Implementing Structured Participation for Regional Level Waste Management Planning*

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Introduction

The issue of waste management not only involves complicated technical issues, but also touches upon the concepts of fairness and equity. The unwanted effects of waste treatment are concentrated in a small area, while the benefits are spread throughout a whole county or as in the following case study, throughout a whole region. There are controversies associated with waste treatment sites, such as health impacts, long-term consequences, institutional trust, and economic disadvantages. Hence, the driving agents of the debate are risk perception and perception of fairness.

Informing the public may help clarify issues but cannot resolve existing conflicts not caused by ignorance or misreading relevant information. Proposers, regulators, stakeholders and the affected public have different values and diverging interests. Resolving conflicts necessitates a process in which stakeholders and affected citizens can take part in decisions. This is hardly disputed among risk managers.[1]

The desirable structure of such a process continues to be debated, especially the process of participation, and the role and authority of the public to take part in the decision making process.[2]

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1 Daniel J. Fiorino, *Citizen Participation and Environmental Risk: A Survey of Institutional Mechanisms*, 15 **Sci. Tech. & Hum. Value**s 226 (1990); Ortwin Renn et al., *Public Participation in Decision Making: A Three-Step Procedure,* 26 **Pol'y Sci.**189 (1993).

2 Peter C. Dienel, *Die Planungszelle,* Westdeutscher Verlag: Opladen (1978);

Dealing with waste management always means dealing with a difficult problem where no "easy" solutions can be found. The "not in my backyard" (NIMBY) syndrome is only one obstacle in the siting process. Other problematic aspects, like uncertainties in waste prognoses, changes in the legal framework, and a range of complex technologies with multi-dimensional consequences for the surrounding area, have to be addressed.

In Germany, special administrative entities named "Gebietskörperschaften" (a county or a city) are responsible for waste collection, treatment and disposal. In a densely populated country, it becomes more and more difficult to assign new sites for waste disposal. Along with increased efforts for recycling and waste reduction, a newly established law defines specific standards for any material to be legally disposable after the year 2005. To comply with these legal requirements, all counties or cities have to upgrade their waste treatment system until the year 2005. While the law does not explicitly call for a certain type of waste treatment, incineration is favored in practice because at the moment, it is the only treatment technology to produce material meeting the official criteria for disposal. Neither the scientific validity of the criteria nor the stability of the law itself are settled. Both topics are discussed widely by experts and politicians.

Theoretical Background

The most important questions in waste management planning are risk related. In trying to resolve conflicts in risk debates there is a need for a structure or organisational model that acknowledges the conditions of the respective risk arena and addresses all three levels of risk conflicts. Most authors agree that such a debate should be

Frances M. Lynn, *The Interplay of Science and Values in Assessing and Regulating Environmental Risks*, 11 **Sci. Tech. & Hum. Values** 40 (1986); Roger E. Kasperson, *Six Propositions for Public Participation and Their Relevance for Risk Communication*, 6 **Risk Anal**. 275 (1986); K. Chen & J. C. Mathes, *Value Oriented Social Decision Analysis: A Communication Tool for Public Decision Making on Technological Projects,* cited in C. Vlek & G. Cvetkovich, **Social Decision Methodology For Technological Projects** (1989); Daniel J. Fiorino, *Technical and Democratic Values in Risk Analysis*, 9 **Risk Anal**. 293 (1989);Ortwin Renn & Debra Levine, *Credibility and Trust in Risk Communication,* cited in **Communicating Risk To The Public** 175 (R. Kasperson & P.J. Stallen eds. 1991).

organised according to the rules of a rational discourse,[3] which is defined as a discussion among all affected parties to resolve conflicts or engage in joint problem solving using a specific set of rules. These rules are summarized below:

Table 1
Rules of a Rational Discourse

Rule Setting	Reaching a consensus on the procedure that the participants want to employ in order to derive the final decision or compromise, such as majority vote or the involvement of a mediator (Majone, 1979).
Evidence	Basing factual claims on the "state of the art" of scientific knowledge and other forms of legitimate knowledge; in the case of scientific dissent all relevant camps should be represented (Rushefsky, 1984).
Argument-ation	Interpreting factual evidence in accordance with the laws of formal logic and argumentative reasoning (Habermas, 1971).
Disclosure of Values	Disclosing the values and preferences of each party, thus avoiding hidden agendas and strategic game playing (Renn, 1986).
Fair Bargaining	Attempting to find a fair solution whenever conflicting values or preferences occur, including compensation or other forms of benefit sharing (Bacow & Wheeler, 1984).

