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# Citizen Participation and Environmental Risk: A Survey of Institutional Mechanisms

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*Standard approaches to defining and evaluating environmental risk tend to reflect technocratic rather than democratic values. One consequence is that institutional mechanisms for achieving citizen participation in risk decisions rarely are studied or evaluated. This article presents a survey of five institutional mechanisms for allowing the lay public to influence environmental risk decisions: public hearings, initiatives, public surveys, negotiated rule making, and citizens review panels. It also defines democratic process criteria for assessing these and other participatory mechanisms.*

The problems by now are familiar: A federal agency proposes to allow incineration of wastes at sea, then faces intense opposition in areas where the burns would take place; the same agency contemplates national standards for a chemical, but cannot establish a scientific or political consensus on the seriousness of the health risk or the acceptability of current risk levels; a state agency must establish criteria for siting, designing, and operating facilities that dispose of chemical wastes within its borders when no community appears willing to accept them; a community must decide whether to allow a laboratory to conduct field studies of genetically engineered organisms. At all levels of government, democratic societies must cope with the effects of existing technologies and anticipate or evaluate the consequences of new ones.

Risk professionals have tended to view these issues in technical and analytical terms. Experts measure and rank risks through quantitative models

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that estimate statistical deaths. Principal models for determining the acceptability of risk rely on methods and assumptions that critics argue are ethically weak and will not be accepted as legitimate by the public (Shrader-Frechette 1985; Zinke 1987; Flores and Kraft 1988). Research on communicating risks focuses on the flow of information from administrative authorities and experts to the lay public, stressing "how experts inform others about the truth" (Plough and Krinsky 1987, 6; Otway 1987). Empirical studies document striking differences between expert and lay perceptions of risk problems (Douglas 1985; Slovic 1987; Fessenden-Raden et al. 1987). Yet institutions for drawing the lay public's views into policy deliberations are rarely studied and only occasionally tested. The standard approaches to defining and solving risk problems are more technocratic than democratic in their orientation (Fiorino 1989b).

It may be that this technocratic orientation is not a problem. Many observers argue that risk decisions are best left to administrative officials in concert with scientific experts, acting under instructions from elected representatives, and consulting as necessary with interest groups representing aggregated "public" interests. Given the sheer complexity of the issues, the "transcientific" nature of the factual premises, and the rapid changes in the definition of problems and their solutions, the lay public lacks the time, information, and inclination to take part in technically based problem solving. Elites, it is argued, will make more rational decisions.

But there are at least three arguments against this technocratic orientation. A *substantive* argument is that lay judgments about risk are as sound or more so than those of experts. Nonexperts see problems, issues, and solutions that experts miss (Isaacson 1986). As Brown (1987) observes in his essay on popular epidemiology, relying solely on the diagnostic and preventive methods of experts would have missed such risks as DES and Agent Orange. Studies of lay judgments about technological hazards reveal a sensitivity to social and political values that experts' models would not acknowledge. The lay public may have better capacity than experts alone for what Barber (1984, 258-59) describes as "institutionalizing regret," or for accommodating uncertainty and correcting errors over time through deliberation and debate.

A *normative* argument is that a technocratic orientation is incompatible with democratic ideals. It is "to ignore the value dimension of policy analysis and to disenfranchise the public who, in a democracy, ought to control that policy" (Shrader-Frechette 1985, 151). The normative argument accepts, as an ethical presupposition, that citizens are the best judge of their own interests. To be a citizen is to be able "to participate in decisions that affect oneself and one's community" (Bachrach 1967, 26; Thompson 1970). In the

American political culture, the sense of “subjective competence” is high. People expect to be able to influence collective decisions that affect them, even if they may not choose to exert that influence (Almond and Verba 1963, chap. 7).

An *instrumental* argument is that effective lay participation in risk decisions makes them more legitimate and leads to better results (e.g., Kraft 1988). The lay public is unwilling to delegate important decisions to experts and administrative authorities simply because those decisions are technical in basis. If we lack mechanisms for lay participation, then the current crisis of confidence afflicting risk institutions can only deepen. In addition, broader participation may contribute to better decision making, incorporate a broader range of values into decisions, and reduce the probability of error.<sup>1</sup>

This article presents a preliminary survey of institutional mechanisms allowing citizens to take part in environmental and risk policymaking. It focuses on the normative argument; it thus emphasizes the merits of participation on democratic process grounds. Its purposes are to propose criteria for assessing participatory mechanisms as democratic processes and to review five mechanisms under these criteria. The five mechanisms are public hearings, initiatives, public surveys, negotiated rule making, and citizens review panels. They represent less a comprehensive list than generic types for discussion. This list also omits several commonly used mechanisms—elite advisory commissions, written comment processes, or site-specific dispute mediation.<sup>2</sup> But the five discussed here define a range of institutional alternatives that involve broad (initiatives) as well as narrow (citizens panel) participation; place varying degrees of emphasis on a decision or outcome as opposed to process; and encompass the most common form of administrative participation (public hearings) as well as more innovative or less frequently used ones (negotiated rule making or citizens panels).

