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Evaluating Public Participation in Environmental Policy-Making*

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Based on a comprehensive review on the current research on public participation in environmental policy-making, this paper proposes an important extension to the evaluation model of Germain, Floyd, and Stehman by inclusion of the social learning dimension. The revised framework, this paper shows, is more comprehensive to evaluate public participation in environmental policy-making. The paper applied the proposed evaluative framework in a case study of roundtable discussions in the Department of Environment Protection of Pennsylvania with the conclusion that policy-makers could be informed about the method of evaluating this public participation technique based on the revised framework.

Keywords: public participation, roundtable discussions, evaluation

Public participation in environmental policy-making is adopted extensively by all levels of government in US. This reflects the general tendency of the citizen engagement in the public administration (Cooper, Bryer, & Meek, 2006) and the societal belief that citizens have the right to be informed, conferred with, and permitted to share with decision-making authority on issues that may concern them (Germain, Floyd, & Stehman, 2001). It is observed that:

> One of the most remarkable trends in environmental policy in the United States… over the past few decades has been the growth in more inclusive, participatory efforts to involve multiple stakeholders in decisions… At all levels of government, citizens and government officials are experimenting with collaborative endeavors. (Koontz, 2005, p. 459)

As a result of this trend, there has been an extensive proliferation of provisions and mandates for public participation throughout all levels of government (Desai, 1989) and an increased understanding of the different types of public participation available to best incorporate the public in environmental policy-making and management. However, despite of the importance and wide adoption of various public participation types, researchers paid less attention to how these public participation types could be evaluated by policy-makers. A comprehensive evaluation framework on the public participation is critically needed for practitioners and administrators in the environmental policy domain. This paper will examine the current research on public participation in environmental policy-making and propose specifically how the model of Germain et al. (2001) could be extended by the inclusion of a social learning dimension to provide a useful tool for policy-makers to

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evaluate public participation. The roundtable, one important type of public participation that has been used extensively by environmental policymakers, will be used as an example to demonstrate how policy-makers could use the extended framework to evaluate public participation.

The paper is organized as follows. In the next section, we will analyze how different types, benefits and criticisms of public participation in environmental policymaking provoke a critical need for an evaluation framework for policy-makers. Then, various models explaining public participation in environmental policy- and decision-making are reviewed with highlights on how the model of Germain et al. (2001) could be adapted for environmental policy-makers to evaluate public participation by an addition of the social learning dimension. The paper then uses a case study of the roundtable discussions in the Department of Environment Protection of Pennsylvania to provide an example of how environmental policy-makers could evaluate this type of public participation by applying the revised framework.

Controversies Provoke the Need for an Evaluation Framework for Policy-Makers

Public participation can be defined as "forums for exchange that are organized for the purpose of facilitating communication among government, citizens, stakeholders and interest groups, and businesses regarding a specific decision or problem" (Wittmer, Rauschmayer, & Klauer, 2006, p. 2), so that the process and outcomes of the decision are "democratic, open, legitimate, technically competent and timely" (Steelman & Ascher, 1997, p. 72). The importance of public participation in the environmental policy process for government agencies is consistently assumed by researchers (Ananda & Herath, 2003; Desai, 1989; Green, 1997; Rauschmayer & Risse, 2005; Raymond, 2002). This assumption, however, is not unchallenged. Controversies could be observed by the fact that many authors have argued for it, citing many diverse benefits, and many also critically examined its faults and weaknesses (Innes & Booher, 2004; Day, 1997).

The benefits of public participation in environmental policy-making are generally classified as substantive, normative, and instrumental (Moynihan, 2003; Stirling, 2004, 2006; Rauschmayer & Risse, 2005; Dietz & Stern, 2008; Blackstock, Kelly, & Horsey, 2007). Substantive reasoning is based on the observation by encouraging multiple perspectives, understanding of the issue improves, which further leads to better solutions. Normative reasoning states that by encouraging learning, both social and individual, public participation enriches both the individual and the society. Instrumental reasoning explains that collaborative relationships assist program implementation, diffuse conflict, increase transparency, and increase buy-in and social trust.

Specifically, substantive benefits for public participation in environmental policy-making include the possibility of a better product through the incorporation of varied interests and local knowledge (Singleton, 2002; Wittmer et al., 2006); the generation of new ideas or the refinement of existing ideas (Ananda & Herath, 2003; Blackstock et al., 2007); and the possibility to help modify laws and regulations through public feedbacks (Desai, 1989). For example, natural resource management often deals with ecological and societal complexities that frequently involve contending positions; thus, decision-makers must take into account scientific and local knowledge, uncertainty and ignorance, the paucity of a decision among society, the quality of stakeholder participation, and the transparency of the process (Wittmer et al., 2006). Public participation allows a "rational, open-minded debate leading to collective decision-making" (Pattern, 2001, p. 221), which creates solutions that integrates all interests (Singleton, 2002; Steelman, 1997). Desai (1989, p. 63) also noted that "some evidence suggests that anticipation of citizen participation influences the regulatory agency staff's decisions regarding permits", because they were more accountable to the public than that they would have been

without citizen involvement mechanisms.