The success or failure of a rational discourse depends on many factors. Among the most influential are:

(1) *Time:* Sufficient time for a discourse must be allocated before the decision has to be made.[4]

(2) *Openness of result:* A discourse will never succeed if the decision has been made (officially or secretly) and the purpose of the communication effort is to "sell" this decision to the other parties.[5]

3 Thomas McCarthy, *Translator's Introduction*, cited in Juergen Habermas, **Legitmation Crisis** (1975); Juergen Habermas, *Theory of Communicative Action,* **Reason and the Rationalization of Society** Vol. 1 (1984); Ray Kemp, *Planning, Political Hearings, and the Politics of Discourse*, cited in J. Forester, **Critical Theory and Public Life** 190 (1985); Laurence Bacow & Michael Wheeler, **Environmental Dispute Resolution** (1984); T.R. Burns & R. Überhorst, **Creative Democracy: Systematic Conflict Resolution and Policymaking in a World of High Science and Technology** (1988); Daniel J.Fiorino, *Citizen Participation and Environmental Risk: A Survey of Institutional Mechanisms,* 15 **Sci. Tech. & Hum. Values** 226 (Spring 1990); Ortwin Renn, *Risk Communication: Towards a Rational Dialogue with the Public,* 29 **J. Haz. Mat**. 465 (1992).

4 Roger E. Kasperson, *Six Propositions for Public Participation and Their Relevance for Risk Communication,* 6 **Risk Anal**. 275 (1986).

(3) *Equal position of all parties:* The internal rules have to give every participant the same status and rights to speak, make proposals, and evaluate options.[6] This requires a consensual decision about procedure and agenda.

(4) *Willingness to learn:* All parties have to be ready to learn from each other, which does not necessarily imply that participants have to change their preferences or attitudes. Learning in this sense involves recognizing the different forms of rationality in decision making and the different forms of knowledge; systematic, anecdotal, personal, or cultural.[7] Each party must be willing to be subject to the rules of argumentative disputes.

(5) *Resolution of allegedly irrational responses:* Discourses with public interest groups or individuals frequently demonstrate conflicts between two contrasting modes of evidence. The public refers to anecdotal and personal evidence mixed with emotional reactions, whereas professionals play out their systematic and generalised evidence based on abstract knowledge.[8] This conflict can only be resolved if both parties are willing to accept the rationale of the other party's position and to perhaps even empathize with the other party's view.[9]

6) *De-moralisation of positions and parties:* As soon as a party moralises its position, the party cannot make trade-offs between its allegedly moral position and the other parties' immoral position without losing face. Moralising also violates the equality principle stated above. Parties cannot assign equal status to opposing parties they deem morally inferior to themselves. Finally, if somebody has only weak arguments to support his or her position, assigning blame to other parties and making it a moral issue can help to win points in the public arena. Moralising does not include ethical arguments, which are essential for resolving environmental disputes.

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5 Daniel J. Fiorino, *Technical and Democratic Values in Risk Analysis*, 9 **Risk Anal**. 293 (1989).

6 Kemp, *supra* note 3.

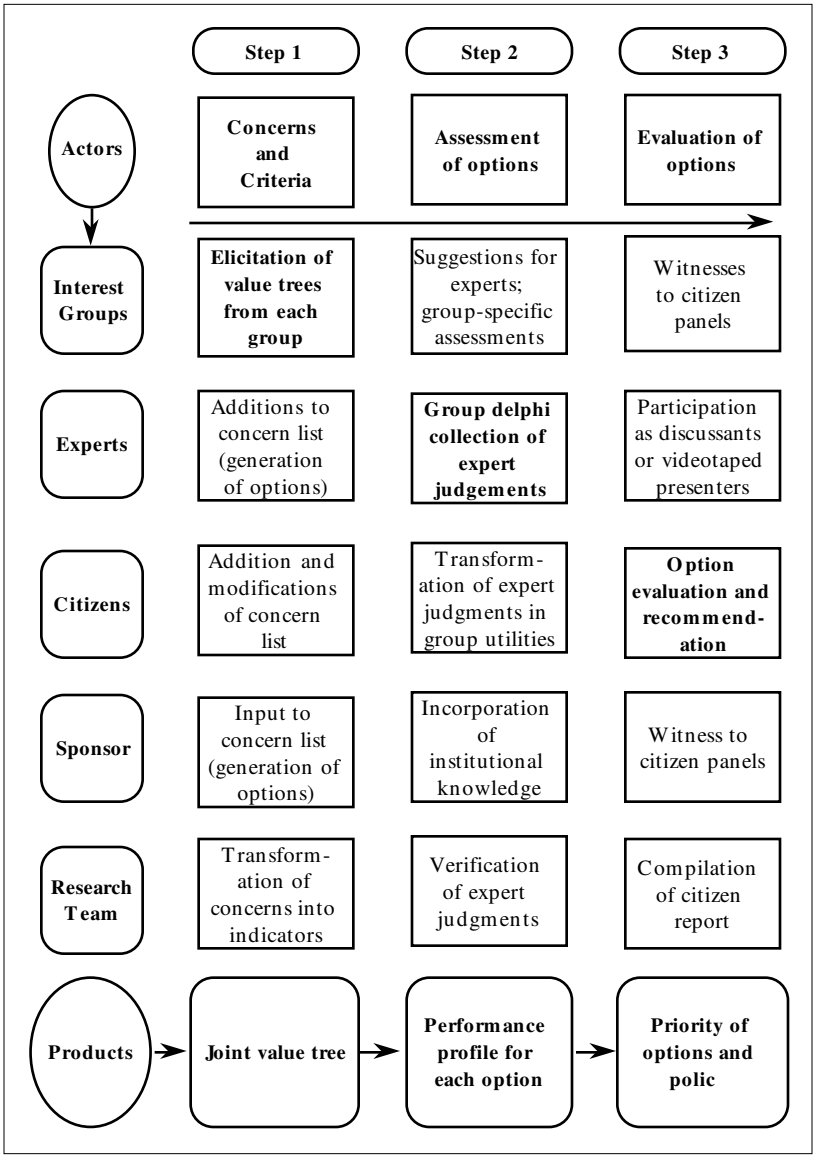
7 Habermas, *supra* note 3.