The next section defines democratic criteria for assessing participatory mechanisms. Following that is a review and assessment of the five mechanisms selected for discussion here.

### Democratic Process Criteria

This article argues that our thinking about participation requires a grounding in contemporary democratic theory. As a framework, I will draw upon what I call the “participation theorists,” who argue that new forms of participation are necessary in a world in which people increasingly lack control over social decisions that affect them. Sources of this decline in

citizen control include problems of scale, technology, and the concentration of power in national institutions.<sup>3</sup>

The participation theorists' diagnosis holds special force in environmental risk and other technically based policymaking. Here, they would argue, a scientific and technical elite plays an increasingly influential role in decisions. Resolution of technical disputes is often entrusted to experts, because the lay public cannot grasp the basis for decisions and their consequences. "Expert" perceptions of problems (e.g., the nature of risk and priorities for collective action) are judged to be more rational than the "subjective" perceptions of the less technically sophisticated public. The particular features of environmental risk policymaking thus exaggerate the general causes of decline in citizen control.

As a response to these trends, participation theory proposes to reinvigorate our conception of "citizen" and of the institutions through which citizens take part in collective decisions. It accepts that people are the best judge of their interests and can acquire the political skills needed to take a part in governance. Participation engenders civic competence by building democratic skills, overcoming feelings of powerlessness and alienation, and contributing to the legitimacy of the political system. Evidence of low political awareness and lack of interest in issues are taken as signs of deficiencies in institutions, not as limitations inherent in individuals (Pateman 1970, 105-11).

Participation theory suggests four criteria for evaluating institutional mechanisms as democratic processes. It is important to view each of these criteria as a continuum, and the assessment of each mechanism as a judgment about its capacity to fulfill the criteria. The first criterion is that a mechanism should allow for the direct participation of amateurs in decisions. At the national level, most participation takes the form of people acting in their capacities as elected representatives, appointed administrators, interest group professionals, or technical experts. Participation theory seeks to involve people in their capacities as amateurs (i.e., citizens) rather than in their professional or career roles.

Second, we can assess mechanisms by the extent to which they enable citizens to share in collective decision making. The ideal in participation theory is to achieve a level of participation that is more than therapeutic, oppositional, or pleading, but in which "citizens share in governing" (Thompson 1970, 3). This occurs when citizens exercise decision authority or codetermine policies in collaboration with government officials.

A third criterion is the degree to which a mechanism provides a structure for face-to-face discussion over some period of time. Discussion, deliberation, the search for shared values, the opportunity to transform conflict into

more constructive directions through mutual talk and persuasion—all are important attributes of a participatory process. With political talk, Barber (1984, 177) asserts, “we can invent alternative futures, create mutual purposes, and construct competing visions of community.”

Finally, participation theory would assess a mechanism by the opportunity it offers citizens to participate on some basis of equality with administrative officials and technical experts. Does a process allow citizens to define issues, question technical experts, dispute evidence, and shape the agenda? Are they dealing with administrative officials who can exercise decision authority, or with staff who can only represent those decision makers? Is there adequate opportunity for education and preparation on factual and analytical issues? We cannot expect lay participants to master the technical aspects of hazard assessment or exposure modeling. But there may be ways to design institutions that enable people to participate more effectively and on a basis of greater equality with agency officials.

### A Review of Participatory Mechanisms

*Public hearings.* Hearings define a broad but familiar category of mechanisms. They tend to be loosely structured, open forums, where interested members of the public hear agency proposals and respond, typically in a format determined by the agency. An agency like the Environmental Protection Agency (EPA) will convene hundreds of public hearings each year. For many issues, the public hearing is the only institutional form of interaction between the agency and the affected public.

Hearings serve several purposes for the agency. They give at least the appearance of individual and community involvement, legitimate decisions already made, warn the agency of potential political and legal obstacles, satisfy legal or procedural requirements, and defuse the opposition (e.g., Checkoway 1981; Checkoway and Van Til 1978; Heberlein 1976; Millbrath 1981). The literature on public hearings is both substantial and thin. It is substantial in the amount of descriptive and prescriptive writing available. The descriptive literature consists largely of case studies, of varying quality. Many of the case studies come from the planning literature. The best work, such as that by Mazmanian and Nienaber (1979), examines public hearings as an element in a larger participation program. The prescriptive literature is also substantial (e.g., Rosener 1975). The literature is thin in systematic research that analyzes the effects of the hearing process on policy outcomes.

