Community Leaders' Views on Water Quality BMPs in Kansas

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Abstract

Determining which strategic communications efforts can encourage environmentally sustainable behavior requires information on barriers to that behavior. To help assess a Kansas water quality program, researchers examined focus group data from community leaders interested in water issues. Working within the context of the theory of planned behavior and two broader conceptual frameworks, researchers found several major themes indicating support for a broad-based approach to water quality programs. Themes included concepts of home and place, awareness and understanding, relationships, ownership of issues, and money. Findings generally confirmed the need to emphasize multiple points at which intervention strategies can occur, including communication and diffusion instruments. Improved educational programs, informational efforts aimed at urban audiences and producer groups, and use of local information sources were cited as areas in which communications efforts would be valuable in water quality programs.

So what?

Encouraging farmers and ranchers to adopt more water-friendly practices is no easy task—especially when the practices are costly. This research used focus groups with community leaders to identify factors that interact to influence producer decisions to adopt recommended water quality practices. Findings can help communicators develop effective strategies to encourage adoption of environmentally sustainable behaviors.

Research

This paper describes an assessment of a Kansas water quality program and its ability to encourage the adoption of water quality best management practices (BMPs) by the state's agricultural producers. The program is a joint effort between the Kansas Center for Agricultural Resources and the Environment (KCARE) and K-State Research and Extension. At the beginning of the assessment, the water quality program was entering the fourth year of a five-year funding period, and state funders were interested in determining whether the general approach of the program had been successful and whether similar approaches should be continued.

Initiated in 2000, the program has depended on the efforts of seven full-time watershed-based extension personnel known as "watershed specialists." All carry out water quality education and assistance programs based on personal contact (individually and in group settings) with agricultural producers and other stakeholders in their primary watersheds. Specialists also have served as key communications links between stakeholders—especially agricultural producers and the Kansas Department of Health and Environment, which, as an enforcement agency, was sometimes perceived as being in an adversarial role relative to producers. The program's general goal is to improve water quality by encouraging farmers, homeowners, and other landowners in targeted Kansas watersheds to adopt water quality BMPs, such as buffer strips along waterways and improved watering systems for cattle. Specialists inform producers of various BMPs and of programs that can assist in adoption of BMPs. They also provide technical assistance and otherwise facilitate the adoption process.

Literature Review

Barriers to the adoption of sustainable agricultural practices have received ample scholarly attention in recent years (e.g., Drost, Long, Wilson, Miller, & Campbell, 1996; Nowak, 1992; Petrzelka, Korsching, & Malia, 1996; Salamon, Farmsworth, Bullock, & Yusuf, 1997; Schneeberger, Darnhofer, & Eder, 2002). Some analysts (Ajzen & Fishbein, 2005; Flury-Kleubler & Gutscher, 2001) suggest that multiple intervention strategies aimed at individual attitudes, norms, and beliefs might encourage intentions to adopt certain behaviors, including those that are considered environmentally responsible.

Literature on sustainable agricultural practice has indicated that barriers to the adoption of sustainable agriculture practices can be overcome. Salamon et al. (1997) compared Illinois farm families to determine factors affecting the adoption of sustainable systems. Families with the systems had environmentalist traditions, systematically did on-farm experimentation,

and were resource-prudent. Predisposition toward sustainability made adoption as much a matter of efficiency or finance as environmental consciousness. Conventional farming families shared many characteristics with sustainable families, but were deemed as potential targets for educational programs because of their perceptions about barriers to adoption, including lack of family consensus, community gossip, and potential for sustainable systems to produce family stress.

Drost et al. (1996) found the minimization of financial risk to be an important factor in adopting sustainable practices. Farmers cited time, information, and management as crucial requirements of sustainability. Most desired to be good land stewards, maintain quality of life, ensure health for families and livestock, and work towards family-farm continuity. Many farmers felt pressured by government, urbanization, and environmentalists to make unnecessary or infeasible changes. The study concluded that good working relationships between information providers and producers were positively related to perceived usefulness of information.

