Regulatory Capture? Arizona's BMP Water Conservation Program

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Introduction

The 1980 Groundwater Management Act (GMA) elevated water conservation issues in Arizona to a predominant position in policy discussions concerning state- and regional-level economic growth (Colby and Jacobs 2007). The GMA established an agency (Arizona Department of Water Resources (ADWR)), four initial Active Management Areas (AMAs) for ground and surface water control, a new water measurement culture throughout the state, and five specified planning periods (1980-1990,1990-2000, 2000-2010, 2010-2020, and 2020-2025). Water conservation in the agricultural sector, necessary to reach the safe yield goal of the GMA in 2025, would be achieved by requiring increased irrigation efficiencies, thereby reducing water allotments for farming operations in the AMAs over time (Anderson, Wilson and Thompson 1999).

As early as the late 1980s, municipalities and farmers were calling for an alternative to the GMA's Base Program that established the initial water use guidelines (i.e. efficiencies, water allotments) for these users. First, the majority of agricultural producers in the AMAs, for a variety of economic, agronomic and program design reasons, were using water at levels far below their allocations under the Base Program and banking the unused portion of their assigned allotment in their flexibility accounts[2]. As a result, by the end of the Second Management Plan growers already had banked over 15 million acre feet in their flex credit accounts (Needham and Wilson 2005). Municipal interests feared land developers would lobby the state legislature to make these banked credits legally transferable to housing developments to meet the state's Assured Water Supply rules that required municipalities and developers to prove they had legal access to a 100-year renewable water supply.

Additional concerns persisted. First, water regulators concluded that the high number of flex credits indicated that the Base Program's water conservation requirements were largely ineffective. Secondly, irrigation district personnel and farm operators were required to provide annual reports for each irrigation grandfathered right (IGFR) under the Base Program[3]. Some farms contained multiple IGFRs, so the agricultural sector was interested in an alternative plan with less intensive reporting. Thirdly, some producers were upset with the historical period of 1975-1980 for the Base Program. These growers felt that to be globally competitive they needed new crop mixes that did not reflect the crops, and their estimated water use, grown during the historical period. In addition, the water allotment defined under the Base Program excluded fallowed land and any growers fallowing land during the historical period believed that they were unfairly penalized by the GMA.

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[2] Flexibility accounts afforded farmers the opportunity to balance water supplies over changing market and climatic conditions. Accounts could be credited when the full allotment was not utilized and debited when more than the allotment was used. Because of the predominance of positive water balances, these accounts generally are referred to as flex credit accounts.

[3] The IGFR is a legal right to pump/use a specific amount of water each year for a specific farm based on the historic water use of cropped acreage between 1975 and 1980.

After intensive and extensive negotiations, both private and public, the Arizona State Legislature amended the GMA in 2002 to include a best management practices (BMP) program as a voluntary alternative to Base Program requirements. The legislation specified that a BMP program must be determined by the Director of ADWR to be at least as water conserving as the Base Program. BMP farmers would be free from the allotment requirements of the Base Program but have to surrender their flex credit balances.

This research explores the hypothesis that agricultural interests negotiated a BMP program that required few, if any, water management changes for growers signing up for the program. We briefly review the pros (e.g., less future litigation) and cons (e.g., regulatory capture) of utilizing regulatory negotiation (reg-neg) in policy formulation. Utilizing a case study research method, we reconstruct the policy-making process that extended over a period of nearly eight years, ultimately producing the BMP program. Finally, an expert panel evaluated the BMP requirements for enrolling in the program in light of water conservation practices being implemented by central Arizona growers prior to the passage of the BMP legislation.

Regulatory Negotiation and Capture

A reg-neg process encourages the design of bargained solutions acceptable to the regulator and the regulatee. Federal agencies utilizing reg-neg procedures are required to follow the guidelines of the Negotiated Rulemaking Act of 1990 while most states follow an ad-hoc reg-neg process based on their adaptation of the federal guidelines to their unique circumstances (Hadden 1995; Harter 2000; Pritzker and Dalton 1995; Ryan 2001)[4]. Advantages of reg-neg procedures include direct representation, reduced commentary on the final rules, higher compliance rates, improved relationships between regulators and regulated parties, better information flows, and greater public support for the rules. Exclusion of some affected parties, high short-term transaction costs, and outcome (i.e., rule) risk represent documented disadvantages (Fiorino 1998; Kazmierczak and Hughes 1997; Langbein 2002; Polkinghorn 2000).

Outcome risk may emerge when state agencies encourage special interests to collaborate in rulemaking and these interests capture the reg-neg process by designing rules that benefit them and not the general public (Stigler 1971). In their synthesis of the regulatory capture literature, Levine and Forrence (1990) argue that slack--discretion or freedom in rulemaking--represents a necessary condition for regulatory capture. Slack generally exists when monitoring the rulemaking process represents significant transaction costs for other stakeholders. Capture, according to these authors, only occurs when the regulator expects to benefit personally by adopting rules that favor the regulatee and would be opposed by the public.