Although the substantive benefits for public participation are most tangible, researchers are paying special attention to the instrumental benefits, which include increased transparency, increased support and buy-in, enhanced credibility of agency, and increased social trust. Transparency is the ease with which the public can view the decision-making process (Bickerstaff, Tolley, & Walker, 2002). Wittmer et al. (2006) explained that the best way to achieve transparency was to include stakeholders and/or the general public in decision-making and was even better when non-participant input were structured into the process. Rauschmayer and Risse (2005) argued that the public participation was clearly conveyed to be democratic through a transparent process which would lead to higher compliance since citizens accepted the outcomes as a product of the democratic values (Ananda & Herath, 2003; Rauschmayer & Risse, 2005). Citizens' buy-in as a result of transparency reduces the regulation costs for implementation and enforcement, enhances credibility of environmental agency, and increases social trust (Rauschmayer & Risse, 2005; Ananda & Herath, 2003; Singleton, 2002).

Compared to the other two kinds of benefits, the normative benefits are not as tangible as the substantive benefits, not as widely emphasized as the instrumental benefits. However, the normative benefits suggest very important aspects of public participation: increasing understanding among the public, and fostering social learning between stakeholders. Social learning is "the process by which changes in the social condition occur—particularly changes in popular awareness and changes in how individuals see their private interests linked with shared interests of their fellow citizens" (Webler, Kastenholz, & Renn, 1995, p. 445). It is significant for environmental policy-making because social learning results in higher level of understanding at a social level, which increases the connection among citizens, increases buy-in, and produces a society capable to confront their problems. Also, the establishment of a deliberative public participation process will allow an individual's public self to mature, resulting in broader and more inclusive policies that reflect more fully the common interests (Singleton, 2002).

Though the benefits of public participation in environmental policy-making are obvious, the process is never perfect. Public participation have been identified with many weaknesses, such as ineffective costs and time consuming without tangible benefits, a disproportional focus on local interests, an increase in public dissatisfaction, and a lack of a common framework to incorporate public and technical inputs. These issues are often developed when a difference is between theory and reality surfaces, to a degree that it can be argued that local collaborative policy-making can create problems instead of solving them.

For example, some researchers pointed out that public participation in environmental policy-making focused too much deference to local interests at the expense of regional and national interests merely because legitimate national stakeholders were excluded from the participation meetings. Singleton (2002) provided an example of this weakness in natural resources management. A dam is proposed to be built to increase the power, employment and recreational opportunities of a town. The effects of a dam can extend to the water flow of downstream inhabitants and can virtually destroy a fishing industry. The health of a major industry is of national concern, but national stakeholders have little say in the decision to build that dam. "While the process is local, many of the sources of the problems it seeks to address and the constituencies it must respond to are not" (Singleton, 2002, p. 70). Further, this disproportional focus on local interests usually intended to reduce social conflict instead of solving a problem. Public participation is meant to include a mix of citizens, stakeholders, and viewpoints with impassioned and contradictory statements. With such varied voices, there is a tendency to "shift definition of success from… improvement of environmental conditions to… reduced social

conflict" (Singleton, 2002, p. 55). The potential to move public participation from a problem-solving process that tangibly benefits the community to a process of reconciliation of conflicts between participants is dangerous. It attempts to placate participants just enough so they will stay controlled instead of addressing the problem. Such a shift in the definition of success can shift decision-makers and citizens alike away from solving the root problem, and focus only on the symptoms, by putting patches on symptoms while waiting for the root problem to return even worse in the future.

Another significant complaint about public participation in environmental policy-making is that it is cost ineffective and very time consuming. A lot of time and effort are spent to solicit input from the public but very few inputs are valuable to be translated into policy (Aronson, 1993; Wittmer et al., 2006). Policy-makers criticize that the public is often not aware of the technical, ecological, and social complexities of the issue. And the suggestions or complaints from citizens have already been analyzed by public administrators and technical experts. Irvin and Stansbury (2004) proposed a cost/benefit analysis to determine the appropriate amount of resources to put into the citizen participation. Based on this cost/benefit perspective, Koontz (2005) identified three key factors influencing local officials' use of public participation in their decision-making: the importance of professional advice, an aspiration to avoid conflict or harm, and the differing facets of a local context. The anticipation for harm or conflict directly affects the level and type of public participation. If there is no fear of conflict, fewer resources and less time are put into public participation. If the fear of conflict is greater, more time and resources will be spent on public participation.

Some authors also noted that public participation can actually increase public dissatisfaction, rather than decrease it (Ananda & Herath, 2003; Haight & Ginger, 2000). This can happen in a number of situations. For example, a poorly managed public participation forum could increase dissatisfaction because citizens did not feel that they had a fair say, if there was no public forum opportunity with the disputed issue. Haight and Ginger (2000) found that there was a negative impact on trust because some citizens perceived that their interests were not represented fully and fairly in the decision-making. It gives the public a forum to voice their concerns, but often the concerns are not adequately addressed in action (Aronson, 1993; Bickerstaff et al., 2002).

