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Theoretical Problems with the Environmental Regulation of Agriculture

by

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ARTICLES

THEORETICAL PROBLEMS WITH THE ENVIRONMENTAL REGULATION OF AGRICULTURE

*Gerald Torres**

This symposium is important for at least two reasons. First, the subject is rarely considered in scholarly legal journals, whether they are environmental, agricultural or of general legal interest. Environmental regulation of agriculture, when considered at all, has usually been treated as a subset of the problems of farm business planning. This collection of articles, coming as it does from a meeting of scholars concerned with agricultural law,¹ itself evidences how environmental issues have become more central to agricultural policy and planning. Lawyers must be concerned about these issues because their farm clients are increasingly so concerned.² In addition, non-farm interests have begun to perceive that agriculture has too long escaped environmental scrutiny.³ This movement toward the centrality of environmental concerns in agriculture is evident in the Food Security Act of 1985.⁴ Environmen-

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¹ Articles in this symposium issue were first presented at the October 1988 American Agricultural Law Association meeting.

² Recent amendments now protect agricultural concerns from nuisance liability under statutes formerly shielding only industrial and/or municipal owners, but each state uses different minimum usage periods to qualify or affords a qualified presumption of reasonableness. Compare, e.g., Ala. Code § 6-5-127 (Supp. 1988), Ariz. Rev. Stat. Ann. § 3-1061 (Supp. 1988) and Cal. Civ. Code § 3482.5 (West Supp. 1989).

³ A public relations representative for an association of agricultural chemicals manufacturers observed in a recent conversation with the author that strict environmental regulation of agriculture will probably stem from a response to an emergency rather than from considered judgment. One day, he remarked, someone will wake up and discover that an entire aquifer system has been contaminated and we will have the "agricultural Love Canal."

⁴ Pub. L. No. 99-198, 99 Stat. 1506 (Dec. 23, 1985), codified in 16 U.S.C. §§ 3831-36

talists played a significant role in formulating the policies of that Act.⁵ The elevation of environmental concerns indicates that agriculture will no longer be insulated from responsibility for the environmental harms it causes.

A second reason for the importance of this symposium is its novel approach to the intersection of agriculture and environmental regulation. Rather than viewing environmental regulation from the perspective of agriculture, these authors examine agriculture from the perspective of environmentalism and conservationism.⁶ This change in viewpoint is notable because it carries with it a markedly different political orientation. Instead of asking how agriculture is different and then pointing to those differences as reasons for exempting farming from regulation, the questions we now ask are these: how are the environmental harms generated by agriculture similar to those caused by other economic activities, and how might agriculture's environmental harms be controlled?

These two factors, the increasing centrality of environmental concerns in agriculture and the decreasing deference to its claims for exception from environmental regulation, have combined to make the environmental regulation of agriculture a current issue of signal importance as debate begins over the provisions of the 1990 farm bill. These factors are important both for those who put environmental concerns first and for those who see them as peripheral to the agricultural enterprise. The discussion that follows endeavors to outline the theoretical problems facing those who try to map the intersection of agricultural and environmental policy. In order for the debate to be productive, the participants must begin to speak the same language and not just engage in sloganeering for a political position. This will require that those in agriculture take seriously the environmental concerns which are raised, and that environmentalists take seriously the special concerns of agriculture. Ultimately, the concerns are the same. We all want a healthier agricultural industry. The argument is about whether a "healthier" industry is a more prosperous one or a cleaner one, and whether both goals can be pursued simultaneously.

In order to join these issues and provide a context for the papers that follow, this article is organized around three themes. First,

(Supp. IV 1986).

⁵ 1985 U.S. Code Cong. & Admin. News 1103, 1514.

⁶ I am ignoring for present purposes the substantial distinctions that arise between people who call themselves environmentalists and those who choose the conservationist label.

any environmental regulation of agriculture must confront the conflicting regulatory cultures of the Environmental Protection Agency (EPA) and the Department of Agriculture (USDA). Second, the heterogeneity of the agricultural industry must be respected, and regulatory solutions to environmental problems must be designed to operate differently where critical differences exist among actors in the industry. Third, the technical, economic and cultural contexts of the problems of production agriculture must be clearly understood, and solutions to the environmental problems caused by agriculture must take account of those contexts. The goal of implementing a successful environmental program can be reached only if legislators recognize both the differences and the commonalities in regulatory cultures, and also understand the link between the economic and cultural context of different agricultural enterprises and the possible technical solutions to the environmental problems that these enterprises cause.

I. THE NATURE OF REGULATORY CULTURE

Effective regulation of the environmental threats posed by agriculture will depend upon a clear understanding of the nature of regulatory cultures. Regulatory culture might be defined quite generally as that set of shared understandings and goals that permits a group of people to work together.⁷ EPA and USDA each has its own regulatory culture; understanding their differences is critical to the policy debate.

Several refinements of the general definition of regulatory culture are important. First, within each culture there will be a "correct" or, at minimum, a preferred way of solving problems. No set of shared understandings is complete throughout a regulatory culture, however.⁸ There is always room for innovation or change from traditional ways of doing things.⁹

Second, the conception of the problem to be solved is part of the shared understanding, and therefore solutions will necessarily be limited to the conception of the problem as perceived by the actors

⁷ Meidinger, *Regulatory Culture: A Theoretical Outline*, 9 *J. Law & Policy* 355, 359 (1987).

⁸ See C. Geertz, *Local Knowledge: Further Essays in Interpretive Anthropology* (1983); J. Culler, *On Deconstruction* (1982).

⁹ See Runge, *Induced Innovation in Agriculture and Environmental Quality*, in *Agriculture and the Environment* 236 (T. Phipps, P. Crosson & K. Price eds. 1986) [hereinafter Phipps, Crosson & Price].

within the regulatory culture. Because the culture of a particular agency includes both the agency and its clients or other constituencies, the interactions between those within an agency and those subject to, or interested in, the outcomes of agency action help to constitute that culture.

Third, culture is practice as well as, or perhaps more than, a set of attitudes. Thus, regulatory tradition as a "way of doing things" exerts a powerful influence over policy choices. Of course, the statutory and general legal framework determines the activity of any regulatory body, but the ways in which the law is applied (as in the formulation of regulations to respond to a particular problem) is a function of the regulatory culture of the particular agency.¹⁰ Furthermore, new statutory missions must be translated through the core cultural matrix that defines the agency in question. Unless both USDA and EPA are understood as legal and cultural institutions, an accurate prediction of how they will act will be impossible, and proposals for combining or changing their missions relating to agricultural pollution will remain problematic.

A. *The USDA Culture*

USDA is a complex department. Its many agencies perform a variety of functions.¹¹ Despite their disparate missions, these agencies all share the central commitment of USDA to the economic health of farming. USDA was created as a Cabinet-level department by Lincoln to be an advocate for the economic interests of farmers.¹² The high status of the department ensures that the agencies respond to this principal concern of the Secretary of Agriculture.