8 Frances. M Lynn, *The Interplay of Science and Values in Assessing and Regulating Environmental Risks*, 11 **Sci. Tech. & Hum.Values** 40 (1986).

9 Laurence Bacow & Michael Wheeler, *supra* note 3 at 191; Chris Zeiss, *Impact Management Priorities at Waste Facilities: Differences between Host Community Residents' and Technical Decision Makers' Values* 9 **J. Envtl. Sys**. 1 (1989-1990).

The Model of Cooperative Discourse

Figure 1
Basic Concept and Elements of the Three-Step Participation Model



Many models for public participation have been suggested in the literature that promise to meet these requirements and to facilitate a rational discourse.[10] One of these suggestions is a hybrid model of

10 Ned Crosby et al., *Citizen Panels: A New Approach to Citizen Participation*, 46

citizen participation termed "Cooperative Discourse". This model has been applied, with several modifications, to studies on energy policies and waste disposal issues in West Germany, for waste-disposal facilities in Switzerland, and to sludge-disposal strategies in the U.S.[11] The model entails the following three consecutive steps, therefore it is also known as the "Three Step Participation Model."

1. Identification of concerns and selection of evaluative criteria:

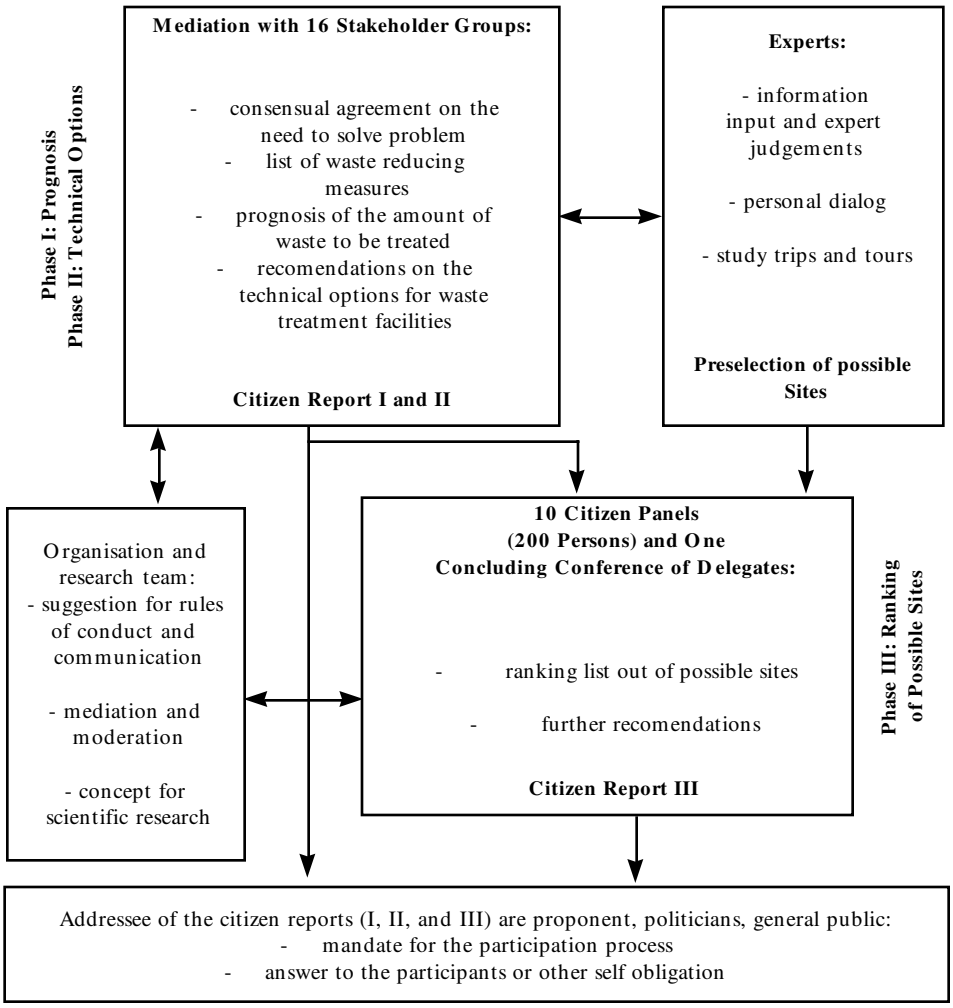
The identification of concerns and objectives is best accomplished by asking all relevant interest groups (i.e., socially organised groups that are or perceive themselves as being affected by the decision) to reveal their values and criteria for judging different options. It is crucial that all relevant value groups be represented and that the value clusters be comprehensive, including economic, political, social, cultural, and religious values. To elicit the values and criteria for such a list the technique of value-tree analysis has proven appropriate.[12] The resulting output of a value-tree process is a list of hierarchically structured values that represent the concerns of all affected parties, as is illustrated in an example in Figure 2.

