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Reasonable Value and the Role of Negotiation in Agriculture's Use of the Environment

Richard F. Kazmierczak, Jr. and David W. Hughes

Department of Agricultural Economics and Agribusiness
Louisiana State University Agricultural Center
Louisiana Agricultural Experiment Station
Baton Rouge, LA 70803-5604

XP2945@lsuvm.sncc.lsu.edu

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Louisiana State University Agricultural Center, H. Rouse Caffey, Chancellor
Louisiana Agricultural Experiment Station, R. Larry Rogers, Vice Chancellor and Director

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Abstract

Social pressures to regulate agriculture's use of environmental resources have been building for many years and show no signs of abating. While the agricultural and environmental communities can react to these events in many ways, perhaps the most promising avenue for resolving joint agricultural and environmental disputes lies with negotiated regulations mediated by governmental agencies. When first conceived by Commons, negotiated regulation was seen as a way to achieve both efficient and equitable dispute resolution by directly using the preferences, skills, and operational knowledge of stakeholders. This approach should be attractive to the agricultural community because it provides an opportunity to educate environmental groups about the complexities facing modern agriculture. It also assures that private business interests are considered in the development of regulations, and should result in regulations that give dynamic flexibility to the way environmental standards are achieved. In today's litigious society, negotiated regulations may also reduce many transaction costs associated with agricultural and environmental issues, particularly those associated with contract development and enforcement. Ultimately, negotiated regulations may be the best hope for satisfying the dual social objectives of a clean environment and an economically viable agricultural sector.

Introduction

U.S. agriculture generates a food and fiber supply whose abundance, quality, and affordability are unmatched in human history. Agricultural policy has played an important role in promoting this productivity, but it has also contributed to many unintended off-farm effects that impose costs on society (Young; Urban). Producers usually do not consider these social costs in their private decision making because the importance of off-farm effects are not directly revealed through market prices. However, the public has recognized the potential importance of production externalities and increasingly supports the use of environmental objectives in agricultural policy (National Research Council).

Various policy instruments have been used in an attempt to encourage stability in the agricultural sector while simultaneously mitigating the aggregate negative externalities of intensive production (Knutson et al.). These policies generally aim to directly or indirectly manipulate the technology used by producers. Over time, shifting policy goals and implementation methods have also generated differing, and sometimes contradictory, implications for the relative rights of producers and other social groups. Producer anxieties over potential property rights changes and insistence by environmental groups for quick action against negative externalities have often led to disputes about the appropriate relationship between agricultural and environmental policy objectives (Cook and Art). This increasingly visible involvement of agriculture in environmental disputes has driven a search for alternative ways of resolving conflicts between agricultural and environmental concerns (Shabman).

Alternative dispute resolution mechanisms are usually characterized by a formal, consensus building process that may encompass direct negotiations, mediated negotiations, and/or arbitration arrangements (Gunton and Flynn). Although formal arbitration has rarely been used in an agricultural/environmental context, experiments with negotiation are as old as political policy-making.

More recently, negotiation has been used to resolve conflicts in the post development, policy implementation process (Kirtz).

The economic rationale for negotiating agricultural/environmental conflicts can be traced to the institutional economist John R. Commons. Commons advocated negotiated regulation for ensuring that an economic system yielded satisfactory solutions to joint public-private resource use problems. Commons' approach was based on a notion of reasonable value, which he defined "not as a metaphysical entity discoverable through abstract logic, but an imperfect compromise to be reached through an administrative process" (Ramstad). While Commons promoted negotiated resolutions on efficiency and equity grounds, modern advocates also suggest that negotiations result in easily implemented and enforceable policy because they generate solutions that satisfy at least part of each interest group's objectives (Bacow and Wheeler; Susskind and Cruikshank).

The purpose of this paper is to highlight the role and operation of negotiations in resolving agricultural/environmental conflicts in policy development and implementation. In the process, Commons' idea of reasonable value will be compared with market-driven solutions and the current direction of regulatory policy. As a result, the discussion is both normative (with respect to Commons' ideal) and positive (with respect to how negotiations have actually been used). The paper begins with a brief history of agricultural/environmental issues. It continues with a discussion of how agricultural/environmental conflicts evolve and the relationship of this evolutionary process to Commons' theory. Efficiency and equity implications of negotiated conflict resolutions are examined next, followed by an overview of the negotiation process. This overview describes how negotiations are typically structured and the potential advantages and disadvantages of a negotiated approach to dispute resolution. Examples of both successful and unsuccessful negotiations are then presented. Lastly, the potential role of agricultural economists and the land grant system in agricultural/environmental negotiations will be explored.