Another defining characteristic of the agencies of USDA, especially those concerned with the use of natural resources in agriculture, is the predominance of a voluntary approach to obtaining farmer compliance.¹³ The history of soil and water conservation ef-

¹⁰ See Meidinger, *supra* note 7, at 370-71.

¹¹ The Department of Agriculture oversees a variety of governmental agencies. These agencies generally deal with seven major problem areas: (1) rural development, (2) food and consumer services, (3) marketing and transportation services, (4) commodity programs, (5) conservation and natural resources, (6) research and education, and (7) economics, policy analysis, and budget. See 1 J. Juergensmeyer & J. Wadley, *Agricultural Law* 199-231 (1982).

¹² Crowder & Young, *Managing Farm Nutrients: Trade-Offs For Surface-and-Ground-Water Quality*, 583 USDA Ag. Econ. Rept. 19 (1988).

¹³ See Phipps & Crosson, *Agriculture and the Environment: An Overview*, in Phipps, Crosson & Price, *supra* note 9, at 3. See also W. Cochrane & M. Ryan, *American Farm*

forts, as well as the regulation of pesticide and other chemical usage, reveal that USDA has largely eschewed a compulsory approach in favor of education and monetary incentives.¹⁴ Indeed, the entire structure of USDA is geared toward education and persuasion rather than the issuance of commands.¹⁵ The use and development of the Cooperative Extension Service and the land grant colleges also reveal this bias.¹⁶

USDA's approach to the problem of groundwater pollution provides one illustration of USDA's culture in practice. The USDA's General Policy for Ground Water Quality supports farming practices that minimize the agricultural threat to ground water¹⁷ while expressly opposing additional regulation of farm chemicals. This approach has two interesting elements at its core. First, it continues to adopt the voluntarist approach, which dominates all other USDA conservation programs with the exception of the Sod-buster and Swamp-buster programs.¹⁸ Second, it assumes the present state of chemical farming as its baseline.¹⁹ The chemical revolution in farming that occurred after the Second World War resulted in a tremendous increase in agricultural output that continues today.

Policy, 1948-1973 (1976).

¹⁴ See generally Malone, *Reauthorization of the 1985 Farm Bill Conservation Provisions: Conservation at the Crossroads*, 8 Va. Env'tl. L. J. 215 (1989); Davidson, *An Environmental Analysis of the Federal Farm Programs*, 8 Va. Env'tl. L. J. 235 (1989).

¹⁵ See, e.g., Crowder & Young, *supra* note 12. Compare the discussion of SCS conservation policy in Malone and Davidson, *id.* Interestingly, USDA's approach as a farm creditor departs dramatically from its regulatory approach. USDA takes a hard line against delinquent farmers and is quite demanding in requiring farmers to develop farm plans that will protect the financial stake of the department. See, e.g., Curry v. Block, 738 F.2d 1556, 1560 (11th Cir. 1984) (rejecting USDA arguments that the Department was not required to promulgate criteria used to determine a borrower's eligibility for deferral of relief); United States v. Markgraff, 736 F.2d 1179, 1186 (7th Cir. 1984) (Secretary of Agriculture is not required to provide FmHA borrowers notice of the availability of deferral of relief); Allison v. Block, 723 F.2d 631 (8th Cir. 1983) (requiring the Secretary of Agriculture to give notice of the availability of section 1981(a) relief to all CFRDA borrowers subject to foreclosure or loan acceleration); Coleman v. Block, 562 F.Supp. 1353, 1357 (D.N.D. 1983) (granting preliminary injunction to farmer on allegation that FmHA violated constitutional, statutory, and regulatory requirements in dealing with farmers' loans). These cases illustrate the negative response of both farmers and courts to USDA's credit practices. This response stems in part from a feeling that USDA has abandoned its traditional mission in this area.

¹⁶ See J. Hightower, *Hard Tomatoes, Hard Times* (1973) (discussing the general failure of the land grant college and Extension Service complex).

¹⁷ Crowder & Young, *supra* note 12, at 2, 15.

¹⁸ See Malone, *supra* note 14, at 217-19.

¹⁹ "Groundwater quality problems cannot be alleviated by implementing soil conservation practices alone, but must include changes in farm chemical use." Crowder & Young, *supra* note 12, at 15.

When USDA adopts chemical farming as its paradigm, it locks in a commitment to existing high levels of production. This commitment seems odd in light of the many other USDA programs aimed at production limitation and in view of the fact that excess capacity has been the chronic problem facing agriculture for the past forty years.

The wish to avoid implementing a mandatory program with the potential to reduce production is understandable in terms of the Department's traditional mission to control production and stabilize farmers' incomes. This mission, embedded in Department policy, naturally gives production programs a priority over environmental protection.²⁰ The agency's regulatory culture may explain the preference: USDA does not perceive itself as having an environmental mission.²¹

Although USDA groundwater policy is aimed at encouraging better husbandry practices, it is also designed to encourage research, education, and technology transfer to private landowners and rural communities.²² This approach is completely consistent

²⁰ USDA General Policy for Ground Water Quality states that the department will:

a. Support the prudent use and careful management of nutrients and other agricultural chemicals in agriculture and silviculture with the objective of avoiding future groundwater contamination. Where groundwater quality enhancement is needed, foster alternative crop management systems, improvements in the management of nutrients and crops, and reductions in the use of chemicals as appropriate.

b. Advocate and foster programs, activities, and practices that can prevent the harmful contamination of ground water from agricultural, silvicultural, and other rural sources to minimize, or make unnecessary, regulatory restrictions on the use of chemicals essential to agricultural production.

52 Fed. Reg. 48,135, 48,136 (1987). See also *Northwest Coalition for Alternatives to Pesticides v. Lyng*, 844 F.2d 588, 598 (9th Cir. 1988) (BLM program to control pesticide use in the control of noxious weeds held sufficient); *United States v. Larkins*, 852 F.2d 189, 192 (6th Cir. 1988) (upholding expansive definition of wetlands for purposes of Clean Water Act jurisdiction).

²¹ See Davidson, *supra* note 14, at 266-67.

²² USDA Policy for Research, Information, Education and Technology Transfer states that the department will:

a. Continue to conduct and support research, monitoring, assessment, and evaluation of: (1) factors affecting the movement of nutrients and agricultural chemicals in soils, (2) effectiveness of efforts to protect ground water quality, (3) procedures to predict the effects of changes in chemical management, (4) effects of agricultural and silvicultural practices on chemical movement in groundwater, (5) economic effects of various strategies to reduce groundwater contamination, (6) economic effects of various strategies to reduce ground water contamination, and (7) relative hazards to animal and human health of substances in soil and groundwater.

b. Provide both nationwide and site-specific information and technical assistance to private landowners to encourage them to use agricultural and silvicultural practices, including non-chemical methods of pest control, that can minimize the risks of

with the values of existing USDA regulatory culture, because it endeavors to induce changed behavior while sending the message that change is not required. Importantly, however, USDA groundwater policy also includes a commitment to fund research specifically aimed at groundwater protection, which contemplates the possible future implementation of mandatory regulation. This commitment, at minimum, means that USDA is exploring alternatives to its traditional voluntary method of regulation.