It also fails to consider hearings as an element of democratic process, or to assess their effects on peoples' sense of political competence, confidence in social and political institutions, and support for policies. The hearing process cries out for "institutional policy analysis" (Gormley 1987).

Checkoway's (1981) assessment of the hearing process demonstrated weak prehearing procedures, poor and overly technical presentation of information, a bias toward participation by parties having a clear economic stake in the decision, and minimal evidence that hearings affected agency decisions. A study of North Carolina's water quality planning in the late 1970s concluded that participants tended to be the more educated, politically active, and better informed members of the community (Godschank and Stiftel 1981). It also found that over half of the participants took part as representatives of organized economic interests. Several studies have noted that public hearings often are dominated by organized interests with an economic stake in the decision (Checkoway and Van Til 1978).

Often hearings are only one element in a larger participation program, such as the Corps of Engineers' use of "open planning" in the early 1970s. The more imaginative districts used large hearings, workshops, seminars, nontechnical information brochures, and other techniques to sustain a high level of public participation at several stages of decision. Participants rated the process much higher than they rated the projects eventually adopted by the Corps. Nonetheless, the Corps eventually lost interest in open planning, despite the favorable public reactions to the process, because it did not lead to a consensus on the substance of the projects (Mazmanian and Nienaber 1979, 30-32, 166-67).

A more recent example is EPA's use of hearings as one element in a larger program to involve the community in setting standards for inorganic arsenic emissions from the ASARCO smelter in Tacoma, Washington. Evaluations of the Tacoma process suggest that EPA's efforts were largely ineffective in communicating technical and risk information to the affected public. Because the smelter closed for economic reasons before the standards were issued, it is not possible to assess the policy effects of the program (Baird 1986; Call 1985; Krinsky and Plough 1988; Reich 1985). But such cases provide examples for study and a basis for experimentation with different institutional forms.

*The initiative.* Initiatives enable citizens to place issues on the ballot for voter approval. In many respects, they are the prototype of democratic process. They emphasize democratic values of equality; all citizens are

entitled to participate, and the influence of each on the result is identical. When the result is binding, the outcome determines policy. For many observers, they are the closest equivalent in modern, mass society to the democratic ideal of governance through a face-to-face assembly of citizens. In the United States, which has never held a national referendum, initiatives are found most frequently in western states, especially California, Oregon, Washington, and Colorado (Butler and Ranney 1978; Hahn and Kamieniecki 1987; Lee 1978). With the passage of Proposition 65 in October 1986, California is the outstanding example of the use of the initiative to establish environmental policies (Haag 1987).

Empirical studies provide an encouraging but mixed portrait of initiatives. Participation generally parallels that for candidate elections, although the rate is usually slightly lower (Hahn and Kamieniecki 1987, 143). In a study of statewide initiatives in western states, Price rejects the assertion that initiatives are principally a vehicle for special interests. Research on voter behavior demonstrates that voters are thinking about issues and can cope with the complexities of issues and their presentation. Price (1978, 262) concludes that initiatives can allow for “decisive decisions on particularly sensitive, hard-to-resolve issues.”

Two of California’s environmental measures were the subject of detailed analysis. The Clean Air Initiative (Proposition 9) failed in June of 1972 with only one-third of the vote, and the Coastal Conservation Initiative (Proposition 20) passed in October of that year with a 55% majority. In both cases, the analysis suggests that (1) most voters were unaware or undecided until the last few weeks before the election and (2) voters initially tended to perceive the measure favorably if it appeared to meet a need or correct a problem, but any doubts would surface or be reinforced in the face of a strong opposition campaign. A response to the defeat of 11 coastal protection bills in the state legislature, the Coastal Initiative “provided an outlet for ecological activism within the system and helped prevent public alienation from the political process” (Lutrin and Settle 1975, 371).

Critics argue that referenda delegate decision authority to an uninformed or otherwise unqualified electorate, measure the direction but not the intensity of beliefs, and weaken the power of elected authorities, especially legislatures. Even advocates of broad citizen participation express reservations about initiatives. One is that they fail to provide an institutional forum for deliberation and debate. They take a snapshot of public opinion and adopt it as the basis for policy. A second is that a majority vote forces a decision from among dichotomous choices rather than establishing a basis for con-



sensus. Others argue that initiatives compare poorly to the legislative process; they cannot reflect differences in the intensity of views or allow for compromise among groups (Wolfinger and Greenstein 1968).

*Public surveys.* As many observers have argued, surveys can complement participation through hearings or written comments by providing a more representative portrait of public opinion (Daneke and Klobus-Edwards 1979). By seeking opinions more broadly than from participants in a hearing, surveys can incorporate the views of the “uninterested but affected public” that would otherwise lack representation (Milbrath 1981, 482). A well-designed survey can assess individual beliefs as part of an overall set of values and attitudes, and measure the intensity as well as the direction of beliefs on issues. A survey can offset the biases that result from the more limited and selective participation obtained through hearings or other mechanisms.