Zinn (2002), rather than defining regulatory capture as binary in nature (e.g., personal reward or not for the regulator) as do Levine and Forrence (1990), argues that the degree of capture falls on a continuum, where personal benefit on the part of the regulator represents an extreme position. Regulators are exposed to a wide range of pressures and incentives that may move them towards the regulatee's position without requiring some form of personal reward. Political pressure for a timely agreement, budgetary concerns associated with negotiation and implementation, shared regulatory norms and interests, agency discretion (i.e., slack), a desired reputation for collaboration, and the lack of competing interest group involvement (i.e., asymmetric participation) are all factors that determine where the rulemaking process will

[4] Negotiated Rulemaking Act of 1990, Pub. L. No. 101-648, 104 Stat. 4969 (codified at 5 U.S.C. §§ 561-570). The Act was permanently reauthorized by the Administrative Dispute Resolution Act of 1996, Pub. L. No. 104-32, § 11.

emerge on the capture continuum. State agencies may benefit, at least organizationally, from capture-like outcomes because they simply want to minimize complaints from special interests and reduce rulemaking costs.

Case Study Design Methods

Case study analysis provides an opportunity to analyze events of a cause and effect nature that are outside the investigator's control, thereby making this research approach valuable for understanding the origin, operations, and impact of reg-neg BMP programs and the possibility of regulatory capture (Eisenhardt 1989; Helper 2000; Kennedy and Luzar 1999; Yin 1994). Our triangulated, mixed method case analysis first relies on background information from regulatory documents, published literature, and interviews with state officials familiar with, but not directly associated with, the rulemaking process (Patton 2002). The second component, BMP working group and Advisory Committee interviews conducted in 2007, provides us with a participant's understanding of the reg-neg BMP design process. Finally, a scoring survey of agricultural experts evaluates the use of BMPs at the farm level prior to program implementation.

Interview questions for BMP working group and Advisory Committee members were developed utilizing a two-stage process. First, a list was constructed of all relevant questions about the negotiation process and BMP design decisions. Then these questions were reviewed and revised following the chronological sequence expected for reg-neg design (i.e., decision to use reg-neg, negotiation, rule implementation). This two-stage process produced an interview protocol of six open-ended questions and a series of in-depth, follow-up questions. The open-ended questions were designed so respondents could provide their observations concerning the negotiation process and decision-making. The follow-up questions were reserved for obtaining further details and pacing the interview. Questions required recall concerning negotiation processes that occurred up to six years prior to the interview. Each respondent received a copy of the questions several days before the interview to allow them time to reflect on past events. Interviewees were informed that their individual views would be kept confidential. Responses for all interviewees were aggregated under each open-ended question and regrouped, when appropriate, into subtopics. Finally a review of emergent themes within the interviews was constructed to capture, into a single narrative, the key components of the reg-neg BMP process.

The expert survey, also conducted in 2007, was utilized as a "second best" approach to a farm-level survey due to reported participation limitations (i.e., "privacy concerns") associated with asking "before and after" type questions. Each agricultural expert worked in the counties impacted by the BMP program and was asked to provide their best estimate of how farm operations would have scored in qualifying for the BMP program prior to the implementation of the new law.

Results and Discussion

Informal Working Group and BMP Committee Interview Results

An informal group (i.e., Pinal AMA working group) of ADWR staff, irrigation district managers and farmers began meeting in the mid-1990s to design a BMP program as an alternative to the Base Program adhering, on an informal basis, to the spirit of reg-neg objectives. The working group utilized USDA documents, conservation programs in other states, and personal expertise to specify the (1) definitions of BMPs and categories, (2) scoring requirements of the program, (3) scores attributed to specific BMPs, (4) scoring worksheets, and (5) land-use permission forms. In December of 1999, under threatened legal pressure from the agricultural community, ADWR postponed adopting the Base Program for the Third Management Plan (2000-2010). The primary concern of the agricultural sector was the stringency of the irrigation efficiency requirements for the Third Management Plan (i.e., 80 percent) compared to the lower

requirements (65-70 percent range) in the preceding plans (ADWR 2001). Avoiding a protracted lawsuit, three letter agreements took place between ADWR and agricultural interests dated December 10, 1999, February 28, 2000, and April 13, 2000. These letter agreements established advisory committees to review the Base Program requirements of the Third Management Plan and to propose alternatives to the plan. A fourth letter of agreement was dated September 18, 2001, consisting of signatures from agricultural representatives, irrigation district representatives, agricultural water associations, and the acting director of ADWR that called for changes in GMA legislation to enact a BMP program, and specified the wording for this new legislation.

