AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Journal of Agricultural and Applied Economics, 40,2(August 2008):465–471
© 2008 Southern Agricultural Economics Association

Integrating Stakeholder Input into Water Policy Development and Analysis

Bridget Guerrero, Steve Amosson, and Lal Almas

Agricultural water use is becoming an issue in much of the South due to population growth. Results of projects evaluating the impacts of conservation strategies aimed at reallocating or extending the life of water supplies are being met with great skepticism by stakeholder groups. In order to gain acceptance of results, it is essential that stakeholder groups be involved from the beginning in the identification of potential water conservation strategies and be kept informed throughout the project. The objective of this paper is to review previous attempts at involving stakeholders and the methodology currently being employed in the Ogallala Aquifer Project.

Key Words: conservation, Ogallala Aquifer, stakeholder, water policy

JEL Classifications: Q250, Q280

Crop production in the Great Plains is largely dependent on irrigation due to limited and highly variable rainfall. The Ogallala Aquifer covers approximately 173,000 square miles (Zwingle) and is by far the largest single water source in the region. However, the groundwater stock in the Ogallala has been steadily declining because the minimal rate of natural recharge is far exceeded by the rate of withdrawals. Irrigation for crop production accounts for approximately 89% of total water use in the Texas Panhandle Region (Senate Bill 1).

The economy of the Great Plains is highly dependent on irrigated agriculture (Amosson et al.; Peterson, Marsh, and Williams). The decline of the aquifer has very serious implications for the many stakeholders involved and the future of the High Plains economy as a whole. Policy makers at both the state and federal levels have considered several options designed at preserving the aquifer or assisting farmers in adapting to diminished water availability. However, there is little available scientific information on the likely short- and long-term effects of these policies with respect to water savings, program cost, producer income, and the regional economy.

The Ogallala Project is funded by the United States Department of Agriculture–Agricultural Research Service (USDA–ARS) and was formed to improve the sustainability of agricultural industries and rural communities through innovative scientific research. The economics section of the Ogallala Aquifer Project recognized the importance of analyzing alternative policies focused on agricultural water conservation to provide policy makers science-based information of their impacts. The overall objective of the study is to provide policy makers and other interested individuals an analysis with the estimated impacts of alternative water conservation policies. The results of this study will be valuable information if water conservation policies are consid-

Bridget Guerrero and Steve Amosson are Extension associate and Regents Fellow, professor, and Extension economist, respectively, Texas AgriLife Extension Service, Amarillo, TX. Lal Almas is associate professor, Department of Agricultural Sciences, West Texas A&M University, Canyon, TX. Funding provided by USDA-ARS Research Initiative.

ered in the future to insure the strategies selected minimize change to incomes and the economy.

Stakeholder involvement in policy development and analysis is essential to the overall acceptance of results of any water policy analysis. Wheaton wrote, "There are enough cases in which the planners have been wrong and their solutions irrelevant to create the necessity for review of their judgments and the public acceptance of those judgments." The policies being analyzed are important in their goal to sustain the Ogallala; however, they are controversial because of the many stakeholders that would be affected by the policies. In addition, the old English common-law of rule of capture that is still being used in Texas is cause for concern for stakeholders. Under the rule of capture, the landowner is entitled to the right to withdraw unlimited amounts of water found beneath his land (Kaiser and Skillern). Stakeholders in the region realize that some steps should and must be made in order to help sustain the Ogallala Aquifer's water supply. Involving stakeholders is not only a way to introduce and inform stakeholders about the policies being analyzed, but also a way to build stronger plans that will be more likely to be implemented.

The objective of this paper is to review previous attempts at involving stakeholders and the methodology currently being employed in the Ogallala Aquifer project. The methodology used to involve stakeholders will be described in detail, as well as the results from the each stage of the process. In addition, plans for future involvement of stakeholders in the project will be described.

Background

There is an array of instances where stakeholder groups were used in forming policies. This is understandable because stakeholders are ultimately the ones that will be affected by the policies in consideration. Not surprisingly, most of these instances pertain to issues concerning economic and environmental trade-offs. Issues such as these often involve a diverse group of stakeholders.