One example of the use of a survey to inform policymakers’ judgments was a Forest Service decision on off-road vehicles at Cape Hatteras National Seashore (Wellman and Fahmy 1985). The project managers compared the survey results to an analysis of written comments on the issue. The analysis confirmed intuitive expectations that written comments were more polarized than the survey responses. Like participants in open public hearings, the written commenters were motivated by more strongly held opinions and exaggerated the degree of conflict. To proponents of such surveys, their value is to clarify the bases of agreement and disagreement and identify values that underlie opinions, rather than to set a clear direction for policymakers.

Environmental agencies’ increasing use of cost-benefit methodology has led to a different application of survey techniques. In a cost-benefit analysis, an agency attaches dollar values to the expected benefits of a regulatory action. For some benefits, there are reasonably clear market referents, such as costs avoided for reductions in morbidity and the damage function approach for physical damage. For others, such as preserving a scenic view or an endangered species, agencies use contingent valuation surveys that ask people about their “willingness to pay for hypothetical levels of environmental quality” (Fisher 1984, 106; Bishop and Heberlein 1987). Unlike surveys, which directly measure public preferences for consideration by policymakers, contingent valuation studies are a method for converting public responses to hypothetical, often artificially defined situations into dollar values. In addition, contingent valuation is designed more to incorporate public preferences into decision models rather than to complement broader participation programs.

There are several criticisms of surveys as proxies for more direct participation. They isolate problems and issues from their social and community context, which are important influences on judgment. Another criticism is that the design of survey instruments can affect responses, and thus the conclusions drawn about public preferences. Influence over decisions is minimal and indirect, especially in contingent valuation, where any influence people have is translated to conform to a decision model they may not understand or accept. Yet as a source of feedback on public attitudes and a corrective to other participatory mechanisms that incorporate more bias, citizen surveys can be a valuable way of informing policymakers.

*Negotiated rule making.* A recent innovation in several federal agencies, negotiated rule making is more clearly defined as an institutional mechanism than the hearing or survey, which define generic types (Harter 1982). Negotiations conducted by EPA and other agencies exhibit three principal characteristics. First, the negotiations complement but do not replace the conventional notice-and-comment rule-making process. Second, the agency participates as a party at interest in the negotiations. It also commits to publishing the negotiating committee's consensus as a proposed rule, so long as it is consistent with the agency's statutory authority. Third, once a negotiating committee is formally constituted, it has substantial control over its mode of operation, composition, use of resources, and the terms and timing of its dissolution. Committees establish their own protocols and are free to define key issues, establish work groups, and assign issues for study and recommendations (Fiorino 1988; Susskind and McMahon 1985).

Although advocates typically stress its value in avoiding or resolving conflict, negotiated rule making also appears to offer other benefits. Participants generally consider the products of a negotiation to be more informed, pragmatic, and workable than products of a conventional rule making. Parties have access to information as it is needed and the opportunity to educate others and persuade them of the reasons behind their positions. The negotiation format and the presence of senior agency officials permit discussion and debate among policymakers and representatives of industry, state and local, professional, and environmental interests. Because it draws on representatives of organized interests, negotiation does not offer the opportunity for the direct participation of amateurs in risk decisions. For several reasons, it also may be inappropriate for decisions affecting fundamental social values or choices. Within its range, however, negotiation may be valuable as a deliberative process — as a mechanism for citizen participation as well as a means of resolving technical or policy conflict (Fiorino 1988).

*Citizens review panels.* The risk literature suggests mechanisms for allowing the lay public to participate in technically based decisions. Shrader-Frechette (1985, 207) proposes a “technology tribunal” of scientists and citizens to evaluate evidence, debate alternatives, and recommend or decide conclusions. Brooks (1984, 48-49) considers the lay jury as a model for democratic participation, citing as its advantages access to technical information, the capacity to debate evidence and issues, and insulation from outside pressures.

A mechanism based explicitly on the jury model that has been applied to environmental issues is the citizens review panel (Crosby et al. 1986). Participants are selected through stratified random sampling, although representatives of affected interest groups may also take part. A steering committee representing a cross-section of interests determines who will present evidence and arguments. The panel hears testimony, questions technical experts, and deliberates issues. The panel typically will take two or more days to study the problem, discuss issues, and reach a conclusion. In contrast to the more common public hearing, participants have the opportunity to ask questions, challenge experts, and explore issues in some depth. The panels’ products could include written recommendations and even meetings with key decision makers as part of the deliberations. Citizens panels differ from the far more common advisory commission because they strive for lay rather than elite or technical participation, and thus reach more broadly for participation and a sense of community values.