Finally, there is often a lack of specificity to incorporate public input properly (Aronson, 1993; Steelman & Ascher, 1997), and a lack of a common methodological framework (Wittmer et al., 2006) to do so. The Monongehela National Forest planning process (Steelman & Ascher, 1997) is the trademark example to illustrate the problems caused by the vague measurement guidance with non-binding direct public involvement. In the beginning of the planning process, few people were aware of this program and thus there was little participation, a common criticism of bureaucrats. When the draft was released, there was a public outcry about the levels of clear-cutting and road-building. Thousands of letters and calls, often representing environmental, hunting, fishing, and recreational interests came into the Forest Service. This correspondence was largely simple and non-technical; however, the volume of correspondence was overwhelming. The timber industry also sent their input, which was fewer in number, but represented significantly more technical data. Without a specified framework to process this input, the Forest Service had significant challenges to incorporate the data properly and was unable to properly satisfy the public. The general public opinions were received just as much attention as technical information. However, it was noted reflectively that the technical information was significantly more valuable than the emotionally-charged public opinions because it contained a more holistic and detailed understanding of the issue, thus should produce better solutions than that from general public

(Aronson, 1993). Therefore, it is often believed that the biggest disadvantage to public participation is how agencies and policymakers could fairly and effectively incorporate the public input and balance it with technical information.

Clearly, public participation is more complex than a simple addition of public opinion in the decision-making process used by government agencies. On the contrary, it is a messy practice with diverse levels, types, techniques, and pros and cons. The public participation programs designed by government agencies do not necessarily empower citizens, do not necessarily generate most appropriate solutions, and do not necessarily promote satisfaction and compliance. Policy-makers are often at loss on how to evaluate public participation programs and how to utilize to their greatest potential in policy-making. This situation calls for more research on how the public participation programs could inform policy-making, and how policy-makers should evaluate the public participation programs. Next, we will propose a theoretical framework for the evaluation of public participation programs from the policy-makers' perspective that can incorporate the complexity of the situations into its scope.

A Proposed Evaluation Framework

In recent years, researchers on environmental policy-making have made meaningful attempts to examine the complexity of the public participation from various perspectives with different policy contexts (Bickerstaff et al., 2002; Smith & McDonough, 2001; Rauschmayer & Risse, 2005; Steelman & Ascher, 1997; Blackstock et al., 2007). For example, Bickerstaff et al. (2002) focused on four key principles of public participation in the process of local transport planning (inclusivity, transparency, interactivity and continuity). Smith and McDonough (2001) paid particular attention to the question of what criteria citizens used when judging the fairness of a natural resource agency decision by asking citizens to describe their experiences with and attitudes toward different types of public participation. Rauschmayer and Risse (2005) and Steelman and Ascher (1997) described several participatory approaches and developed criteria for choosing suitable approaches of public participation. These work laid a solid foundation for the possibility of developing a framework that policy-makers could use to evaluate public participation. One of such attempts was made by Germain, Floyd, and Stehman in 2001 when they identified and categorized major variables for the evaluation of the public participation in environmental policy-making.

By conducting a survey designed to evaluate citizens' satisfaction levels with public participation within the USDA (United States Department of Agriculture) Forest Service management programs, Germain et al. (2001) provided a structured model composed of equity, effectiveness and efficiency factors in policy-making processes and outcomes. In the model, process is defined as the progression that is taken to reach a conclusion, and is evaluated along with equity, effectiveness and efficiency. Process equity was evaluated by scoring the concepts of fairness, access, and perception of bias. Process effectiveness was evaluated by the opportunity for public participation, ample opportunity for input, and the process design. Process efficiency was assessed by evaluating the time efficiency, financial value of the citizen participation, and resources expenditure. In parallel, outcome is defined as the end result of the process, and is evaluated along with the same dimensions of equity, effectiveness, and efficiency. Outcome equity was scored by decision fairness, level of bias to one point of view, and the perception of justness. Outcome effectiveness was assessed by influence, extent of negotiation, environmental soundness, and the quality of how well the public interest was served. Outcome efficiency was assessed by how well the implementation was financially sounded, efficient, timely, and technically feasible.

Though the model of Germain et al. undoubtedly captured the major factors in evaluating public participation in environmental policy-making and categorized these factors in a systematic way, they have missed a critically important factor—social learning, with which a more comprehensive framework could be constructed. Pointed by both scholars and practitioners, public participation has the normative benefits that stakeholders are able to exchange rationales, perspectives, and assumptions for or against pursuing policies. As such, argued by Beierle (1999), the key elements of a successful approach to environmental decision-making was the capacity to facilitate and engage in social learning in an ecological context. Environmental policy-making is complex, technical, and at times difficult to grasp, yet it affects the lives of ordinary citizens in a substantive way. Finding and implementing sound solutions to environmental problems may require continuing and broadened participation beyond the usual experts (Coenen, 2009). This requires a continuous knowledge flow between the public, experts, and policy-makers, which is important to a well-functioning environmental regulatory system.

Social learning could happen in multiple directions. On the one hand, knowledge could be added by the public to the decision process (Coenen, 2009). The administrators, because of their regular contact with citizens who might otherwise not be engaged in the policy process, learn which policies are likely to be unpopular and how to avoid such policy failures (Irvin & Stansbury, 2004). On the other hand, knowledge could be flowed from experts and policy-makers to the public to allow the public to carry out the role of identifying violations, applying community pressure, enforcing laws, and contributing to decision-making (Beierle, 1999). Moreover, citizens learn from each other and gain a better understanding of environmental problems. Renn, Webler, and Wiedemann (1995) stressed the educational process that took place with public participation. People learn that they have things in common; and by banding together, they can achieve their goals and meet their needs. They also discover that other groups and individuals have interests and needs strongly different from their own. This knowledge flow is exactly what we call social learning, in which learning extends beyond science and technical issues to the decision-making process itself, allowing decision participants and all stakeholders to understand the tradeoffs involved in various policy processes and outcomes (see Table 1).