The History of Agricultural/Environmental Issues

There is a long history of government agricultural policy and the way in which that policy affects agriculture's use of environmental resources. Agriculture's entitlement to the land as a production resource was initially fee simple and designed to facilitate the rapid development of agriculture as an economic sector (Batie). Subsequent policies focused on maintaining the economic viability of small scale farming, thereby preserving the social influence of rural landscapes and the presumed moral superiority of the family farm (Bromley; Thompson). However, the implementation of agricultural price and supply policies unintentionally penalized resource conserving production practices (Young) and promoted a trend toward large, industrialized farming operations (Urban). Some government programs did attempt to guide the private sector's use of production resources in a conserving direction, particularly those programs designed to prevent the loss of productive soils.

Originally targeted at preserving productive soils, attempts to integrate policy objectives expanded to include many other joint agricultural/environmental problems. The most prominent problem has been agriculture's use and potential degradation of surface and ground water supplies, including the range of issues surrounding the disposal of agricultural chemicals and other production wastes (Klonsky, Norris, and Buckles). Specific legislative attempts to address soil and water issues include the 1995 Food Security Act's Conservation Reserve Program (CRP), the conservation compliance provisions in the same Act, and the sodbusting, swampbusting, and soil conservation plans of the 1990 Food, Agriculture, Conservation and Trade Act (Luzar; Zinn). In particular, conservation compliance provisions linked farmer participation in subsidy programs to their use of environmentally sound practices. This mandatory linkage between subsidy programs and environmental practices represented a break from the tradition of protecting the farmer's rights to use their land as they saw fit.

Although some concerns for agriculture's use of environmental resources have been gradually recognized in agricultural policy, environmental statutes have also shaped joint

agricultural/environmental disputes. Federal environmental laws apply three types of rules for identifying relevant environmental impacts that can affect policy decisions in agriculture (Percival et al.): 1) purely health-based approaches that permit standards to be set without regard to costs (e.g., Clean Air Act); 2) balancing approaches that require agencies to assess the relative risks and costs of an action (e.g., Toxic Substances Control Act and the Federal Insecticide, Fungicide, and Rodenticide Act); and 3) technology-limited approaches that take into account the feasibility of an action (e.g., Safe Drinking Water Act). Each of these rule-making approaches has had influence on subsequent agricultural policy and the structure of producer operations, though agriculture was not necessarily the targeted economic sector. As a result, regulatory implementation of the policies contained in legislation has often been perceived as an assault on producer rights, in part because the regulatory process has been technocratic and relatively closed to public participation (Percival et al.).

While the enactment of joint agricultural/environmental policies suggests an overwhelming focus on agriculture's use of environmental resources, many in the environmental community continue to believe that policy implementation has been slow and unevenly enforced (Cook and Art). The perceived lack of progress in meeting environmental objectives, the spiraling cost of agricultural support policies, and the often perverse effects of commodity programs on the environment have led to a search for other ways in which to manipulate agricultural production practices. But with this search, and the suggestion of direct regulation of producer practices, has come frequent property rights conflicts between agricultural and environmental interests.

Agricultural/Environmental Conflicts

The environment can be viewed as a scarce resource, with differing social philosophies and economic self interests competing for its use, option, and existence values. As a result, many social problems involving agriculture and the environment arise from indeterminant or disputed environmental

property rights. Conceptually, these joint agricultural/environmental policy conflicts often evolve through three distinct phases. Conflicts initially emerge as negative experiences that are transformed into perceived injuries, only later to become grievances used to confront the parties responsible for the perceived injury. These three phases have been termed “naming” (the perception that something has become a harmful experience), “blaming” (the identification of the source of the harm), and “claiming” (communication of the grievance to the person believed to be responsible) (Felstiner, Abel and Sarat). A similar conceptualization of the disputing process provided the motivation for the work of Commons.