As a corollary to its voluntarist approach to regulation, USDA encourages cooperation and coordination among USDA agencies, other federal and state agencies, and private concerns. USDA recognizes that there are a variety of federal and state agencies, as well as private concerns, interested in groundwater protection. Chemical manufacturers will benefit from this cooperation since USDA policy makes them a crucial party to policy development. This aspect of USDA's culture of voluntarism is an aid to the development of a successful policy: affected parties can be expected to comply with a program more wholeheartedly if their views are represented in its design.

On December 18, 1987, USDA adopted a formal policy for ground water quality protection and enhancement.²³ The policy is designed to give general guidance to the agencies within the Department of Agriculture. Unfortunately, the regulations are unclear about how the new policy will materially change the mandate of those agencies. The policy does not state how it will be implemented, or how it will affect the priorities of the agencies within the department. Experience with other environmental initiatives, however, cautions that unless this policy receives a large allocation of the scarce resources of each agency, it is likely to have only a superficial impact. Agencies are loathe to abandon their constituencies unless specifically ordered to do so.²⁴ Not only does the

groundwater contamination levels that are harmful to public health and the environment.

c. Provide information and education to people and communities in rural areas about methods to maintain safe wells; to avoid local contamination by pathogens, agricultural chemicals, other nutrients, and other substances; to obtain tests of groundwater quality; and to treat their water to remove natural and artificial contaminants when needed.

52 Fed. Reg. 48,135, 48,136 (1987).

²³ *Id.*

²⁴ USDA Policy for Cooperation and Coordination states that the department will:

a. Strive to ensure that the Departmental policies and programs are implemented in a manner that encourages agricultural and silvicultural practices that avoid harmful

groundwater policy add another concern to the already complicated mission of the USDA, but it may cause the agency to run afoul of such traditional constituencies as chemical manufacturers, farm lenders, farm product purchasers, and farmers themselves. USDA is reluctant to embark upon such a course.

B. *The EPA Culture*

EPA, in stark contrast to USDA, has traditionally used what has come to be called the "command and control" model. EPA has adopted a method of enforcement that until recently has relied heavily on the command: a standard is established by regulation, and liability results if the standard is not met. One prominent policy implication of this approach is its "polluter pays" ethic. This ethic is diametrically opposed to the general persuasion-through-cost-sharing approach of the USDA.²⁵ Only recently have environmental statutes administered by EPA permitted a more flexible approach.²⁶

The EPA was created in 1970. Unlike USDA, EPA was not created by Congress, but by an Executive Order.²⁷ Accordingly, the

levels of contamination in groundwater.

b. Coordinate with state agencies, other federal agencies, manufacturers, and others to help ensure that they adequately consider the needs of agricultural and silvicultural land users to use nutrients and pesticides correctly to maintain productivity of soil, plant, and animal resources. Coordinate with and encourage agencies, manufacturers and others to help agricultural and silvicultural land users, through technology transfer, to demonstrate how they may avoid or minimize adverse affects on groundwater quality.

Id. See generally Sax, *The (Unhappy) Truth About NEPA*, 26 Okla. L. Rev. 239 (1973) (discussing the failure to produce environmentally attractive alternatives to airport runway expansion under NBPA).

²⁵ See, e.g., Crowder & Young, *supra* note 12, at 8. The cultural model that prevails could determine important distributive decisions. See *id.* at 19 (pointing out that the distributions of who pays is a political question).

²⁶ The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C.A. §§ 9601-9675 (West 1988) was amended in 1987 to explicitly permit alternative dispute resolution procedures in order to achieve the environmental goals of the Act more quickly. See *id.* § 9612(a) which was enacted to "expedite effective remedial actions and minimize litigation." Similarly, § 9612 permits arbitration to be used to resolve disputes over claims against the reimbursement fund. See Openchowski, *Changing the Nature of Federal Enforcement of Environmental Laws*, 17 ELR 10304 (1987); Dinkins, *Shall We Fight Or Will We Finish: Environmental Dispute Resolution in a Litigious Society*, 14 ELR 10397 (1984). At least one commentator, however, is not so sanguine about the prospects of alternative dispute resolution in the environmental context. See D. Amy, *The Politics of Environmental Mediation* (1987).

²⁷ 5 U.S.C. app. at 1132 (1982). "Reorganization Plan 3 of 1970 established the U.S. Environmental Protection Agency (EPA) in the Executive branch as an independent agency,

agency lacks a statutory charter and is under the direct control of the President. The Administrator serves at the pleasure of the President and, lacking a Cabinet rank, reports to the President through the Office of Management and Budget. This arrangement puts the EPA at a structural disadvantage in relation to the USDA, which has both a Congressional charter and Cabinet rank.²⁸ Rather than speaking directly to other departments about environmental concerns as they cut across departmental lines, EPA must first make its case to a budgetary officer and then, secondarily, to those concerned with substantive programs.

At its creation, the EPA was divided into a headquarters and ten regional offices.²⁹ Each regional director reports directly to the administrator.³⁰ This decentralization gives the agency an internal flexibility not found in USDA. The headquarters sets policy and makes general rules, and the regional offices carry out the programs.³¹ One of the features arising out of the peculiar genesis of the EPA is the competition between regional offices and the central office.³² Additionally, the various statutes EPA must administer create a maze of detailed functions that differ from statute to statute and from problem to problem.³³

effective December 2, 1970," 40 C.F.R. § 1.1 (1987).

²⁸ Legislation that would elevate EPA to cabinet rank is currently under consideration. See S. 276, 101st Cong., 1st Sess., 135 Cong. Rec. S601-01 (1989).

²⁹ 40 C.F.R. § 1.5(a) (1987).

³⁰ 40 C.F.R. §§ 1.5(a), 1.61 (1987).

³¹ *Id.*

³² The central office is responsible for setting agency policy, but the regional offices are primarily responsible for enforcement of EPA programs. The regional offices are reviewed by the central office to evaluate their effectiveness. Importantly, however, if a case is "considered significant, the EPA Office of Enforcement in Washington frequently assumes direct control." Zener, *Guide to Federal Environmental Law* 221 (1981). The central office will often take over if the nature of the defendant demands it or if the enforcement action has a high political profile. *Id.*

³³ In the area of groundwater contamination alone, for example, a plethora of federal statutes all have some impact on the management of the problem. See, e.g., Clean Water Act, 33 U.S.C. §§ 1251-1387 (1982) (regulates discharges into the nation's waters from point sources, establishes effluent guidelines and limitations for a variety of contaminants, controls the construction of public sewage disposal works, authorizes development of plans to control nonpoint source pollution); Safe Drinking Water Act, 42 U.S.C. §§ 300f-300j-11 (1982 & Supp. IV 1986) (establishes federal authority for protecting drinking water, public water supplies, and specific aquifers); The Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901-6991i (1982 & Supp. IV 1986) (creates federal authority for regulating the disposal of hazardous wastes, including the impact of such disposal on groundwater sources); The Federal Insecticide, Fungicide, Rodenticide Act 8 U.S.C. §§ 136-136y (1982 & Supp. IV 1986) (regulates the environmental impact of federally licensed pesticides, including the leaching properties of those pesticides); The Comprehensive Environmental Response, Compensation

Given this structure, EPA's groundwater policy provides an example of the agency's regulatory culture in practice and offers a useful comparison to the approach taken by the USDA. While USDA is principally concerned with the economic vitality of the agricultural industry, EPA was created to protect public health from the perils of industrial pollution, and functions to pursue that goal alone.