Pub. Admin. Rev 170 (1986); M. Kraft, *Evaluating Technology Through Public Participation:The Nuclear Waste Disposal Controversy* in **Technology and Politic**s (M.E. Kraft & N.J. Vig eds. 1988); T. R. Burns & R. Überhorst, **Creative Democracy: Systematic Conflict Resolution and Policymaking in a World of High Science and Technology** (1988); K. Chen & J. C. Mathes, *supra* note 2.

11 Ortwin Renn et al., *Sozialverträgliche Energiepolitik. Ein Gutachten für die Bundesregierung in Wandel* **HTV Edition Technik und Sozialer** (1985); Ortwin Renn et al., *Citizen Participation for Sludge Management* (Final Report to the N.J. Department of Environmental Protection, 1989); Ortwin Renn & Debra Levine, *Credibility and Trust in Risk Communication,* **Communicating Risk to the Public** 175 (R. Kasperson & P.J. Stallen eds. 1991); Ortwin Renn et al., *Citizen Participation for Hazard Management* 3 **Risk** 12 (1991); Ortwin Renn et al., *Public Participation in Decision Making: A Three-Step Procedure* 26 **Pol'y Sci**. 189 (1993).

12 Ralph L. Keeney et al., *Structuring West Germany's Energy Objectives* 15 **Energy Pol'y** 352 (1987); Detlof Von Winterfeldt & W. Edwards, **Decision Analysis and Behavioral Research** (1986); Detlof von Winterfeldt, *Value Tree Analysis: An Introduction and an Application to Offshore Oil Drilling*, in P.R. Kleindorfer & H.C. Kunreuther, **Insuring and Managing Hazardous Risks: From Seveso to Bhopal and Beyond** 439 (1987).

Figure 2
Applied Model in the Project: Macrostructure



2. *Identification and measurement of impacts and consequences related to different policy options:*

The evaluative criteria derived from the value-tree are operationalised and transformed into indicators by the research team or an external expert group. These operational definitions and indicators are reviewed by the participating stakeholder groups. Once approved by all parties, these indicators serve as measurement rules for evaluating the performance of each policy option in all value dimensions. Experts from varying academic disciplines with diverse perspectives on the topic of

the discourse judge the performance of each option on each indicator. For this purpose, a modification of the Delphi method has been developed and applied.[13] This method is similar to the original Delphi format,[14] but based on group interactions instead of written responses. The objective is to reconcile conflicts about factual evidence and reach an expert consensus via direct confrontation among a heterogeneous sample of experts. The desired outcome is a range of scientifically legitimate and defensible expert judgements and a distribution of expert opinions with verbal justifications.

3. *Conducting a rational discourse with randomly selected citizens as jurors and interest groups as witnesses:*

The last step is the evaluation of potential solutions by one or several groups randomly selected citizens.[15] These panels are given the opportunity to evaluate and design policy options based on the likely consequences and their own values and preferences. The participants are informed about the options, the evaluative criteria and the consequence profiles. The interest groups representatives and experts take part as witnesses; they provide arguments and evidence to the panels who ultimately decide on various options. This process takes time; citizen panels are conducted as seminars over three to five consecutive days. All participants are exposed to a standardised program of information, including hearings, lectures, panel discussions, videotapes, and field tours. The process is similar to a jury trial with experts and stakeholders as witnesses and procedural advisers as "professional" judges.