Petrzelka et al. (1996) suggested that information sources, along with social influences like reference groups, are powerful intervening variables in the attitude-behavior relationship. Most sustainable farmers relied on personal experience for information about sustainable practices; their needs included more information and more educational programs. The authors recommended more educational programs on the personal, family, community, and societal benefits of sustainable agriculture. They also recommended more public policy education for leaders of public and private institutions in order to increase awareness of the need for research into the agronomic and economic issues surrounding the use of sustainable agriculture, as well as the need for better dissemination of research information.

Nowak (1992) noted that producers may be unable to adopt new techniques because of information scarcity, costs of obtaining information, complexity of new techniques or systems, short planning horizons, expensive management systems for new techniques, excessive labor requirements, inadequate management skills, limited supporting resources, or lack of control over adoption decisions. Simultaneously, farmers might be unwilling to adopt in cases of information conflicts or inconsistencies, poor information applicability or relevance, conflicts between production goals and new technology, and a number of other barriers. Nowak thought these could be countered with sophisticated communications campaigns and marketing strategies in addition to education, regulation, or subsidies.

Schneeberger et al. (2002) investigated barriers to the adoption of organic agriculture by Austrian cash crop farmers. Conventional farmers

rated technical challenges in cropping and additional labor requirements as the most important barriers to adoption, followed by fear of decreased income and marketing problems. Pouta and Rekola (2001) examined willingness to pay for abatement of forest regeneration policy and concluded that the theory of planned behavior predicted willingness to pay reasonably well. Tanner (1999), in a nonagricultural study, found that a range of constraints inhibited personal action to reduce driving activity. The study found that objective conditions, such as place of residence, income, or lack of an automobile, also inhibit proenvironmental action. Multiple regression analyses indicated that subjective constraints explained a significant amount of variance in behavioral reports, but structural constraints also contributed to explaining variance.

The theory of planned behavior (Ajzen, 1991) explores how attitudes, subjective norms, and perceived behavioral control relate to an underlying foundation of beliefs about a behavior. Intentions, perception of behavioral control, attitude toward the behavior, and subjective norms each reveal a different aspect of the behavior, and each can serve as a focus of attention in efforts to encourage alternate behavior. In their review of empirical and theoretical evidence to support extending the theory, Conner and Armitage (1998) found that intention is a central factor and that there is a strong relationship between self-efficacy and behavioral intention. Conner and Armitage also found that planned behavior research has shown that individuals are motivated to seek situations in which they can act in accordance with their attitudes (cf. DeBono & Snyder, 1995); that anticipated affective reactions to behavior may help determine attitudes and intentions, especially when consequences of behavior are unpleasant or affectively negative (cf. van der Pligt & de Vries, 1998); and that if an individual anticipates feeling regret after performing a behavior, he or she may be unlikely to perform it (cf. van der Pligt, Zeelenberg, van Dijk, de Vries, & Richard, 1998).

Because addressing the origins of behavioral, normative, and control beliefs is not within the scope of the theory's purpose and uses, its primary developers, Ajzen and Fishbein (2005), have suggested that other work is necessary to identify and deepen understanding of these behavioral determinants—a primary purpose of this project's approach. Planned behavior theory emphasizes the complexity of individual behavior, which may be impacted by a variety of factors. This complexity is likewise found in Kansas water issues. To help identify important intervening factors in water quality issues, project researchers also used two other frameworks to bring compatible context and concepts to a planned behavior approach.

The first of these approaches is a Swiss model based on a theoretical framework for changing human behavior and promoting sustainable behavior (Kaufmann-Hayoz & Gutscher, 2001). It presumes that interventions should include a variety of strategies, rather than a single instrument, so that new mental patterns associated with behavioral change become stable and long-term sustainable behavior results. The model integrates several theories, including theories of utility and rational choice (Luce & Raiffa, 1990) and the theory of planned behavior (Ajzen, 1991; Ajzen & Fishbein, 1980). It includes a typology of tools for promoting sustainability, comprising "classic" and "new" policy instruments (Flury-Kleubler & Gutscher, 2001). Classic instruments are command and control instruments (e.g., enforcement) and economic instruments (e.g., subsidies). New tools include service and infrastructure instruments, collaborative agreements, and communication and diffusion instruments. These categories were used in analysis of data for the current study because of their ability to suggest approaches to encouraging sustainable water quality behavior.