Commons’ began with the assumption that there were no static natural processes through which to coordinate social interactions. Instead, the existing rules governing social interactions were considered the result of a complex series of decisions by a society to organize in a particular way. From this perspective, economic systems are artificial structures that evolve over time through "the authoritative apportioning of opportunities and inducements by those empowered by the sovereign to consecutively decide the rules governing transactions" (Ramstad). This economic framework, termed Commons’ Volitional Theory of Value, suggests that the outcome of market-based economic interactions is dependent on a dynamic process of adjusting property rights, entitlements, and other economic rules. This concept of a structurally dynamic economy explicitly recognizes that the strength of a capitalist society comes from its ability to adjust to the changing preferences of its members and the physical or cultural conditions that surround them (Ramstad).

Given the role of property rights adjustments in Commons’ theory, it is not surprising that he advocated a process of negotiated dispute resolutions. In fact, it was within the process of naming, blaming, and claiming that Commons saw the potential for negotiation to reduce transactions costs and arrive at efficient and distributionally just resolutions to policy conflicts. But to accomplish these objectives, Commons believed that negotiation had to be a process through which all interest groups could be engaged fairly and equitably, an ideal that can be difficult to obtain when there are competing

agricultural and environmental policy perspectives. Farm groups are typically concerned about the apparent bureaucratic and arbitrary nature in which environmental policies are implemented, at times without providing for economically viable production alternatives (The American Farmer). Environmental groups point to continuing difficulties in achieving environmentally sensitive agricultural policy because of blocking coalitions in the agribusiness community (Sierra; Dietz and Straaten). At stake in this conflict is a delineation of agricultural/environmental property rights that imposes a polluter-pays principle on agricultural operations.

In the past, the willingness to enforce on agriculture the implicit polluter-pays principle has fluctuated with the net income levels of producers. In recent years, policy efforts have focused on making explicit the polluter-pays principle, but subjecting its implementation to negotiation (Reichelderfer). While this explicit policy would increase the financial burden on agriculture, it was hoped that negotiation between farm and environmental groups would lead to the development of low cost, nonlitigious means of achieving both environmental standards and economic prosperity. These goals raise questions concerning the impact of negotiations on the economic efficiency and equity of resulting conflict resolutions.

Efficiency and Equity Issues in Negotiations

Given his view that economies were dynamic entities, Commons' proposals focused on issues of distribution and fairness in the dispute resolution process. While questions of efficiency were considered important, it was not the narrow, abstract efficiency of neoclassical economics. Instead, Commons was concerned with efficient resolution of conflicts between what is now called private and public interests. Because these conflicts occur at the level of the individual, Commons believed that potential solutions must be generated with the individual's explicit or tacit approval. Thus, Commons rejected the existence of public interest and decision making processes that were separable from the specific interests of individuals and well-defined social groups (Ramstad).

Instead, he emphasized that truly enforceable resolutions could only be obtained through compromise between special interest groups with stakes in solving the existing problem (Chase). To Commons, the efficiency question concerned how to accomplish this compromise in a timely and cost-effective manner.

Commons suggested that a properly designed and mediated system of negotiated regulation had the potential to reduce the transaction costs that are of concern to neoclassical economists. Transaction costs can be defined as the costs of coordinating a social system and/or the operations of individual firms (Coase; Williamson). Typical transaction costs include the costs associated with setting up contracts, policing agreements, and obtaining information (Schmidt; Barkema and Drabenstott). In reality, it is the process of delineating public and private rights that leads to large contractual, policing, and information costs, especially if litigation is required or the groups involved are slow to accept the final delineations. But, if cooperatively brokered, negotiated agreements have the potential to reduce litigation and other transaction costs embedded in conflict resolution. Further, negotiated agreements may prevent the establishment of static, restrictive regulations that preclude mutually beneficial solutions generated by technical change. Thus, negotiated regulations tend to reduce the imposition of unrealistic working rules on firms and "bring reluctant individuals up to ... a reasonable idealism ... already demonstrated .. as practicable by the progressive minority under existing conditions" (Ramstad; Commons 1934).

Although motivated by transaction efficiency, Commons also realized that the success of a negotiated approach to conflict resolution depended on the distribution of bargaining power among interest groups (Ramstad). Equal bargaining power, and especially the lack of undue coercion, was considered an essential element of negotiations. Without the willing cooperation of stakeholders during and after negotiations, conflict resolution is apt to be subject to forms of moral hazard and viable only until an interest group finds ways to circumvent it. In fact, the emphasis placed on negotiation procedure was motivated by the nature of the inducements through which competing

interests arrived at an agreement. If unequal power does exist, groups with access to more resources can avoid meaningful negotiation or bias the negotiation process, thereby unduly influencing the transaction. The more equitable the negotiation processes, the more likely its outcome would approach that of a bargain between parties with equal economic power. As a result, negotiated resolutions should be stable over time and more representative of the distributional concerns of the effected parties. Thus, the agreements should hold the advantage of relative ease of enforcement. In essence, Commons sought "devices of collective action that would transform conflict into the search for a just society" (Chase).