Figure 1 also shows that all three groups (experts, interest groups, and the general public) play a role in each step of the process. Each group is encouraged to impact the decision process with its own specific

13 Ortwin Renn & Ulrich Kotte, *Umfassende Bewertung der vier Pfade der Enquete - Kommission auf der Basis eines Indikatorkatalogs*, cited in G. Albrecht & H. U. Stegelmann, **Energie im Brennpunkt** 190 (1984); Thomas Webler et al., *The Group Delphi: A Novel Attempt at Reducing Uncertainty*, 39 **Techn. Forcasting & Soc. Chng.** 253 (1991).

14 Murray Turoff, *A Summary and Analysis of a Delphi on Civil Defense Policy,* Office of Emergency Preparedness Tech. Memo. 122 (Feb. 1970); *see generally* Murray Turoff & Harold Linstone, **The Delphi Method: Techniques and Applications** (1975).

15 Dienel, *supra* note 2; Peter C. Dienel, *Contributing to Social Decision Methodology: Citizen Reports on Technological Projects*, cited in C. Vlek & G. Cvetkovich, **Social Decision Methodology for Technological Projects** 133 (1989).

knowledge. This division of labour provides a check-and-balance process and a sequential order for multiple actor involvement.

Several procedures lend themselves to application during such a discursive process. They have to be chosen according to the specific requirements of the case, checked during the process and adjusted to emerging new situations due to the uncertainties of a constantly changing system of actors.

Specific Requirements and Application of the Model

The above mentioned legal situation in Germany influenced the official process of waste management planning in the Northern Black Forest Region, but was even more politically complicated than the usual waste management planning process.

In 1993, after a history of separate planning efforts, the three counties and the City of Pforzheim formed a panel to seek a common regional solution for their waste problems. For this task, a special planning organisation (PAN) was established and supported by the counties and city. An engineering consultant was hired to provide the decision making committees with the necessary technical information. When PAN representatives learned about Professor Renn and his experiences with structured public participation, they decided to incorporate a similar program in the upcoming planning process. The representatives worked with Professor Renn and the Centre of Technology Assessment in Baden-Württemberg to develop a program. To meet the unique requirements of the region, the elements of the original model of cooperative discourse were modified.

Specifically, the task of developing the waste management concept was divided into three consecutive decision phases, each of them setting the necessary framework for the following phase. The first step consisted of a waste prognosis for the planning horizon of the year 2005, which set the minimum and maximum benchmarks of the treatment capacity needed for the regional concept. The second phase used this result to select the appropriate treatment techniques that defined the technique specific selection criteria required for the third phase, siting the facilities. The results of the participation program had to be available according to this time frame and the discussions had to proceed parallel to the topics of the official phases.

Hence, three separate phases of participation were planned, each with a specific task and the actors especially legitimised to decide on each phase. Figure 2 illustrates the modified scheme that was developed for the case, based on the conflict analysis prior to the start of the participation program. The participation methodologies also changed according to the conditions in the three phases. In phases II and III, the value-tree-analysis method[16] for structuring the decision process was applied The nature of these tasks allowed the use of this method because it provided different options (different treatment techniques in phase II, siting alternatives in phase III). The first phase (waste prognosis) did not call for such a method, as forecasting is an evolutionary procedure.

In terms of participatory methodologies, in phases I and II the team followed the mediation concept. Stakeholder groups came together in a series of consensus conferences, first developing a waste prognosis and then ranking possible technical options for waste treatment. After these tasks were completed and the political decision for a combination concept for the region was made, the third phase of site selection could be started. One central incinerator and two biomechanical treatment plants should be located in the region. Sixteen communities had been identified in a preliminary suitability study by the consultant as potential sites for treatment plants, some of which were suitable for both types of facilities.

A random selection of approximately 200 inhabitants from the potential sites for the waste treatment facilities formed ten parallel working citizen panels. Each panel had the same number of representatives from each potential site community. The panels were directed to find the most suitable sites among the sixteen. Four of the panels focused on the siting of the incinerator and six groups developed criteria for siting the biomechanical treatment plants. They developed site selection criteria and a resulting ranking list of the sites by considering social, political, ecological, and economic impacts as well as equity issues including benefit sharing packages.

Each of the ten panels reached a unanimous conclusion with respect to the ranking list. Fairness issues played a major role in assessing the

16 Keeney, *supra* note 12.

relative burden to the communities and in balancing the economic and social concerns. In the end, every group elected three delegates, who met separately to develop one common suggestion incorporating both treatment techniques.

Finally, each panel was given the opportunity to comment on the result of the conference and all suggestions were included into the citizen report.