The premise of the citizens panel and similar mechanisms is that under the right conditions, representatives of the lay public can acquire the information and understanding to enable them to apply their judgment to technical policy problems. Participants can influence the agenda, question experts, evaluate evidence, balance competing considerations, and debate issues, possibly with authoritative decision makers. Although risk agencies could not delegate decisions to a panel, they could use it as a mechanism for informing their judgment about lay values and concerns. Unlike a survey, a panel can make only limited claims to representativeness, in the sense of representing a cross-section of an affected population; its primary influence will derive from the quality of its deliberations and its recommendations to policymakers. Yet the limitations of the citizens panel are clear. It reaches only a small proportion of the affected public; requires a substantial investment of time and money; and, by raising expectations of possible influence that may not be met, can involve a fair amount of risk for the agency or administrator and of frustration for the participants.

**Table 1. Summary of Mechanisms Under the Participation Criteria**

<i>Mechanism</i>	<i>Direct/ Amateurs?</i>	<i>Share Authority?</i>	<i>Discussion?</i>	<i>Basis of Equality?</i>
Public Hearings	Yes	No	Limited	No
Initiatives	Yes	Yes	Potential	Some
Public Surveys	Yes	Limited	Unlikely	No
Negotiated Rule Making	Unlikely	Yes	Yes	Yes
Citizen Review Panels	Yes	Limited	Yes	Some

### An Assessment Under the Democratic Criteria

How do these participatory mechanisms fare under the democratic process criteria? Table 1 presents a summary. Four of the five permit direct participation by amateurs. The exception is negotiation, where there is participation by representatives of interests. Negotiated rule making relies explicitly on a pluralist model of interest group representation. In the other four, the quality of this direct participation varies. In a hearing, it is participation as a commenter, and in a survey, as a respondent. The initiative and review panel achieve something close to participation as a citizen; participation is not primarily reactive, and there is some recognition that individuals are capable of judging what is in their own interests.

Only in the initiative do citizens exercise full decision authority, although any one person's influence over the result is small. The best example of shared authority is a negotiated rule making, where all of the parties must consent to a decision before it can be said to reflect a consensus. The other three mechanisms offer limited or no opportunity to share authority. A hearing is most likely to have influence when it reveals intense and vocal opposition. As a form of citizen influence, it may be most effective in blocking or forcing reconsideration of decisions that face intense opposition. A citizens review panel can inform policymakers' judgment, based on good information and careful deliberation, but cannot officially share authority for the result. To the extent that participants in a survey affect the result, they are likely to be unaware of it.

Similarly, the survey fares most poorly as a forum for debate and discussion. The citizen is reduced to the role of a respondent who reacts to carefully structured, closed-ended questions in isolation from group influences or opinions. In contrast, even a vote on an initiative is part of a public process that can stimulate a search for information and community debate. The

opportunity for discussion and debate is a particular strength of negotiations and review panels. Negotiations engage people in problem solving over time, with substantial opportunity to present information, persuade and be persuaded, and discover common ground or clarify bases of disagreement. The format of a review panel is designed to inform lay participants on complex issues, encourage interaction between experts and nonexperts, and promote group discussion. The hearing offers a forum for some discussion, but it often is superficial and may emphasize conflict over the search for common ground.

In allowing people to participate on some basis of equality with administrative officials and experts, the public hearing and surveys are weakest. In a typical hearing, the agency defines the agenda, establishes the format, and controls the information and the analytical resources. Presentations of information are not likely to equip nonexpert participants to take an effective part in the proceedings, even in more elaborate educational efforts, such as the ASARCO case. Respondents to a survey typically have no preparation and respond in a virtual vacuum. Because their consent is necessary in an initiative or negotiation, participants are in a position of greater equality with government authorities. Parties attempting to influence the outcome will provide information and arguments to negotiators or voters. In a negotiation, participants have substantial influence over the definition of issues and access to technical experts. Their consent is a condition for the successful conclusion of the process.

Each mechanism exhibits weaknesses as well as strengths. Negotiated rule making promotes collective problem solving and sharing of information, but at the national level is unlikely to achieve direct participation by amateurs. A hearing is an open forum, with minimal preparation, but may force participants into a reactive, oppositional role. The dominance of the hearing process by organized interests can bias policymakers' perceptions of public concerns. A survey is more representative and can measure intensity of views, but takes opinions out of context, with no opportunity for discussion. An initiative delegates authority to citizens and may stimulate discussion and a search for information, but forces a majority decision.

The more common mechanisms for citizen participation fare poorly under the democratic process criteria. Hearings exhibit a number of weaknesses, especially for issues as dynamic and complex as those in environmental policymaking. Surveys are even less appealing from a democratic process perspective. They fail to enlarge upon the public's understanding and remove citizens from the effects of their influence. Citizens review panels permit

direct participation by amateurs, but cannot claim to be representative of the affected public and reach a small number of people.

