity of remaining farms has increased.[18] This has occurred through the evolution of farms from many diverse operations, each producing a combination of crops and livestock, to a conglomeration of fewer, more specialized, larger farms that are geographically concentrated.[19] This evolution has been described as "industrializing."

Industrializing agriculture is the "process whereby the production of goods is restructured under the pressure of increasing levels of capital and technology in a manner which allows for a management system to integrate each step in the economic process to achieve increasing efficiencies in the use of capital, labor, and technology."[20] The result is that farms specialize in one portion of the process of food production, which, while increasing the efficiency and profitability of the farming industry, puts a far greater strain on the land and increases environmental

15. Census, supra note 12 (under the definition of farms used by the USDA, in 1997, farms ranged in size from 49 acres to over 2,000 acres and brought in anywhere from $2500 to over $500,000. In addition, families, corporations, partnerships, and individuals owned farms. Farms raised crops ranging from corn and grain to cotton, tobacco and hay, in addition to raising livestock ranging from hogs and pigs to broiler chickens, laying hens and beef and milk cows).

16. Census, *supra* note 12.

17. Census, *supra* note 12.

18. Census, *supra* note 12 (of the American farms examined in the 1997 census, roughly half generated annual product values under $10,000, accounting for less than 1.5 percent of total farm production value, whereas roughly 3.6 percent of farms generated over $500,000 in annual product value, accounting for over 56 percent of total farm production value. A small percentage of the total farms in existence are producing a disproportionately large portion of agricultural products).

19. Charles W. Abdalla, *The Industrialization of Agriculture; Implications for Public Concern and Environmental Consequences of Intensive Livestock Operations*, 10 PENN STATE ENVTL. L.R. 175, 176 (2002) (citing the location of poultry and livestock producers nearer to the processing and infrastructure locations specialized to their needs as a means of increasing productivity).

20. Hamilton, *supra* note 9, at 5.

degradation.[21] This process was first implemented in the 1960's when the chicken producing industry became industrialized, and since that time, the remainder of the farming industry has moved in the same direction.[22]

B. How are Farms Able to Impact the Environment?

1. Lack of Regulation

The largest difficulty in dealing with the farming industry's environmental harms is that farming is inherently destructive to its environment.[23] Traditionally, farming consists of removing all existing vegetation from the land and leveling it, deploying a single crop or species of livestock, cultivating that crop or livestock with water and chemicals, removing the crop or livestock and associated waste products from the land and starting over.[24] The consequences of this pattern are habitat loss and degradation, water pollution in the form of soil erosion and sedimentation, and air pollution.[25]

The lack of a comprehensive regulatory program to regulate the farming industry is the main cause of the farming industry's poor environmental record.[26] Some commentators have gone so far as to say the farming industry has been given a license to pollute.[27] The lack of federal regulation has enabled the farming industry to increase its productivity and profitability, but the cost of these increases has been extreme environmental degradation.[28]

2. Exemptions from the Clean Water Act

Beyond the lack of a federal regulatory program relating to the farming industry, commentators cite the Clean Water Act ("CWA") as the source of the farming industry's most noticeable environmental degradation.[29] The Clean Water Act makes unlawful the discharge of

21. *See generally* Hamilton, *supra* note 9, at 5.
22. *Id*.
23. Ruhl, *supra* note 3, at 274.
24. *Id*.
25. *Id*.
26. *Id*. at 263 (stating that given the amount environmental harms caused by farms and that federal environmental law has yet to develop a comprehensive regulatory program for the industry, farms "have been given a license to pollute").
27. *Id.*
28. *Id*.
29. Commentators have found that the subsidies provided to farmers by the federal government encourage overuse of land, overproduction of crops, and use of unsuitable land for raising crops. Subsidies ensure that farmers will have a market for the crops that

any pollutant by any person[30] while regulating lawful discharges of pollutants through a series of permit programs.[31] Despite the broad prohibition against any emission of any pollutant into the nation's waterways, the Clean Water Act clearly exempts many environmentally harmful farming practices from regulation.[32]

The Clean Water Act regulates most wastewater pollutants that are the product of American industry including "agricultural waste discharged into water."[33] While this appears to include the farming industry under the scope of the Act, the farming industry largely escapes regulation through a loophole relating to which sources of pollution the Act actually regulates. The Clean Water Act regulates only those sources of pollution that can be classified as "point sources."[34]

they grow in addition to ensuring that the prices for the crops remain high enough to support the agriculture industry. *See generally* David E. Adelman and John H. Barton, *Environmental Regulation for Agriculture: Towards a Framework to Promote Sustainable Intensive Agriculture*, 21 STAN. ENVTL. L.J. 3, 12 (2002) (stating that in the United States, as well as globally, environmental subsidies contribute to the environmental costs of agriculture. Subsidies lead to unnecessary production, or production that might be conducted more efficiently somewhere else, as well as encouraging unnecessary use of inputs. Currently, on a global basis, agricultural subsidies account for approximately forty percent of the gross income from agriculture worldwide and agricultural subsidies account for seventeen percent of agricultural gross income in the United States).