Figure 3
Applied Methodologies in the Project: Microstructure

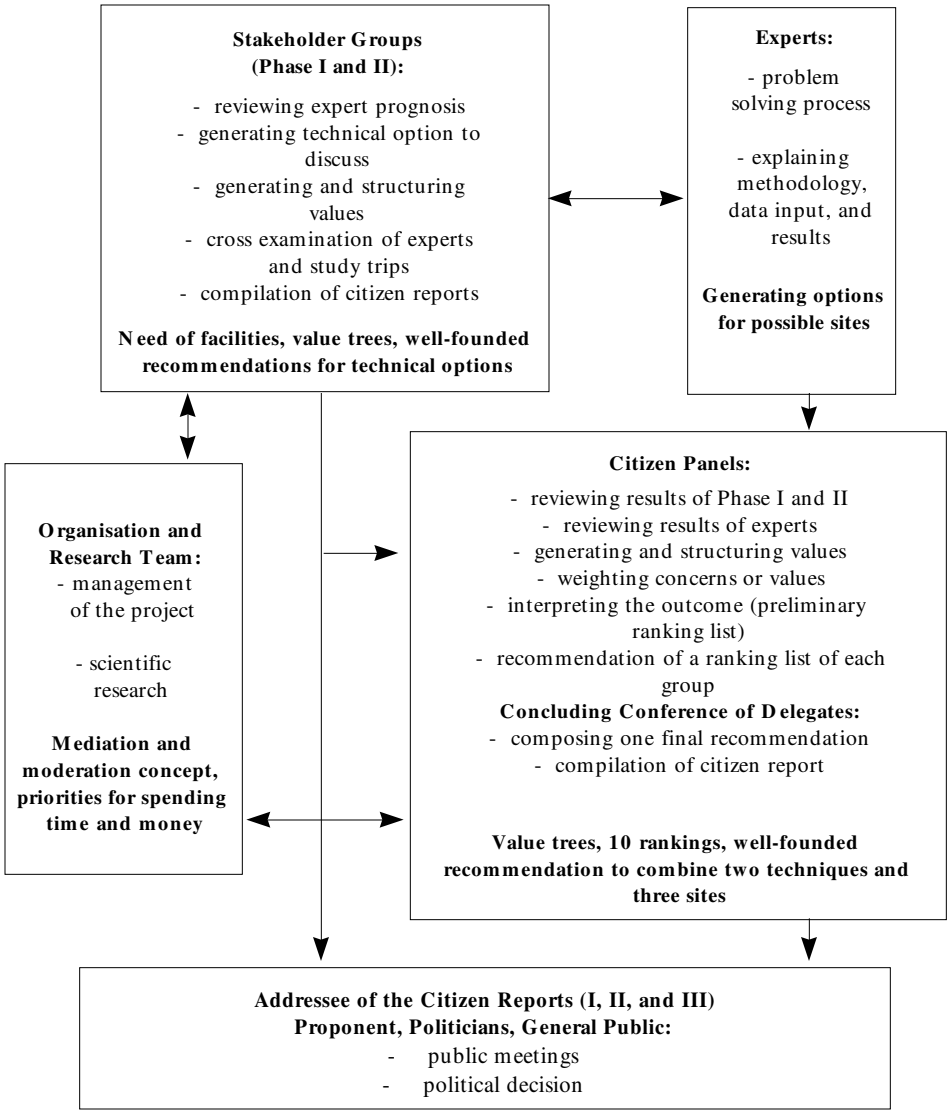


Figure 3 shows the applied set of methodologies in each phase.

In the third phase we applied a modified version of the concept of planning cells,[17] instead of the mediation concept. We worked in a deductive way, basically following Multi-Attribute Decision Theory:

- building of a value-tree in one brainstorming and several discussion sessions, so all members of the group could agree on the values and on their hierarchical structure;
- construction of a catalogue of criteria which could be filled with information;
- weighting of the criteria;
- judging and ranking of the options relatively to each other according to their performance profiles with regard to the different criteria;
- discussing the results and compiling a final document.

Figure 4 illustrates one of the elicited value trees. This example gives an impression of the complexity that had to be dealt with during the discussions. The groups used the value tree as a guideline for structuring the available flood of information according to their individual frame of evaluation criteria.

Before the participants could weight and rank the options to reach a decision, we had to select and transmit information they requested. This was an especially difficult task as we were dealing with very complex waste management problems, which are complicated by technical innovations and legal changes. In addition to these difficulties, we were obliged to maintain our neutral position and simply had to deal with the logistical problems of providing almost 200 people with a lot of information during a short period of meetings.