Gregory and Keeney developed a guide to social trade-off decisions that was used to determine whether a coal mine should be developed in a pristine tropical rain forest. The methodology used three steps to structure a decision with the stakeholders. The steps included setting the decision context, specifying the objectives to be achieved, and identifying alternatives to achieve the objectives. Meetings were held with stakeholders and analysts for each step of the process. Five different groups of stakeholders were selected to be included in the decision process. A workshop was organized in which approximately 25 stakeholders attended. The workshop consisted of presentations to inform participants about the decision context. In addition, stakeholders as a group and as subgroups collaborated and developed their ideas. The last part of the workshop included a discussion between stakeholders and analysts to develop a list of policy alternatives. The result of the workshop was a list of policy alternatives that were created based on stakeholder values and clear, constructive communication between stakeholders and analysts.

Popp et al. utilized stakeholder input to create an effective water quality management plan for the Lincoln Lake watershed in Northwest Arkansas. Their overall goal was to collect stakeholder perceptions of watershed water quality, sources of pollution, and effectiveness of best management practices and use these results to move stakeholders from conflict to cooperation in meeting water quality goals. They used three surveys aimed at a diverse group of stakeholders to meet this goal. Separate meetings were held (for agricultural and nonagricultural stakeholders) in which the survey data was collected. Surveys were mailed to stakeholders not present at the meetings. The results of the surveys have brought officials a step closer in understanding perceptions of watershed stakeholders.

Burby proposed that the method used to involve stakeholders in the plan-making process is crucial to obtain a desirable plan that will result in action on the issues being addressed. He suggested that the keys to obtaining a strong plan are a broad spectrum

of stakeholders and strong plans that are based on broad stakeholder involvement. The proper method will give you a plan that has the advantage of true stakeholder input. The underlying advantage of stakeholder involvement is the communication that occurs and information that is shared between planners and stakeholders throughout the participation process (Innes; Hanna).

Methodology

It is important to get stakeholders involved early in the policy development process. It is equally important to keep the stakeholders informed throughout the entire project and to involve them in reviewing the final results. The methodology used by the economics group included different approaches to accomplish this including an initial survey to see which policy alternatives they would like to see analyzed and a stakeholder meeting to get suggestions on modeling the policies. Finally, feedback to the stakeholders has occurred throughout the process and a presentation of the results will take place when the policy analysis is complete.

The study area of the project is the area overlying the Ogallala Aquifer from the northern border of Kansas to the southern reaches of the aquifer just north of the Midland–Odessa area of Texas. The Southern Ogallala Aquifer Region is divided into three subregions. The northern subregion consists of the area overlying the aquifer in Kansas and Colorado. The central subregion consists of the Oklahoma and Texas panhandle areas south to the line of counties including Parmer, Castro, Swisher, and Briscoe counties. The southern subregion extends from that line of counties for Texas and New Mexico south to Andrews and Martin counties of Texas. It was important to involve stakeholders from each of the three subregions equally through each step of stakeholder input process so that the results would be representative of the entire Southern Ogallala Region.

The first step to involve stakeholder input was an initial survey to see which policy alternatives would be evaluated. The survey formed the base of the policy analysis process as it collected stakeholders' rank of the top five potential policies they would like to see evaluated out of twelve possible policies listed. In essence, the survey "set the stage" for the entire policy analysis and introduced stakeholders to the project and project objectives.

A stakeholder meeting was the next step in involving stakeholder input. An Industry Review Committee (IRC) was formed with carefully selected stakeholders from each subregion. The purpose of the meeting was to obtain stakeholder values and opinions through presentations and open discussion. These values were used in revising the description of the policies to be analyzed and developing implementation parameters. Another goal of the meeting was to further inform stakeholders of the project objectives and the methodology being used to analyze the policies. Stakeholders were introduced to the economic optimization and socioeconomic models being used for the analysis and were given a brief overview of how they work. A clear statement of objectives and methodology was essential in obtaining useful stakeholder input as they were able to see exactly what was trying to be accomplished and the capabilities of the models.