30. 33 U.S.C. § 1311(a) (2000) (making the discharge of any pollutant by any person unlawful).

31. 33 U.S.C. § 1342(a)(1) (2000) (stating that "[e]xcept as provided in sections 1328 and 1344 of this title, the Administrator may, after opportunity for public hearing, issue a permit for the discharge of any pollutant, or combination of pollutants, notwithstanding section 1311(a) of this title, upon condition that such discharge will meet either (A) all applicable requirements under sections 1311, 1312, 1316, 1317, 1318, and 1343 of this title, or (B) prior to the taking of necessary implementing actions relating to all such requirements, such conditions as the Administrator determines are necessary to carry out the provisions of this chapter." *See also id*. at § 1342(b) (stating that a state may implement their own permitting program. "At any time after the promulgation of the guidelines required by subsection (i)(2) of section 1314 of this title, the Governor of each State desiring to administer its own permit program for discharges into navigable waters within its jurisdiction may submit to the Administrator a full and complete description of the program it proposes to establish and administer under State law or under an interstate compact").

32. *See* 33 U.S.C. § 1362(14) (2000) (excluding irrigated agriculture stormwater discharges and return flows from the definition of point source).

33. 33 U.S.C. § 1362(6) (2000) (defining the term pollutant to be "dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water").

34. 33 U.S.C. § 1362(12)(2000) (defining the discharge of a pollutant as "(A) any addition of any pollutant to navigable waters from any point source, (B) any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft").

Due to the large number of farms and the administrative difficulty of issuing individual permits to all of them, Congress defined "point source" to exclude certain agricultural sources of pollution.[35] Congress concluded that farm irrigation return flows are nearly indistinguishable from most other agricultural runoff[36] and redefined point source to exclude return flows from irrigated agriculture.[37]

The definition of point source is the most important part of the Clean Water Act because it has been largely successful in bringing point source pollution under control.[38] Conversely, nonpoint sources have become the largest polluters of the nations waterways, and of those nonpoint sources, agriculture remains the largest source of pollution.[39]

C. Limited Regulation of Farming Under the Clean Water Act

Included within the CWA permitting program's definition of point source is pollution from concentrated animal feeding operations.[40] A concentrated animal feeding operation is an animal feeding operation that confines a specified number of non-aquatic animals for a specified period of time.[41] While the inclusion of concentrated animal feeding

35. Ruhl, *supra* note 3, at 295.

36. *Id*.

37. 33 U.S.C. § 1362(14)(2000) (defining point source as "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture"). *See also* Pub. L. No. 95-217.

38. *See* Ruhl, *supra* note 3, at 295.

39. Clean Water Action Plan, *supra* note 1.

40. 33 U.S.C. § 1362(14) (2000) (defines point source to include concentrated animal feeding operations).

41. 40 C.F.R. § 122.23(b)(1) (defining concentrated animal feeding operation. "Animal feeding operation ("AFO") means a lot or facility (other than an aquatic animal production facility) where the following conditions are met: (i) animals (other than an aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and (ii) crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility"). *See also* 40 C.F.R. § 122.23(2) (specifies when an animal feeding operation becomes concentrated and therefore is within the scope of the Clean Water Act regulations. "Concentrated animal feeding operation ("CAFO") means an AFO that is defined as a Large CAFO or as a Medium CAFO by the terms of this paragraph, or that is designated as a CAFO in accordance with paragraph (c) of this section. Two or more AFOs under common ownership are considered to be a single AFO for the purposes of determining the number of animals at an operation, if they adjoin each other or if they use a common area or system for the disposal of wastes"). *See also* 40 C.F.R. § 122.21(c) (specifying that an AFO that does not satisfy the standards set for CAFOs can be classified as a CAFO if the AFO is a significant water polluter). *See also* 40 C.F.R. § 122.21(b)(1) (despite this inclusion of concentrated animal feeding operations within the scope of the Clean Water Act, an animal feeding operation that

operations within the CWA permitting program regulates a large portion of agriculture's most harmful pollutants,[42] it is not sufficient. The CWA permit program ignores other significant sources of pollution created by the farming industry such as agricultural runoff. As a result of this limited regulation under the CWA, agriculture remains the most significant contributor to the nation's water pollution problem.[43]

Non-point source environmental degradation is not entirely unregulated by the Clean Water Act. The CWA directs states to develop plans to regulate nonpoint source discharge of pollutants into certain waterways.[44] Specifically, the Act directs states to identify waterways within their boundaries that will not be able to achieve the required water quality standards without regulation of nonpoint sources.[45] Once a waterway has been identified, the state must prepare a state management program prescribing the best management practices to control nonpoint sources of pollution,[46] and if the EPA approves the program, the state will be eligible for federal financial assistance to implement the program.[47] While the drafters of the Act used this program as

sustains crops, vegetation, forage growth, or post-harvest residues is exempt from the concentrated animal feeding operation regulations under the Clean Water Act).

42. 33 U.S.C. § 1362(14) (2000) (defines point source to include concentrated animal feeding operations).