To ensure equitable resolutions to conflicts, Commons saw negotiations as consisting of representatives of the affected parties in equal numbers. Negotiations were also to include one or more neutral parties, with the stipulation that they were not to be appointees of politically elected representatives (Ramstad). Within this framework, an emphasis would be placed on precedent and on the right of appeal (Commons 1913). Given an appropriate dispute, negotiation might be expected to (Richard): 1) produce a consensus about the implementation and enforcement of a new rule; 2) develop the rules, and reach the objectives of the rules, in less time, at less cost, and with more certainty than would be typical of a less open process; and 3) produce a regulatory structure that acknowledges the interdependence of the environment and the agricultural economy.

Besides the theoretical underpinnings for negotiated conflict resolution provided by Commons, Lindblom and Downs have highlighted the potential importance of negotiations through their model of partisan mutual adjustment in the political process. In this model, society is composed of interest groups who develop, through bargaining, compromise solutions to policy conflicts. Interest groups are motivated to participate in negotiation by their desire to obtain long-run political support for their position. The role of both political and bureaucratic government is to mediate the negotiations in a way that achieves acceptable outcomes at minimum cost (Gunton). Mediators accomplish these objectives by providing information and maintaining an orderly negotiation process. Politicians also

may have an additional interest in maximizing their electoral support (de Gorter and Tsur). Regardless, the resulting public policies should, in a broad sense, represent the appropriately weighted public interest because the interest groups participate in a quasi-market by using their votes in negotiations to influence policy outcomes (Gunton and Flynn).

Negotiating Policy Conflicts

Although theoretically developed in the 1950s, research on the role of negotiations did not expand until prompted by the rising cost of litigation, increasing public opposition to unilateral regulatory decisions, and spreading public policy paralysis of the 1980s (Gunton and Flynn). At first basing their work on experiences from labor relations, investigators quickly realized that environmental-based conflicts were significantly different from labor disputes due to the wide variability in conflict scope, substance, and participants. Specifically, the number and identities of effected parties in environmental conflicts are usually not preestablished, issues for bargaining are not well defined by tradition or law, and the bounds on potential agreements or the means of implementation are primarily discoverable within the negotiating process (Cormick). Moreover, agricultural/environmental disputes typically involve complex technical issues that may result in irreversible decisions, a situation that can decrease the willingness of parties to compromise (Canadian Bar Association).

The complexity of most agricultural/environmental conflicts requires that potential negotiations be highly structured and transparent in process and motivation. Negotiating mechanisms themselves normally consist of three stages: pre-negotiation, negotiation, and implementation (Susskind and Cruikshank). The first part of pre-negotiation involves determining the suitability of the conflict for negotiation, identifying the relevant stakeholders, and ensuring that stakeholder representatives can make final decisions for their organizations (Wondolleck). This latter requirement has proven important because it avoids having to interrupt negotiations for representatives to get direction from

their constituents (Bingham). Unfortunately, it also raises the possibility that representatives might make decisions that are ultimately rejected by their groups. These initial steps should be the responsibility of objective governmental or third party mediators trained in the negotiation process (Susskind and McMahon).

Once the participants are identified, their first task is to agree on agenda and protocols for negotiation. This second part of pre-negotiation is important not only to allow participants to become acquainted with each other, but also because it allows the parties to set the negotiating bounds and processes before delving into the substance of the dispute (Cormick; Susskind and Cruikshank). Meeting location and frequency, rules of procedure, the role of the media, deadlines for tasks, and provisions for revision of the protocol all must be addressed (Gunton and Flynn). Identifying what happens if negotiation fails can also be important, especially in cases where policy actions are statutorily required. Joint information gathering or sharing often follows and provides an opportunity for participants to have the availability and accuracy of information assessed by independent experts.

After completing the pre-negotiation tasks, the ideal negotiation process begins with participants attempting to identify potential solutions that lead to mutual gain (Gunton and Flynn). The objective in this phase is to identify a solution set that contains options that might be combined or modified to achieve an outcome acceptable to all interest groups. When a specific solution option is agreed upon, a tentative document is drafted to include performance criteria, both in terms of measurable policy outcomes and interest group commitments to the agreement.