The second framework employed for this study is a definition of barriers or constraints (Crawford, Jackson, & Godbey, 1991; Jackson, Crawford, & Godbey, 1993; Jackson & Scott, 1999). Barriers (or, alternatively, "constraints") are referred to frequently in literature related to sustainable agricultural or environmental practices (e.g., Drost et al., 1996; Salamon et al., 1997; Schneeberger et al., 2002; Tanner, 1999). The barriers framework emphasizes factors that are internal to individuals, external to individuals, or dependent on interactions among individuals. Barriers are thus categorized as internal, interpersonal (socially related), or structural (external factors such as institutional penalties or lack of opportunities). The framework helps broaden a planned behavior approach by focusing attention on what Ajzen & Fishbein (2005) termed "background factors" in the planned behavior model. Like the Swiss model, the barriers approach guides data analysis by helping define and categorize important concepts.

Methods

This study used qualitative techniques for collection and analysis of data—specifically, focus groups of community leaders involved in water issues in seven Kansas watersheds where watershed specialists were located. Qualitative data-gathering can provide the depth and richness of data that quantitative approaches often cannot, and can therefore assist in further theory-building or suggest new avenues of research (Bowers, 1968; Lindlof, 1995; Miles & Huberman, 1994). Focus groups were conducted

between January and March 2005 at central locations within the watersheds. Following Kreuger (2000), the research team designed a question route and tested it with a group of community leaders in one of the watersheds. The line of questioning was deemed suitable for further use, with only minor adjustments made for subsequent groups. Data from the first group also were deemed valid for inclusion with subsequent data. Six more sessions were conducted—one in each of the other six Kansas watersheds with extension watershed specialists. The research team sought 12 commitments per group in order to reach the ideal of 8 to 10 participants per group (Krueger, 2000). The number of participants who actually showed up to each group varied, but in all cases except two (with 5 and 11 participants, respectively), the ideal group size was reached. Participants received a meal before the start of each focus group, but no other incentives were offered.

Participants included a wide range of individuals, comprising representatives of district conservation offices, basin advisory committees, basin planners, city water quality coordinators, groundwater management districts, rural water districts, city convention and visitor bureaus, resource conservation and development councils, concerned citizens, and agencies such as the Kansas Biological Survey, the Kansas Rural Center, and the Kansas Water Authority. In each group, the research team attempted to reach a balance of diverse interests from various agencies and organizations. It also attempted to minimize the number of participants who were also agricultural producers (the targets of a later study phase). Limiting the number of producer-participants was expected to give a better overview of state and local issues from regulatory, governmental, or other official perspectives, as well as from business and other perspectives, and mitigate any tendency among individuals to identify too closely with the values, beliefs, and attitudes of agricultural producers. Across sites, community leaders worked closely with producers and tended to be understanding of producers' circumstances and the difficulties of carrying out water quality BMPs. It was presumed, however, that leaders' overall perspectives were balanced enough to provide an accurate, relatively reliable range of opinions reflecting the concerns of multiple stakeholders.

Data Treatment and Analysis

When all interviews and focus groups had been conducted and transcriptions of recordings made, data were transferred into NUD*IST analytical software for qualitative data, where categories (or "nodes" in the software's tree-root system) could be more easily tracked and manipulated. Researchers sought keywords, phrases, and concepts from the data without

imposing any external structure on the data, then tagged data to identify these keywords and concepts.

The data's richness resulted in a lengthy list of nodes. In a second analysis, it became apparent that data would fit relatively easily into categories corresponding with key concepts used in the Swiss model (Flury-Kleubler & Gutscher, 2001) and Ajzen's (1991) theory of planned behavior. Researchers reassigned all text units to one or more of seven major nodes: issues, producer attitudes and values, social norms and perceptions, intentions, perceived behavioral control, actual behavioral control, and intervening events. The "issues" category allowed researchers to compile issues of concern identified by community leaders. Each of the remaining categories, except intervening events, corresponds to the five major parts of Ajzen's model of factors that influence behavior (2002). The intervening events category, which is not part of the model, included all factors that may help shape other factors in Ajzen's model. These factors, which have been called both "intervening events" (Ajzen, 1991) and "background factors" (Ajzen and Fishbein, 2005), are the universe of circumstances in which other parts of the model exist and are influenced. Intervening events were divided into the subnodes of "barriers" and "approaches," and the approaches subnode was further divided into categories based on the Swiss model's classic and new policy instrument types (Flury-Kleubler & Gutscher, 2001).