### Implications and Directions

This review suggests several directions for practice and research. One would be to complement one mechanism with another. A survey could provide a mechanism for “social mapping” (Roberts et al. 1984) to clarify the bases of disagreement on issues in preparation for a negotiation or a series of public hearings. A series of citizen review panels could add balance and depth to what policymakers are likely to hear in open public hearings. Any one mechanism can also be modified to account for its deficiencies. Barber’s (1984) proposal for a national initiative incorporates a multichoice format allowing voters to express intensity and other nuances of views on issues. He recommends a two- or three-stage voting procedure that would require voters to reaffirm decisions after a six-month reading period, as a “built-in check on public mercurialness” (p. 284). Because people are more likely to seek information on salient issues, the obligation to establish a position for a vote could stimulate learning and discussion.

A principal research need is for institutional policy analysis that relates participatory mechanisms to different kinds of technological policy problems. There is a difference between the issues that can be presented to the public in a municipal or state-wide initiative and those that can be addressed through a regulatory negotiation or citizens review panel. One may be suited better to seeking community guidance on the need for more stringent controls on medical wastes, another to asking representatives of the public to weigh the results of a risk assessment and advise on the need for regulatory controls.

Even the public hearing, despite its pervasiveness, has received little empirical analysis. For many purposes, a hearing may be appropriate. But there are issues in which face-to-face contact and the motivations for participation may further polarize positions, increase conflict, and obstruct the search for common ground and shared values.<sup>4</sup> Hearings offer an especially rich opportunity for research, because they are so common, are a matter of public record, and the participation and proceedings typically are well-documented. A result could be research-based, prescriptive guidelines that would tell us not only how to hold a public meeting, but when. Such research exists on negotiation, and agencies have found it useful for designing negotiation processes and selecting rules.

Another useful direction would be the use of participatory mechanisms to engage citizens in deliberation about decision models underlying policy decisions. Shrader-Frechette (1985, 210) proposes a scheme for weighting decision models to account for the lay public's emphasis on low-probability events with catastrophic potential. Participation could inform policymakers on such generic issues as how to weigh sources of uncertainty in risk assessments, how to compare risks that are distributed broadly to those that are concentrated and socially disruptive, or how to balance scientific uncertainty against the magnitude or irreversibility of health or ecological effects. The objective should be to inform our models through mechanisms that rank high under the democratic process criteria — by informing judgment as well as measuring preferences, by not isolating issues from group or community influences, and by engaging people in the reasoning and discussion that defines their role as citizens.

### Normative and Other Criteria

The emphasis here has been on normative grounds for assessing participatory mechanisms, in the form of the democratic process criteria, principally because they are often overlooked in the literature on participation. Assessments under instrumental and substantive criteria are also important. Among these criteria are capacities for clarifying the factual basis of disputes, for achieving consensus, for improving acceptance of and compliance with decisions, for increasing public support for agencies and their programs, or for educating the public on the sources of environmental risk and the trade offs of policy options. We could also assess participatory mechanisms by their capacities for drawing a broader range of views into decisions or for reducing the likelihood of policy errors. It is also necessary to consider a number of practical issues. Cost is one such issue; another is the typical lack of incentives for lay participation in decision making. To the extent that practical incentives to encourage participation are missing, or that agencies consider the administrative costs unacceptable, then institutional development and experimentation are unlikely.

Yet the case for participation should begin with a normative argument — that a purely technocratic orientation is incompatible with democratic ideals. The democratic process criteria outlined here offer a basis for assessing institutional mechanisms in normative terms. These democratic criteria project a vision of citizenship that can help to place the more obvious

practical difficulties in perspective. Their lesson is that if administrative institutions and processes do not reflect the ideals of a democratic society, then we may want to rethink their acceptability on analytical or efficiency grounds alone.

## Notes

1. A thorough discussion of the instrumental arguments for participation can be found in Cook and Morgan's *Participatory Democracy* (1971). Also see Davis (1986), Elliott (1984), and Johnson (1987) on how increased public control over the management of facilities may reduce opposition to controversial siting decisions. On the divergence between technical and social perceptions of nuclear power, see Bickerstaffe and Pearce (1980).

2. On participatory mechanisms and environmental risk decisions, see the report by the Organization for Economic Development and Cooperation (1979); Nelkin and Pollak (1980); Nelkin (1977); and Kraft (1988).

3. This discussion draws upon Barber's *Strong Democracy* (1984); Bachrach's *The Theory of Democratic Elitism* (1967); Cobb and Elder's *Participation in American Politics* (1972); Mansbridge's *Beyond Adversarial Democracy* (1980); Margolis's *Viable Democracy* (1979); Cook and Morgan's *Participatory Democracy* (1971); Olsen's *Participatory Pluralism* (1982); Pateman's *Participation and Democratic Theory* (1970); and Thompson's *The Democratic Citizen* (1970). The democratic process criteria discussed in this section are developed more fully in Fiorino, *Environmental Risk and Democratic Process: A Critical Review* (1989a, 530-39).

