View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by HAL-CIRAD

# Designing participation processes for water management and beyond

Y. Von Korff, P. D'Aquino, K.A. Daniell, R. Bijlsma

▶ **To cite this version:**

Y. Von Korff, P. D'Aquino, K.A. Daniell, R. Bijlsma. Designing participation processes for water management and beyond. Ecology and Society, Resilience Alliance, 2010, 15 (3), 29 p. <hal-01068485>

**HAL Id: hal-01068485**

**https://hal.archives-ouvertes.fr/hal-01068485**

Submitted on 25 Sep 2014

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Copyright © 2010 by the author(s). Published here under license by the Resilience Alliance.
Von Korff, Y., P. d'Aquino, K. A. Daniell, and R. Bijlsma. 2010. Designing participation processes for water management and beyond. *Ecology and Society* **15**(3): 1. [online] URL: http://www.ecologyandsociety.org/vol15/iss3/art1/

*Synthesis*, part of a Special Feature on Implementing Participatory Water Management: Recent Advances in Theory, Practice and Evaluation

# Designing Participation Processes for Water Management and Beyond

*Yorck von Korff* [1,2], *Patrick d'Aquino* [3], *Katherine A. Daniell* [2,4], *and Rianne Bijlsma* [5]

ABSTRACT. This article addresses the question of how to design participation processes in water management and other fields. Despite a lot of work on participation, and especially its evaluation, this question has received little attention in the research literature. However, it is important, because previous research has made it clear that participation may yield important benefits for humans and the environment but that these benefits do not occur automatically. One precondition is sound design. The design of participation processes has been addressed in detail in the so-called "craft" literature but more rarely in the scientific literature. This article helps close this gap by systematically analyzing and comparing five design guides to determine whether it is possible to combine them into a more robust guide. The article confirms that possibility and presents a preliminary outline for such a guide. Principles for participatory process orientation are presented, as well as numerous partially iterative steps. The adaptive process is laid out in a way intended to help designers determine the objectives of the participation process and the initial design context, and make preplanning choices that eventually lead to the selection of suitable participation mechanisms. There are also design tools that facilitate this work. We discuss how our findings are largely compatible with previous research on participation, notably the work on criteria for "good" or "effective" participation processes. We also argue that our article advances research on an important remaining question in the scientific literature on participation: What process should be chosen in which context?

Key Words: *Design guides; participation; water management*

## INTRODUCTION

Interactions between human and ecological systems are increasingly influenced by public or stakeholder participation, which we will call "participation" in this article. International agreements such as the 1992 Rio Declaration or the 1998 Aarhus Convention, European legislation such as the 2000 Water Framework Directive, and national regulations, e.g., for France (Roche 2003), demand the involvement of the affected parties in the management of natural resources such as river basins, national parks, and coastal areas. A series of research projects financed by the European Commission, including HarmoniCOP, AquaStress, and NeWater among others, has examined how stakeholders may become involved in water management decisions and water management research. Some researchers now consider participation as "both a prerequisite and an element of good governance and the sustainable management of natural resources" (Enserink et al. 2007, similar to Pahl-Wostl et al. 2008).

The issue of public participation is becoming more important not only in natural resources management (Syme and Sadler 1994, Chess and Purcell 1999, Webler and Tuler 1999, Beierle and Konisky 2000, Bryner 2001, Webler and Tuler 2001, Beierle and Cayford 2002) but also in fields such as science and technology (Nelkin and Pollak 1979, Rowe and Frewer 2000), the health sector (Abelson et al. 2003), urban planning (Arnstein 1969, Portland Development Commission 2007), public transport (O'Connor et al. 2000), risk management (Wiedemann et al. 1993, Stern and Fineberg 1996, Renn 2001, Mazri 2007), and industry (Doppler and Lauterburg 2000, Mumford 2003). This "rise of public participation" (Rowe and Frewer 2004) has been accompanied by research that focuses on two pivotal questions (Webler 1999, Webler and Tuler 2001):

[1]Lisode, [2]Cemagref UMR G-EAU, [3]CIRAD, [4]Australian National University, [5]Deltares

1. What could be the possible benefits of participation, in other words, why should participation be undertaken?

2. How can "good" or "effective" participation be carried out and evaluated?

In addition, concepts and methods of stakeholder analysis in natural resources management (Grimble and Wellard 1997), as well as in public policy analysis (Bryson et al. 2002), have been discussed in detail to enable planners and policy makers to better understand complex social-ecological systems prior to intervention.