Table 1

Proposed Public Participation Evaluation Model

	Process	Outcome
Equity	Fairness Accessible Perception of an unbiased agency	Decision fair to me Not biased toward one viewpoint Seems just to me
Effectiveness	Sufficient opportunity for participation Ample opportunity for input Process skillfully designed	My comments/input influenced final outcome Public interest well served by the decision Final decision considered negative consequences Environmentally sound
Efficiency	Efficient use of time and money Resources well spent Not long or drawn out	Implementation financially sound Efficiently implemented Timely implementation Technically feasible
Social learning	Facilitating convergence Develop group solidarity	Learning Changing behavior Changing perspectives Capacity building

Note. Source: Based on the model of Germain et al. (2001) with an addition of social learning.

Social learning is undoubtedly an important facet to a comprehensive evaluation framework because

factors of process and outcome occurring outside the implementation of the public policy or management decision have been argued to be just as important as the inclusion and integration of citizens into the policy or management decision. Haight and Ginger (2000, p. 754) found that “process design and the role of science and social values in decision-making were identified as important factors related to trust and understanding in the relationship within and between groups of participants”. Thus, social learning inherently implies social interactions and promotes individual learning on social issues. “When citizens become involved in working out a mutually acceptable solution to a project or problem that affects their community and their personal lives, they mature into responsible democratic citizens and reaffirm democracy” (Webler et al., 1995, p. 444).

From a process viewpoint, social learning brings convergence and understanding between different stakeholders when relevant parties could “walk in each other’s shoes” and develop group solidarity. It forces relevant groups to work together and to break down barriers between them. From an outcome perspective, social learning brings behavior and attitude changes when relevant parties develop a sense of responsibility to others, develop moral reasoning and problem-solving skills to solve conflicts, integrate cognitive knowledge into one’s opinion, and learn how to cooperate to solve collective problems. It ensures the decision continuity so that lessons learned could be clearly carried over to concurrent and future operations.

Public participation exhibits many indications of social learning. When a community of people come together, with diverse, but also common interests, and seek to reach a collective agreement, social learning has the characteristics:

> By which changes in the social condition occur-particularly changes in popular awareness and changes in how individuals see their private interests linked with the shared interests of their fellow citizens. This is a product of individuals learning how to solve their shared problems in a manner that is responsible to both, factual correctness and normative consent (meaning legal and social responsibilities). (Webler et al., 1995, p. 446)

Not only do citizens involved in public participation gain technical knowledge about the issue being discussed, but they also learn about collective values and preferences, and the impressions and feelings of other participants in the decision-making process. Knowledge is enhanced through social learning when decision stakeholders learn about the state of the problem, about the possible solutions and the accompanying consequences, about other peoples’ and groups’ interests and values, about one’s own interests (reflection), and about methods and strategies of communicating well.

Overall, literature widely suggests that social learning is a critical component to the public participation in the environmental decision-making process, as well as to other policy-making at the federal, state, and local level. It is clear that public participation could bring about these social learning effects that occur outside the specific implementation of the public policy or management decision, thus, this paper argues that social learning is a significant factor in public participation, and warrants inclusion to the evaluative framework that measures the quality and impact of public participation on decision and policy-making. Based on this analysis, a revised framework (see Table 1) could be proposed as a more comprehensive evaluative model that environmental policy-makers could use to evaluate public participation. In the next section, we will use roundtable discussions, a major type of public participation, to illustrate how policy-makers could use the proposed framework to evaluate and assess quality and impact of this public policy decision-making technique.

Proposed Framework Applied—A Case Study on Roundtables

Roundtable discussions are an important type of public participation that involves discussions between

citizens and public officials about a government action or program. Because of the relative easiness of organizing roundtables, this form is widely adopted by government agencies to collect opinions and feedbacks related to policy- and decision-making. Haight and Ginger (2000) found a correlation between roundtables and an increase in trust between citizens and a governmental body, e.g., the Vermont FRAC (Forest Resources Advisory Council). They found that "popular views, as reflected in the press, indicate that some people connected the roundtable approach with the production of good policy outcomes" (Haight & Ginger, 2000, p. 755). Similarly, Rauschmayer, and Risse (2005) found that cooperative discourse (of which roundtable discussions were a part of) was the most complete of citizen participation because it communicated information to the most varied group of people, systematically worked with uncertainty, had very high inclusion rate of varied interests, and high convergence of ideas.

An unresolved argument presented in the literature is that there are few, if any, studies that evaluate one-time public participation roundtables. Policy-makers are at loss of how they could make judgment on the quality and effects of roundtables. They often raise questions to researchers such as: How useful is the roundtable in the process and outcome of the formulating environmental policies? How could policy-makers be informed about the method of evaluating this public participation technique? To better answer these questions on the role of roundtables in the environmental policy-making, we propose that policy-makers could use the revised framework (see Table 1) as a more comprehensive evaluative model to evaluate this form of public participation. We use a case study as an example on how a government agency, the Pennsylvania Bureau of Abandoned Mine Reclamation (BAMR) under the Pennsylvania Department of Environmental Protection (PA DEP), could use the proposed framework to analyze roundtables for the proposed policy formation concerning Title IV of the Surface Mining Control and Reclamation Act (SMCRA) within the Commonwealth of Pennsylvania, some estimated the costs to be as high as $15 billion.