Following ratification of the negotiated agreement, the implementation stage begins when the appropriate governmental organization passes laws or promulgates regulations to enact the agreement. The final step is to devise a monitoring system linked to the agreed upon performance criteria, a task typically assigned to a government agency. However, other monitoring and enforcement mechanisms could be used. For example, Lovejoy suggests that farm groups could use various sanctions and social pressures to obtain compliance by producers unwilling to meet

regulations, with the scrutiny of environmental groups providing the motivation for such action. Legal sanctions can then be used as a backstop enforcement mechanism instead of a mechanism of first resort.

If properly initiated and conducted, negotiation can potentially decrease the time and cost associated with finding a resolution to agricultural/environmental conflicts compared with unilateral planning and/or litigation. But to be successful, the three phases of negotiation must be managed based on four key principles (Ury). First, the conflict problem needs to be separated from the individuals involved so that the issues are attacked, not the individuals. Second, negotiators must be reminded to focus on the ultimate interests of opposing groups, not on their public positions. Only by having all participants understand the objectives of each group will there be opportunities to recognize and develop potential compromise solutions. This understanding directly affects the third principle, which requires that negotiators focus on options for mutual gain. Lastly, negotiations must be based on objective information and criteria whenever possible, for getting agreement on the criteria used to decide is often easier than getting agreement on a decision itself.

As implied by the process structure, one advantage to negotiating agricultural/environmental conflicts is that the results are more likely to be supported by stakeholders because they will reflect their preferences. A second potential advantage is that negotiations are more likely lead to decisions that are in the public interest, assuming that all relevant interest groups were included in the negotiations. However, even proponents caution that negotiation is not appropriate or possible in all circumstances. The work of Harter suggests that negotiation of agricultural/environmental conflicts might only be possible if there are: 1) a limited number of interests and individuals to represent them; 2) well-defined issues ready for decisions; 3) issues that can be resolved without compromising fundamental values of interest groups; 4) deadlines for negotiated action; 5) a sufficient number and diversity of issues so that interest groups can set priorities and allow room for compromise; and 6) impartial government representatives present throughout the negotiations who can implement any

subsequent agreement. In other cases, an initial adversarial approach such as litigation might be needed as a catalyst to stimulate negotiation (Cormick). While many environmental-based conflicts may not meet the criteria for a successful negotiated resolution (Talbot), others undoubtably will, including some related to agriculture.

Examples of Negotiated Agricultural/Environmental Conflicts

Recent history shows that many disputes involving agriculture's use of the environment arise from conflicts over land use and the attendant regulations (Weinberg). Land use regulations will only be successful in the long-run if the rules receive public and private support. Private support for regulations requires economic incentives that cannot always be identified or appropriately structured without assistance from those directly affected by the regulations (Leone and Jackson; Gaffney and Loeffler). Thus, achieving a workable balance between proscription and incentives requires negotiations that can be encouraged by creating government-sponsored mechanisms for this purpose (Hughes). While experiments with negotiated solutions to agricultural/environmental problems have expanded in recent years, success has varied. The following examples illustrate the kinds of issues that might be open to negotiated settlements and reinforce the conditions necessary for the ultimate success of the negotiation process.

The use of negotiation in resolving agricultural/environmental conflicts had its U.S. beginnings in the early 1980s with a demonstration project sponsored by the U.S. Environmental Protection Agency (EPA). The project was designed to see if stakeholders and the EPA could, by consensus, fashion legislatively mandated federal environmental rules (Kirtz). Pressures to develop an alternative method of creating regulations arose because the EPA had become the most frequently named defendant in the Federal Administrative Docket. The EPA's legal problems occurred even though many months and staff hours went into seeking stakeholder comments and suggestions before promulgating regulations. The critical difference between the demonstration project and the EPA's

normal regulatory process was that stakeholders were actively and visibly involved in regulation development from the beginning, not just during the period designated for public comments. It was hoped that involving interested parties would lead to better regulations, reduced litigation, lower uncertainty, and shorter delays in the rulemaking process.