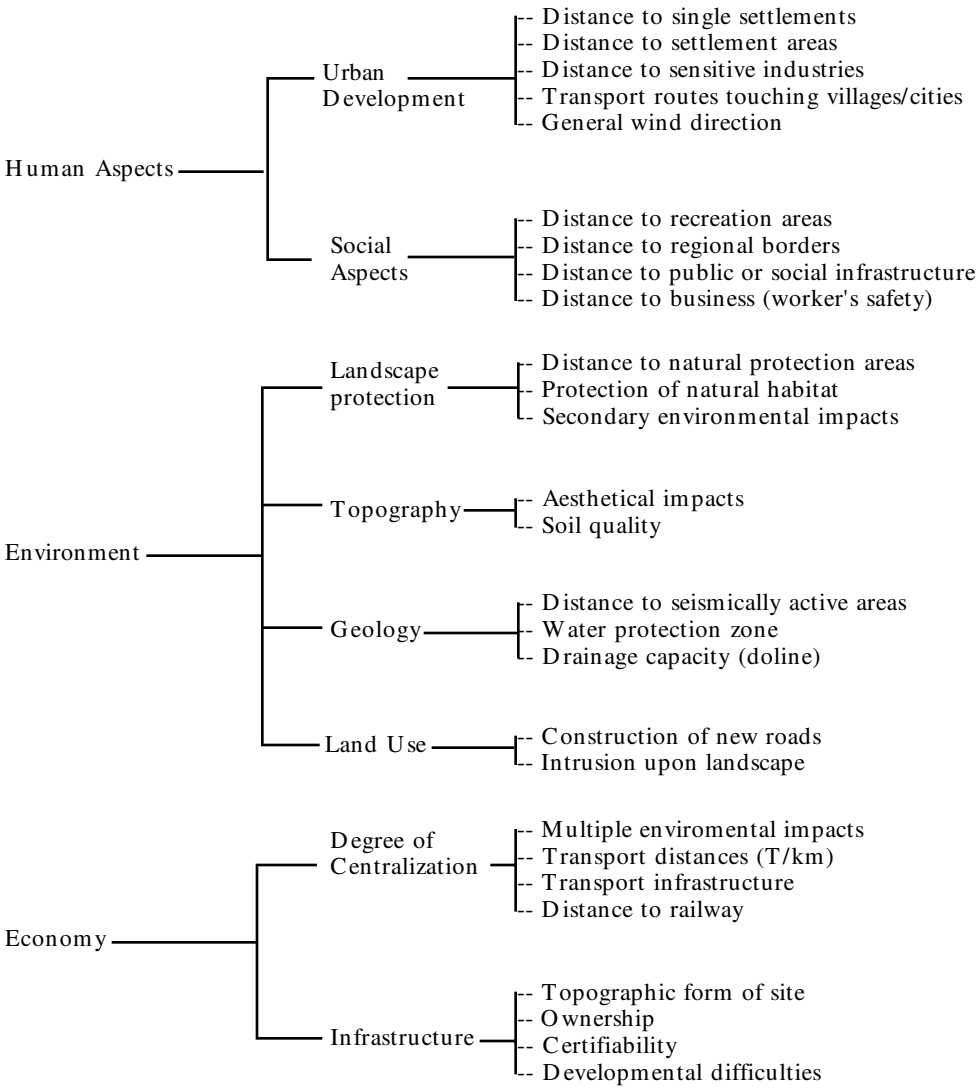
The consulting engineers worked parallel to the citizen panels using a different method (pairwise comparison of options) on their site-recommendations. We did not adopt this method because we did not want to create a situation in the citizen panels where the individual inhabitants of the potential sites would discuss the site selection as opponents against each other.

Our objective in using multi-attribute utility techniques was to help the participants recognise that there was no 'ideal' option to be found and that all options had their specific advantages or disadvantages in regard to certain criteria. In Germany, it is very unusual to discuss

[17] Dienel, *supra* note 2.

compensation measures using this scheme, so the resulting recommendations of the citizens consisted of a list of preferred sites based upon special basic conditions or scenarios.

Figure 4
Value Tree of One Citizen Panel for Ranking of Potential Sites for Waste Treatment Plants



Experiences and Discussion of Possible Implications

At this time, it is still difficult to identify the full range of questions arising from our case study. The final political decision concerning the siting process has not been made by the local parliaments, keeping the process in an incomplete status. Internal and external teams are currently conducting research on the project. Some points of discussion can be stated, serving as hints for future research and further development of the underlying participation model:

1. The development of regional waste management is a very complex task and the specific political context made it necessary to split up the central task into several steps. This helped to structure the phases, to generate technical information and to select the participants for each phase according to legitimisation and special competence. During the course of discussion, interrelated topics could not be completely separated, thus influencing each step of the process. A consecutive structure such as that applied in our case, with each phase depending on the results of the prior, can present problems if the tasks of any period are not fulfilled completely.

2. We combined the basic structure with a phased process, each phase dealing with a relevant subject for decision. For organisational, economical and motivational reasons, we abandoned the strict division of work between the different parties involved. Instead of repeating the whole set of the model in each phase, we invited local interest groups and citizens according to their competence to be the main actors in one specific phase. Both the organised groups and the citizens elicited value trees and ran the complete process of ranking and weighting of options in one specific field.

