Voluntary and Regulatory Approaches: What is Necessary in Conservation Today?

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Background

Significant federal involvement in conservation of private lands began about 65 years ago. With few exceptions, the emphasis has been on the voluntary approach. Hugh Hammond Bennett, the father of soil conservation in the United States, called attention to soil erosion. His campaign coincided with the national economic crisis, the Great Depression. The issues of erosion and land degradation seemed linked with the economic depression in the countryside. The emergency employment program afforded Bennett an opportunity to place trained soil conservationists in the countryside. The mid-1930s were also a time of drought in the Dust Bowl, although it should be remembered that Bennett had placed great emphasis on water erosion especially in the Southeast. The dust storms that swept over Washington D.C. aided passage of the Soil Conservation Act of 1935. Through the act, the Natural Resources Conservation Service (successor to the Soil Conservation Service) has provided technical assistance to farmers and locally organized conservation districts.

The Agricultural Conservation Program (one of the predecessors to the Environmental Quality Incentives Program) was enacted in 1936. It provided Federal cost-share payments to farmers who installed conservation practices and provided much needed cash to the countryside. In principle, the portion of the payment to landowners is thought of as society's share of the cost, since society gains environmental benefits from conservation of farmland. Other programs, such as the Soil Bank and the current Conservation Reserve Program, paid landowners rent to shift land from intensive agricultural uses to less intensive grassland or forest uses. All of these programs were voluntary.

The 1985 farm bill linked conservation with eligibility for price support and other program benefits. Under the conservation compliance provision, farmers who received assistance from USDA, including technical assistance, price support payments, loan subsidies, crop insurance subsidies, and other assistance were required to have an approved conservation plan developed and implemented on highly erodible land. Some viewed the programs as "voluntary" in the sense that landowners chose whether or not to request these various types of assistance from USDA. Nonetheless, it added a new dimension to the voluntary approach and resulted in conservation on many additional acres.

Introduction

This report addresses the major issues surrounding the value of voluntary and regulatory approaches to natural resources conservation. The merits of these two approaches influence the design of conservation policy and programs as they seek to improve environmental conditions.

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This paper compares some of the environmental, social, and economic costs of the two approaches. It describes models that can be used to design and implement efficient and effective natural resource conservation programs. Where appropriate, for illustrative purposes, policy activities are drawn upon and highlighted, emphasizing non-point source pollution.

Scientific sources used to develop this paper include information from journals, books, and personal communications with academic and other experts. Research indicates that the voluntary approach is effective in the vast majority of cases and that the most difficult conservation problems are concentrated on a small percentage of land involving a small percentage of producers.

Models Underlying the Voluntary Approach

The Adoption-Diffusion Model

This model, in use for 60 years, includes a series of social-psychological stages and informational needs for individuals and groups. Going through these stages may lead to the adoption of an innovation and its diffusion among potential users. A goal of the model is to explain the process that most people experience prior to voluntarily adopting an innovation, whether this innovation is new or perceived to be new. The model also categorizes larger populations (e.g., communities) with respect to how long it takes before members of the population voluntarily adopt an innovation. Factors that favor rapid adoption include high potential benefits and minimal risks. The Adoption-Diffusion model continues to influence research for some in the academic community, the business sector, and in governmental program design.

The traditional Adoption-Diffusion model emphasizes risk reduction and benefit enhancing attributes such as technical assistance, educational assistance , and financial assistance. It explains how individuals voluntarily accept innovations and the resulting diffusion patterns. This model worked particularly well to motivate producers to adopt production technologies that reflected society's preference for a "cheap and abundant" source of food and fiber, such as hybrid seed corn (Hoban, 1999; Lovejoy, 1999; and Ribaudo and Caswell, 1999).

In 1992, 1,062 farmers in Wisconsin were surveyed about their knowledge and use of atrazine on cornfields. This study used socio-economic factors to assess the knowledge and behavior of farmers inside and outside of areas that were designated as either a management or prohibited area. Management areas were cornfields in which atrazine application was restricted due to vulnerability to groundwater contamination. Atrazine could not be applied in prohibited areas. One study finding showed that farmers had incomplete knowledge of how to properly mix atrazine in a mixing tank or how to recognize atrazine under a different trade name. If the aim of a program was to change behavior, one would assume it is important to have a "working knowledge" of that which is to be changed. Incomplete knowledge adversely impacted just "how much" atrazine was actually applied in areas targeted for vulnerability (Nowak, 2000; Wolf, 1996). This example emphasizes the need for educational and technical assistance to farmers to stimulate the adoption of appropriate agricultural chemical application techniques.

The traditional Adoption-Diffusion model continues to influence current research. Alternative models and paradigms are being generated to address contemporary conditions and societal values, complementing the traditional Adoption-Diffusion model. Some examples of the "complements" are discussed below.

