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Strategies for Engaging Scientists in Collaborative Processes

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Strategies for Engaging Scientists in Collaborative Processes

Abstract
Scientists are often reluctant to get involved in collaborative efforts to address natural resource issues because of potential professional repercussions. As agents for change, Extension professionals can help to bring scientists into these problem-solving efforts. In this article, collaborative and scientific processes are compared and contrasted to provide one way for Extension professionals to communicate the role of scientists in collaborative problem solving. Extension activities can be instrumental in efforts to move scientists from experts outside of the problem-solving process to scientists as key players and full partners in the process.

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Collaboration in Natural Resource Management Decision Making

The current trend in public policy decision-making is away from a command-and-control approach toward increasing collaboration. In natural resource management, the former relied on the best available scientific data (with a bit of politics thrown in for good measure) to develop policies and regulations. Given the current state of our natural resources, resource managers realized that this method was not working as well as was needed. Thus, collaboration (also known as "stakeholder involvement," "public participatory process," "consensus-based problem solving," and a host of other names with marginal differences in meaning) has become a critical strategy in resolving natural resource management problems.

Although Extension professionals should not be advocates of a position on any issue, it has been argued that Extension professionals should be advocates for the use of collaborative, inclusive, problem-solving processes (Favero & Haaland, 2000). Among the factors that have been associated with successful collaborative problem solving is the inclusion of skilled, committed people in the planning and outcome (Flynn and Harbin, 1987; McKenna & Carroll, 1999).

Extension professionals play an important role in ensuring the process is properly designed and conducted, and that it includes all of the interested and affected parties, including those with expertise, skills, and knowledge that may be helpful in resolving the issue. These parties include the experts--natural and physical scientists, economists, social scientists, planners, lawyers, and so on--those who have some authority over the issue, such as managers, and the people whose lives will be affected by the decision and those who will have to comply with the decision. Many expert stakeholders such as planners, social scientists, and resource managers are actively involved in public processes as part of their professional positions.

Although natural and physical scientists have vital information to contribute to the problem-solving process, gaining their active participation can be difficult (National Academy of Science, 1995). As advocates for public participatory processes, Extension professionals can play a critical role in bringing scientists to the table. The following discussion offers some tools and strategies to do this.

Engaging Scientists in Collaborative Processes

Much has been written by both scientists and non-scientists about the appropriate role of scientists in public policy decision-making (Kaiser, 2000; Kennedy, 2003; NAS, 1995; Wheeler, 1997). Some argue that while scientists should be objective in designing, conducting, and drawing conclusions about their research results, they should be advocates of public policy based on what they have learned from this research (Kennedy, 2003). Others fear that involvement in public policy decision-making, and particularly advocating a position in that process, could jeopardize one's career (Kaiser, 2000).

Extension professionals, as the interpreters of science for the public, also can help to translate collaborative processes for scientists. Extension staff can help scientists become more comfortable engaging in the process by defining what collaborative problem solving is, how it works, why scientists should be involved, and how they can effectively contribute (without losing their credibility). By comparing and contrasting the scientific method with the methodology for collaborative problem solving, Extension professionals can answer these questions using an example from the scientists' experiences.

Defining the Collaborative Process for Scientists

Collaboration, like science, is a set of complex attitudes and skills that have to be learned (Boss, 2003). To define for scientists what collaborative processes are and how they work, Extension professionals can use the scientific method as a starting point. Table 1 provides a comparison of the scientific process with collaborative problem solving. This tool can help Extension professionals clearly articulate to scientists the similarities and differences in the collaborative and scientific processes in a familiar format. Extension professionals who are facilitating a collaborative process in which scientists are participating can better communicate the meeting(s) process by presenting this information either graphically using the table or orally.

Table 1.
A Comparison of the Collaborative Problem-Solving Processes and the Scientific Problem-Solving Process. Adapted from NOAA CSC, 2000.

Collaborative Problem-Solving Process	**Scientific Problem-Solving Process**
1. Identify a problem	1. Identify a problem through initial observations
2. Frame the problem ("How do we . . .?")	2. Frame the problem ("Is this different than the hypothesis . . .?")
3. Identify participants	3. Identify what others have done through a literature search
4. Design a strategy and a structure to answer the framed problem	4. Design experimental methods and materials that will test the hypothesis
5. Conduct the collaborative process according to the established strategy and structure, i.e., the process a. Hold preliminary meetings to define the problem and establish ground rules	5. Conduct the research according to the prescribed methods and materials, i.e., the process a. Gather preliminary data b. Develop a complete understanding of the problem