One of the first examples of a negotiated agricultural/environmental regulation occurred in 1984 when the EPA began reevaluating the regulations associated with emergency pesticide exemptions under Section 18 of the Federal Insecticide, Fungicide, and Rodenticide Act (Kirtz). The Act allowed EPA to exempt federal or state agencies from the Act's provisions if it were determined that emergency conditions existed. In general, exemptions were allowed during pest outbreaks for which there were no suitable alternative means of pest control. However, the original 1973 regulations governing the process were inadequate, with both internal and external analyses suggesting that major changes were needed. In August 1984, the EPA formed an Advisory Committee to negotiate new emergency pesticide exemption requirements. Membership included representatives of environmental organizations, producers, state agricultural and health departments, trade associations, the U.S. Department of Agriculture, and the EPA. The Committee first met at the end of September and agreed to four months of negotiations, during which the committee reached a consensus on the exact wording of the proposal that appeared in the April 8, 1985 Federal Register. The EPA received only nineteen minor responses to a call for public comment, three that came from negotiation participants in support of the proposal (Kirtz). Final regulations were promulgated on January 15, 1986. The process was considered successful because the final regulations did not lead to subsequent litigation.

Another example of the EPA's attempts to negotiate an agricultural/environmental conflict concerned the 1974 farm worker protection standards. After extensive discussions with potential stakeholders, the EPA chartered a negotiating committee that consisted of producers, farm workers, states, and enforcement interests. However, this time negotiation proved difficult, and after four

months a major interest group left the negotiations. The remaining parties continued to balance the interests of all potential stakeholders, but an official consensus was impossible without the participation of the absent group. A negotiated draft was eventually published by the EPA, but hundreds of critiques and complaints were received during the public comment period. Criticism of the draft regulations and the general divisiveness of the farm worker protection issue severely hampered the EPA's attempts at a negotiated resolution and ultimately prompted revisions in the original legislation mandating regulations (Kirtz).

As this latter example illustrates, negotiation is not a panacea for agricultural/environmental conflicts. The EPA's practical experience with negotiations suggests several factors that determine the probability of success (Harashina; Kirtz). Fundamental to the process is the existence of a well developed and widely accepted knowledge base upon which to build meaningful discussions of the issues. Reasonable deadlines also might be needed, and all negotiation participants must recognize the legislative boundaries placed on the outcome of the negotiation process. In most cases, the object of negotiation will be the development of performance-based regulations where the regulated groups are expected to meet an environmental goal. Reaching the goal, however, can be accomplished in ways that can incorporate the concerns of their private business situations (Shabman). In addition, disputes that are multifaceted, or those that have interdependent issues, will generally be much more difficult to solve because the underlying interest group preferences are not "single-peaked" (Quiggin).

A recent example of a successful negotiated solution to a difficult agricultural/environmental conflict concerned the City of New York's compliance with the 1972 Clean Water Act and the 1986 amendments to the 1974 Safe Drinking Water Act (McGuire). Having come under federal and state pressure to protect the quality of its water supply, the city was faced with two potential choices. The first choice required the creation of a $6 billion water filtration system that would cost at least $400 million per year to operate. The second choice was to impose strict controls on land use in the

Catskill-Delaware watershed that supplied the city with much of its drinking water. City regulations that were initially developed using the traditional process would have imposed economically ruinous costs on the approximately 500 producers in the watershed. Thus, it was not surprising that the city's draft regulations met resistance that promised years of costly litigation and delays. The potential court battle prompted the search for a negotiated solution that would include ideas from the city, the EPA, county Soil and Water Conservation committees, local politicians, and Cornell University agricultural scientists. The year-long negotiation resulted in a comprehensive watershed agriculture strategy that employed city funding for the development and implementation of best management practices in the watershed. This negotiated solution was facilitated by the fact that the city was willing to pay the bill for protection given the high cost of its alternative actions. In addition, producers in the watershed were willing to cooperate in finding a mutually beneficial solution because the city clearly had the legal authority to regulate their activities.

Roles of Land Grant Scientists in Negotiations.

As suggested by the Catskill-Delaware watershed management example, agricultural scientists have participated in past negotiated agricultural/environmental conflicts. While their role has varied, land grant scientists may be able to increase the probability of a negotiation's success by supplying many elements necessary for the highly structured process. These areas of contribution include supplying objective information, acting as mediators, helping in the development of an interest group's negotiating strategy, and conducting research aimed at improving the negotiation process.