However, despite this work, one important aspect of participation has remained characteristically underilluminated in the scientific literature: practical instructions on how to design a participation process, in water management or elsewhere. Exceptions to the above include Edelenbos (1999) and de Bruijn and ten Heuvelhof (2002). Typical challenges for designing such processes include weak participant interest, control-focused local leaders, or highly complex local social relationships (Michener 1998, Alff et al. 1999, Cleaver 1999, Agrawal 2003, Mansuri and Rao 2004).

At the same time, because a gap was perceived (Creighton 2005, d'Aquino 2007, Mazri 2007), a rich practitioner or "craft" literature has proliferated that provides more or less concise advice for designers of participation processes. The advice provided by this literature is often at a "meta-guide" level that seeks to orient process design in varying contexts. Nevertheless, the knowledge produced in this literature has scarcely entered the academic debate, with the exception of Webler (1997 and 1999, see also Webler and Tuler 1999), who has emphasized this point himself. The reason for this is possibly the fact that the practitioner literature, which is often based on the experiential knowledge of its authors, can sometimes be considered suspect because it has not always been peer reviewed or otherwise systematically reflected upon (Webler 1999). An additional concern when using practitioner literature, which we will refer to in the rest of this article as "design guides," to design participation processes is that authors often focus their recommendations on a very specific field, such as urban or land-use planning (see, for example, Vic Roads 1997 or Portland Development Commission 2007), and that they are not always transferable to other fields (Mazri 2007).

The lack of scientific focus on design questions in previous academic research is relevant for two connected reasons. First, it is clear that participation may yield important benefits for humans and the environment (Fiorino 1990, Laird 1993, Webler et al. 1995, Webler and Tuler 2001, Beierle and Cayford 2002, Klinke 2009). These benefits can include:

- improved legitimacy for decision-making administrations because the increased responsiveness of decision makers to affected parties helps to take into account stakeholder values and create trust;

- more pertinent and lower-cost decisions because stakeholders add otherwise unavailable vital information, reframe problems, and contribute new ideas;

- better chances for decision implementation because people are less likely to oppose a decision that they have helped to shape; and

- increased civic competency and social capital because participant interaction may foster learning related to these aspects.

These benefits of participation may in turn encourage the sustainability (Ostrom 1990, Johnson 1997) and greater adaptive capacity of social-ecological systems (Lynam et al. 2002, Pahl-Wostl et al. 2007).

Second, it is also clear that benefits do not occur automatically and that participation processes can miss out on these potential benefits if they are not properly designed and implemented. In fact, poorly designed processes can have negative effects (e.g., Brett 1996, Colgianese 1997, Eversole 2003, Höppner et al. 2003, Delli Carpini et al. 2004, Irvin and Stansbury 2004, Barreteau et al. 2010). These include:

- stakeholder disillusionment with participation and lost trust because of unclear or disputed objectives, raised but eventually unfulfilled expectations, and the dominance of powerful participants;

- relaxed environmental legislation or otherwise lopsided decisions because environmental or other interests were inadequately represented;
- reluctance to participate, increased conflict, or reluctance to adopt a decision because stakeholders and decision makers were not adequately identified and involved; and
- lost time and money as a result of the preceding points.

In light of this need to understand more about design, our aim in this article is to bring practitioner knowledge more directly into the academic debate through a comparative analysis of existing guides. In particular, we plan to investigate the responses to the following questions:

- What kind of advice do design guides provide?
- What type of practical knowledge do they draw upon?
- What does this knowledge add to those aspects of participation that are discussed in the scientific literature?
- Is it possible, by systematically comparing these guides, to combine them into an outline for a more robust design guide? This is the central question in the article.

Before beginning to address these questions, we will clarify some of our main concepts.

Following Enserink et al. (2007), we define participation as "the involvement of individuals and groups [i.e., the public or stakeholders] that are positively or negatively affected by or are interested in a proposed intervention." The latter is in our case a policy decision represented by point *z* in Fig. 1. In European water management, typical policy decisions that involve participation include water management plans.