Once the policy analysis is complete, the economics group will hold another meeting with the IRC to present the preliminary results. Input on the results will also be obtained at this meeting and changes will be made if necessary. In addition, the results of the analysis will be presented to the original survey recipients that first decided which policies would be analyzed.

Results

Stakeholders have been involved in every major step of the project. The primary steps where stakeholders have been included are a survey of key individuals involved in water in the region, an Industry Review Committee made up of select stakeholders, and a continual effort to provide feedback to stakeholders as the project progressed.

Survey

A water conservation policy survey was conducted to determine what alternative water conservation policies stakeholders wanted to see analyzed for potential impacts with respect to water savings, implementation costs, producer income, and the regional economy (economic activity, employment, and income) under the Ogallala Aquifer Project. The economics project group met and developed an initial list of 12 policies that either had already been implemented or had the possibility of implementation in the near future.

The potential policies were used in the development of the stakeholder survey. The survey was one page in length with instructions to the survey participants to select their top five choices out of the 12 listed, and rank them in order of preference with one being the most preferred and five being the least preferred. In addition, survey participants could list additional policies that they would like to see analyzed that were not included on the survey. An internal review of the survey was conducted where eight individuals reviewed the survey and their changes were incorporated. The survey also underwent an external review in which 10 individuals reviewed the survey. As a result of the external review, one policy choice was added and another was removed. The final 12 water conservation policies and their descriptions included in the survey are listed in Table 1.

Survey recipients were carefully selected from the Southern Ogallala Region based on expertise and interest in agricultural water policy and included water districts, senators and representatives, commodity organizations, Ogallala Project leadership team, water planning groups and agencies, state authorities, and other authorities. A total of 150 surveys were evenly distributed across three subareas of the Southern Ogallala Region. Texas stakeholders received 100 surveys between the two subregions, and Kansas stakeholders received 50 of the surveys. In Texas, a group of experts were identified to participate in the survey who resided outside the study area; however, they were familiar with the region and had knowledge of the water policy alternatives being considered in other areas of the state. This group of stakeholders was simply named "Texas Other." Therefore, 45 surveys were distributed to both the central and southern subregions, 10 were distributed to "Texas Other," and 50 were distributed to Kansas for a total of 150 surveys.

The surveys were administered using an approach similar to Don A. Dillman's methods (Dillman). Initially, they were mailed to the participants with a postage-paid return envelope and a letter describing the purpose of the survey and a description of the overall project. After two weeks, a postcard follow-up was sent to the stakeholders to remind them of the survey and boost the response rate. Finally, a reminder email was sent after two more weeks had passed, again reminding stakeholders of the survey. The email also contained an attachment of the survey so that it would be more convenient to fill out and return. The Dillman method was truncated early due to an overwhelming response from survey participants.

The response rate was tremendous as 78% of the stakeholders retuned their surveys. The response rate alone tells just how many people are interested or concerned about the decline of the Ogallala Aquifer and what the impacts of the different policies in consideration might mean in terms of producers' income and the regional economy. Many phone calls were received from stakeholders concerned about the survey and the overall project goal. Possibly one of the greatest advantages of the survey was that it allowed stakeholders to defuse and get a better idea of the project objectives before the actual face-to-face meeting.

The top five–rated alternative water conservation policies were chosen to be analyzed by the stakeholders and included permanent conversion to dryland production, technology adoption, biotechnology, water use restriction, and temporary conversion to dryland production (Table 2). The top five results by region were compared to ensure that the overall results were not weighted heavily by one of the three regions (Table 3). The results show that