3. The interest groups contributed their knowledge of waste reducing measures and technical means of waste treatment. Affected citizens living near the host communities contributed anecdotal and local knowledge to the process and were especially legitimised to participate in the siting decision. We learned that links between the phases (here I+II and III) have to be defined very well.

5. The first and second phases were conducted as mediation processes with all their chances and difficulties. For example, the demand for voluntary participation impacted the composition of the

consensus conference because not all groups participated regularly. For future improvements, this question should be addressed in the rules of conduct defined at the beginning of each project.

6. The research-team in the original model became an organising-team with a range of practical functions including mediator and process manager, especially during the third phase. Therefore a scale of ten parallel working groups cannot become a standard for participatory planning procedures.

7. Three elected delegates from each group had the task of composing a final recommendation for siting during the last stage of the process. We learned that more time was necessary for this important element of the process and that additional feedback-loops were also necessary.

8. The role of the sponsor in the model changed during the process. Political conflicts arose in the region making it necessary to support the participation process by press releases and positive public relations. Due to the complexity and size of the project, the Centre of Technology Assessment sponsored part of the cost. Without this funding, a similarly large-scale project is not likely to be implemented. Hence, research efforts should be allocated in developing smaller lay-outs for specific needs.

9. The PAN not only functioned as the proponent and sponsor, but also supported the highly technical discussions by contributing relevant legal and technical information. The representatives worked hard to win the participant's trust, and only became accepted after a lengthy dialogue.

10. The group Delphi was not applied due to the lack of time in the "hot working phases" of the siting discussions. A range of other methods invited expert input. Site visits, presentations, video interviews with experts and supplementary materials gave the participants sufficient information to draw their own conclusions and find a balanced opinion. The best information tools appeared to be study trips and face to face discussions with the experts.

11. The necessity of different information types seems to be typical in such processes. The participants want to know details: to whom should they address their recommendation, how will the politicians

decide, etc. Any participation procedure is contingent on having an addressee to whom the recommendations are directed. In this case, it was difficult because of the transboundary cooperation between the administrative entities in the PAN during the working phases of the process. Only the final decisions of each phase were left to the legal political parliaments.

12. Expert input cannot be limited to technical issues in a case like this. The different worlds of expertise, e.g. knowledge of legal, political, and planning preconditions, do not lend themselves to one single type of input. Different interpretations of information cannot be resolved by a common method applicable to all kinds of expert disputes.

Conclusion

Involving citizens in the decision making process requires careful planning, thoughtful preparation and the flexibility to change procedures on demand. A cooperative discourse aims at getting public input prior to the final decision. It is meant to address public concerns, to collect local knowledge, and to exchange arguments among the various stakeholder groups. Such a pre-decisional discourse can only succeed if the following requirements are met:

1. A clear mandate for the discourse participants: What are topics of discussion? What is the product that they are asked to deliver?

2. A clear understanding of the options and permissible outcomes of such a process: If, for example, the site for a risk producing facility is already chosen, the discourse can only focus on issues such as choice of technology, emission control, and compensation.

3. A predefined time table: It is necessary to allocate sufficient time for all the deliberations, but a clear schedule including deadlines is required to make the discourse effective and product-oriented.

4. A mutual understanding of how the results of the discourse will be integrated in the decision making process of the regulatory agency: As a pre-decisional tool, the recommendations cannot serve as binding requests. They should be regarded as consultancy reports similar to the scientific consultants who articulate technical recommendations to public authorities.

The experiences from our project, together with other case studies, clearly show that it is a difficult task to develop a case specific structure that can meet the twofold requirements of science and planning reality. However, being methodologically sound, applying a transparent and logical procedure, and serving the practical interests of the involved parties makes it possible to facilitate the process of finding a well balanced solution.

One might be tempted to ask why project supporters should urge participation or go beyond the mandated public hearing if citizen involvement is so difficult and painful. The first response to this question is that social acceptance of any policy is closely linked with the perception of a fair procedure in making the decision.[18] The best "technical" solution cannot be implemented if the process of decision making is perceived as unfair or biased. In addition to this argument, our experiences indicate clearly that the public has something to contribute to the planning process. The rationality of public input depends, however, on the procedure of involvement. Provided citizens are given a conducive and supportive structure for discourse, they are capable of understanding and processing risk-related information and of articulating well-balanced recommendations. The discourse models are an attempt to design a procedure that allows citizens to take advantage of their full potential and includes the professional knowledge and expertise necessary to make prudent decisions.



18 S. Rayner & R. Cantor, *How Fair is Safe Enough? The Cultural Approach to Societal Technology Choice*, 7 **Risk Anal.** 3 (1987).