4. Even as strong an advocate of governance through face-to-face contact as Mansbridge observes that some distance may be appropriate in situations of high conflict (see Mansbridge, 1980, 272-77).

## References

- Almond, G. A., and S. Verba. 1963. *The civic culture: Political attitudes and democracy in five nations*. Princeton, NJ: Princeton University Press.
- Bachrach, P. 1967. *The theory of democratic elitism: A critique*. Boston: Little, Brown.
- Baird, B.N.R. 1986. Tolerance for environmental health risks: The influence of knowledge, benefits, voluntariness, and environmental attitudes. *Risk Analysis* 6:425-35.
- Barber, B. R. 1984. *Strong democracy: Participatory politics for a new age*. Berkeley: University of California Press.
- Bickerstaffe, J., and D. Pearce. 1980. Can there be a consensus on nuclear power? *Social Studies of Science* 10:309-44.
- Bishop, R. C., and T. A. Heberlein. 1987. The contingent valuation method. In *Valuing the environment: Economic theory and applications*, ed. G. N. Kerr and B.H.M. Sharp, 99-115. Canterbury, New Zealand: Centre for Resource Management.
- Brooks, H. 1984. The resolution of technically intensive public policy disputes. *Science, Technology, & Human Values* 9 (Winter):39-50.



- Brown, P. 1987. Popular epidemiology: Community response to waste-induced disease in Woburn, Massachusetts. *Science, Technology, & Human Values* 12 (Summer/Fall):78-85.
- Butler, D., and A. Ranney, eds. 1978. *Referendums: A comparative study of practice and theory*. Washington, DC: American Enterprise Institute.
- Call, G. D. 1985. Arsenic, ASARCO, and EPA: Cost-benefit analysis, public participation, and polluter games in the regulation of hazardous air pollutants. *Ecology Law Quarterly* 12:567-617.
- Checkoway, B. 1981. The politics of public hearings. *Journal of Applied Behavioral Science* 17:566-82.
- Checkoway, B., and J. Van Til. 1978. What do we know about citizen participation? A selective review of research. In *Citizen Participation in America*, ed. Stuart Langton, 25-42. Lexington, MA: D. C. Heath.
- Cobb, R. W., and C. D. Elder. 1972. *Participation in American politics: The dynamics of agenda building*. Boston: Allyn & Bacon.
- Cook, T. E., and P. M. Morgan. 1971. *Participatory democracy*. New York: Harper & Row.
- Crosby, N., J. M. Kelly, and P. Schaefer. 1986. Citizens review panels: A new approach to citizen participation. *Public Administration Review* 46:170-78.
- Daneke, G. A., and P. Klobus-Edwards. 1979. Survey research for public administrators. *Public Administration Review* 39 (September/October):421-26.
- Davis, C. 1986. Public involvement in hazardous waste siting decisions. *Polity* 19 (Winter):296-304.
- Douglas, M. E. 1985. *Risk acceptability according to the social sciences*. Beverly Hills, CA: Sage.
- Elliott, M. 1984. Improving community acceptance of hazardous waste facilities through alternative systems for mitigating and managing risk. *Hazardous Waste* 1:397-410.
- Fessenden-Raden, J., J. M. Fitchen, and J. S. Heath. 1987. Providing risk information in communities: Factors influencing what is heard and accepted. *Science, Technology, & Human Values* 12 (Summer/Fall):94-101.
- Fiorino, D. J. 1988. Regulatory negotiation as a policy process. *Public Administration Review* 48 (July/August):764-72.
- . 1989a. Environmental risk and democratic process: A critical review. *Columbia Journal of Environmental Law* 14:501-47.
- . 1989b. Technical and democratic values in risk analysis. *Risk Analysis*. 9:293-99.
- Fisher, A. 1984. An overview and evaluation of EPA's guidelines for conducting regulatory impact analyses. In *Environmental policy under Reagan's executive order: The role of cost-benefit analysis*, ed. V. K. Smith. Chapel Hill: University of North Carolina Press.
- Flores, A., and M. E. Kraft. 1988. Controversies in risk analysis in public management. In *Ethics, government, and public policy*, eds. J. S. Bowman and F. A. Elliston, 105-35. New York: Greenwood Press.
- Godschank, D. R., and B. Stiffl. 1981. Making waves: Public participation in state water planning. *Journal of Applied Behavioral Science* 17:597-614.
- Gormley, W. T., Jr. 1987. Institutional policy analysis: A critical review. *Journal of Policy Analysis and Management* 6 (Winter):153-69.
- Haag, M. 1987. Proposition 65's right-to-know provision: Can it keep its promise to California voters? *Ecology Law Quarterly* 14:685-712.
- Hahn, H., and S. Kaminiecki. 1987. *Referendum voting: Social status and policy preferences*. New York: Greenwood Press.
- Harter, P. J. 1982. Negotiating regulations: A cure for the malaise? *Georgetown Law Review* 71 (October):1-118.