Table 1. Potential Water Conservation Policies included in Stakeholder Survey

Potential Policy	Description
Water use restriction	A mandatory annual or multiyear limit that reduces the amount of water pumped
Drawdown restriction	A mandatory restriction on the reduction in saturated thickness over a specified period of time
Water use fee	A mandatory per unit tax on the amount of water pumped ($/acre–foot)
Energy tax	A mandatory per unit tax on the amount of energy (electricity, natural gas, propane, diesel) used to pump groundwater for irrigation ($/unit)
Convert to dryland, temporary (water CRP)	A voluntary incentive-based program that compensates landowners to temporarily (10 years) convert irrigated cropland to dryland
Convert to dryland, permanent (water right buyout)	A voluntary incentive-based program that compensates landowners to permanently convert irrigated cropland to dryland
Technology adoption	A voluntary incentive-based program that encourages landowners to adopt more water-efficient irrigation technology
Irrigation scheduling	A voluntary incentive-based program that encourages landowners to adopt irrigation scheduling
Conservation tillage practices	A voluntary incentive-based program that encourages landowners to adopt conservation tillage practices
Biotechnology	A voluntary incentive-based program that encourages landowners to adopt more water-efficient crop varieties
Compensated water use restriction	A voluntary incentive-based program that compensates landowners to permanently reduce water use by a specified amount
Precipitation enhancement	A state/local district funded program for rainfall enhancement

each region had four of their top five choices included in the overall top five policies to be analyzed.

Industry Review Committee

The IRC was formed with the purpose of providing input into how the policies should be developed and what level of implementation should be used in the policy analysis process. There were 15 stakeholders over the entire Southern Ogallala Region selected to be a part of the IRC. The three subregions each selected five members to be on the committee that they felt would provide beneficial insight into the policy analysis. Each member was contacted personally, by phone or in person, and invited to be a part of the committee.

A policy packet was created by the economics group that documented each of the five policies selected in the survey. The packet outlined each policy and provided documentation to show if or how water conservation policies have been implemented in other areas of the United States. In addition, a proposed method for implementing the policies including implementation costs was included. The policy packet and agenda was sent out to the members of the committee prior to the initial meeting of the IRC.

The IRC committee meeting was the cornerstone in the development of the policies to be analyzed and the implementation

Table 2. Water Conservation Policy Survey Results (Top Five Choices)

Policy	Average Rating[a]
Conversion to dryland, permanent	4.18
Technology adoption	4.19
Biotechnology	4.28
Water use restriction	4.51
Conversion to dryland, temporary	4.53

[a] On a scale of 1–5 (a rating of 6 was applied to choices with no response).

Table 3. Summary of Top Five Survey Results by Region

Region	Conversion to Dryland, Permanent	Technology Adoption	Biotechnology	Water Use Restriction	Conversion to Dryland, Temporary	Total
Kansas	X		X	X	X	4
Texas, North Plains		X	X	X	X	4
Texas, South Plains	X	X	X		X	4
Texas, Other	X	X		X	X	4

"X" indicates policy was selected in the region's top five choices.

parameters that should be used. At the meeting, objectives of the project were explicitly stated. The head of the Ogallala Project presented the overall goals of the initiative. In addition, the goals and objectives of the economic policy analysis project were affirmed to the committee. The economic models to be used in analyzing the policies were also explained to the committee to give them an idea of the capabilities of the models and what the results of the analysis would show. Economists presented each of the five policies to the committee followed by very specific questions regarding concerns with modeling or implementation levels of the policies. Each of these presentations was followed by an open discussion with the stakeholders addressing the questions of concern. The discussion allowed stakeholders to come to an agreement on what values should be used in the policy analysis as well as implementation levels.

The initial meeting with the IRC was a success, as it gave the economics group a better idea on how to develop each of the five policy alternatives so that the estimated impacts of the policies analyzed would be meaningful. In addition, the stakeholders on the IRC are now completely informed of the goals and objectives of the Ogallala project and the policy analysis that the economics group is conducting.

Feedback to the Stakeholders

Feedback to the stakeholders is an important objective and has occurred in each step of the process. The results of the water policy survey were developed into a four-page finished document and distributed to the 150 survey recipients across the region. A thank-you letter and a copy of the original survey accompanied the survey results. Feedback was also provided to the stakeholders following the initial meeting. The policy packet that had once served as an introduction to the stakeholder meeting was revised to include the parameters of the analysis that had been decided by stakeholders. The revised policy packet was not only sent out to the 15 IRC members, but the original 150 survey recipients as well. Feedback and communication will continue with stakeholders as the project progresses. A meeting is planned with the Industry Review Committee to present the results of the analysis and get their feedback. After incorporating feedback from the IRC, the results will be presented to the 150 survey participants through three subregional meetings.