EPA administers a number of environmental protection statutes that concern groundwater protection strategies.³⁴ None of the statutes, however, gives direct authority for a comprehensive groundwater protection strategy. Instead, the EPA uses its statutory authority to fashion a general policy that should result in a coherent policy for groundwater protection.³⁵

The first part of EPA's policy is designed to answer the general questions in groundwater protection: which waters do we protect, and what criteria determine protection? In adopting a differential groundwater protection approach, EPA has made the judgment that all groundwater is worthy of protection, but that priorities will be based upon the use and value of particular groundwater supplies. Thus, the level of protection given to particular aquifers will vary under EPA's policy.

EPA's protection criteria are expressed as MCL (Maximum Con-

and Liability Act, 42 U.S.C. §§ 9601-9675 (1982 & Supp. IV 1986), *as amended in* 42 U.S.C.A. §§ 9601-9675 (West 1988) (authorizing federal response to releases or threatened releases of hazardous substances, including releases that threaten groundwater).

³⁴ These include FIFRA, SWDA, CWA, RCRA and CERCLA. Office of Pesticides & Toxic Substances, *Agricultural Chemicals in Ground Water: Proposed Pesticides Strategy* 42 (1987).

³⁵ The Office of Pesticides and Toxic Substances publication, *Agricultural Chemicals in Ground Water: Proposed Pesticides Strategy* (1987), sets out EPA's intended policies:

The Agency will use a differential protection approach to protect the groundwater resource. With this approach, the Agency will focus on groundwaters that are current or potential sources of drinking water or that are vital to fragile ecosystems. . . . Additional measures may be taken to ensure protection of certain "high priority groundwaters."

Id. at 75;

EPA will use MCL's (Maximum Contaminant Levels), as defined under the SDWA (Safe Drinking Water Act), as reference points for helping to determine unacceptable contamination of groundwaters that are drinking water sources. When no MCL exists, EPA will use interim drinking water protection criteria as its reference points. These will be equivalent to an MCLG (Maximum Contaminant Level Goal) for non-carcinogenic pesticides and to a negligible risk level for carcinogenic pesticides. The Agency will also use ecologically based protection criteria as reference points for helping to determine unacceptable contamination of groundwaters.

Id. at 78.

taminant Level), MCLG (Maximum Contaminant Level Goal), and negligible risk standards.³⁶ These standards are derived from the Safe Drinking Water Act.³⁷ Under the SDWA, EPA is required to set a Maximum Contaminant Level Goal for any potential drinking water pollutant at the level for which there is no known or anticipated effect. The policy sets the level at absolute zero for carcinogens and at a percentage of the Acceptable Daily Intake dose for non-carcinogens.³⁸ Negligible risk standards are established at the level of exposure determined to produce no significant health risk. For some chemicals, the negligible risk standard is set at the point of detection — a very strict standard indeed. The Maximum Contaminant Level is based on the MCLG under the SDWA. The MCL is set at a level that is both enforceable and protective of drinking water from public water systems. The MCL must be set as close to the MCLG as possible, taking into account factors of cost, feasibility, contaminant reduction, and protection of public health. Because MCLs do not take into account the value of the contaminant to society, they are both measurable and enforceable public health standards.³⁹

The second part of EPA's groundwater protection strategy, after determining which waters to protect and at what level to protect them, involves preventing the continued contamination of groundwater sources. This raises four main issues: 1) how should local variability be addressed, 2) what are the appropriate state/federal roles, 3) what role should pesticide users and registrants play, and 4) how should contamination be controlled once it is detected.⁴⁰

EPA's proposed strategy addresses local variability by basing preventive regulations on groundwater vulnerability. This requires aquifer mapping by use, value, and vulnerability. Accordingly, administration of these programs must devolve to the lowest feasible level, in most cases the county, although mapping might extend to sub-county levels in order to reduce the possibility of over- or un-

³⁶ *Id.*

³⁷ 42 U.S.C. § 300f(3) (1982).

³⁸ Office of Pesticides and Toxic Substances, *supra* note 34, at 72 n. 1, explains the development of the ADI dose:

[The Acceptable Daily Intake] is developed by first determining the concentration of a chemical that shows no observable effect level (NOEL) in animal tests. After factoring the size of humans and possible other biological differences, the NOEL is divided by a margin of safety factor, the magnitude of which is determined by the quality of the toxicology data and other factors.

³⁹ *Id.* at 72.

⁴⁰ *Id.* at 86.

derprotective regulations. EPA maintains that the "number of vulnerability levels is practicably limited by (1) the technical ability to accurately differentiate vulnerability; and (2) the number of different prevention measures that could reasonably be used to provide differential protection."⁴¹

The strategic policies proposed by EPA are far more aggressive than those contemplated by the USDA. EPA will continue to apply both a uniform standard for contamination determinations and uniform actions for the mitigation of aquifer contamination. Like the policy reflected in the Clean Water Act, EPA's groundwater policy addresses local variability by applying a single standard to similarly situated groundwater supplies.⁴² Furthermore, the states will have principal management authority, initially creating the groundwater management plan themselves.⁴³

EPA mandates an expanded role for manufacturers of pollutants in preventing groundwater contamination, including increased technical support for users and the development of substitutes for chemicals now in use.⁴⁴ The user's role in preventing ground water contamination is pivotal. In recognizing the need to alter "traditional practices" and to increase the use of environmentally sound alternatives, EPA policy differs significantly from that of the USDA, which resists the alteration of traditional practices and

⁴¹ *Id.* at 92.

⁴² *Id.* at 102-103:

EPA will continue to take uniform action for pesticides causing widespread, national concerns and will establish generic prevention measures to address certain pesticide use and disposal practices that pose groundwater threats independent of area specific vulnerability. National uniform measures will not be differentiated on the basis of local differences.

EPA will also adopt a new approach of differential management of pesticide use based on differences in groundwater use, value and vulnerability to an extent that is administratively feasible. County or State level measures based upon groundwater vulnerability will be employed, including use cancellations. In some cases, the user will have to determine the applicability of differential prevention measures based on interpretations of local field conditions and the user's location within areas of "high priority groundwaters."