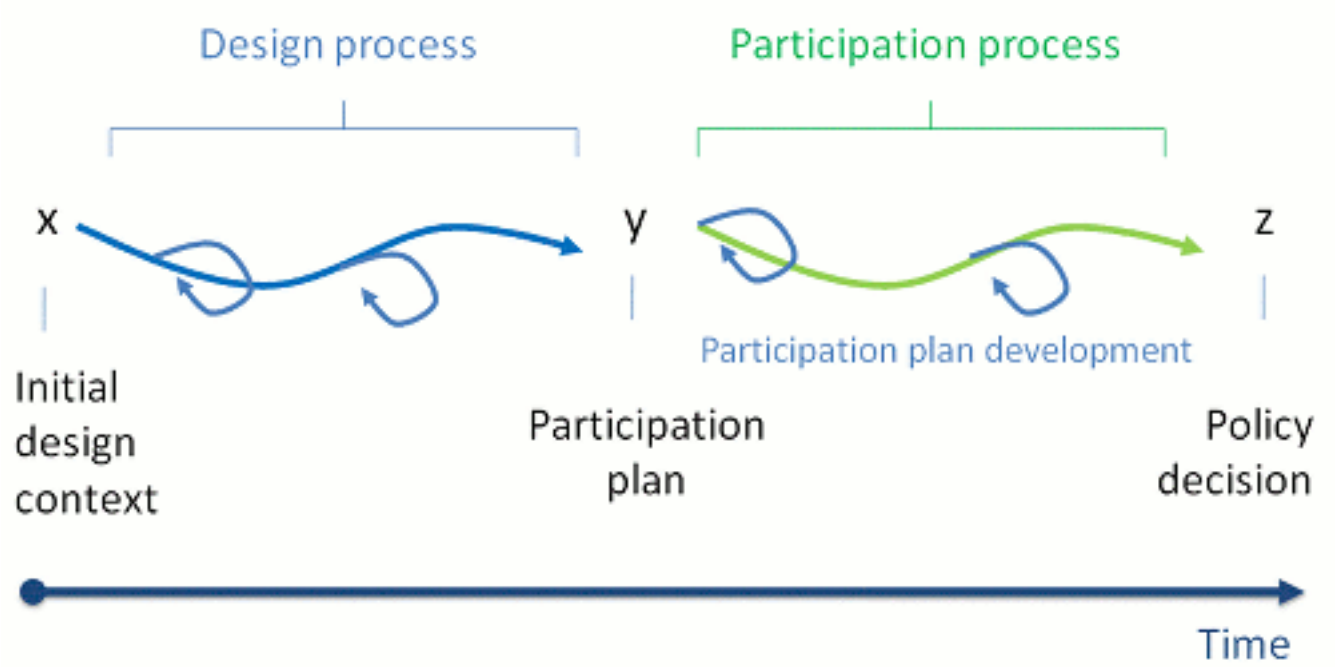
Leading up to the policy decision is the participation process, represented by the space between points *y* and *z*, in which stakeholders interact with each other but also with the agency responsible for the process; we refer to this agency as the "lead agency." These interactions may be, and probably should be, based on a participation plan (point *y*) that foresees how and when this interaction is supposed to happen, who is to be involved, and which questions should be addressed (Creighton 2005). The plan may be, and in our view should be, designed, i.e., constructed rationally with a clear purpose in mind, finished, and possibly tested before implementation starts (Bots 2007).

Following Bots (2007), we note that the word "design" can denote an activity as well as a product. In this article, design as a product is synonymous with the participation plan (point *y*). This plan is based on design as an activity, represented here by the space between points *x* and *y*. What needs to happen in this phase (*x*-*y*), which we call the design process, is the focus of much of this article. We would like to emphasize that design often develops, as in our view it should, through various feedback or iterative cycles. Figure 1 indicates this by the curved lines.

Point *x* represents the situation that designers face when they begin their activities. This initial design context is usually characterized by the following general features:

- There is a water management or other policy decision to be made, e.g., to determine desired groundwater levels in a specific area or to draw up rules for the management of an aquifer.
- There is one or, more typically, several decision makers for this policy decision, e.g., local water authority, municipalities, regional decision-making bodies, the ministry of the environment, etc.
- One of these decision makers is likely to be the lead agency, i.e., the institution that designs and organizes the process.
- The designer may be an employee, e.g., a project manager, of the lead agency or he or she may be an externally hired consultant or an action researcher with the function of a consultant who supports a project manager.
- Even though one person may often be officially in charge of design, the design process is typically a team effort involving

**Fig. 1.** Defining process design.




various individuals who are later also required for the participation process, e.g., decision makers, facilitators, consultants, public relations people, etc. (Daniell et al. 2010).