- Heberlein, T. A. 1976. Some observations on alternative mechanisms for public involvement: The hearing, the public opinion poll, the workshop, and the quasi-experiment. *Natural Resources Journal* 16:197-221.
- Isaacson, P. 1986. Pollutant regulation and public sensibility. *Environmental Impact Assessment Review* 6 (September):229-32.
- Johnson, B. B. 1987. Public concerns and the public role in siting nuclear and chemical waste facilities. *Environmental Management* 11:571-86.
- Kraft, M. E. 1988. Evaluating technology through public participation: The nuclear waste disposal controversy. In *Technology and politics*, eds. M. E. Kraft and N. J. Vig, 253-77. Durham: Duke University Press.
- Krimsky, S., and A. Plough. 1988. *Environmental hazards: Communicating risks as a social process*. Dover, MA: Auburn House.
- Lee, E. C. 1978. California. In *Referendums: A comparative study of practice and theory*, eds. D. Butler and A. Ranney, 87-222. Washington, DC: American Enterprise Institute.
- Lutrin, C. E., and A. K. Settle. 1975. The public and ecology: The role of initiatives in California's environmental politics. *Western Political Quarterly* 28 (June):352-71.
- Mansbridge, J. J. 1980. *Beyond adversarial democracy*. New York: Basic Books.
- Margolis, M. 1979. *Viable Democracy*. New York: St. Martin's Press.
- Mazmanian, D. A., and J. Nienaber. 1979. *Can organizations change? Environmental protection, citizen participation, and the Corps of Engineers*. Washington, DC: Brookings Institution.
- Milbrath, L. W. 1981. Citizen surveys as citizen participation mechanisms. *Journal of Applied Behavioral Science* 17:478-96.
- Nelkin, D. 1977. *Technological decisions and democracy: European experiments in public participation*. Beverly Hills, CA: Sage.
- Nelkin, D., and M. Pollak. 1980. Problems and procedures in the regulation of technological risk. In *Making bureaucracies work*, eds. C. H. Weiss and A. F. Barton, 259-78. Beverly Hills, CA: Sage.
- Olsen, M. E. 1982. *Participatory pluralism*. Chicago: Nelson Hall.
- Organization for Economic Cooperation and Development. 1979. *Technology on trial: Public participation in decision-making related to science and technology*. Paris: OECD.
- Otway, H. 1987. Experts, risk communication, and democracy. *Risk Analysis* 7:125-29.
- Pateman, C. 1970. *Participation and democratic theory*. Cambridge: Cambridge University Press.
- Plough, A., and S. Krimsky. 1987. The emergence of risk communication studies: Social and political context. *Science, Technology, & Human Values* 12 (Summer/Fall):4-10.
- Price, C. M. 1978. The initiative: A comparative state analysis and reassessment of a western phenomenon. *Western Political Quarterly* 28 (June):243-62.
- Reich, R. B. 1985. Public administration and public deliberation: An interpretive essay. *Yale Law Journal* 94:1617-41.
- Roberts, M. J., S. R. Thomas, and M. J. Dowling. 1984. Mapping scientific disputes that affect public policymaking. *Science, Technology, & Human Values* 9:112-20.
- Rosener, J. B. 1975. A cafeteria of techniques and critiques. *Public Management* 57:16-19.
- Shrader-Frechette, K. S. 1985. *Risk analysis and scientific method: Methodological and ethical problems with evaluating societal risks*. Boston: D. Reidel.
- Slovic, P. 1987. Perception of risk. *Science* 236 (April):280-85.
- Susskind, L., and G. McMahon. 1985. The theory and practice of negotiated rulemaking. *Yale Journal on Regulation* 3 (Fall):133-65.

- Thompson, D. F. 1970. *The democratic citizen: Social science and democratic theory in the twentieth century*. Cambridge: Cambridge University Press.
- Wellman, J. D., and P. A. Fahmy. 1985. Resolving resource conflict: The role of survey research in public involvement programs. *Environmental Impact Assessment Review* 5:363-72.
- Wolfinger, R. E., and F. I. Greenstein. 1968. The repeal of fair housing in California: An analysis of referendum voting. *American Political Science Review* 62 (September):753-69.
- Zinke, R. C. 1987. Cost-benefit analysis and administrative legitimation. *Policy Studies Journal* 6 (Autumn):63-88.

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