Summary and Conclusions

Great strides have been made thus far through the involvement of stakeholder input into the Ogallala Aquifer Project. First, the survey sent to 150 stakeholders throughout the Southern Ogallala Region identified the water conservation policies that stakeholders wanted to see analyzed with respect to their economic impacts. The response rate was tremendous at 78%, which shows that the stakeholders were interested in the project and its output. The survey was also the first step in opening the communication channel between project leaders and the stakeholders, which created awareness of the policy analysis project and its goals. The next step of stakeholder involvement was a stakeholder meeting in which a

group of 15 stakeholders across the region participated. The Industry Review Committee meeting was successful in the procurement of actual stakeholder values and estimates to be used in the policy analysis.

Feedback to the stakeholders has kept the communication channel open throughout each step. Survey results were distributed back to each survey recipient. In addition, a revised policy packet with the integrated stakeholder input was sent out to not only the IRC, but the original survey recipients as well. Plans for future involvement of stakeholders include a meeting with the Industry Review Committee to present the preliminary results and obtain their input on any needed revisions to the analysis. Following the IRC meeting, three regional meetings are planned to present results to the original survey recipients.

The involvement of stakeholders in all phases of the project process is critical especially when dealing with controversial issues such as water conservation strategies/policies for several reasons. First, it insures that the appropriate conservation strategies are being evaluated and that realistic implementation schedules are being modeled. Second, stakeholder involvement increases the likelihood of public acceptance of project results. Finally, a well-informed stakeholder group is better prepared to develop effective water conservation strategies. However, extensive stakeholder involvement does have its drawbacks, including additional costs and project delays associated with waiting for their feedback.

References

Amosson, S., L. Almas, F. Bretz, D. Gaskins, B. Guerrero, D. Jones, T. Marek, L. New, and N. Simpson. "Water Management Strategies for Reducing Irrigation Demands in Region A." Prepared for Agricultural Sub-Committee, Panhandle Water Planning Group. Texas A&M University Agricultural Research and Extension Center, Amarillo, Texas, 2004.

Burby, R. "Making Plans that Matter: Citizen Involvement and Government Action." *Journal of the American Planning Association* 69,1(Winter 2003):33–49.

Dillman, D.A. "Mail and Telephone Surveys: The Total Design Method." New York: John Wiley & Sons, 1978.

Gregory, R., and R. Keeney. "Creating Policy Alternatives Using Stakeholder Values." *Management Science* 40,8(August 1994):1035–48.

Hanna, K. "The Paradox of Participation and the Hidden Role of Information." *Journal of the American Planning Association* 66,4(Autumn 2000):398–410.

Innes, J. "Information in Communicative Planning." *Journal of the American Planning Association* 64,1(Winter 1998):52–63.

Kaiser, R., and F. Skillern. "Deep Trouble: Options for Managing the Hidden Threat of Aquifer Depletion in Texas." *Texas Tech Law Review* 32(2001):249–304.

Peterson, J.M., T.L. Marsh, and J.R. Williams. "Conserving the Ogallala Aquifer: Efficiency, Equity, and Moral Motives." *Choices* First Quarter (2003):15–8.

Popp, J., G. Rodriquez, E. Gbur, and J. Pennington. "How Attitudes of Important Stakeholder Groups Can Influence Effective Water Quality Management." Selected Paper at the American Agricultural Economics Association 2007 Annual Meeting; Portland, Oregon.

Senate Bill 1. "Regional Water Plan—Panhandle Water Planning Area." Prepared for the Panhandle Water Planning Group through a contract with the Panhandle Regional Planning Commission, Amarillo, Texas. Vol. 1, 2001.

Wheaton, W.L.C. "The Federal Role as an Incentive to Local Development." *Regional Planning: Challenges and Prospects*, M.H. Hufschmidt, ed., pp. 238–59. New York: Frederick A. Praeger, 1969.

Zwingle, E. "Ogallala Aquifer: Wellspring of the High Plains." *National Geographic* (March 1993):80–109.