b. Develop a complete understanding of the problem by: i. learning and educating participants through exchange of information about fears, concerns, perceptions, and interests ii. gathering information to address these iii. analyzing the information and situation	by: i. continuing to observe and record data ii. gathering sufficient data to draw meaningful solutions iii. analyzing the data
6. Generate options	6. Interpret the data
7. Evaluate the options and select the best one(s) to solve the problem	7. Develop descriptions, explanations, or models from the evidence
8. Come to an agreement	8. Reach conclusion(s)
9. Develop an action plan for implementing the agreement	9. Develop and present possible alternative solutions
10. Report on progress and capture lessons learned	10. Report on the experimental process and results
11. Evaluate the decision-making process, including lessons learned	11. Evaluate the research methods used, including lessons learned

This technique proved very helpful in collaborative meetings with scientists, such as the Southeast Coastal Ocean Science workshop (January 2003, Charleston, SC) and the Integrated Ocean Observing System/Coastal Ocean Observing System (IOOS/COOS) Education workshop (March 2004, Charleston, SC). Both of these meetings addressed, in part, research needs for coastal management and education initiatives, so scientist participation was essential.

For the former meeting, the Table 1 graphic was presented to the group to help explain the specific process that would be followed. The parallels to the scientific process clarified for the scientist participants why the meeting progressed in the manner that it did. As one participant described in his post-workshop evaluation, "the explanation of the methods and materials helped me to understand the typical meeting facilitator nonsense that used to frustrate me--very helpful."

For the latter meeting, the facilitators described the parallels of the meeting process and the scientific method to help participants understand the multi-day meeting agenda and their roles in various parts of the meeting. Again, participants (both scientists and Extension professionals) indicated on their workshop evaluation forms that this explanation clarified what had been "the mystery" of why facilitated meetings proceeded as they did.

This tool is also used in the NOAA Coastal Services Center workshop Public Issues and Conflict Management. The workshop is designed for coastal resource managers, researchers, and Extension agents to help them design and conduct more effective public participatory processes. In follow-up participant evaluations conducted 1 and 2 years after the workshop, participants have frequently referred to this table as having been "very useful" in conveying to others how and why the process is designed as it is and what the participants' roles were (Hinkey & Hinchcliff, 2004).

Among the first steps in both the scientific and collaborative processes are the identification of a problem, framing the problem in the appropriate manner, and selecting methods and materials that will lead to credible, viable information. Later in each process, the data or information is analyzed to determine the best solution to the problem, and the process for reaching that decision is critiqued to determine how it could be improved for future efforts.

One of the greatest differences between the two problem-solving strategies is in the manner the problem is framed. The scientific process frames the question as a test of the null hypothesis. The possible answers to this question can only be that results did or did not differ from the hypothesis tested. The scientific method does not conclude with a "right" answer, but with an answer that is either not wrong or different from the proposed answer (hypothesis).

The collaborative process frames its question as a "how do we . . .?" statement that addresses the issue of concern. The range of possible solutions to the problem is limited only by the creativity of the participants. To find a solution that is not necessarily "right" but that best addresses the interests of all participants, the framed problem moves away from participants' positions to their specific interests and concerns. The broader question addresses the issue and interests of those involved. Any prospective answer includes an answer to the question "what's in it for me?" or WIIFM. WIIFM describes the benefits or outcomes that are of interest to a participant. The answer to WIIFM may be personal, professional, self-interested, or altruistic (community-oriented).

For an example, consider a community with a traffic congestion problem. To address the issue collaboratively, the question cannot be framed in terms of a single proposed solution such as "should we build or expand a highway?" This only allows participants to take positions for or against that particular solution. By examining the stakeholders' interests during the preliminary identification of the problem (e.g., long commute times, traffic jams, noise, pedestrian-friendly neighborhoods, child safety), the question can be framed in a manner that asks about the issue--traffic--without limiting the possible answers or solutions to "yes" or "no." An example would be, "how do we address our community's traffic problem while maintaining our pedestrian-friendly community?" A broad range of WIIFMs are addressed in this framing of the issue, including both self-interest (commute times and child safety) and community interest (traffic problems and community character or pedestrian-friendliness).

The answer or outcome of the process, in order to be "correct" for the participants, has to answer their WIIFMs. In the example above, the solution should result in shorter commute times, reduced traffic congestion, and safer streets that provide plenty of pedestrian amenities and opportunities. The participants themselves would specify how this would be accomplished.