The Pinal AMA working group, prior to the formation of the BMP Advisory Committee, developed the majority of the BMP program. Interviews revealed that individuals not involved in the working group viewed the Governor's BMP Advisory Committee as a means to put a seal of approval on the working group's program design. According to interviews, the main goals of BMP committee members were to (1) finalize the program and (2) balance ADWR goals with a program that was flexible and represented reduced reporting requirements for growers and irrigation districts. The regulatory goal, at least on paper, was to identify and implement practices that would conserve water. Several of the working group members were included on the BMP Advisory Committee while other working group participants were regular spectators at committee meetings. Interviews revealed that working group members publicly defended the BMP design process, guided committee discussions, and urged the committee to finalize the program. The BMP Advisory Committee made only minor changes to the program designed by the Pinal AMA working group.

Respondents reported several program shortcomings. First, there was a lack of data for both the Pinal AMA workgroup and the BMP Advisory Committee on the effectiveness of water management practices. Although the point-scoring system suggests that some BMPs are more effective than others, there was limited scientific evidence to support the awarded weight (i.e., points received) for each practice other than "common sense". Secondly, several interviewees mentioned that some of the BMPs could be interpreted differently by regulators and agriculture, or even by different farmers. Even though there were some perceived deficiencies, both the ADWR and farmers reported satisfaction with the results of the design process and the final program.

Expert Panel Results

To enroll in the BMP program, a farming operation must achieve ten points. Farms can receive a maximum of three points toward their total from each of the four categories: Agronomic Management, Water Conveyance Systems, Farm Irrigation Systems, and Irrigation Water Management (Table 1). The BMPs in the Irrigation Water Management and Agronomic Management categories are each given a point value of one, and each of these categories requires a minimum of one point to qualify for enrollment. A different scoring technique is used for the Water Conveyance System and Farm Irrigation System categories. The Water Conveyance Systems category is based on the percent of acreage using a particular BMP. The point score ranges from one point for 50 percent of on-farm acreage using the BMP to three

Table 1: BMPs by Category for Water Conservation

Agronomic Management
Crop rotation (1 point)
Crop residue management (1 point)
Soil and water quality testing (1 point)
Pre-irrigation surface conditioning (1 point)
Transplants (1 point)
Mulching (1 point)
Shaping furrow or bed (1 point)
Planting on bottom of furrow (1 point)

Water Conveyance Systems (points range from 1=50 percent of acreage to 3=100 percent of acreage)
Concrete-Lined Ditch
Pipelines
Drainback System

Farm Irrigation Systems
Slope systems without uniform grades with tailwater reuse (1 point)
Uniform slope systems without tailwater reuse (1 point)
Uniform slope systems with tailwater reuse (2 points)
Uniform slope within an irrigation district that captures/redistributes return flows (2 points)
Modified slope systems (2 points)
High pressure sprinkler systems (2 points)
Near level systems (2.5 points)
Level systems (3 points)
Low pressure sprinkler systems (3 points)
Trickle irrigation systems (3 points)

Irrigation Water Management
Laser touch-up (1 point)
Alternate row irrigation (1 point)
Furrow checks (1 point)
Angled rows/contour farming (1 point)
Surge irrigation (1 point)
Temporary sprinklers (1 point)
Participation in an educational irrigation water management program (1 point)
Participation in a consultant or irrigation district sponsored irrigation scheduling service (1 point)
Participation in an irrigation district program to increase flexibility of water deliveries (1 point)
Measure flow rates to determine the amount of water applied (1 point)
Soil moisture monitoring (1 point)
Computer based model using meteorological data (1 point)

Table 2: Expert scoring summary for water conservation BMPs utilized prior to 2002

		Expert									
	BMP Category	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
80 Percent of Farms	Agronomic Management	5	2	4	4	2	4	2	5	2	4
	Water Conveyance Systems	3	3	3	3	3	3	3	3	3	3
	Farm Irrigation Systems	3	-	3	3	3	2	3	2	3	3
	Irrigation Water Management	6	-	0	6	1	0	0	3	1	1
	Sum/Sector Score	17	5	10	16	9	9	8	13	9	11
90 Percent of Farms	Agronomic Management	3	2	4	4	2	0	0	4	1	4
	Water Conveyance Systems	3	3	3	3	3	3	0	3	3	3
	Farm Irrigation Systems	3	-	3	3	3	2	3	2	3	3
	Irrigation Water Management	3	-	0	2	1	0	0	2	1	1
	Sum/Sector Score	12	5	10	12	9	5	3	11	9	11

points when 100 percent of on-farm acreage uses the BMP. The Farm Irrigation Systems category has a range of point values from one to three, depending on the expected efficiency of the BMP. A minimum of two points must be achieved in this category. The experts were asked to score each category for the agricultural sector prior to program implementation; then a composite sector score was calculated by adding the points earned in each category (Table 2).