- There are other stakeholders who may need to be involved in the design and then in the participation process itself.

- There is a set of contextual factors that need to be taken into consideration when designing the participation plan. These can include existing levels of conflict among stakeholders, their previous experiences with participation, relevant legal or regulatory settings, available budgets, the degree of stakeholder apathy or interest, and many more. These contextual factors are only partly revealed to the designer at this point (point *x*).

- There are a great number of interaction mechanisms, such as public hearings, open houses, workshops, citizen juries, and many others, that the designer may more or less appropriately choose, or even create, and arrange them in the participation plan (*y*).

The designer's task is thus to clarify the initial design context and respond to it. This takes place during the design process (*x*-*y*), in which a rationally justifiable proposal (*y*) for the participation process (*y*-*z*) consisting of one or several stakeholder interaction mechanisms is created in view of the final policy decision (*z*).

Then, during the implementation (*y*-*z*) of the designed plan (*y*), the plan will in all likelihood be adjusted to new requirements that arise during the interaction process (*y*-*z*). This adjustment can be understood (see Bots 2007) as development, which is characterized by a suite of planning and implementation activities, rather than just design.

We will now turn to outlining the main methods we used to respond to the key questions of our paper given in the previous section. This will be followed by a presentation of results related to the first and the third questions about the advice provided by the design guides and about what form the outline for

a more robust design guide could take. The discussion section will address the second question regarding additions to the current scientific debate. It will also present a new outline for a more robust guide, investigating its strengths, weaknesses, and additions to the current debate. The article concludes with a proposal of how to further develop this outline.

## METHODS

To answer the three main questions of this article, we opted for an in-depth analysis and comparison of five design guides: Stern and Fineberg (1996), Beierle and Cayford (2002), Creighton (2005), Mazri (2007), and d'Aquino (2008).

### Criteria for selecting the design guides

The design guides were selected based on previous reviews of the craft literature (e.g., Webler 1997, von Korff 2007) as well as the practical experience of the authors, who have all used design guides to aid in the conception of participation processes (see Bleiker and Bleiker 1994, U.S. Environmental Protection Agency 1996, Vic Roads 1997, U.S. Department of Energy 1999, OECD 2001, EU 2002, Straus 2002, Miskowiak 2004, HarmoniCop 2005, Steyaert and Lisoir 2005, Portland Development Commission 2007). We selected the guides for this article according to the following criteria:

- All the guides are "meta designs," which is to say that they offer general principles and processes that help designers to develop participation processes for unique initial design contexts. This means that they are the opposite of a blueprint, which outlines how a participation process should look.
- They can be applied to various domains of participation even though the backgrounds of several of their authors are domain-specific.
- They are either widely cited, e.g., Stern and Fineberg (1996) and Beierle and Cayford (2002) in Google Scholar; widely used in higher education, e.g., Creighton (2005); or are French-language guides, e.g., d'Aquino (2008) and Mazri (2007). Because of our own work background in French-speaking countries, we particularly wanted to include the latter to add useful diversity to our study. Because citation frequencies for French-language guides on Google Scholar were rare, we chose these two authors on the basis of our personal knowledge of the quality of their work.

These choices were intended to meet the following criteria:

- The guides must be of help even in the great variety of initial design contexts that designers face at the outset of different design situations.
- The guides must be of interest to a larger community of participation designers.
- The guides must meet certain quality safeguards. This is an important point, because we base the very idea of analyzing and comparing various design guides on the premise of their quality, as we will explain in the next subsection.
- At least some of the French literature on participation, which is not often represented in the international discussion, must be made accessible.

Before moving into our comparative analysis approach, we first provide a brief introduction to the design guides by outlining the types and backgrounds of the guides and their authors.

### Background of the design guides

*Stern and Fineberg (1996)*

This work is the output of a 17-member committee composed of a variety of practitioners and scientists and convened by the U.S. National Research Council with a mandate to improve decision making through the reconceptualization of how risk is characterized. Their envisioned risk-characterization process, which is intended to promote the making of sound and accepted decisions, is based on both technical analysis and deliberation with interested and affected parties. The guide discusses the issues with traditional expert-based risk characterizations as well as the role and limitations of deliberation,

the purpose and implementation of analysis, the integration of deliberation and analysis, and practical steps to implement an integrated approach. It also includes several case studies and an overview of participation mechanisms. The planning approach of the guide has been discussed for watershed management by Webler and Tuler (1999).