⁴³ *Id.* at 105:

EPA will encourage the development of a strong State role in area-specific management of pesticide use to protect the groundwater resource. State pesticide management plans will be used to strengthen EPA's foundation for decisions on pesticide use. In some cases, the use of a pesticide in a State will depend on the existence of and adequacy of such a State management plan. Under its management plan, a State will develop and implement highly tailored prevention measures based on local differences in ground water use, value and vulnerability.

⁴⁴ *See id.* at 111.

seeks to preserve the Department's relationships with its clients.⁴⁵

EPA looks to manufacturers to aid both state governments and individual users in monitoring groundwater quality. Monitoring is the linchpin of the policy. As the EPA publication on ground water strategy put it:

Increased monitoring of pesticides in groundwater is critical to the implementation of this strategy. EPA will establish an "early-warning," or "yellow light/red light," approach to prevent further area contamination, once detected. The approach will use the MCL or other EPA specified protection criteria as the point of reference to evaluate, and when necessary, change pesticide management plans.⁴⁶

Under the proposed strategy, EPA intends to work more closely with the states in responding to aquifer contamination from the ordinary use of pesticides. This strategy may reflect a shift towards the cooperation norm that characterizes USDA's voluntary approach to regulation. EPA will help identify responsible parties, establish safety standards, provide funds for removal actions, and, when faced with an imminent public health threat, provide alternative sources of drinking water. Specific proposed policies include the enforcement actions available to EPA under the general environmental statutes and limitations on pesticide use that are geographically triggered.⁴⁷ An important question that the EPA policy

⁴⁵ See Davidson, *supra* note 14.

⁴⁶ Office of Pesticides and Toxic Substances, *supra* note 34, at 113.

⁴⁷ *Id.* at 121-22:

Where a pesticide has reached unacceptable levels in groundwater, strong actions must be taken to stop further contamination. These actions can range from enforcement actions to modification of the way a pesticide is managed, including geographic restrictions on the pesticide's use.

EPA will encourage a strong State role in responding to contamination. A State's management plan should consider the development of a valid corrective scheme.

Id. at 122;

EPA will continue to develop and stress enforcement of MCLs. Under the SDWA's emergency powers, EPA will consider issuing orders requiring responsible parties to provide alternative water supplies when levels of pesticides present an imminent and substantial endangerment to public health.

Id. at 125;

EPA and the States will place greater emphasis on coordinating FIFRA, SDWA, and CERCLA enforcement activities to identify parties responsible for groundwater contamination as a result of the misuse of pesticides, including illegal disposal or leaks and spills.

On a case-by-case basis, EPA may assist States by undertaking CERCLA Fund-financed removal actions to provide alternative drinking water supplies where there is an imminent human health threat.

does not adequately address is the assessment of financial liability for violations. The agency's proposed policy indicates that the task is more complicated than identifying "responsible parties" under Superfund,⁴⁸ because the user as well as the manufacturer may be implicated in the clean-up costs and may have, in fact, placed himself at risk.⁴⁹ The formulation of a fair and effective liability scheme will likely call for more participation from states and industry.

Given the difference in regulatory cultures between USDA and EPA, appropriate questions are: Can the industrial regulatory model favored by EPA be applied to agriculture?⁵⁰ Can both agencies reconcile their approaches to include elements of both voluntary and mandatory regulation? It is clear that the 1990 Farm Bill will receive the most searching environmental scrutiny of any agricultural statute to date. A critical question facing policymakers is whether environmentalists who grew up challenging industrial polluters or trying to control activities on public land will be able to forge a new strategy for dealing with agricultural pollution on private land.

II. THE HETEROGENEOUS NATURE OF AMERICAN AGRICULTURE

When policymakers talk about agriculture they usually mean at least three things. "Agriculture" describes the industry, while "farming" and "agri-business" describe the enterprises that make up the industry. The conflation of agriculture, farming and agri-business in policy discussion has, for too long, obscured the substantive issues at stake and skewed the policy debate. Whether agriculture as an industry ought to be made responsible for the environmental harms it causes is a fundamentally different issue than whether those regulations ought to be uniformly applied to the various enterprises that constitute the industry. Any policy designed

Id. at 126.

⁴⁸ CERCLA § 107, 42 U.S.C. § 9607 (1982). See Burkhart, *Lender/Owners and CERCLA: Title and Liability*, 25 Harv. J. on Legis. 317 (1988).

⁴⁹ "The question of who should pay for long-term corrective actions at sites contaminated by the approved use of a pesticide is a legislative question. EPA believes several aspects of the problem must be considered before a decision can be made." Office of Pesticides and Toxic Substances, *supra* note 34, at 126 (EPA believes that the user, the applicant, the registrant, the agencies that registered the product and possibly the well owner, if he is guilty of placing his well at risk, all may be responsible parties and that liability in such a situation ought to be limited to mitigating the public health threat).

⁵⁰ See Davidson, *supra* note 14.

with only one type of farming enterprise in mind will necessarily have perverse effects when applied to different enterprises. Recognition of variety must form the core of a successful regulatory approach.

While it is popular to talk about farmers and farming as though they are the same across the country, the reality is that farms and farmers vary widely. The most popular stereotype is that of the midwestern grain or livestock farm.⁵¹ However, this model excludes a large number of farms. Farms may be distinguished on the basis of what they produce, where they are located, whether they are dryland or irrigated operations, whether state law prohibits classes of investors and any number of other grounds. For environmental regulatory purposes, policymakers will have to determine which differences really matter and what distinctions can fairly be made.

In the nonfarm context, EPA is quite skilled at distinguishing among classes of producers within particular industries.⁵² USDA, on the other hand, has not been quite as successful at distinguishing among classes of producers for any purposes other than economic policies. Even in the soil conservation programs, where USDA comes closest to using the command and control model, it has not been successful in making useful distinctions among the classes of producers it is regulating.⁵³ The classic example of this failure can be seen in USDA's soil erosion policy. Soil erosion has been a major concern of agricultural policy since the thirties.⁵⁴ The traditional approach provides farmers with information and economic incentives to take erosion-sensitive land out of production. Recent studies indicate, however, that the worst problems arise on a small%age of the land under cultivation. Taking that erosion-prone land out of production and changing cultivation practices on the remaining acreage would resolve many of the problems associated with soil loss.⁵⁵

If USDA had targeted that specific erosion-prone acreage, the soil conservation program would have been much more success-

⁵¹ See M. Kramer, *Three Farms: Making Milk, Meat and Money From the American Soil* (1980).

⁵² See Davidson, *supra* note 14.

⁵³ See Malone, *supra* note 14.

⁵⁴ See, e.g. the Agricultural Adjustment Act of 1938, 7 U.S.C. §§ 1281-1392 (1976 & Supp. III 1979).