In this second stage of analysis, the research team reviewed each NUD*IST node, discussing text coding, definitions for nodes, and relationships of each node in the tree-root system. This resulted in collapsing numerous categories, shifting others, and redefining nodes to make coding of each text item internally and logically consistent with the analytical framework. The final tree-root system did not result in radical changes to coding and allowed the research team to more clearly define each category and subcategory, allowing for greater accuracy and, often, clearer delineations between categories. Ultimately, these multiple stages of analysis left the data with a still-large number of categories, maintaining its richness, but in a logical, easily comprehended format that allowed thorough comparison and theoretical speculation.

At that point, a third stage of analysis was conducted to search for general themes, topics, and relevant quotes, using the approach of "constant comparison," as described by Lindlof (1995). While the intent of such an approach is to avoid imposing an external structure on data, Lindlof notes that themes generally do come from both data and framework. In this study, the expansive nature of the combined frameworks allowed analysis to

proceed so that themes "grew" naturally out of ideas found in the data and the theoretical/conceptual frameworks; the conceptual structure imposed no undue limitations on thematic interpretation. This final analysis sought common threads across nodes and revealed five major themes. Four of these crossed the two primary categories of barriers to adopting BMPs and approaches for overcoming those barriers.

Results

Because the study's purposes were to identify both barriers to adopting BMPs and ways to overcome them, separate cross-case content-analytic summary tables (Miles & Huberman, 1994) were developed to summarize the data related to each. The major themes that were found to underlie the discussions of each seemed to represent two sides of the same coin. In essence, this perspective saw challenges and opportunities arising out of the same issues. Five major themes related to barriers were identified in transcripts, and each of the major themes is more accurately described as a shortfall of other characteristics or factors (lack of money; lack of knowledge, awareness, and understanding; lack of strong relationships; lack of ownership; and lack of enforcement). Conversely, when participants discussed approaches to overcome barriers, their comments tended to revolve around concepts that paralleled major barrier themes. Major approach-related themes identified from transcripts were knowledge, awareness, and understanding; strong relationships; ownership of issues; enforcement; and a fifth major theme that was not as pronounced during discussion of barriers—the notion of home/place/community.

Barrier Themes

Table 1 displays major themes that emerged from the discussion of barriers. For each theme, the table lists two specific barriers to the adoption of BMPs that reflect the theme. For each specific barrier, a supporting quote that indicates the barrier's presence is listed.

Perhaps the least surprising barrier—an issue found across watersheds—was also one of the most frequent: lack of funding. The need for greater financial support for BMP-related programs was mentioned in every focus group, often in an opening statement. The significance of opening responses in focus groups is that they generally follow a question designed to underscore common characteristics of participants and establish a basis for sharing information (Kreuger, 2000). When these questions included references to money, statements tended to generalize about broad financial needs that were a backdrop against which other aspects of water quality programs were discussed. Group agreement about such statements was

generally evident through both nonverbal demonstrations of assent, such as nodding, and more audible agreement, such as murmurs indicating conformity. Groups therefore rarely addressed the theme of money in any detail; the implicit assumption appeared to be that more money would always be needed for cost-share or other subsidy programs, as well as for general funding for water quality programs. Participants seemed to take that need for granted and therefore focused on other barriers and ways to overcome them. However, specific mentions of cost included statements about lack of resources (even with cost-share) to make changes, as well as statements about less obvious situations, such as loss of production during the time lags that occur when converting cropland to grass.

Table 1. *Major Themes Emerging From Focus Group Data and Examples of Theme-Related Barriers That May Discourage Adoption of Water Quality Best Management Practices*

Theme: Lack of money

Barrier	Salient quote
Lack of state or federal funding	It's hard to get funding for watershed pumps to slow water down going into creeks to keep rivers from flooding. And when we can't get funding, we don't have money to build these pumps.
Resentment at bearing cost of public good	I just can't afford the $10-, $20-, $30,000 . . . . I'd like to do it . . . it's a farmer issue, but it's also a public issue.

Theme: Lack of knowledge, awareness, and understanding

Barrier	Salient quote
Ignorance of impacts	How do you get people to understand you just can't go dump things down the drain . . .[or] in the backyard . . . and expect it not to affect the environment? You can't produce chemicals by the railroad-car loads, spray it all over the country, and not have some impact on the environment and our health.