*Beierle and Cayford (2002)*

The authors conducted a rigorous survey of 239 North American examples of participatory natural resource management. Even though their survey focused mainly on possible results, i.e., the "social goals" of participation, they also included a more craft-based chapter on process design, the recommendations from which are based on "informal insights as well as ... formal results." Their advice is for both governmental and nongovernmental project planners and organized in five steps or phases that are concise and drawn in part from their empirical findings.

*Creighton (2005)*

Creighton's work is the result of 36 years of experience as a participation practitioner, mostly in North America. The founding president of the International Association for Public Participation (IAP2) has, according to his own indications, contributed to or designed more than 300 public participation programs and written more than 30 guides on the topic. His 2005 work is meant to help practitioners in diverse fields of participation. It captures much of his professional experience but also considers the results of research on participation. The advice on design comes in 16 detailed steps that are supported by general principles, numerous examples, contingency discussions, and other tools.

*Mazri (2007)*

This author writes in the context of French public administration and from the point of view of a consultant or *analyste* who advises a decision maker, the *préfet,* on how to set up a participatory process for a specific policy decision. Mazri has tested his approach in a risk management context but emphasizes its applicability in other areas. The approach is a design process of five phases, including advice on how the designer should proceed in each phase plus various models for illustration. To develop this design process, Mazri extensively reviewed bodies of management, decision-support, risk, and participation literature.

*d'Aquino (2008)*

Patrick d'Aquino relies on 20 years of implementation and evaluation experience, mostly in a natural resource management context and in developing countries. His approach is, at this point, the least conceptually developed design method of the guides presented here, although it is linked to a theoretical analysis (see d'Aquino 2007). So far, the approach principally consists of a series of multidimensional worksheets based on empirical findings about how to guide designers to shape answers to "how," "when," and "why" questions on participation (for an example, see Fig.2).

## An approach for analyzing and comparing the design guides

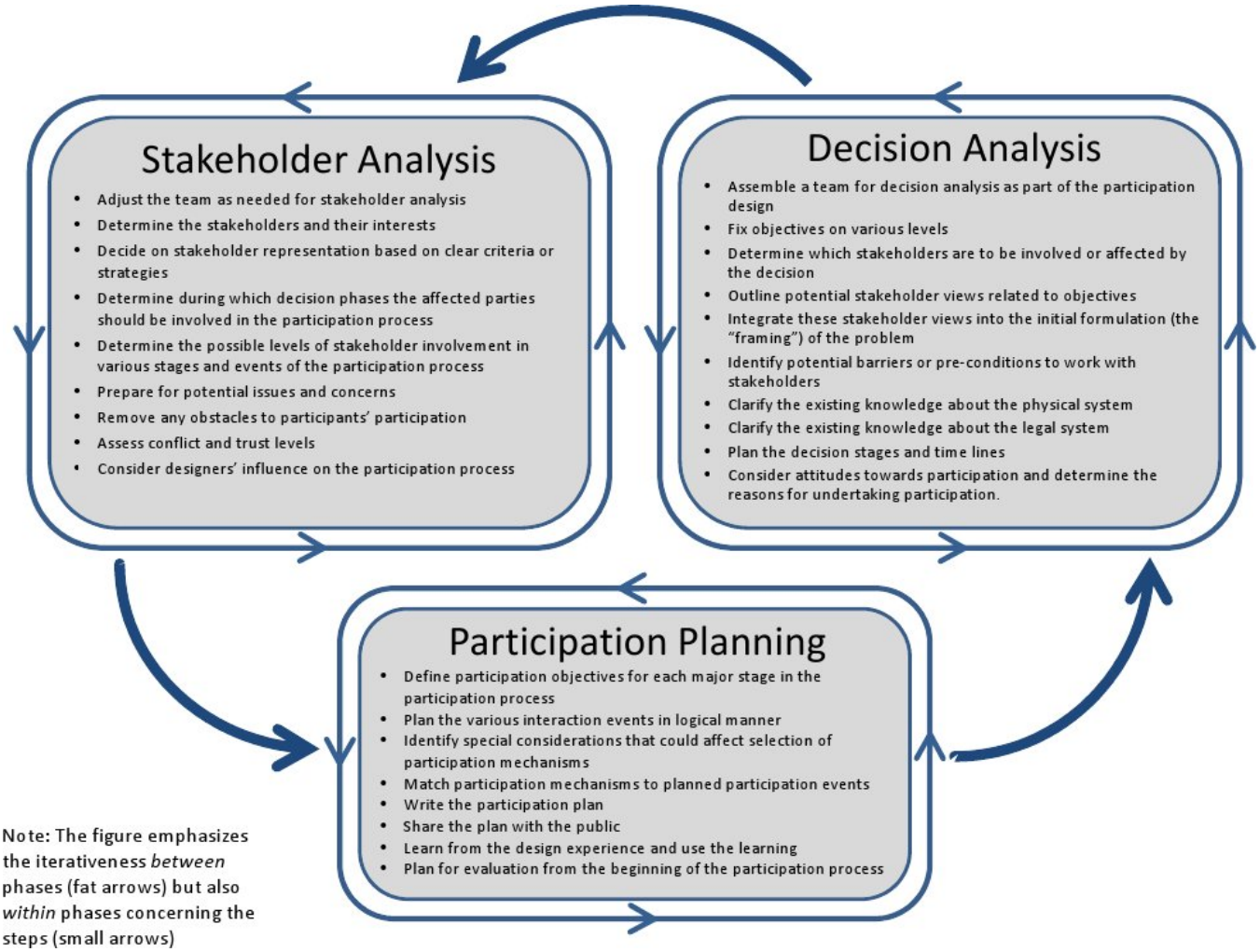
For our research questions we required a method that would allow us to determine:

- the content of the guides and their similarities and differences,
- the extent to which it is possible to combine the various elements of these guides into an outline for a new and more scientifically robust guide, and
- how this outline would add to the existing state of knowledge.

In a first stage to aid our analysis, we defined typical elements of the design guides:

- Phases are the larger units of the design process. One phase consists of a number of steps. The idea of using phases and the selection of the eventual three phases were largely inspired by Creighton's 2005 design guide.

**Fig. 2.** A model for the new guide.




- Steps are smaller units of the design process, typically based on a topic such as potential participants. This often takes the form of a number of questions that designers should ask to develop their participation plans, such as the following: Who is the decision maker? Who is likely to be affected by the decisions? Who has resources for informing this decision?

- Substeps are distinct and comparable pieces of advice that may include individual questions such as those given above. Because of inconsistency in language, e.g., what one guide refers to as "steps" are called "stages" or "phases" in another, and the overlapping of the guiding questions and advice in the design process steps, we found that deconstructing the guides into individual pieces of advice or substeps provided an easier basis for comparison. This discussion will be further developed below.

- Design tools are used in substeps and help the designer carry out the practical work. They could be any of the following: sets of guiding questions, including for contingency discussions, e.g., what the designer should do if something unexpected or undesired happens; models; comparison tables; and worksheets.

- Principles are general pieces of advice for the designer that may be relevant for the design process as a whole or for individual parts of it. If the phases and steps help orient the designer in terms of what to do first and what to do next, principles provide a compass in a variety of situations. Principles take precedence over other design elements such as steps or tools.

As a second stage of our method, to find a more robust core for a potentially new design guide we deconstructed, compared, and reorganized the various steps and principles of the five guides. We proceeded as follows:

For each author, we created "author tables" (Appendix 1: Tables A1-1–A1-5) based on substeps. In these tables we listed the step as originally named by the author, deconstructed the step when this appeared necessary for comparability, and explained the substep according to the descriptions by the authors of the guide. In the fourth column of the author tables, we noted which substeps in the other guides corresponded to the substep under examination, which brings us to reconstruction.

In three "reconstruction tables" (Appendix 2: Tables A2-1–A2-3), we recombined the results (substeps) of the author tables into steps that could be the basis for a new, more robust guide. The new steps appear in the left-hand column of the reconstruction tables, and the substeps are listed in the next column. Essentially, we combined substeps into new reconstructed steps if the substeps were highly similar in terms of the advice they offered and the questions they asked. In some cases, we also recombined substeps that could be summarized under one common umbrella even if they were slightly different, such as step DA 2 in Table A2-1 (Appendix 2). There are also examples of newly formed steps in which the substep of one author would thematically include some or all of the other substeps, such as step PP (participation planning) 3 in Table A2-3 (Appendix 2). However, we did attempt to avoid partial overlaps in which the recombined substeps contained elements that did not fit into the newly formed reconstructed step. If substeps appeared unable to be combined according to the above-mentioned criteria, e.g., highly similar, common umbrella, or mutually inclusive, we listed them as distinct steps in the reconstruction table. We discuss similar, complementary, and contradictory elements of the substeps in the third column of the reconstruction tables. Finally, we suggest in the right-hand column of the reconstruction tables what the reconstructed steps may mean for designing participation processes in water management.