⁵⁵ American Farmland Trust, *Soil Conservation in America: What Do We Have To Lose?* (1984).

ful.⁵⁶ USDA's policy has ignored the heterogeneity of agriculture in important ways by insisting that farmers be treated as though they were all similarly situated.⁵⁷ Where USDA makes distinctions, it typically distinguishes farms according to economic status, not according to environmental sensitivity.

III. THE ECONOMIC AND CULTURAL CONTEXT OF AGRICULTURAL-ENVIRONMENTAL PROBLEMS

A. *The Farm Economy*

The nature and structure of the farm economy will play a major role in the development of the proper regulatory model for the environmental regulation of agriculture. Generally, the economic structure facing the individual farmer most closely approximates the neoclassical paradigm of perfect competition.⁵⁸ The farmer is a price taker. In most cases the farmer can influence neither the prices he pays for inputs nor the prices he receives for his product.⁵⁹ His principal control over income is in the number of units he produces for sale.

The basic economic fact of farmer-as-price-taker demands a sensitivity to farming's heterogeneity. A given regulatory program will impose costs unevenly across farming enterprises, and the impact of additional costs will be felt differently depending on the size and organizational structure of the farm. This heterogeneity, together with the competitive nature of the markets in which farmers operate, severely limits the ability of farmers to pass the costs of reducing pollution on to consumers or purchasers further along in the production chain.⁶⁰ In general, large farmers will be able to absorb costs and vertically integrated farms can spread costs through other parts of their operations. On the other hand, smaller

⁵⁶ *Id.* Soil erosion continues to be a major problem. S. Batie, *Soil Erosion: Crisis in America's Croplands?* (1983). Part of this continued problem may be explained by the traditional reliance on voluntarism, but that alone does not explain the policy failure or the reluctance to change the structure of sanctions and incentives. *Id.*

⁵⁷ See W. Cochrane & M. Ryan, *supra* note 13.

⁵⁸ See *id.* at 15-17; see also G. Shepherd, *Agricultural Price Policy* 5-18 (1947) (explaining competitive paradigm in comparison with free market assumptions).

⁵⁹ Hedging, forward contracting, price later contracting, and other devices are used primarily to stabilize prices farmers receive. However, they do not effectively reflect any important market power for the average producer. The existence of cooperatives and producers' unions, as well as the repeated efforts to use politics to secure higher commodity prices, all reflect this fact. Marketing orders, acreage set-asides, dairy buy-outs, and myriad other programs are also responses to the fundamental economic reality facing farmers.

⁶⁰ See Phipps, Crosson & Price, *supra* note 9.

farmers, and those on whom the costs of regulation hit especially hard, may not survive the regulation.

The government's role in the farm economy is more than merely reactive. The government has helped create the farm economy; underlying economic policies have had much to do with the structure of American agriculture.⁶¹ Agricultural economic policies can determine how farm ownership and use patterns will develop⁶² and those patterns will in turn affect the structure of environmental regulatory programs.

B. Types and Sources of Environmental Problems

Environmental problems related to traditional production agriculture are divisible into two basic types, regardless of the crop or product produced. Drs. Tim Phipps and Pierre Crosson have defined these problems as either "input-related" or "fundamental."⁶³ Input-related problems are "potentially correctable problems involving soil, water, fertilizer, and pesticides."⁶⁴ Fundamental problems "are intrinsic to agricultural production"⁶⁵ and therefore cannot be avoided without stopping production. This distinction is often blurred, however, because most problems in conventional agriculture will be both fundamental and input-related. An example is the problem of soil erosion caused by plowing techniques. This problem is fundamental because the land must be cultivated; it is input-related because the problem can be mitigated by using the least damaging cultivation method.

Unfortunately, some environmental problems associated with the production of food and fiber are not susceptible to technical solutions. "Fundamental" problems are intrinsic to modern production agriculture in America. For instance, conversion to "no-till" production may address the problem of cultivation-related soil erosion, but it ignores the increased use of herbicides that is sub-

⁶¹ Quite clearly, both public and private forces have played a major role in determining the shape of the modern American agricultural economy. Which force has been more significant is, of course, the subject of substantial debate. It is beyond cavil that the central California agricultural industry would not look the same without the delivery of cheap water made possible by the Federal Reclamation Act, and the failure of the federal government to enforce acreage limitations established in the Act. 43 U.S.C. § 390 (Supp. IV 1986).

⁶² See U.S.D.A., *A Time to Choose* (1981).

⁶³ See Phipps & Crosson, *Agriculture and the Environment: An Overview*, in Phipps, Crosson & Price, *supra* note 9, at 7.

⁶⁴ *Id.* at 5.

⁶⁵ *Id.*

stituted for weed control. These herbicides may cause environmental problems of their own. Cultivation, as a fundamental matter, produces some inescapable environmental problems. The issue is not how to eliminate them, but rather which alternatives cause the least harm.

Input-related problems of agriculture are associated with activities undertaken in the course of production that are not absolutely essential to the production of food and fiber. They are, in a sense, "external" to the fundamentals of farming. Pesticides and nonorganic fertilizers, for example, are essential only if one assumes conventional agricultural practices as the baseline.⁶⁶ This view of the "essentials" of farming ignores the reality of modern American agriculture as an evolved system that has taken its particular shape in response to a variety of private and public decisions. If the assumptions imposed by this evolution are relaxed, many of the practices which lead to harmful environmental effects become "external" to the basic concept of farming. While practical policymaking calls for the acceptance of things as they are, creative policymaking asks how they got that way and what we might imagine them to be in the future.

Many of these environmental harms are external to food production in the traditional economic sense⁶⁷ as well, since they manifest themselves as costs of production borne by people off the farm, sometimes far off the farm. Much of environmental policy has been aimed at forcing an internalization of all costs associated with particular enterprises. This is justified because an enterprise is presumed to benefit unfairly by sloughing off some of the cost of production onto others. The forced internalization approach, however,

⁶⁶ Whether or not conventional agricultural production methods should be accepted as a baseline measure is the subject of widening debate. See, e.g., T. Gipps, *Breaking the Pesticide Habit: Alternatives to Twelve Hazardous Pesticides* (1987); M. Schapiro & D. Weir, *Circle of Poison: Pesticides and People in a Hungry World* (1981).

⁶⁷ In the argot of economics, externalities are costs associated with production that are incurred by parties other than the producer, and that are not taken into account in the economic decision-making of the producer. Pollution is a classic externality: while the smoke or noise or contaminated water that results from a production process imposes costs on those who suffer from it, these costs are not reflected in the decision-making process of the producer simply because (absent corrective regulation) they are not presented to the producer for payment. Thus they are "external" to production decisions. When a producer is able to "externalize" costs onto society at large, he creates an allocative problem which the free market cannot correct: his activity produces more social costs than other activities to which the resources might be devoted to achieve the same social benefit, and thus the over-allocation to his activity creates a social loss. See Coase, *The Problem of Social Cost*, 3 J. Law & Econ. 1 (1961).

raises complicated distributional issues. In some cases the benefits of reduced pollution are shared widely while the costs are localized, and in others the costs are spread widely while the benefits accrue only locally.⁶⁸ Unfortunately, merely calling a cost an externality says nothing about who should be made to bear the cost.⁶⁹ The externalities of agricultural production are no exception. In view of the heterogeneity of the industry and its stark economic realities, a rigid internalization approach to environmental regulation is even more problematic there than elsewhere.