"The purpose of this [Pennsylvania Abandoned Mine Reclamation] Plan [was] to establish a frame-work for organizing [watershed] reclamation efforts, for coordinating among those involved in reclamation activities, for prioritizing expenditures and for decision-making" (PA DEP, 2008a). Because the BAMR only had $1.4 billion in 2007 to address abandoned mine problems (PA DEP, 2008c), they needed to prioritize the neediest areas, the best management plans for those areas, and maximize both public input and local leadership. Under the guidance, the Bureau sought citizen input for their latest and largest recent project, the Pennsylvania Abandoned Mine Reclamation Plan. The BAMR organized 10 roundtable discussions throughout the Commonwealth to gain insight from geographically diverse viewpoints. Facilitated by Citizen's Advisory Counsel, a counsel within the PA DEP whose primary mission was to lead public participation events, these roundtables sought input from local citizens on four primary issues within the plan:

(1) What should funds be spent on (land reclamation, water supplies, abandoned mine drainage)?

(2) How much funding should be set aside for acid mine drainage, and how should it be used?

(3) How can [the department] maximize our efforts?

(4) Are there any related issues that need to be considered (unintended consequences of other programs, future land use, and economic benefits)?

The topic for these roundtable meetings was the re-authorization of the Federal Surface Mining Control and Reclamation Act, which provided a significant increase in funds available to the Commonwealth for abandoned mine reclamation and also offered the Commonwealth the opportunity to set aside up to 30% of these funds for abatement and treatment of abandoned mine drainage. The intent of the roundtable meetings

was to enable the public to provide input to assist in the decision-making process for the expenditure of the re-authorization funds. Regarding the decision to set aside funds for mine drainage abatement and treatment, the appropriate level of funds must be weighed against the need to restore sites that impact the health and safety of the Commonwealth's citizens. Participants were educated about the policy prior to the discussion and then all were allowed to offer preferences and share their concerns. Instead of presenting only oral testimony, this discussion format allowed all participants to provide initial comments then react to other comments as more ideas were presented (PA DEP, 2008b). Written comments were also accepted by the Bureau and follow-up information and the response documents were posted on the department website.

According to the testimonies, these roundtable meetings seemed successful (PA DEP 2008c). However, this judgment on the success is not based on a structured analysis on how the policy-makers and governmental officials evaluate these roundtable discussions. To address this missing link, we conducted semi-structured interviews based on the "echo" method of Bavelas (1942) to investigate how the roundtables were evaluated by governmental officials and policy-makers. This method is designed to examine the interactions in social networks significant to an interviewee's job situation and has been used for analyzing various organizational situations (Barthol & Bridge, 1968; Barthol & De Mille, 1969; Duimering et al., 1998; Safayeni et al., 1992). Using "echo" method, each interview begins by asking the interviewee to describe his/her work situation in general terms and to identify other individuals or groups in the organization with whom she/he interacts when performing certain jobs. As a result, a diagram in the shape of a star is formed with the interviewee in the middle surrounded by other nodes representing individuals or groups comprising the interviewee's immediate task-related social network. "Echo questions" are then used to examine these task-related interactions between the interviewee and each of the identified nodes. The interviewee is asked to provide concrete examples of behaviors performed by other nodes that are helpful when they perform the task, and examples of behaviors that are not helpful. By asking for specific examples of positive and negative behaviors, interviewees are encouraged to provide descriptive information about actual events or situations experienced on the job rather than ungrounded opinions or stereotypical descriptions about the behavior of others.

Eight interviews are conducted on public officials who are willing to openly address how effectively public participation influences their management decisions. The interviewees (denoted as I1, I2, I3 … I8) represent a cross section of four major government functions involved with the roundtables: the Citizens Advisory Council, the Mining and Reclamation Advisory Board, the PA DEP Policy Analysts, and the BAMR Leadership. The interviews were conducted ranging from one to two hours in length and were audio-taped and transcribed for further analysis. The coding of interview responses was done through an iterative process of coding, reflection, and recoding using the proposed framework in Table 1. The unit of analysis was the individual example of a helpful or unhelpful behavior. Comments describing specific examples of behaviors were categorized based on the similarity of the behaviors described. From these behavior categories, various issues on the quality and impact of the roundtable discussions in influencing the actual decision-making were analyzed.

Consistent with empirical findings of Germain et al. (2001), we found ample evidence to support the dimensions of equity, effectiveness, and efficiency in the framework, comprising 16.7%, 23.2%, and 17.9% of the total comments made by interviewees. More interestingly, we also found a very strong signal of the social learning dimension, comprising 18.2% of the total comments, suggesting a consensus of the significance of the social learning effects for roundtable discussions (see Table 2).