Sometimes, reconstruction resulted in additional steps, which are marked as such in the reconstruction tables. Although these steps are not required in the new outline, they may be useful in some contexts.

For working on the design principles, we used a similar approach. We first listed the various principles in an overview table for four guides (Appendix 3: Tables A3-1–A3-4); the fifth guide (d'Aquino) does not mention principles. We analyzed each principle for similarities and differences with other principles (right-hand columns). Because principles would often not match up exactly, as happenend with the steps, we reconstructed seven "umbrella principles." Under each of these, we listed a number of similar principles in a principles summary table (Appendix 4: Table A4). We discussed the meaning of each umbrella principle and the comparison of its underlying principles from the four guides in the right-hand column, as well as agreement among these principles as expressed in the guides.

Our assumption behind this recombination method is that any reconstructed elements, whether they are steps or principles, are more robust than when they stem from only a single guide, because they will be based, in many cases, on several similar steps in various guides. The limitations of this assumption, and also the fact that our reconstruction method involves a degree of subjective choice, will be addressed in the discussion section of the paper.

As a last word on design tools, there are many tools presented in the five guides, but because of space restrictions, we chose not to present and compare them in detail in this article. We consider tools as essentially connected to specific steps and substeps and have confined our analysis to categorizing them and providing a few examples.

## RESULTS

In this section we will present the results of our comparative analysis of the five guides. By doing so, we hope to understand what advice on design processes the guides contain and to what extent this advice is similar, complementary, or contradictory. In addition, the analysis will allow us to present the outline for a new, potentially more robust and comprehensive design process. The outline as presented here consists of principles, phases and their interior steps, and tools for participation processes.

We will now turn to the various elements of the potential new guide. We will start by presenting the principles of design, followed by the steps and tools.

### Design principles

The comparison of the principles (P) contained in four guides (Tables A3-1–A3-4) led us to propose seven overarching design principles:

1. P1: See the participation process as an opportunity for effective decision making and not as a constraining obligation. Decision makers should welcome the idea of participation when it is appropriate, because a successful process will enable them to implement a decision. This principle also implies that any interaction with stakeholders during design or later during implementation should be clearly and transparently linked to specific decisions that are to be made.

2. P2: Consider the input of the stakeholders during design and implementation. This principle follows from P1. It means that the lead agency must commit to taking the contribution of stakeholders into account. It does not mean to do exactly what the stakeholders want but to consider their input for any decisions that are to be made. From this, it follows that the lead agency should transparently explain on what grounds it decided or declined to take into account specific stakeholder inputs.

3. P3: Encourage inclusive and appropriate stakeholder involvement. This principle means that a balance needs to be found between involving all affected and interested parties early on, which could mean erring on the side of too much participation, and remaining efficient in the use of resources for participation, i.e., refraining from involving everybody in everything.

4. P4: Clearly define the roles and responsibilities of the lead agency and those of the participants. From the beginning, the lead agency should be transparent about the influence that participants may have on the decision as well as about the roles the agency itself is to play in the design and implementation processes, e.g., neutral or partisan.

5. P5: Respect political realities. This principle establishes that the main decision makers, not necessarily the lead agency, need to be identified and that they remain responsible for the final decision even if they choose to delegate this responsibility. Decision makers may also be responsible for many decisions during the design process, such as deciding who will be involved in the participation process and on what issues. This principle is in natural tension with the second, so the two should be balanced.

6. P6: Meet the needs of the stakeholders and context. This principle integrates a number of ideas. Among other concepts, it states that stakeholders should be involved in framing or formulating the problem to be addressed in the participation process; that participation mechanisms should be chosen according to the needs of the public, e.g., interest, knowledge, and the realities of the context, e. g., resources, environment, political situation, and objectives; and that participants should be provided with the means, e.g., knowledge, opportunities, to participate in a meaningful way.

7. P7: Always remain open to adjusting the process design. This principle highlights the fact that designers should be prepared to

adjust the planned participation process and the subject matter to be treated in the process as information or additional constraints arise through the design and implementation of the participation process. It considers that critical or reinforcing stakeholder feedback can incite adjustment of the process in areas such as the topic chosen (as already pointed out in P6), the focus of the problem analysis, the experts selected to address a specific question, the stakeholders to be involved, and the participation mechanisms foreseen.