In keeping with the Phipps/Crosson taxonomy, input-related problems are those for which there are possible solutions. Many of the solutions are, for lack of a better word, cultural.⁷⁰ For example, keeping a completely weed-free field is unimportant as a production matter, but as a practice it may be continued to avoid appearing slovenly or lazy or just plain "not a good farmer" to one's neighbors. This contributes to the use of unnecessary herbicides. Given the economic context within which farmers operate, they frequently respond to what their neighbors are doing in an effort to maintain every possible production edge. If the community standard is to apply a certain level of nitrogen to the fields, farmers may substitute that community standard for a rationally calculated decision.⁷¹

Often input-related environmental problems emerge from cultural sources outside of the agriculture industry. For example, consumers often prefer food with chemically-induced characteristics that may be completely unrelated to its wholesomeness,⁷² and thus create a demand for chemically produced commodities. Large cus-

⁶⁸ An example of each type of mismatch of costs and benefits of corrective regulation might be imagined at the same midwestern coal-burning electric power plant. Whereas the costs of stringent emissions controls to reduce acid rain would be borne by local ratepayers and the benefits enjoyed by citizens of several states far to the north, the same ratepayers would bear the costs of capping the onsite coal heap so that its runoff ceases to pollute the wells of a few nearby residents. While it might be argued that the parties benefited by the regulation are entitled to be free of the external costs, the forced internalization of those costs is not necessarily the optimal allocation of society's resources. *See id.* at 44.

⁶⁹ *Id.* *See also* R. Posner, *Economic Analysis of Law* 52 (2d ed. 1977).

⁷⁰ *See* W. Berry, *The Unsettling of America: Culture and Agriculture* (1977); W. Berry, *The Gift of Good Land* (1981); M. Fukuoka, *The One Straw Revolution* (1978); *Meeting the Expectations of the Land.* (W. Jackson, W. Berry & B. Colman eds. 1984).

⁷¹ *See* Agricultural Law and Policy Institute, *Ground Water Study: Preliminary Report* (1988).

⁷² The increase in "brand-name" produce, for example, has arisen in response to a consumer demand for luxury items when the items themselves may be no more wholesome than their generic counterparts.

tomers base major purchases on these cultural factors, a force that compels farmers to undertake environmentally harmful activities. If a major distributor of watermelons demands that the melons be free of scabs, even though surface scabs are completely harmless, farmers will use a pesticide that produces scabless melons.⁷³

Cultural factors also affect the ways in which farmers receive and evaluate information and how they view regulatory regimes. A recent Agricultural Law and Policy Institute study of farmer's attitudes toward groundwater contamination examines how these attitudes are formed.⁷⁴ The study first addresses how farmers get their information and what kind of information they value.⁷⁵ The results show marked preferences among sources of information for solving environmental problems.⁷⁶ The Institute's study also examines the

⁷³ Just this scenario created the aldicarb scandal in California. See L. Mott & K. Snyder, *Pesticide Alert: A Guide to Pesticides in Fruits and Vegetables* 134 (1987). In July 1985, nearly 1,000 people in the western United States and Canada became ill after eating California watermelons tainted by illegal residues of the pesticide aldicarb. Early reports severely underestimated the extent of the poisoning outbreak. One California health official described it as the "largest food-borne pesticide outbreak in North American history." *Summer Watermelon Poisonings Hit More People Than Thought*, L.A. Times, Feb. 14, 1986, at 3, col. 4. Although aldicarb was not registered for use on the fruit, several growers apparently applied it to their watermelon fields. *Watermelons Sweet, Feelings Bitter After Poisonous '85 Crop*, L.A. Times, July 6, 1986, at 3, col. 4.

⁷⁴ Agricultural Law and Policy Institute, *Agricultural Contamination of Ground Water: A Survey of Farmers in Five Diverse Sites*, Preliminary Report (Dec. 1, 1988) [hereinafter *Preliminary Report of the Findings*].

⁷⁵ For example, farmers were asked to rank the sources of information they rely on to learn about groundwater issues. See *id.*

⁷⁶ In the Institute study in which the author took part, we identified five watershed areas in different parts of the country: two in the Midwest, one in the South, one in the East, and one in California. We spoke to farmers in order to find out what they know about groundwater contamination and what their attitudes are toward that contamination and possible solutions. We also wanted to find out how the source or quantity of information affects farmers' beliefs and attitudes toward possible remedies. *Id.*

We found that the most important source of information about the use of chemicals and their impact on groundwater comes from agricultural chemical manufacturers or dealers. *Id.* in *Summary of Preliminary Survey Results* at 3. We also discovered that the issue of groundwater contamination is increasingly important to farmers. *Id.* The heavy reliance on these two sources, however, suggests that there is additional information to be gathered and understood, rather than just disseminated. An implicit critique of existing programs is contained in the data.

Although farmers receive information from many sources, the volume of that information does not correlate to farmers' opinion of its reliability. What factors lead them to discard most of the information they receive? Farmers are clearly using an editorial process, but how they weed out unreliable information remains unclear. Farmers' belief systems form a kind of editorial grid through which they push the information they receive. What we need to understand better is how that editorial grid is constructed —what factors contribute to the belief that one source or particular kind of information is better than another.

formation of farmers' attitudes.⁷⁷ Here the study discovered important differences and commonalities in attitudes about the appropriateness of alternative regulatory approaches.⁷⁸

While our study did not directly address why farmers value some sources of information over others, it did reveal that such preferences exist. For example, for information about herbicides and pesticides, farmers tend to rely most often on information communicated to them in person or over the telephone by manufacturers of those products. *Id.* at Table 5. Farmers' second choice is information provided by herbicide and pesticide dealers, followed by advice and information received from other farmers. *Id.*

When the means of communication change, however, so do farmers' preferences. Our study suggested that the Cooperative Extension Service is the most valued source of herbicide and pesticide information transmitted by radio, television, or in public meetings. Agricultural chemical manufacturers and dealers were the second most preferred choice, while the Soil Conservation Service ranked third. *Id.* at Table 7. Generally, the study suggested that farmers most value the information and advice they receive from those either engaged in the same task as they are, or from those who have a material interest in farmers getting good information. Hence, a farmer is likely to rely most heavily on advice and instruction about pesticide application from a pesticide dealer or manufacturer. *Id.* at Table 8. One other important thing this data tells us is that information in the form of *specific oral advice* is the most sought and the most valued.