Threshold estimates of 80 percent and 90 percent for farms meeting the individual BMP requirements were used in the expert scoring system to test the sensitivity of the experts' perceptions.

Nine of the ten members of the expert panel provided complete answers for the water conservation program. Expert 2 only answered for two categories, and scored three points for Water Conveyance Systems (the 'Concrete Ditches' BMP) and two points to Agronomic Management at both levels of confidence, citing a lack of information about specific BMP implementation at the farm level. At the 80 and 90 percent threshold levels, six of the nine remaining experts estimated that the agricultural sector, prior to the passage of the regulation, met the minimum rule requirements for each of the four categories. The remaining three expert scores show that minimum requirements for three out of the four categories were met at the 80 percent level. The exception in all three cases was the Irrigation Water Management category.

The composite (sum/sector) score indicates that five of the nine experts believe the agricultural sector met the requirements (i.e. 10 total points) of the BMP program without any changes in water management. At the 80 percent level, three additional experts' composite scores are within one point and another expert is within two points of the required ten points for program implementation. At the 90 percent level, experts 3, 5, and 9 have farming operations within two points of meeting program requirements.

Several BMPs received high scores (not shown in Table 2). In the Agronomic Management category, 'Crop Rotation', 'Residue Management', 'Surface Conditioning', and 'Shaping of Bed or Furrow' received consistent points from the panel. For Irrigation Water Management, the 'Laser Touch-Up' and 'Alternate Row Irrigation' also received repeated recognition. However,

some experts identified several common practices that failed to meet the BMP definitions. These include 'Soil Moisture Monitoring', for which farmers generally use a "feel method" (if the soil is moist, no need to irrigate), and 'Flow Rate Measurement', which irrigators generally are skilled at determining through practice, using an "eyeball method". The BMP definitions specify using a measuring device in both cases. ADWR personnel reportedly were willing to accept the "feel method" as acceptable, if the farm was consistent in irrigation practices over time. Thus, the experts may have expected a lower qualification score than the actual score a farm might receive on a program application to ADWR (depending on the farm operator's level of communication with ADWR personnel).

In the Water Conveyance System category the "Concrete Ditch" BMP was identified at 90 percent of farms or higher by all but one expert. In the Farm Irrigation Systems category, most respondents reported a combination of "Near Level Systems" and "Level Systems" at 60 percent or greater (these receive 2.5 and 3 points, respectively). There was much confusion among experts concerning this particular category. Several panel members believed that most fields are engineered so the land can fit into "Level Systems" or "Near Level Systems" and the "Uniform Slope" BMPs in the category. ADWR, however, will not allow any field to apply to more than one BMP in this category. As a result, in several cases ADWR's BMP definitions did not adequately differentiate the BMPs, thereby creating confusion among the experts.

These expert results imply that many, widely recognized water conservation technologies and practices were commonly utilized in the agricultural sector prior to the initiation of the BMP program. Most farming operations qualified outright for the BMP program or would qualify with the adoption of low-cost changes in their agronomic and/or irrigation management practices. The data implies that any incremental water conservation attributable to the BMP program would be insignificant, at best.

Conclusion

The agricultural sector-led BMP program design process insured that many, if not most, farmers qualified for the new program. But does this finding imply that agriculture captured the reg-neg process? The BMP program benefited a small group of influential growers who were unable to respond to changing market forces due to their historical water allotments while the majority of farmers remained largely unconstrained in their future water use due to their accumulation of credits over the first two management plans (1980-2000) and into the third (2000-2010). So on the capture continuum, ADWR utilized its slack to reduce its future regulatory costs (i.e. lawsuits) in exchange for the reg-neg output risk of increased water use on a relatively small number of farms. As a result, Arizona's BMP Water Conservation Program meets Zinn's (2002) criteria for a capture-like outcome but falls far short of Levine and Forrence's (1990) definition requiring personal gain on the part of the regulator.

A Postscript

In 2010, ADWR sponsored an evaluation of the design and implementation of the BMP Water Conservation Program (Bautista and Waller 2010). The authors found that approximately six percent of the eligible irrigated lands were enrolled in the BMP program, with most of those enrollments occurring during the first year of program implementation. Participants reported that lower transaction costs and future water use flexibility were the principle drivers for enrolling in the program. Seventy percent of the participants noted that no adjustments in their water management practices or irrigation systems were necessary to qualify for the BMP program. Any change in water use on their farms had been driven by relative market prices and weather, with the average BMP farm's water use consistently exceeding its base program allotment over the evaluation period.

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