Table 2
The Distribution of the Categorized Comments

	Process	Outcome	Total
Equity	24 (7%)	33 (9.7%)	57 (16.7%)
Effectiveness	38 (11.1%)	41 (12%)	79 (23.2%)
Efficiency	29 (8.5%)	32 (9.4%)	61 (17.9%)
Social learning	35 (10.3%)	27 (7.9%)	62 (18.2%)
Others	82 (24%)		82 (24%)
Total			341 (100%)

Equity

The first dimension in the revised evaluation framework is "equity" exemplified by key concepts such as fairness, accessibility and perception of an unbiased or neutral agency. The categorized comments from interviews show a very strong perceived support for these indicators of the equity. For example, in terms of fairness, the roundtable discussions and moderators promoted equity in the meetings by making a point of hearing from everybody that wanted to speak: "We did not cut anybody off, whether [they were] being critical or not… we let them have their say…" (I4); "It was very fair because we just asked for their input, they could speak as long as they wanted… and say anything that they wanted" (I2). In providing the responses to the questions posted by the public, one interviewee remarked that: "we answered on what we thought the facts were and what the response should be… we didn't try to make it political at all or make up an answer that they wanted to hear" (I7). In terms of accessibility, interviewees commented that at some of the roundtables there were individuals in senior positions available to the public including the Deputy of Mineral Resources and the Director of the Bureau of Abandoned Mine Reclamation. They will emphasize in some cases that: "if that's your recommendation, make it as a recommendation. Don't ask if it's possible; tell us that you want to look into making it possible" (I5).

Interviews revealed that the roundtable discussions were well-attended. Notice of the meetings were advertised in the local newspapers and sent to watershed groups in the area. The discussion moderators would also let the public speak on other topics rather than the four target issues, as commented: "they [the public] didn't just stick to the question we were going to talk about at the time, they just brought up anything and we tried to fit it in" (I3) to the discussion. One interviewee was "amazed at how much input we did get from the first 10 sessions… a lot of people were involved with it" (I2). In terms of the perception of neutrality (not biased, seems just), the PA DEP and the BAMR attempted to maintain independence and neutrality in dividing the appointments between partisan political representatives. There were 18 appointed members, six from the House of Representatives, six from the Senate, six from the Governor's Office, and no more than half of any one appointing authority's members could be from one political party. The Governor's Office had six appointments; only three at the most could be either a Democrat or Republican. This composition increases the perceived neutrality to the relevant stakeholders. One of trained facilitators according to one interviewee remarked that "these roundtables are quite neutral, we did not have an interest necessarily in the subject, or at least we didn't have a position on the subject… we felt we did that well" (I1).

Effectiveness

The second dimension in the revised framework is "effectiveness" exemplified by key concepts such as opportunity for participation, input influencing final outcome, public interest well-served, and the skillfully

designed process. Similar to equity, the categorized comments from interviews show a very strong support for the indicators of the effectiveness. For example, in terms of the opportunity for participation, all interviewees emphasized the Bureau's effort to facilitate roundtable meetings.

> The purpose [of the meeting] being to hear from people that are interested in the issue out in various parts of the state, as to what they thought would be the best way to administer the program as we get this jump in federal funding… it was my impression they went out with a clear intent to hear from people… as to how to go about doing it [spending the funds]. (I4)

One interviewee also discussed that it was "my understanding that we [Pennsylvania] are actually the only ones going out and trying to find what all our partners think we should do" (I6). The impetus for the roundtables came from the Secretary of the Department, who "wanted to have the roundtables and find out what the public input was" (I8). The interviewee recognized that the purpose of the meetings were to hear from the public even though "they're [the public was] probably mostly all biased to their own viewpoints" (I2).

As for the ample opportunity for inputs that influence final outcome, the Bureau has attempted to be open to all of the public and provide ample opportunity for their responses and input on the issues constructed during the roundtable discussions. The meetings were held in 10 different locations geographically dispersed around the Commonwealth and the public comments were facilitated through three channels: at the roundtable meetings, through written correspondence to the Department, and by responding to the posted notes and transcripts on the Department website. The Department recognized early that the involvement of the public was necessary because the Department staff "cannot fix the environmental problems themselves and they rely on outside stakeholders" (I1). Stakeholders' inputs through these channels were treated seriously by the Department.

> We also had staff who recorded the primary discussion topics or the primary comments that were received at the meetings… internally we had one person who went through all the transcripts, went through all the written and verbal comments that were made and assembled them into a listing of comments and tried to group them you know with similar comments together. (I3)

Rather than simply answering questions with a "yes or no", the group tried to embellish it and provide an excerpt of the act to assist and educate the inquirers the reason why a question was answered in a certain way. One interviewee commented that they tried to:

> Say yes this is something we are already doing, or something that we will try to do, or something that we have done or can't do and explain what the results were that led us to say why we can't or why we tried it and it didn't work. (I6)

In a similar response, an interviewee said:

> We split up the comments to who we thought could take the first best stab at drafting a response, and then we had a group of at least half a dozen individuals who got together with the Bureau Director and read over that first pass response and modified it and talked and maybe brainstormed about some other angles and came up came up with our recommendation. (I5)

Efficiency

The third dimension in the revised framework is "efficiency" exemplified by key concepts such as efficient use of time and money, resources well-spent and that the policy outcomes of the roundtables were not long or drawn out. Interestingly, different from the previous two dimensions, many of the comments in efficiency dimension are quite negatively connoted, an indication of the weak support of the efficiency. For

example, even though all interviewees agreed that the roundtable meetings were quite helpful and not a waste of time and money, a few indicated the concern of the public on the efficient use of resources. “One of the comments they [the public] had about the costs,” one interviewee said,