Tradition/habit: don't see action as problematic	But most guys really haven't thought about it. They're feeding cattle [under the trees] for the protection and [availability of water]. And if they weren't . . . that's where the cattle would be. [So why not] just feed them there . . . most producers haven't figured out it's a problem.

Theme: Lack of strong relationships

Barrier	Salient quote
Isolation from other stakeholders	Because of the great diversity of ethnicity, there isn't a lot of cooperation. They do tend to keep to themselves, and that's the underlying problem.
Rural-urban polarization	Too much "us versus them." There is definitely a lack of cooperation, organizing, and cohesiveness to even begin to address these issues.

Theme: Lack of ownership of issues

Barrier	Salient quote
Displacement of blame	We've got more watershed dams, more no-till farmers, irrigation efficiency improved, we're getting better at capturing water where it falls. When you say there's no water in the river, the irrigator's reaction is that it's not all his fault. It's not him taking all the water.
Tenant issues	They may be leasing that particular place. So they're not going to be putting any money into it.

Theme: Lack of enforcement

Barrier	Salient quote
Too much leniency	I'm not overly impressed with KDHE's livestock management and enforcement. They're a little too lenient because I do get complaints . . . . I'll pass that complaint along and then four or five years later the situation still exists.
Inconsistent enforcement	Rules and regulations that are already in place need to be enforced, period. You can't be 10 years out of compliance because people learn from those examples . . . . Start from zero with everybody . . . . We can't keep letting this one guy get by because he pays more taxes than, than me. He's gotta pay, too.

Lack of knowledge, awareness, and understanding was the next most pervasive theme. Community leaders clearly had faith in the intrinsic value of water quality programs, BMPs, and movements toward sustainable behavior. They also demonstrated confidence in producers, who were seen as willing to "do the right thing" and as good stewards of land and water. However, leaders also believed producers (and others) possessed attitudes, beliefs, and norms based on inadequate information. Among key barriers reflecting this theme: lack of measurability and standards (data necessary to make decisions), ignorance of impacts, the weight of tradition and habit (as they constrain awareness and understanding), the need to understand consequences of economic and community growth, and cultural differences. Leaders suggested that producers were receptive to information and education programs that help to reshape attitudes, beliefs, and norms. Across sites, leaders perceived barriers as directly related to, ameliorated by, or perhaps even removable through use of effective information programs.

Lack of strong relationships was another major theme across watersheds. Agency inefficiency, inconsistency between agencies, producer isolation from other stakeholders, narrow political agendas, and urban-rural polarization were among the barriers leaders perceived as important that reflect this theme. Time was an additional concern underlying the barrier of agency inefficiency and inconsistency. Participants observed that it is difficult for producers to have to work through several agencies—for instance, one to confirm regulatory requirements, another for funding assistance, and

a third for technical assistance and expertise. They also pointed to those agencies' different, often incompatible time schedules. Participants believed that the range of stakeholders involved in water issues, the different natures and interests of those stakeholders, their varying goals, geographic diversity and distance, and other factors contribute to the presence of these barriers.

Lack of ownership was also a frequent topic. Community leaders noted that ownership is not just a matter of producers taking responsibility for the water they might affect; it is also an issue for all stakeholders, whether they are agencies, urban audiences, or members of other groups. Despite their confidence in producers' environmental stewardship, leaders noted that the range of barriers faced by producers made ownership of issues a matter of constant effort, development, or renewal. Major barriers included lack of producer ownership of specific issues, bureaucracy or lack of ownership within agencies or organizations, legislative inertia, tenant issues, and unchecked economic growth. For instance, producers might not recognize their own actions (such as feeding or wintering livestock on stream banks) as problematic, or agencies might pass information seekers on to other organizations rather than assisting with a problem.

Finally, lack of enforcement was a fifth major theme. This theme differed from the others: It had a more limited scope, with references to only a single general type of barrier. This barrier's status as a theme unto itself is based solely on the number of references to enforcement made across focus group sites, the conviction with which references were made, and the apparent acceptance of the references by other focus group members. Although a few participants were themselves agricultural producers and might have been expected to be more sympathetic to producers (particularly in regard to sensitive issues such as enforcement), little discussion and virtually no rebuttal was given to the idea that fair, consistent, and more active application of water quality rules to producers was necessary.