Of interest and concern to scientists are how and why they should participate in the process. When the framed problem is presented to scientists, it is important to provide information not only on how the process works, but also on how their participation can benefit them (what's in it for them). This can help to overcome their concerns, as well as provide motivation for them to be involved. Table 1 provides scientists with the necessary information on how the process works. The next section describes how Extension professionals and collaborative process facilitators can answer some common WIIFMs of scientists.

What's in It for the Scientist?

Although the answers to WIIFM for scientists differ as much as they do across any group of individuals, some of the main concerns that have been expressed by scientists are that involvement in public policy decision-making and particularly advocating a position in that process could jeopardize one's career (Kaiser, 2000) and that the reward system in the academic and scientific world precludes their participation. Publication, not application, is what merits promotion, tenure, and increased standing and respect in the scientific community.

Framing the question to answer the concerns of scientists can help to convey the importance of their participation in the process. The same traffic problem may be framed for scientists in various formats that speak to their interests. To address the issue of advocacy, the problem could be framed to solicit possibilities rather than a position:

- "How can your research help us to address our community's traffic problem?"
- "What might be the outcome to the traffic situation if the information you have on habitat fragmentation is not included in the process?"
- "How can the findings of your research on the relationship of impervious surface and water quality be shared and incorporated without putting you in the role of advocate?"

To address concerns about pressures to publish, the question could be framed to examine the possible research interests of the issue:

- "How could the additional information on [demographics, land-use planning, etc.] that you'll obtain as a participant in the process help to shape your future investigations on the topic?"
- "How can this issue offer new directions or insights into your research findings?"
- "Are there possible sources of funding for future research because of this issue?"

Scientists, like Extension professionals, are problem solvers. When they develop potential solutions to the questions that address their interests, they will have more reason to participate in the process.

Extension, Collaborative Processes, and Change

The similarities in collaborative and scientific processes are obvious. Neither process results in an absolute right answer, but both result in the best one given the current information, tools, and abilities. Both are limited in their ability to find the best solution by the skill of those conducting the process and by limitations in the current best practices, methods, and materials available.

The differences also are obvious. Scientific studies manipulate one or a few variables while holding all others constant to understand causal relationships and what factors influence them. Collaborative processes are used to address natural resource problems that affect or are affected by people. As anyone in Extension can verify, people are a difficult variable to hold constant. Rather than attempt to hold some variables constant, collaborative processes strive to change all of the variables, or participants. The process is designed to change the participants' knowledge and understanding of the issue by exchanging information and learning about the issue from multiple perspectives.

At their heart, collaborative processes are really just complex learning processes. In collaborative processes, all of the participants learn from each other, including agency representatives, the content experts like scientists, and the affected public. Unlike compromise solutions, which reduce the solution to the lowest common denominator acceptable to all parties after they've given up parts of their preferred solution, collaborative processes help identify better or more preferred solutions based on a gain of knowledge and information. Mutual learning results in all of the participants arriving at a new or different solution, not by coercion or compromise but because of their increased understanding of the issue. The increased understanding leads to changes in interests, positions, and what is seen as the best possible solution to the problem.

One of the primary areas that Extension professionals work in is Public Issues Education (PIE). PIE is a broad label that encompasses all of the components of collaborative problem solving: public policy education, community development, leadership development, and coalition building (Favero & Haaland, 2000). Learning as a tool to effect change also is the heart of Extension. As agents for change, Extension professionals use sound process skills to ensure that all of the stakeholders in a process can make the appropriate changes in knowledge, skills, attitudes, and behaviors to resolve the issue at hand. Extension professionals, as advocates for sound problem-solving processes, are uniquely equipped to ensure that the players--experts and impacted participants--understand what collaborative processes do, how they do that, and the role of each member in the process.

Conclusion

The natural resource management issues that are addressed through collaborative processes are complex issues that involve more than one area of expertise. Physical, natural, and social scientists, and engineers and accountants each bring different expertise to the table. All have correct and useful information to add, but no one discipline or interest has the "right" answer because the questions are more complex than that. All of these experts must learn from, as well as educate, the other participants. Including natural and physical scientists in these processes helps ensure that the final outcome is based on a comprehensive understanding of the issue from all perspectives, including but not exclusively the scientific one.

Extension professionals, as change agents and unbiased purveyors of information, are in a unique position to lead the ongoing transition from command and control management to collaborative solutions for complex natural resource problems. One important role for Extension professionals in this effort is to help move scientists from experts outside of the problem-solving process to key players and full partners in the process. Extension professionals can ensure that scientists are fully prepared and comfortable as participants in the process by educating scientists on the nature of collaborative processes and the role of the scientist in them. Comparing and contrasting collaborative processes with scientific processes is one simple technique to increase scientists' willingness and ability to participate.

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