The Assessment, Segmentation, Targeting, and Evaluation (ASTE) Model

The Assessment, Segmentation, Targeting and Evaluation model engages in a process that assesses a group's capabilities and need for conservation. The group is segmented based on biophysical conditions, socioeconomic characteristics and personal capabilities. Assistance is designed to offer feasible and accessible alternatives. This customized assistance is targeted to the segmented group. Evaluation of the success of this process must be ongoing (Nowak, 2000).

Insights from the Adoption Diffusion and the ASTE models can be combined with the result being a more effective application of the voluntary approach. The Comprehensive Planning approach, discussed below, goes one step further by integrating production systems with conservation and environmental goals.

Comprehensive Planning

Comprehensive planning is an approach that emphasizes production systems that complement conservation and environmental goals. Through comprehensive planning, society's needs and the needs of an individual farmer can be considered. In the absence of comprehensive planning, production can run counter to environmental goals and even contribute to environmental degradation.

This approach was proposed in a recent study in the Midwest. Data were collected in the fall of 1998 and the winter of 1999 from 1,011 land owner-operators in three watersheds (Ohio, Iowa, and Minnesota) to assess adoption of soil and water conservation practices (Napier, 2000). Land owner-operators were asked how frequently they used 18 different conservation practices. Findings revealed that although many farmers within the three watersheds adopted conservation practices, they also reported using production practices that could negate many of the environmental benefits associated with conservation practices presently in use. Respondents in the Iowa and Ohio watersheds reported greater use of conservation practices than did farmers in the Minnesota watershed. However, there were no significant differences between Ohio farmers and Iowa farmers in terms of conservation practice use, despite the large amount of educational, technical and financial assistance from government and private sources in the Ohio watershed. Findings strongly suggest that conservation initiatives should place emphasis on "comprehensive planning" so that production practices used on a specific farm will be complementary to both production and environmental goals.

Flexible Incentives

Flexible incentives include subsidies; educational assistance; technical assistance; compliance rewards; deposit refunds; marketable permits; ecolabeling; performance bonds; contracts and assigned liability. In the appropriate combination, they offer good potential to abate environmental degradation while simultaneously meeting the production goals of producers. (Batie and Ervin, 1999; Ribaudo and Caswell, 1999; Segerson, 1999)

Success occurs when flexible incentives are based on the socioeconomic and political conditions of the targeted geographical area and the particular characteristics of farmers within the targeted area. Most producers apply rational decision-making to their agricultural enterprise activities. Many want to adopt conservation practices/systems, but they calculate the social and/or economic costs as being too high. Voluntary incentives need to offer high enough monetary compensation. They also need to produce a determination that social benefits outweigh social costs and coincide with the producer's short and long term planning horizons.

Flexible incentives can be an effective means to attain environmental goals and outcomes through the application of environmental performance standards. Performance standards should reflect inputs from all stakeholder groups, including producers, the scientific community, input suppliers, environmental groups, government at all levels, etc. They must be clearly stated in measurable terms and coupled with consistent and effective enforcement. Voluntary incentives that are used to encourage performance should be linked to environmental standards. These incentives may need to be coupled with regulatory penalties when environmental performance falls below standards.

The Environmental Quality Incentives Program is a good example of a program that incorporates flexibility to meet environmental goals. However, the current program lacks sufficient funding to meet the demands placed on it and there appears to be an emphasis on process. These limitations can easily slip into the technology design tradition that ignores social and economic considerations (Batie and Ervin, 1999).

The Locally Led Process

The locally led process rests on the principle that

people closest to a problem or an opportunity have the best understanding of how to address the problem or take advantage of the opportunity. In the locally led process, the governmental authority can help provide technical expertise and cost-sharing assistance and serve as facilitators in accomplishing conservation objectives. Local stakeholders come together to formulate their environmental objectives, develop an overall plan, and implement that plan because they have decision-making authority. The process usually works with less tension when only local issues and priorities are involved.

Within the last three decades, federal and state governments have increasingly established national and state environmental priorities which are foisted onto the local level. Non-local funds are often made available to local groups and individuals when the local objectives fall under national and state priorities. This potential discrepancy between local needs and national/state priorities can become a source of tension when local priorities are different.

The locally led process involves the nation's conservation districts and the Natural Resources Conservation Service (NRCS), working with stakeholders involved with an issue. Some of the groups that may be involved include small, medium and large producer groups, (including women and minorities), agricultural input suppliers, contractors and processors, scientists, elected officials, conservation and environmental groups, other non-profit organizations, and federal, state, and local agencies. Using a locally led process can preclude the need for "top-down"command and control regulation.

One example of the locally led process involves nutrient management planning activities in California. Since 1995, more than 100 Marin-Sonoma County livestock producers, operating on more than 500,000 acres, completed Voluntary Ranch Planning Courses to assess water quality issues on their properties and develop water quality plans, including monitoring and manure management. The California Cooperative Extension Service conducts the courses with planning assistance from NRCS. Many of the activities in the area came about as the result of decisions made by a dairy committee composed of dairy producers, NRCS, Cooperative Extension, and water quality regulators. Dairy producers are being proactive in addressing problems that they identify in their watersheds through an active water quality-monitoring program (Flach, 2000).