43. Clean Water Action Plan, *supra* note 1.

44. 33 U.S.C. § 1329(a)(1)(2000) ("[t]he Governor of each State shall, after notice and opportunity for public comment, prepare and submit to the Administrator for approval, a report which (A) identifies those navigable waters within the State which, without additional action to control nonpoint sources of pollution, cannot reasonably be expected to attain or maintain applicable water quality standards or the goals and requirements of this chapter; (B) identifies those categories and subcategories of nonpoint sources or, where appropriate, particular nonpoint sources which add significant pollution to each portion of the navigable waters identified under subparagraph (A) in amounts which contribute to such portion not meeting such water quality standards or such goals and requirements; (C) describes the process, including intergovernmental coordination and public participation, for identifying best management practices and measures to control each category and subcategory of nonpoint sources and, where appropriate, particular nonpoint sources identified under subparagraph (B) and to reduce, to the maximum extent practicable, the level of pollution resulting from such category, subcategory, or source; and (D) identifies and describes State and local programs for controlling pollution added from nonpoint sources to, and improving the quality of, each such portion of the navigable waters, including but not limited to those programs which are receiving Federal assistance under subsections (h) and (i) of this section).

45. *Id*.

46. 33 U.S.C. § 1329(b)(1)(2000) ("[t]he Governor of each State, for that State or in combination with adjacent States, shall, after notice and opportunity for public comment, prepare and submit to the Administrator for approval a management program which such State proposes to implement in the first four fiscal years beginning after the date of submission of such management program for controlling pollution added from non point sources to the navigable waters within the State and improving the quality of such waters").

47. 33 U.S.C. § 1329(h)(1) (2000) ("[u]pon application of a State for which a report

justification for the exclusion of irrigation return flows from point source classification[48] the programs have yet to produce meaningful results.[49]

III. Analysis

A. Why is the Farming Industry Unregulated?

The development of a regulatory framework for the farming industry to offset agricultural environmental degradation faces substantial opposition. In 2002, there were over two million farms in the United States.[50] Of these farms, over 1.6 million were family or individually owned.[51] The owners and operators of these farms constitute a large portion of similarly situated voters able to pressure politicians in those areas to vote against all regulation of the farming industry.[52]

While farm workers and owners are not a dominant voting power throughout the country, any low presence of farm owners and operators is offset by voters associated with other industries that rely heavily on farming. Farms play a critical role in the economic fate of their suppliers and customers. "The vast agrochemical and food processing industries are characterized by greater corporate presence and concentration of economic power than is found in the farm industry. These industries rely heavily on farms and can be expected to align themselves politically with the interests of farms."[53]

Federal regulation of the agriculture industry faces further opposition from the American Farm Bureau, one of the most powerful

submitted under subsection (a) of this section and a management program submitted under subsection (b) of this section is approved under this section, the Administrator shall make grants, subject to such terms and conditions as the Administrator considers appropriate, under this subsection to such State for the purpose of assisting the State in implementing such management program. Funds reserved pursuant to section 1285(j)(5) of this title may be used to develop and implement such management program").

48. *See generally* Ruhl, *supra* note 3, at 298 (discussing the enactment of 33 U.S.C. § 1329(h)(1) by Congress as a rationale for redefining point source to exclude irrigation return flows and thereby remove it from the CWA permitting program and from the dredge-and-fill permitting program).

49. *Id*. ("In the absence of any concrete, enforceable federal blueprint for addressing nonpoint source pollution, the success of Sections 208 and 319 depended largely on state initiative. It is little surprise, then, that neither Section 208 nor Section 319 produced meaningful results").

50. Census, *supra* note 12.

51. *Id*.

52. Ruhl, *supra* note 3, at 331.

53. *Id*. at 332 (stating that "the Chemical Manufacturers Association, the Fertilizer Institute, and the National Agricultural Chemicals Association regularly weigh in on farm policy issues").

lobbying forces in the nation.[54] This organization has extreme financial strength, and purporting to speak for the entire farming community, the American Farm Bureau Federation has successfully fought against all proposed environmental regulation of farms.[55] Currently, the American Farm Bureau is lobbying against additional regulations of agricultural nonpoint sources under the Clean Water Act.[56] Through this lobbying effort, the Bureau is opposing direct federal regulation of agricultural nonpoint sources and is instead supporting "voluntary incentive-based approaches based on sound scientific information, technical assistance to landowners and site-specific flexibility."[57] This is an approach that would be minimally effective and without the power to quickly remedy environmental problems associated with farming.

Finally, many commentators feel that the regulation of agriculture is difficult because there is a romanticized view of the nation's agricultural community.[58] This view of agriculture results from the nation's agrarian history traditionally based in the family-owned farm.[59] Contemplating the farming industry from this perspective is harmful in that it ignores the rapid transition of the farming industry to industrial production techniques. The reality is that corporately owned farms dominate many segments of the industry and these farms have little relation to the nation's agrarian history.[60]

54. *Id*.