Approach Themes

Table 2 displays major themes emerging from discussion that focused on approaches to overcoming barriers. It also includes examples of suggested approaches for overcoming barriers to BMP adoption that reflect each general theme, as well as salient quotes that illustrate the approach and the theme.

Table 2. *Major Themes Emerging From Focus Group Data and Examples of Theme-Related Approaches to Encourage Adoption of Water Quality Best Management Practices*

Theme: Build sense of place, home, and community

Approach	Salient quote
Use local opinion leaders	We have a really active seven-member board, and their communications with their neighbors are probably the key things we do, one of the most effective . . . . They talk to people at the ball game, on the side of the road, or at the café. We do wintertime meetings where they'll invite 5 or 10 neighbors to their house.
Share info with local stakeholders	I look for ways to bring the most partners to the table on a project . . . . I never market a piece that the guys from U.S. Fish & Game and Kansas Wildlife & Parks don't read through.

Theme: Increase knowledge, awareness, and understanding

Approach	Salient quote
Demonstration projects	Voluntary is better than mandatory [for education and demonstrating BMPs] . . . if we can get one of their neighbors to implement some things, and [they] realize there's cost-share money, I think some of them still will come around.
Public promotions	Say you're going to have a "Water Depletion Day." And we're just going to shut all the water supplies down for one day . . . a "No Water Day" would get everybody's attention.

Theme: Build strong relationships

Approach	Salient quote
Partner with environmental groups	They probably ought to be brought into the loop . . . you might need to partner with them before you have a problem. . . the Sierra Club, the National Wildlife Federation, Audubon.

Educate urban children about agriculture and rural life	I never see busloads of city kids going to the country. Some of those city kids may end up agency heads, legislators. I guess the better urban and rural folks . . . understand each other's issues, it would be easier for us to work together on solutions . . . .

Theme: Encourage ownership of issues

Approach	Salient quote
Promote local involvement and decisions	Within our watershed it's really important . . . for them to have power to make decisions themselves, rather than someone else legislate answers for them.
Reward positive behavior	If . . . a traditional system allows sewage to leach down and you get the same amount of cost-share you would to put in a constructed wetland that treats 95% or more . . . there should be incentive to build the one better for the environment.

Theme: Improve enforcement

Approach	Salient quote
Employ regulations	I think on where we're trying to get behavioral changes there has to be a stick or a threat behind it . . . . Why do I want to change without some kind of fear or something?
Regulate development	If development moves out into the county . . . keeping a handle on that is going to be another challenge. I'm sure we have rules in place for those people so we can shake a stick at them, to make sure construction doesn't cause problems.

Among the major "approach" themes, only "place, home, and community" did not have a strong parallel theme among barrier themes present in the data. The place theme reflects a sense of responsibility toward the place where one lives and works. This idea of place may go beyond one's immediate physical home or community to include a somewhat larger geographical area, such as a watershed. This theme is similar to the theme "ownership of the issues," but differs in the object of responsibility (which is responsibility

toward one's home or community, as opposed to responsibility for the issue itself, whether local or statewide). Major approaches tied to the place theme included vigilance in monitoring and preventative measures within watersheds, using competition to foster community pride, promoting local involvement, and using commerce as an incentive. Leaders emphasized preventative measures and the need for community and state leaders to be proactive rather than reactive. Postimprovement monitoring to maintain quality was also mentioned. Soil conservation as a starting point for achieving water quality, friendly competitions between neighboring districts, and promotion of local water quality as an incentive to draw business or community development were other suggested approaches.

Regarding the theme of ownership of issues, discussants suggested encouraging preventative measures to help locals avoid the effects of water quality problems, promoting local involvement and decision-making, rewarding positive behavior, and improving water testing and data-gathering efforts for local waters.