These findings suggest several questions that will need to be addressed by future agricultural regulations. If, as our results demonstrate, farmers depend upon one another for a large portion of information underlying their decisions about chemical use, how can farm policy be structured to assure that farmers will get all the information they need? If farmers prefer the personal, oral advice of those who manufacture or sell agricultural chemicals to written instructions and warnings, the regulations should take that into account. In addition, what do these results suggest about farmers' perceptions of government as a reliable provider of information? Are the SCS and the Cooperative Extension Service perceived as agents of the government and do farmers' general attitudes toward government apply to them?

⁷⁷ Preliminary Report of the Findings, *supra* note 74, at Table 2.5.

⁷⁸ The Institute's study concluded with an attempt to determine what environmental protection policies farmers would find acceptable. *Id.* at Table 3.11. Almost 90% of the farmers interviewed expressed a strong interest in *free* technical advice that would help reduce their dependence on chemical herbicides and pesticides. *Id.* at Table 3.1. More than three-quarters said they thought farmers would be willing to rotate crops, so long as their commodity base could be protected, illustrating the strong impact commodity programs have on planting decisions. *Id.* at Table 3.5.

In general, the data revealed that farmers opposed policy options that included fines or taxes to reduce chemical use. The majority opposed proposals to reduce chemical and fertilizer usage by imposing fines for excessive use. *Id.* at Table 3.11. On average, farmers opposed government taxing farm chemicals to create price disincentives to the continued use of chemicals at present levels. *Id.*

One interesting attitude we uncovered is that a substantial minority of farmers thinks of groundwater as their property to use and treat as they like. In response to the statement, "The groundwater under my land is my property to use as I need," 53% of the farmers surveyed in Pennsylvania and 53% of those surveyed in Wisconsin replied affirmatively. However, in response to the same statement, only 37% of the farmers surveyed in Florida and 37% of those surveyed in Iowa answered affirmatively. *Id.* in *Summary of Preliminary Survey Results*, Table 11. The prevalence of this attitude varied, but it suggests an important insight into what kind of regulation will be acceptable. If farmers think they have a

Understanding the preferred informational medium and the likely responses of farmers to a regulatory scheme is important to the design of such a scheme because regulations must be communicated to those who will be made subject to them in a way that will ensure compliance. As discussed earlier, the policies of EPA and USDA are based on conflicting assumptions about how to change the behavior of polluters. Those assumptions are rooted in the cultural make-up of the agencies. However, unless we discover what information farmers get and what information they actually use, reliance on either a voluntary or mandatory program is purely an act of faith. The makers of new federal and state policies must begin to understand why farmers value particular information and must use that knowledge to create the exchange that permits education, prevention, and control to occur simultaneously.

Cultural distinctions emerge as important variables in how the environmental regulation of agriculture should occur. In addition, the technical solutions are often tied quite directly to the economics of the individual farming enterprise. This link, that is, the technical-economic-cultural link, has a direct impact on the types of solutions that are acceptable to the industry. The environmental regulatory community has also developed a culture,⁷⁹ and it has taken two models as its starting point: the model of the industrial polluter and the model of the consumer of natural resources.⁸⁰ Neither of these models is directly applicable to the regulation of agriculture, but the insights that have been gained from thirty years of environmentalism should help inform solutions to the input-related environmental problems of agriculture.⁸¹

CONCLUSION

Whatever the cultural or economic context, crops must be planted and kept weed- and pest-free. They must be harvested, stored, and processed. Livestock must be raised and kept healthy.

property right in groundwater their resistance to direct regulation is going to be higher. We would like to discover why attitudes toward groundwater differ from state to state. Perhaps the educational process has been different; maybe the legal regime that controls groundwater usage encourages one attitude rather than another. In any event, the differences need further examination.

⁷⁹ See Meidinger, *supra* note 7.

⁸⁰ See S. Hays, *Beauty, Health and Permanence: Environmental Politics in the United States, 1955-1985* (1987).

⁸¹ See *id.*; S. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1800-1920* (1974).

It must be fed out, slaughtered, transported, and processed. Regardless of why particular decisions are made, all of these processes involve certain material interactions that cannot be eliminated and that present certain environmental challenges.

The goal of a comprehensive environmental program must be to change behavior so that the least environmentally harmful choices will be made. When seen in this light, the importance of understanding the technical-economic-cultural link becomes clear. The successful program focuses on those problems which are susceptible to a solution, while seeking to reduce the harms flowing from those which are not. To design such a program, policymakers must know which harms are which, and how well the alternative solutions will work in the varied context of farming. To implement it successfully, policymakers must also understand the regulated people, and how they will respond to the regulation.

The growing concern that agriculture should be called upon to account for the environmental harms it causes demonstrates the need for this symposium. The participants hope that it sparks a new approach both to environmentalism and to agricultural regulation. The traditions of both cultures have much to contribute to a comprehensive program of environmental regulation of agriculture. This symposium seeks to generate a meaningful debate on the difficult issues at this intersection, so that the industry can become "healthy" from all perspectives.

In her article, "Conservation at the Crossroads: Reauthorization of the 1985 Farm Bill Conservation Provision," Linda Malone provides an overview of the conservation programs in the Food Security Act of 1985 (Farm Bill) and their use to mitigate environmental damage. Under the swampbuster, sodbuster, and conservation compliance provisions, eligibility for USDA subsidies is contingent upon compliance with the Act's wetlands protection requirements and implementation of mandatory soil conservation plans. Conservation easements are authorized under the Farmers Home Administration. Finally, there is a conservation reserve program which sets aside fragile, highly erodible cropland from cultivation. Malone identifies a conflict in the goals of supply control and environmental protection that is inherent in the structure of these programs as they exist now. With an eye towards the scheduled reauthorization of the Farm Bill in 1990, Malone presents proposals to amend and strengthen the Farm Bill's conservation provisions.

The second article, "An Environmental Analysis of the Federal

Farm Programs," surveys the various federal agricultural programs and their impact upon the nation's water quality. John Davidson first recounts our early efforts to control soil erosion during the 1930's, and how this movement eventually changed from soil conservation to intensification of cultivation. After briefly reviewing the different types of federal farm programs, the article details how our current price and income support programs — particularly set-asides and acreage limitations — encourage destructive cultivation methods by farmers. Davidson argues that federal policymakers must begin to consider the effects of farm legislation on water quality, and he concludes by offering a number of proposals for incorporating these environmental goals into our agricultural policy.

The Tax Code is also playing a productive role in mitigating the environmental damages caused by agriculture. "Conservation Easements: Prospects for Sustainable Agriculture," by Kaid Benfield and Justin Ward, discusses the donation of easements by private landowners to the federal government in return for tax deductions. Called "conservation easements," these property rights involve private landowners "freezing" existing land uses to protect scenery or wildlife habitat. Benfield and Ward explain the role of easements in land conservation, the methods of improving conservation easement tax benefits, and the need for complementary tax incentives to firmly establish the conservation easement as a viable tool in mitigating agricultural damage to the environment.