55. *American Farm Bureau Statement of Purpose* (The American Farm Bureau "is an independent, non-governmental, voluntary organization governed by and representing farm and ranch families united for the purpose of analyzing their problems and formulating action to achieve educational improvement, economic opportunity and social advancement and, thereby, to promote the national well-being. Farm Bureau is local, county, state, national and international in its scope and influence and is non-partisan, non-sectarian and non-secret in character. Farm Bureau is the voice of agricultural producers at all levels"), *available at* http://www.fb.org (last visited January 22, 2004).

56. *Id*.

57. *Id.*

58. Adelman, *supra* note 29, at 5 (stating that "[s]ociety's naturalistic vision of agricultural practices compounds these political dynamics. Drawing on this romanticized view of agriculture, the political left has promoted concern about new high-tech practices, such as genetically-based technologies, while the political right has used it to obscure the significant environmental impacts agriculture causes, like nitrate pollution from fertilizers. This dynamic creates the worst of all possible worlds: bias against new technologies that have the potential to be more environmentally sustainable, combined with failure to regulate (or to create the right incentives to alter) existing unsustainable practices. Governments thus frequently exclude agricultural production from general environmental requirements, regulate it at a lower standard than other industries, or regulate it in ways that encourage unsustainable practices").

59. *Id*.

60. Census, *supra* note 12 (stating that of the American farms examined in the 1997 census, roughly half generated annual product values under $10,000, accounting for less than 1.5 percent of total farm production value, whereas roughly 3.6 percent of farms generated over $500,000 in annual product value, accounting for over 56 percent of total

B. Sustainable Agriculture: An Alternative to Regulation of the Farming Industry?

1. Is Sustainable Agriculture Necessary?

Current conventional agriculture practices have developed over the last thirty years to make the farming industry more productive and profitable than ever before while utilizing less land.[61] Conflicts arise as increased productivity heightens the negative impact on the quality of air, land, water, and natural ecosystems, necessary to this productivity and for the economic well-being of the nation in general.[62]

Understanding that the farming industry needs to develop less depleting agricultural methods, the federal government and several states throughout the country, have begun funding research into alternative methods of farming that will aid in sustaining the natural resources available to the farming industry and the country as a whole.[63] Funding sustainable agriculture research in anticipation of the development of practices that can be implemented on a large scale has been presented as the alternative to direct regulation of conventional agriculture.[64]

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farm production value).

61. Census, *supra* note 12 (amount of land in farms in 1964: 1,110,187,000 acres. Amount of land in farms in 1997: 931,795,255 acres. Market value of agricultural products sold in 1964: 35,393,431 dollars. Market value of agricultural products sold in 1997: 196,864,649 dollars).

62. *See* Board on Agriculture and Natural Resources (The National Academies, Advisers to the Nation on Science, Engineering, and Medicine), *available at* http://dels.nas.edu/banr/ (last visited January 20, 2004).

63. *See generally* 7 U.S.C. § 5801 (a) (2000) ("[i]t is the purpose of this subchapter to encourage research designed to increase our knowledge concerning agricultural production systems that (1) maintain and enhance the quality and productivity of the soil; (2) conserve soil, water, energy, natural resources, and fish and wildlife habitat; (3) maintain and enhance the quality of surface and ground water; (4) protect the health and safety of persons involved in the food and farm system; (5) promote the well being of animals; and (6) increase employment opportunities in agriculture"). *See also generally* 3 PA. CONS. STAT. ANN. § 2101 (2004) ("[t]he General Assembly finds and declares as follows: (1) Funding is needed to promote sustainable agriculture in this Commonwealth. (2) The practice of sustainable agriculture is intended to offer the farmer the greatest return on his labor and capital by reducing operating expenses while enhancing the value of the end product. (3) Sustainable agriculture emphasizes the practice of an agriculture that is ecologically beneficial, that would improve and ensure the quality of soil and water for future generations and, at the same time, would enable the farmer to earn a livelihood consistent with his capital investment and labor. (4) Sustainable agriculture emphasized farm practices that make the best use of on-farm labor and resources to reduce or eliminate the need for the purpose of off-farm inputs").

64. *See generally* Hamilton, *supra* note 67, at 2-3 (discussing the promises of sustainable agriculture and its role in the development of U.S. agricultural policy. Further, stating for "those who decry the ills of modern chemical-intensive farming practices and advocate a return to more traditional practices, sustainable agriculture offers

2. Sustainable Agricultural Practices

Sustainable agriculture is concerned with lessening the impact of farming on the environment while maintaining or increasing the profitability of farming.[65] This requires that environmentally sound modifications to conventional farming techniques be made at no further cost to the farmer.

There are five main farming practices associated with sustainable agriculture.[66] The first, crop choice, focuses on diversifying crops year-to-year rather than planting the same crop in the same field every year. Pest and weed control makes use of integrated pest management (IPM) practices as an alternative to pesticide reliance.[67] Soil fertility and cultivation focuses on the use of organic materials to maintain soil fertility including the use of manure and nitrogen rich crops.[68] Additionally, soil fertility and cultivation concentrates on reducing soil erosion through preventative measures including winter crop management. Livestock production focuses on the inclusion of livestock in crop focused farms.[69] The livestock provide organic materials important to soil fertility, and livestock pasture can be used to offset erosion on highly erodible land.[70] Lastly, sustainable agriculture uses tillage systems that leave thirty percent of the previous crop's residue on the surface after spring planting.[71]

Although sustainable agriculture has been presented largely as a conceptual model, there is evidence that, at least on a small scale, it can be environmentally sound as well as economically feasible. The successful history of farming prior to the use of chemicals, pesticides, and off-farm inputs demonstrates a basic potential for sustainable agriculture. Prior to World War II, most farms in the country were diversified without a large number of concentrated animal feeding

the nation a chance, perhaps its last, to develop a land ethic that integrates concern for people, the land, and how we produce our food").