For knowledge, awareness, and understanding, the main approaches discussed were employing regulations (including the enforcement of existing regulations and the elimination of grandfather clauses), designating basin masters as key sources of information, addressing "producer myths" regarding strength of stewardship, educating urban audiences about chemicals, developing state-standards-compliant educational programs for school children, having a promotional day when citizens would try to severely curtail water use, and using programs like the watershed specialists program. Even though leaders generally viewed producers as good stewards, they noted that various meanings of stewardship exist, that not all producers were good stewards, and that others might not be good stewards across time periods or issues. Often the very management practices producers believe to be good stewardship can be detrimental, one participant noted; to some producers, good stewardship means having weed-free fields and a finely tilled seedbed, which could actually contribute to erosion.

Approaches reflecting the relationship theme stressed one-on-one communication, appearances before producers at events they normally attend, and educating general or urban audiences to improve their awareness and understanding of water problems (especially about rural-urban interaction and how problems of both groups are related on watershed or statewide levels). School programs were seen as a way to build relationships between rural and urban children who will be future community leaders and will need to work together to address mutual concerns. Likewise, participants believed personal contact or cooperative approaches to share information

were the best ways to reach producers and urban audiences. The watershed specialists program was seen as particularly useful for increasing knowledge, awareness, and understanding, and for building strong relationships.

For the strong relationships theme, additional suggested approaches included requiring land tenants to use BMPs, initiating one-on-one contacts, including environmental groups in discussion, approaching urban communities to contribute to local community cost-share, educating urban children about agriculture and rural life, and providing incentives or recognition to producers who do effectively protect water.

Enforcement again was referenced so frequently and with such conviction that it served as its own approach theme. Community leaders strongly supported using regulations to achieve behavioral change; they reasoned that change would not occur unless there was sufficient cause to change. There also was strong support for equal enforcement of regulations (no leniency for established practices) and for enforcing regulations on economic development (which sometimes harms natural resources). Another approach community leaders endorsed was for landowners to require that their tenants follow BMPs on their operations.

Discussion

The study's findings would seem to both validate and be validated by a tested set of theoretical principles and by a practical framework (the Swiss model) that has been practiced in another setting. That model suggests that a variety of tools and approaches are necessary for successfully encouraging environmentally sustainable practices. In addition, the theory of planned behavior suggests that a variety of interventions may be needed at different points to alter behavior or help alter it. The data clearly supported the general principles of both frameworks.

The practical strength of the Swiss model lies in its ability to remind policymakers of options for encouraging sustainability—particularly strategies relying on communication and informal influence that perhaps have been underutilized (Stern, 2001). During coding, researchers associated approaches and barriers (see examples in Tables 1 and 2) with classic or new policy instruments (Flury-Kleubler & Gutscher, 2001), general barrier types, and parts of the planned behavior theoretical model. These associations (see examples in Table 3) can be used as a guide for development of interventions for improving water quality. Such interventions could include strategic communication programs to address attitudes, motives, beliefs, perceptions of behavioral control, or other appropriate determinants of behavior.

Table 3. *Planned-Behavior Theory Aspects, Barrier Concepts and Policy Tools Affiliated with Barriers, and Approaches Discussed by Community Leaders*

Theme: Lack of money (from Table 1)

Approach	Theoretical model aspects	Associated barrier types	Policy instruments suggested
Resentment at	Attitudes	Internal	Economic
bearing cost of	Beliefs	Structural	Service/infrastructure
public good	Norms		Communication and
	Actual behavioral control		diffusion
			Collaboration

Theme: Improve knowledge, awareness and understanding (from Table 2)

Approach	Theoretical model aspects	Associated barrier types	Policy instruments suggested
Educate urban	Attitudes	Internal	Communication and
and rural	Beliefs	Interpersonal	diffusion
schoolchildren	Norms		Collaboration

The conceptual structure can help suggest such linkages for virtually all approaches and barriers discussed in the study—some of which are quite obvious. For example, barriers that clearly can be identified as structural, such as lack of money, also would have readily suggested solutions according to the Swiss model (economic instruments or service and infrastructure instruments). But the conceptual structure can also indicate other instruments and approaches. Table 1 quotes one leader who hints that differing financial costs might affect producers' behavior. In one case, a producer might face a cost of $600 to $800 and a subsequent choice between competing economic, time, enforcement, and social interests. In another scenario, a cost of many thousands of dollars might seem to remove all choice from a producer who cannot afford to take action. In the first case, logic suggests that planned behavior approaches addressing attitudes, beliefs, or norms could help reconcile competing interests in favor of environmentally sustainable behavior. Focusing on those theoretical components would clearly suggest other instruments included in the Swiss model, such as

communication and diffusion efforts, or collaborative relationships. Water quality planners can improve their offerings by being aware of the range of issues they need to address and the tools they need to address them.