> Can’t you do something to lower your cost of organizing these meetings so there is more money for your projects? So our answer would be, you know, this is what it costs and [there would be] 3 or 4 pages typed explaining what goes into the costs [and] not just the admin costs but the crucial design and conducting these meetings… and we actually gave the costs and the breakdown for all those areas, things like that… (I2)

Clearly, the full impact and question of whether the resources were spend efficiently has yet to be seen because the process was not yet completed, as one interviewee suggested, “I think there’s benefits of [the roundtables], the full benefits remain to be seen until we finish up the discussions…” (I7). In answering a following up question “Is doing the roundtables a good use of time versus actually doing the work?”, one interviewee explained that “we’re primarily engineers and geologists and biologists and I think we would prefer to do the work and get another site reclaimed than take the time to build a website…” (I8), but also acknowledged that there needed to be a balance of doing the work and receiving public input as well as educating individuals on the issues.

In terms of examining whether the implementation of the reclamation process was timely, it was clear that the interviewees did not have the hindsight to provide an accurate response. In one reply, an interviewee acknowledged that the process could be lengthy.

> Most of them [the public] want 30% set aside which, you know, we’re all for, but in the beginning years there’s not much money… it takes a few years to get up to what the money should be… But, you know, the first couple years it’s not going to be easy… it doesn’t include the admin [administrative costs]… it’s that the resources aren’t there. (I2)

Moreover, the outcome of the policies will be long and less visible.

> You can’t actually say, here’s the environmental outcome that you could if you put money into a capital project, you can’t say it cleaned up that stream, but if you got a better process for cleaning up all the streams, then it’s a good use of money… the idea is to end up with a better process, and frankly get some buy in… you know, if you come up with a process that a bunch of people had a say in, they’re going to help you implement it because they’re happy with where you’re headed. So, I don’t know how measurable the benefit is… like environmental education is… how do you measure the environmental outcome of that? (I1)

We also sense a hesitance of using roundtables as an efficient tool in policy-making. For example, one interviewee described:

> Of the comments some recommended that groups be convened… to talk about what projects we do and what projects we don’t do, but while that may get more public participation, it also slows down the entire process… and gives us more administrative and overhead costs to get that implementation done… so I think our preference is to define the goals and standards that we’re going to operate under and then get the rest of the distractions out of the way and go about operating as efficiently as we can under those guidance that we came up with. (I5)

These comments provide a useful indicator on whether roundtables in the Department efficiently use time, money and other resources from different perspectives, and whether the policy outcomes of the roundtables are long or drawn out.

Social Learning

The last dimension in the revised framework is “social learning” exemplified by key concepts such as

facilitating convergence, changing behavior or perceptions, and developing group solidarity. This dimension was strongly supported by the categorized comments from interviews that all reflected and observed the strong social interactions and individual learning on social issues. Roundtables promote citizens' involvement in conceptualizing and contributing a mutually acceptable solution to issues related to their community and their personal lives. Learning happened in two ways: on the one hand, citizens were educated on the problems and the background of law at the beginning of the roundtables, which "gave everybody a common ground for their comments, a better understanding; the reauthorized law, it's fairly complicated in terms of what you can and can't do" (I1). Putting the public on an equal footing by educating them early in the sessions provided the citizens with the necessary background to ask informed questions about the issues. Even further, "sometimes you do find that somebody's concerns are based on misunderstanding or that there are ways to address those things that satisfy them" (I7) and other individuals "just assume that it can't be fixed, and they are going to live with the orange water. So when you go out there and you start talking and saying 'here's what we can do' … it's eye opening to them" (I2).

On the other hand, learning also happened on the part of the department: "I think it made us take a harder look at all of our policies and actions and why we were doing or are doing what we're doing…" (I3). Roundtables could also change citizen's perception and perspectives. As explained by two interviewees, "it's important to get people together, because you might find that a group that's opposed to something isn't opposed for the reason you think, and their opposition might be something you can address" (I6). "From the comments, we see definite areas where the perception has a disconnect…" (I4). Learning and changing perceptions will result in a development of the group solidarity and capacity building. "The interaction, the informal interaction, can be beneficial as well. You know, you give a local person a chance to talk to maybe a bureau director in the department about something that they might not have talked about otherwise" (I5).

Building capacity and solidarity comes from the intense interaction between different stakeholders.

> I think one of the big things about roundtables is that it makes people interact. If you just put something on the internet, we haven't gotten any comments from that… But, if you really want people to interact, the only way they are going to do it is if they are in public [forum]. (I8)

This intense interaction strengthens communications, thus promoting social learning.

> I think that there's been a lot of follow-up and other avenues of communication that the roundtables have opened and I think they'll stay open as a result of that… so I think we'll have better communication with outside groups and individuals than we did before and I think that's a good thing that came out of it, so I definitely think it put us in a better position… (I3)

From the perspectives of the interviewees, holding the roundtable meetings and interacting with the public assisted the department in building capacity and relationships between themselves, stakeholders and the public, for the department to be better situated to carry out further activities and programs.

Barriers and Challenges

The interviews also signal some important barriers and challenges in the roundtable discussions (24% of the total comments) evaluated by policy-makers and government officials, resonating the weaknesses of public participation discussed in the first section of the paper. These challenges come from a few sources, for example, how to deal with and utilize the large amount of public comments that are in direct contradiction with the Department's current policy or practice.