65. *See* 7 U.S.C. 3013(17) (2000). *See also* PA. ST. 3 P.S. § 2103 (West, WESTLAW through Act 2003-21).

66. *See generally* James Stephen Carpenter, *Farm Chemicals, Soil Erosion, and Sustainable Agriculture*, 13 STAN. ENVTL. L.J. 190, 221-4 (1994) (discussing sustainable agriculture practices and citing NATIONAL RESEARCH COUNCIL, COMMITTEE ON THE ROLE OF ALTERNATIVE FARMING, ALTERNATIVE AGRICULTURE: COMMITTEE ON THE ROLE OF ALTERNATIVE FARMING METHODS IN MODERN PRODUCTION AGRICULTURE 85 (1989) (National Academy Press 1989).

67. *Id.*

68. *Id.*

69. *Id.*

70. *Id.*

71. *Id.*

operations.[72] Although looking to historical farming practices is helpful, sustainable agriculture does not advocate a return to earlier methods, in some part because of the limited availability of land available for agricultural purposes. Instead sustainable agriculture focuses on combining the success of earlier methods of sustaining resources with current availability of technological innovations.[73]

Further evidence for the prospects of sustainable agriculture rests in a study conducted by the Secretary of Agriculture in 1979 that suggested the feasibility of sustainable practices.[74] The report compiled and interpreted scientific evidence regarding the yield, net returns, and other performance indicators of organic farming in the United States.[75] The report showed that sixty-nine organic farms in twenty-three states were able to remain sustainable and profitable at the same time.[76] The USDA used the evidence from the report to recommend research, education, and public policies in support of sustainable agriculture.[77] The Reagan administration eventually rejected the report, but it remains the earliest evidence of the potential of sustainable agriculture.[78]

C. Federal Legislation in Support of Sustainable Agriculture

Federal legislation promoting and supporting sustainable agriculture is limited.[79] This legislation sets out a series of directives to the Secretary of Agriculture to implement research programs into sustainable agricultural practices.[80] The legislation specifies the type of projects that are to be undertaken including research projects that facilitate and increase scientific investigation and education in order to reduce the use of chemicals, improve existing low-input farming practices, and promote crop diversification.[81] In addition, the legislation establishes a Federal-State matching grant program to assist states in creating or enhancing sustainable agriculture research and education programs.[82]

72. *See generally* Census, *supra* note 12.
73. *See generally* Ruhl, *supra* note 3, at 293-4.
74. Western Region, Sustainable Agriculture Research and Education, (Conception of the Program) (*available at* http://wsare.usu.edu/history/concept.htm#N_3_) (last visited January 20, 2004).
75. *Id*.
76. *Id.*
77. *Id.*
78. *Id.*
79. *See* 7 U.S.C. § 5801-5832 (2000).
80. *See* 7 U.S.C. § 5801(a) (2000).
81. *See* 7 U.S.C. § 5811(a) (2000) (listing the types of projects the Secretary is to implement).
82. 7 U.S.C. § 5813(a-d) (2000) (establishing a Federal-State matching program. Under the program, eligible state programs will receive funding if the state is able to pay fifty percent of the costs. In addition, the state plan must directly involve farmers in the

Under the authority of the legislation, the Secretary of Agriculture developed the Sustainable Agriculture Research and Education (SARE) program. The SARE program works to advance "farming systems that are more profitable, environmentally sound and good for communities through an innovative grants program."[83] The program aims to increase the knowledge about economically viable, environmentally sound and socially responsible farming practices.[84] Since 1988 the program has funded projects for research and education, professional development, projects working jointly with the EPA to find and expand ways to prevent agriculture-related resource degradation, and grants for producers to fund on-farm research or demonstration projects.[85]

In addition, through the USDA, the SARE program funds the Sustainable Agriculture Network (SAN).[86] The SAN is a cooperative effort of university, government, farm, business and nonprofit organizations dedicated to the exchange of scientific and practical information on sustainable agriculture.[87] Beyond funding research into alternative practices of sustainable agriculture, federal legislation creates incentive based programs, providing grants to farmers interested in making use of sustainable farming practices.[88] These programs focus on developing methods of agriculture that will meet the definition of sustainable agriculture, yet do nothing to directly affect conventional agriculture as participation is voluntary.

D. State Legislation Supporting Sustainable Agriculture

State legislation relating to sustainable agriculture, similar to federal legislation, focuses on funding research into sustainable agriculture practices. In 1986, California became the first state to enact legislation relating to sustainable agriculture with passage of the Sustainable Agriculture Research and Education Act.[89] The Act's stated purpose is to "promote more research and education on sustainable agricultural practices, such as organic methods, biological control, and integrated pest managements, including the analysis of economic factors influencing the long-term sustainability of California agriculture."[90] The

development, implementation, and evaluation of the program).