Under the structure, an approach mentioned in several focus groups (educating urban children about agriculture and rural life) is categorized as an internal and interpersonal barrier that can be addressed by communication and collaborative instruments at the points of attitude and subjective norms in the theoretical model. One watershed specialist demonstrates such an approach by offering an environmental education program in elementary schools within the specialist's home watershed. The program provides all necessary materials for hands-on activities to teachers and also satisfies state standards, meaning that the teachers face fewer planning burdens and that students can learn about water-friendly practices while preparing to meet standards-based state tests.

The approaches suggested in these focus groups indicate that community leaders believe many elements are in place to effectively address Kansas water quality issues. From their perspective, a critical breakdown is in a lack of awareness. They indicated that some programs need to be continued or enhanced; others, like the watershed specialist program, need more time to achieve their goals. In addition, leaders stressed the need for public school programs.

Although this study's initial phase did not include the ultimate targets for assessment (agricultural producers), it is useful in helping to understand the factors underlying attitudes, beliefs, and norms that shape producer choices about behavior. To explore those more effectively, researchers will use these findings to shape a question route and to target issues of interest for producer focus groups during a second phase of this study. For instance, one suggested approach to increase ownership of water issues is to promote local involvement and decision-making (thereby making use of local knowledge). Comparing producers' ideas of effective ways to do this with community leaders' ideas may provide valuable insight into the best ways to make it happen.

Even when the focus group themes of lack of money and enforcement did not produce corresponding discussions of the approaches needed to overcome those two general barriers, they did strongly imply corresponding approaches. Leaders' discussion and commentary included few direct suggestions as to which rules or laws to enforce more strongly and which specific programs to fund. However, the implications of the two themes are fairly obvious: Because lack of money and inconsistent enforcement appear to be major barriers, judicious funding and enforcement is called for. A well-

planned question route for producer focus groups may help determine which attitudes, beliefs, and norms are important in these areas, and perhaps could result in suggestions for interventions to address the barriers identified. Producer focus groups may provide useful information regarding fairness in funding and cost-share programs; ideas on research needed for information campaigns and informed decision-making; the best information sources for producers; and how to target campaigns to those sources.

Other practical implications should result from this research, including the continuation, expansion, or initiation of statewide water quality programs that focus on building relationships among stakeholders, both individually and in organizational settings; expanded use of the extension model of personal contact to reach educational and informational goals; cross-checking of statewide programs and agencies for consistency in their regulations; and complementary cost-share funding cycles and coordination of services between agencies. Although the state does rely on available subsidies and enforcement to encourage adoption of BMPs, the research implies that these approaches should be continued, expanded, and used more consistently.

According to Trumbo and O'Keefe (2001), strategically planned information programs, carefully targeted and preferably involving community participation, can be influential in positively affecting people's attitudes and behaviors toward sustainable agriculture. Vanclay and Lawrence (1994) noted that until there is general recognition of the importance of a particular environmental problem and of the suitability of agricultural management practices dealing with that problem, widespread adoption is not likely to occur—a remark with clear implications for communicators. The findings of this initial assessment generally confirmed that community leaders believe that communications research and communications processes are important for effective education and awareness about water quality issues in Kansas. Local leaders acknowledged the critical role of useful and readily available information for producers, public understanding of water quality issues and the function of public policy and enforcement, and programmatic functions that work from the strengths of local involvement and relationships of trust and cooperation among key stakeholders.

Future project research will include a series of focus groups with producers across the state's key watersheds. In light of previous work on overcoming barriers to sustainable agricultural practices, it is anticipated that the data gathered will be a rich and deep source of information on a wide range of factors affecting Kansas producers' adoption decisions. This, in turn, will help communications professionals working with Kansas water quality

issues to tailor strategic communications planning, processes, and products to locally oriented and watershed-based audiences whose participation in remedial or preventive programs is critical for improved water quality in the state. It is also hoped that the findings will enrich understanding of the theoretical frameworks used to guide assessments such as this, leading to more effective communications practices.

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