Perhaps the most important way land grant scientists can participate in negotiated agricultural/environmental conflicts is by serving as providers of objective information and analyses. Information is critical to the negotiation process, and land grant institutions have proved adept at developing knowledge concerning the functioning of agricultural and environmental systems. In addition, the extension service components of these institutions have a history of providing this

knowledge to the public in an easily understandable form. However, participation as information providers requires that land grant institutions be perceived as neutral to the conflict and capable of supplying information within a short time frame.

The public perception of neutrality is important because the knowledge base upon which negotiations depend must be recognized as objective and authoritative by all the opposing interest groups. Effective participation by institutions and individual scientists will be at least partly determined by the amount of past public or political advocacy conducted in the interests of agriculture. Competing with the land grant institutions for the role of information provider will be the myriad non-land grant institutions of higher learning. Some of these alternative sources will encounter credibility problems due to past environmental advocacy, but many are perceived as objective sources of information. Thus, land grant institutions that wish to be widely recognized as sources of information for negotiation must cultivate a public image of objectivity even as they strive to serve the agricultural community that is the base of their financial and political support.

While agricultural/environmental conflicts may develop over many years, the opportunities to negotiate solutions typically occur unexpectedly and with a sense of urgency. The imminent start of negotiations is not the time to begin research programs aimed at creating the necessary information base. Instead, agricultural scientists need to be aware of emerging agricultural/environmental conflicts years in advance and conduct research programs that will supply the necessary information when it is needed in the future. This long-run, sustained view of agricultural research has been a historical strength of the land grant system (Evenson). But recent moves toward expanded private/public partnerships in agricultural research raises the danger that research priorities might become progressively influenced by short-term rent seeking behavior. These short-term objectives may not only divert resources from the long-term research programs necessary for developing the information needed by agricultural/environmental negotiators, but it also contributes to the perceived ties between land grants and agricultural interests.

Given their unique mission, land grant institutions may have some difficulty cultivating the objective image necessary to be widely recognized as viable information providers to the negotiation process. However, individual scientists and research teams within the institutions can cultivate a reputation for objectivity by conducting research programs that systematically examine all facets of joint agricultural/environmental problems. To the extent that they are successful in this task, individual scientists can probably fill the role of mediator in the negotiation process. Mediators should be intimately familiar with the agricultural/environmental conflict in question, not only from a technical perspective but also in terms of knowing whom the relevant interest groups are, what their ultimately objectives might be, and how they might be persuaded to join in negotiations. Taken together, these qualifications suggest that potential mediators within the land grant system will come from the ranks of experienced and active scientists. Failing perceived objectivity, both land grant institutions and individual scientists could have a role in developing the strategic and tactical negotiating strategies of a specific interest group.

A specialized role that a land grant social scientist can fill relates to the improvement of the negotiation process. Because agricultural and environmental interest groups still have limited experience in negotiating conflicts, it is likely that the process and structure of negotiation can be improved. These improvements should ideally focus on the concepts of efficiency and equity in negotiation. In addition, opportunities exist for developing a new understanding of the role of negotiated agricultural/environmental conflicts in a capitalist society.

Conclusion

Social pressures to regulate agriculture's use of environmental resources have been building for many years and show no signs of abating. Agricultural policy will continue to be influenced, and may eventually be subsumed, by both general environmental policy and specific restrictions targeted toward agriculture. While the agricultural and environmental communities can react to these events

in many ways, perhaps the most promising avenue for resolving joint agricultural and environmental disputes lies with negotiated regulations mediated by governmental agencies.

When first conceived by Commons, negotiated regulation was seen as a way to achieve both efficient and equitable dispute resolution by directly using the preferences, skills, and operational knowledge of stakeholders. This approach should be attractive to the agricultural community because it provides an opportunity to educate environmental groups about the complexities facing modern agriculture. It also assures that private business interests are considered in the development of regulations, and should result in regulations that give dynamic flexibility to the way environmental standards are achieved. In today's litigious society, negotiated regulations may also reduce many transaction costs associated with agricultural and environmental issues, particularly those associated with contract development and enforcement.

Of course, the negotiated approach to agricultural/environmental conflict resolution is not a panacea. Experience suggests that disputes need to have specific characteristics in order for there to be a high probability of a successfully negotiated outcome. But, the use of negotiated resolutions to joint agricultural and environmental disputes has been limited, and continued exposure of stakeholders to the process may broaden the range of problems that can be addressed. Ultimately, negotiated regulations may be the best hope for satisfying the dual social objectives of a clean environment and an economically viable agricultural sector.

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