83. Sustainable Agriculture Research and Education website, *available at* http://www.sare.org/ (last visited January 20, 2004).

84. *Id*.

85. *Id*.

86. *Id*.

87. *Id*.

88. *See* 7 U.S.C. § 5822 (2000).

89. CAL. FOOD & AGRIC. CODE § 550-54 (West, WESTLAW through end (Ch. 909) of 2003-04 Reg. Sess. urgency legislation, Ch. 13 (end) of 1st Ex.)

90. CAL. FOOD & AGRIC. CODE § 552 (West, WESTLAW through end (Ch. 909) of

Act established the Sustainable Agriculture Research and Education Program at the University of California in an effort to achieve the Act's stated purpose.[91] The Program supports competitive grants for topics relating to the issues presented in the act.[92]

California's statute regarding sustainable agriculture was the first such statute in the nation and immediately recognized the importance of sustainable agricultural to the environment and the human population, while recognizing that the widespread implementation of sustainable agriculture practices was not currently feasible. Following California, other states implemented similar statutes aimed largely at funding research and education into sustainable methods of agriculture.[93]

Iowa has emerged as the leader in research and funding relating to sustainable agriculture. As a part of the Iowa Groundwater Protection Act of 1987, the State Legislature established a program at the Iowa State University of Science and Technology to provide financial assistance for agricultural research.[94] The result of the legislation is the program for sustainable agriculture at the Leopold Center for sustainable agriculture.[95] The Leopold Center is the leading research center in the nation for issues relating to sustainable agriculture.[96] Its mandated missions are "to identify negative impacts of agricultural practices, contribute to the development of profitable farming systems that conserve natural resources, and cooperate with the Iowa State University

2003-04 Reg. Sess. urgency legislation, Ch. 13 (end) of 1st Ex.)). Remainder of purpose sections states: This article is intended to foster economically and ecologically beneficial means of soil improvement, pest management, irrigation, cultivation, harvesting, transportation, and marketing for California agriculture based on methods designed to accomplish all of the following:

> (a) The control of pests and diseases of agricultural importance through alternatives that reduce or eliminate the use of pesticides and petrochemicals;
>
> (b) Produce, process, and distribute food and fiber in ways that consider the interactions among soil, plant, water, air, animals, tillage, machinery, labor, energy, and transportation to enhance agricultural efficiency, publish health, and resource conservation.

91. CAL. FOOD & AGRIC. CODE § 553(a)(1) (2004).

92. *Id*. (stating "[i]t is the intent of the Legislature that the Regents of the University of California establish the Sustainable Agriculture Research Education Program to support . . . [c]ompetitive grants for research on topics described in Section 552. Section 552 lists as topics the control of pests and diseases of agricultural importance through alternatives that reduce or eliminate the use of pesticides and petrochemicals, and the production, processing and distribution of food and fiber in ways that consider the 'interactions among soil, plant, water, air, animals, tillage, machinery, labor, energy, and transportation to enhance agricultural efficiency, public health and resource conservation'").

93. *See* IA. CODE ANN. § 266.39B (2004), MINN. STAT. ANN. § 17.115 (2004), 3 PA. CONS. STAT. ANN. § 2103 (2004).

94. IA. CODE ANN. § 266.39B(1) (2004).

95. IA. CODE ANN. § 455E.11(e) (2004).

96. *See* Hamilton, *supra* note 9, at 8.

Extension to inform the public of new research findings."[97]

The Iowa Legislature outlined the sort of research proposals that would be eligible for grants at the Leopold Center.[98] All eligible grant proposals must assist Iowa in maintaining productive soil, viable communities, and farms with incomes sufficient to support a family.[99] In addition, research included in the grant proposals must enhance the profitability of farmers and must lead to farming that will enhance and preserve Iowa's environment.[100]

The criteria for grant proposals demonstrate that the Iowa legislature sees enormous potential for sustainable agriculture to positively contribute to the state's farming industry. In 2002, the Leopold Center funded thirteen projects involving a diverse number of issues.[101] Projects were grouped into four categories; agriculture and communities, crop systems, ecology, and livestock systems with some projects receiving funding upwards of $30,000 a year.[102]

The current state of sustainable agriculture legislation is focused almost entirely on research and education. There are twelve states with legislation either providing funds for research into sustainable agriculture practices or providing grants for farmers who practice sustainable methods of agriculture.[103] These states receive funding from the federal government for this research.[104]

While this legislation exists, its focus on research makes the future of sustainable agriculture uncertain. Whether sustainable agriculture practices will be able to impact conventional agriculture without regulation of the farming industry directly implementing such practices is difficult to surmise but seems unlikely.

E. Is Current Legislation Adequate for Supporting Sustainable

97. Leopold Center for Sustainable Agriculture Center Progress Report 2003, *available at* http://www.leopold.iastate.edu/pubinfo/pubinfo.html (last visited January 26, 2004) [hereinafter Center Progress Report].