When including small and minority producers in the locally led process, outreach strategies must be based on the characteristics and needs of each group. These characteristics will often call for increased government cost-share, low cost technologies, demonstrations designed for smaller than average fields, and training materials and programs commensurate to the group's management skills. Use of the group's native language and other cultural values also facilitates the voluntary approach. Such a program was explicitly designed in California's Fertilizer Research and Education Program, which guides the state's current voluntary approach to fertilizer management. Meetings were held with growers on their farm or ranch. Their needs as growers, relative to specific information and practices that can be used to reduce groundwater pollution from the excess use of nitrates on small acreage, were incorporated into research projects and demonstrations (Franco, 1994).

Backing up the Voluntary Approach with Regulation

It is sometimes not an either-or question of whether agriculture should use a regulatory or voluntary approach, but rather a selective combination of approaches. In Oregon, all farmers within targeted watersheds were responsible for developing their own sets of management practices. These practices were then evaluated by local governing agencies for consistency with Total Maximum Daily Load (TMDL) goals. Because of the difficulty in linking farm and ranch practices to ambient conditions, local agencies were using landscape performance standards, such as minimum residue on tilled acres, and no tail water irrigation discharges into streams. If producers within the watershed failed to meet these standards, the state agency would then intervene and impose civil fines to secure compliance (Batie and Ervin, 1999).

One of the roles of regulation in a system that also includes voluntary approaches is to gain the attention of all producers. This encourages more producers to participate in voluntary programs. There are a few "bad actors" who resist changing their behavior toward being environmentally responsible, despite the offers of a variety of monetary incentives, educational help, and technical assistance. For these individuals, regulation may be appropriate.

Ongoing research indicates that environmental degradation is concentrated among a few "bad actors" on a small percentage of the land during a very short period of time (Nowak, 2000). For example, in Pennsylvania, preliminary findings show that relative to phosphorus (P) loading in surface water, 70 percent of total P is delivered during only 10 percent of the time; 98 percent of the runoff comes from only 14 percent of the land area; and only 8 percent of the producers are two standard deviations or more above the average delivery of P from their fields. Given the emphasis on looking at mostly physical resources, the agricultural and conservation communities do not seem to understand that only a very small percentage of land users engage in inappropriate behaviors in vulnerable settings that cause a large proportion of our environmental degradation (Nowak, 2000 and Sharpley, 2000).

If research continues to indicate there are only a few bad actors, then it becomes apparent that a "top-down, command and control" regulatory approach is not warranted. Such an approach has substantial enforcement costs, both in personnel and dollars. Currently, any Maryland producer with sales of $2,500 or more is mandated to have an approved nutrient management plan by December 31, 2001. In 2002, the producer must implement this plan. The Maryland legislature approved funding for 80 new state employees to assist in meeting these requirements. Producers have expressed their opinions on the nutrient management regulations. Their comments reflect concern over equity, responsibility, violations, and overall confusion over definitions used in the law (Maryland Department of Agriculture, 2000). Reflections by some Maryland farmers are:

- With respect to equity and responsibility among landowners, one producer commented, "this law really doesn't go far enough, it needs to go to every 'Harry' homeowners' front door. Regulate his purchase of fertilizer, what certification does he have?"
- Another felt that this was the public agency's responsibility to educate the farmer, "you can't get a positive reaction when you're holding a stick over the farmer's head."
- Some Mennonite farmers expressed the sentiment that they "do not expect a religious exemption." This comment reflects a concern that since Mennonite farmers do not accept cost-share monies, and do not have machinery to load or haul manure for transport, it will be nearly impossible for them to comply with regulations if they cannot continue to use manure on site.
- A number of producers expressed "confusion over the law;" i.e., the requirements concerning timing of nutrient application were not clear to them. Public agencies need to clarify these matters since the terms crop removal and full utilization of P are both used and are not the same thing.
- One producer said, "I am scared of ambiguous terms and wording"; this was in reference to the BMP section of the proposed nutrient management regulations.

This example shows that stringent regulatory control has its own problems and social and economic costs.

Conclusion

The effectiveness of the voluntary approach to conservation is supported by a variety of social science models and by empirical findings. The voluntary approach is more likely to be successful when both the biophysical resources managed by producers and their personal characteristics are taken into account in program design and implementation. In addition, adequate levels of technical, educational, and financial assistance are necessary to support the voluntary approach. Even with access to information and technical assistance, some producers fail to adopt resource-conserving practices. The locally led

process provides an excellent vehicle to foster the voluntary approach. A regulatory back-up approach can be costly and too difficult to administer. However, such an approach may be necessary if voluntary programs are not properly designed and supported.

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