> A lot of people were recommending something that the department just went in a different direction… and it's still an issue… there is no perfect way to do any of this, but at least you hear from people and you know where your opposition is going to come from and why. (I1)

Some interviewees acknowledged that there was a negative perception of government that affected their efforts of reaching out to people through roundtables.

> One of the things is that they are kind of frustrated with government in general… there's no way for them to say anything to the people who actually do the work, there's no interaction, unless you go and complain to one person… [they] actually think government works a lot better when you actually go out and have roundtables and talk back and forth… but I don't think, unless they really were being affected, that they really came out in the numbers we expected. (I7)

There is also an acknowledged disconnect between the agency and the public.

> I think part of it too is just the culture in an agency like DEP… there's a lot of technical people, they are not necessarily very good at dealing with other people… there's a mind set with some of the technical folks, that, they're just not trained in dealing with people. (I4)

On the other hand, the technical people in the Department complains the public for not being willing putting efforts to understand the whole picture of the issue.

> We put it [the issue] up on the internet for what our program is about, but people aren't going to read all that… 30 pages, and they just want their specific question answered. They don't want to read through all of that to figure out what the answer is. (I3)

The interviewees also suggested that the roundtable meetings were important but should not be and were not the only means of interactions with stakeholders.

> I think it [the roundtables] needs to be in conjunction with some other things. The advantage of the various advisory committees is you have a group of people that [have] interest or expertise in that particular area, because most of the advisory committees are single issue. (I8)

Reflections on the Use of the Proposed Framework

The case study provided a vivid picture of how roundtable discussions at PA DEP were used as a channel for public participation in environmental policy-making. We demonstrated through this case study how the proposed framework could be used to evaluate the quality and impact of the different types of public participation in a comprehensive way. The proposed framework provides a structured method for policy-makers on how to evaluate public participation programs and how to utilize their greatest potential to the participation programs in policy-making. It not only addresses the missing link in literature that there are few, if any, studies that evaluate one-time public participation, but also provide a practical guidance to policy-makers on how they could make sound judgment on the quality and effects of public participation in the process of formulating environmental policies.

Through the lenses of the proposed framework, we found that roundtable discussions at PA DEP were largely serving its purpose from the perspectives of policy-makers, especially in the dimensions of equity, effectiveness, and social learning. The large amount of negatively connoted comments on the efficiency of roundtable discussions reveals that as a means of public forum, organizing roundtables and incorporating the diverse comments collected from roundtables are not free from costs and difficulties. It is, indeed, not the most efficient way to public policy-making if we only consider efficiency dimension on the proposed framework.

However, with the addition of the social learning dimension, the proposed framework provided a more comprehensive and balanced lens to evaluate this public participation technique, and overall, the public participation roundtable meetings held by the BAMR under the PA DEP appeared to have been largely successful in engaging the public and receiving their input. However, if we map the roundtable discussions organized by PA DEP into Arnstein's (1969) model, interestingly, it is fallen in between the Placation and Partnership—it does more than just tokenism, but it is not a type of "citizen power" yet. The challenge for the Bureau is how to move the current format of the public participation fully into a form of "citizen power" described by Arnstein. This is not an easy task, but a necessary step for a true effective public participation.

It should also be noted that this case study on roundtables is not intended to serve as a test of evaluative frameworks nor to prove or to disprove the framework. Rather, it is a demonstration of how the framework can be applied by the policy-makers to evaluate any kind of public participation technique. We hope that the framework could enhance policy-makers' ability to evaluate and compare a wide and varied range of citizen engagement activities. For example, through our analysis, we found a number of factors contributing to the success of the BAMR roundtables. Strong public interest, focusing events such as incidents near homes and the re-authorization of Title IV, and a favorable political environment with the roundtables supported and urged by the Secretary of the Department could all be said positively correlated to such success. However, the degree of the success would not be as significant as it is now evaluated without the addition of the fourth dimension in the revised framework: social learning. The importance of including process and outcome factors occurring outside the implementation of the public policy decision is indeed just as important as the inclusion and integration of citizens into the policy decision. By incorporating the social learning dimension, the intangible benefits of public participation forums could be revealed. As the case study indicated, social learning allowed for convergence and understanding between different individuals and groups which promoted group solidarity. Social learning also brings changes in behavior, perceptions and attitudes. Group solidarity and convergence supports cooperation and helps solve collective problems. As such, the full benefits of public participation on public decision and policy-making could be demonstrated. When public participation increases social learning and as a result facilitates convergence and develops group solidarity, the work of the department in implementing or carrying out a policy is that much easier. When individuals, stakeholders and groups of citizens are all on the same page, it provides an opportunity for the department not only to act on a problem and develop alternatives, but will likely result in less opposition in the implementation phase of the policy process.

Conclusions

Public participation becomes increasingly an important and indispensable part of public policy-making. However, the research dealing with public participation and evaluating its quality and impact in policy and decision making does not provide an evaluation tool encompassing all factors impacting this trend. This paper extends the Germain, Floyd, and Stehman's (2001) evaluation framework of public participation that compares equity, effectiveness and efficiency to the process and outcome of decision- and policy-making by recommending that social learning is added to the framework to be more comprehensive. The proposed framework, as this paper shows, addresses key considerations presented by researchers in the public participation arena, and provides a useful tool for policy-makers to evaluate public participation in a more structured and comprehensive way.

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