98. IA. CODE ANN. § 266.39B(1) (2004).

99. IA. CODE ANN. § 266.39B(1)(a) (2004).

100. IA. CODE ANN. § 266.39B(1)(b) and (c) (2004).

101. Center Progress Report, *supra* note 97.

102. *Id.*

103. *See generally* WASH. REV. CODE ANN. § 15.92.010 (2004), VT. STAT. ANN. tit 6, § 4701 (2004), MONT. CODE ANN. § 20-25-233 (2004), MASS. GEN. LAWS ch. 29 § 2III(2004), MINN. STAT. ANN. § 17.114 (2004), ME. REV. STAT. ANN. tit. 7 § 241 (2004), KAN. STAT. ANN. § 76-4, 103 (2004), 505 ILL. COMP. STAT. 135/1 (2004), CAL. FOOD & AGRIC. CODE § 550 (2004), 3 PA. CONS. STAT. ANN. § 2101 (2004), IA. CODE ANN. § 266.39B (2004).

104. 7 U.S.C. § 5813(a-d) (2000) (establishing a Federal-State matching program. Under the program, eligible state programs will receive funding if the state is able to pay fifty percent of the costs. In addition, the state plan must directly involve farmers in the development, implementation, and evaluation of the program).

Agriculture?

The goal of legislatively funded research into sustainable agriculture is to develop a method of farming that conforms to the statutorily mandated definitions. Regardless of legislative definitions, since 1894 sustainable agriculture has been in the process of definition.[105] The earliest explanation of sustainable agriculture stated that "sustainable agriculture does not deplete soils or people."[106] Modern definitions of sustainable agriculture greatly expand on these same basic ideas.

The definition of sustainable agriculture contained in federal legislation is strict in its requirements of what constitutes sustainable agriculture. It describes sustainable agriculture as an integrated system of plant and animal production practices that will:

> (A) satisfy human food and fiber needs;
>
> (B) enhance environmental quality and the natural resources base upon which the agriculture economy depends;
>
> (C) make the most efficient use of non-renewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls;
>
> (D) sustain the economic viability of farm operations; and
>
> (E) enhance the quality of life for farmers and society as a whole.[107]

All research into sustainable agriculture funded by the federal government focuses on this definition, a definition that describes sustainable agriculture as an integrated system. By defining sustainable agriculture as an entire system of farming that will meet all of the outlined requirements, the legislation has set the bar extremely high for research into sustainable agriculture.

State legislatures have defined sustainable agriculture in a similar manner. The Pennsylvania Legislature strictly defined sustainable agriculture in legislation enacted to promote research into sustainable agriculture practices.[108] The legislation defines sustainable agriculture as an:

105. Hamilton, *supra* note 9, at 3 (quoting from W. Berry, MEETING THE EXPECTATIONS OF THE LAND: ESSAYS IN SUSTAINABLE AGRICULTURE AND STEWARDSHIP (1894)).

106. *Id.*

107. 7 U.S.C. § 3101(17) (2000).

108. 3 PA. CONS. STAT. ANN. § 2103 (2004).

> [I]ntegrated system of plant and animal production practices having a site-specific application that will over the long term satisfy human food and fiber needs, enhance environmental quality and the natural resource base upon which the agricultural economy depends, make the most efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls, sustain the economic viability of farm operations, and enhance the quality of life for farmers and society as a whole.[109]

This definition is virtually identical to the definition contained in federal legislation. Both definitions describe exactly what constitutes sustainable agriculture and require a complete system of farming that preserves economic viability while conserving natural resources and lessening the impact of farming on the environment.[110]

While legislation containing these definitions is currently aimed at research, it is difficult to imagine that the goal of enacting legislation appropriating $40,000,000 a year toward research into sustainable agriculture[111] was not to eventually implement the results of that research. As a result, legislative definitions relate directly to the success of sustainable agriculture because research will not be completed and implementation cannot begin until the definition has been satisfied. This important relationship currently undermines the potential success of sustainable agriculture. By defining sustainable agriculture as an entire system of farming, legislation has made its widespread implementation unfeasible. It is unlikely that current research into sustainable agriculture could lead to the development of an entire system of farming that will meet the requirements of sustainable agriculture and be ready for large-scale implementation.

F. Proposed Alternative to Current Legislative Definitions of Sustainable Agriculture

The success of sustainable agriculture depends on the development of a feasible definition which appeals to a large segment of the farming industry.[112] A widely accepted definition will provide legitimacy to the concept of sustainable agriculture and will make its acceptance by the greater farming industry more likely.[113]

109. *Id*.

110. *See* 7 U.S.C. § 5841(17) (2000). *See also* 3 PA. CONS. STAT. ANN. § 2103 (2004).

111. 7 U.S.C. § 5814 (2000).

112. *See generally* Hamilton, *supra* note 9, at 2 (discussing the difficulty in defining the term, made more difficult by the importance of the definition to the success of the concept).

113. *See generally id*. (discussing the benefits of a widely accepted definition.

Developing a feasible definition is made difficult by the divergent viewpoints relating to the role of sustainable agriculture in the farming industry. Many members of the farming industry involved in the use and development of conventional practices see sustainable agriculture as a threat to the economic self-interest of the farming industry.[114] This view stems from the increased profitability of farming and a reluctance to alter conventional practices in a manner that could affect that profitability. Conversely, there are those who see sustainable agriculture as the nation's last chance to preserve the limited resources available to the farming industry.[115]

Currently, most legislation defines sustainable agriculture as an entire system of farming which, among other things, maintains profitability while preserving natural resources and lessening environmental impacts. This definition separates farming into distinct and complete processes and implies that sustainable agriculture, if implemented, will completely replace conventional practices. Defining sustainable agriculture in this manner is too restrictive. An alternate definition would envision sustainable agriculture as any practice which maintains agricultural profitability, preserves natural resources, and lessens environmental impacts but which can work within a larger, more conventional farming process. This altered definition is more feasible because, while it is not currently conceivable to implement an entire system of sustainable agriculture, it is conceivable that segments of the conventional farming system could be made more sustainable.

Under this definition, a sustainable practice of crop rotation which preserves soil viability and limits erosion could be integrated into a conventional farming system, thereby lessening the environmental impact. While this alternate definition is largely the same as current legislative definitions in the requirement of economic viability, minimal environmental impacts, and preservation of natural resources; it would not require an overhaul of the entire farming process.

A modification of current legislative definitions of sustainable agriculture to include those individual practices within a larger conventional farming practice which maintains profitability while decreasing environmental impacts of conventional farming methods

"[D]efinitions can play an important role for at least three reasons. First, considering various definitions provides those involved in the debate an opportunity to refine their thinking and to justify the policies and ideas they advocate. Second, the varying definitions illustrate that many different views of the concept exist, depending on the perspective of the speaker. Third, the identification of different perspectives allows the listener, whether policy maker, farmer, or researcher, to consider the motivations and understanding behind any proposal").

114. Hamilton, *supra* note 9, at 2.

115. *Id.*

would greatly increase the likelihood of implementation. This view would improve the sustainability of conventional farming while minimally intruding into conventional agricultural practices. Focusing on these aspects would make sustainable agriculture more tolerable to a larger majority of those involved in farming. Instead of viewing the changes as a drastic conversion, they could be seen as a supplementation of conventional agricultural practices which, because they maintain profitability, are unobjectionable. Sustainable agriculture would become a gradual lessening of the impact of the farming industry on the environment instead of an entirely new system of farming.

If sustainable agriculture is to be a solution to the environmental problems associated with conventional agriculture, it must have a flexible definition. Current definitions contained in legislation promoting research into sustainable agriculture are too restrictive. Because of the restrictive definition, legislation supporting research into sustainable agriculture cannot support the definitions it contains. It is essentially wasteful legislation funding research into something that is very likely unachievable.

IV. Conclusion

Currently, the farming industry is the greatest source of water pollution in the nation as the farming industry is under-regulated by the federal government.[116] This under-regulation extends to the Clean Water Act which exempts many environmentally harmful farming practices from its scope.[117] The result of this lack of regulation is increasing pressure on the farming industry to remedy the pollution problem.[118]

Many people feel that sustainable agriculture is a clear solution to the environmental difficulties faced by the farming industry.[119] Governments, both state and federal, recognize the potential of sustainable agriculture and have enacted legislation to encourage the development and demonstration of a system of sustainable agriculture with the potential to replace conventional farming.[120] Unfortunately, legislation dealing with sustainable agriculture at both the state and federal level define sustainable agriculture in a way that makes its actual

116. *See* Clean Water Action Plan, *supra* note 1.
117. *See* Ruhl, *supra* note 3, at 263.
118. *See* Carpenter, *supra* note 6, at 191.
119. *See* Hamilton, *supra* note 9, at 2-3.
120. *See e.g.*, WASH. REV. CODE ANN. § 15.92.010 (2004), VT. STAT. ANN. tit. 6, § 4701 (2004), MONT. CODE ANN. § 20-25-233 (2004), MASS. GEN. LAWS CH. 29 § 2III (2004), MINN. STAT. ANN. § 17.114 (2004), ME. REV. STAT. ANN. tit. 7 § 241 (2004), KAN. STAT. ANN. § 76-4, 103 (2004), 505 ILL. COMP. STAT. 135/1 (2004), CAL. FOOD & AGRIC. CODE § 550 (2004), 3 PA. CONS. STAT. ANN. § 2101 (2004), IA. CODE ANN. § 266.39B (2004).

development unlikely.

If sustainable agriculture is intended as a remedy for highly destructive conventional farming practices, the legislation needs to be more lenient in defining sustainable agriculture. Sustainable agriculture should be seen as a supplement to conventional agriculture practices. Legislation should support the development of individual sustainable practices to replace single steps in the farming process and their implementation as they are shown to improve environmental quality and maintain farm productivity and profitability. Without this view of sustainable agriculture, it will remain in the research phase indefinitely as the development of an entire system of sustainable agriculture that maintains the economic viability of an industry at the height of its productivity is unlikely.

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