These seven principles, as pointed out in the methods section, resulted from grouping similar principles across guides under a common umbrella. We note that different recombinations and thus summary principles may also be feasible because there is some subjectivity that cannot be avoided in our analyses, as will be further outlined in the discussion.

Among these principles, we found no direct contradictions between the guides; our corresponding analysis can be traced with the help of the author principle tables, A3-1–A3-4 in Appendix 3, and the summary table in Appendix 4, Table A4. Nevertheless, we realized that there were tensions between several of the principles, e.g., between P2 and P5, or even within principles such as P3. This means that designing participation processes consists of finding a balance between pushing for the breadth and depth of participation and respecting political, financial, cultural, and psychological realities.

After looking at the principles that provide more general guidelines for design, we will now turn to the phases and steps that walk the designer through the construction of a participation process in more detail.

## Three phases in design

While studying and comparing the guides, it occurred to us that it may be possible to organize the outline for a new guide into three distinct phases. The idea of doing so was inspired by Creighton, although after comparative analysis of the other guides, some adjustments to phase content and labels have been made. The three we see as important from our comparative analyses are:

1. decision analysis,
2. stakeholder analysis, and
3. participation planning.

We will now explain the phases in more detail by introducing the steps we see contained within them. The phases and their steps are also represented in Fig. 2.

## Steps for design

### *Decision analysis*

Decision analysis (DA) serves to identify the relevant decision makers, the purpose of the decision, and the rationale for a possible participation process. It also helps to pre-identify timelines and potential stakeholders and to set up a design team. The term comes from Creighton (2005), who considers that decision analysis can be broken down into six distinct steps (see Appendix 1: Table A1-3). For the other authors, similar elements played a role in this first phase as the author tables on decision analysis show. In summary, the comparison resulted in the reconstruction of 10 steps on which there appears to be considerable agreement among the five guides.

1. DA 1: Assemble a team for decision analysis as part of the participation design. Its members should belong to the lead agency, e.g., the water board, but can also include stakeholders or hired consultants if this appears useful for the following steps.
2. DA 2: Fix objectives on various levels. This step consists of asking: From our point of view as lead agency, what are the problems to be solved, e.g., depleting aquifers or water quality issues? What are the decisions to be taken, e.g., developing a water management plan? What are the possible purposes of the participation process, e.g., gaining the support of stakeholders for the measures to be taken? What is the possible purpose of the decision, e.g., to arrive at a sustainable water management situation?

3. DA 3: Determine which stakeholders are to be involved in or affected by the decision. Ask: Who are the actors who are likely to be interested in or affected by the problems under consideration and the decision to be made? This can also be extended to nonhuman stakeholders such as ecological systems and future generations.

4. DA 4: Outline potential stakeholder views related to objectives. Consider what stakeholder views could be with regard to the proposed objectives and the issues that were evoked in DA 2. This is not yet to be a fully fledged stakeholder analysis, only a preliminary sketch.

5. DA 5: Integrate these stakeholder views into the initial formulation or framing of the problem. The stakeholder views that were previously considered are now built into the objectives, political and resource constraints permitting. The basic idea is to take into account assumed and already known stakeholder opinions to avoid stakeholders' later disappointment. It is especially important to consider the views of high-level decision makers and other agencies that may have some shared decision-making authority. For a water authority, this could mean considering the views of officials at the provincial and ministerial levels, land-use planners, and other authorities such as managers of parks and wildlife areas.

6. DA 6: Identify potential barriers or preconditions to working with stakeholders. Analyze what competencies stakeholders need before the participation process starts in terms of their motivation, knowledge, and practical capacities so that they will be able to effectively participate.

7. DA 7: Clarify the existing knowledge about the physical system. Determine what studies, models, and action plans for the system, e.g., an aquifer, already exist and create a preliminary synthesis of state-of-the-art knowledge on the system. In many water management processes, including the development of water basin management plans, careful consideration is required to account for the spatial and temporal diversity of hydrological and social systems over the basin's area. This knowledge may then be linked to questions of stakeholder selection, among others.

8. DA 8: Clarify existing knowledge about the legal system. This may include relevant high-level legal texts, e.g., the European Union Water Framework Directive for water management in the EU states, and national and local regulations. Often it is also necessary to consider legal regulations that are not directly linked to water management or natural resources management but are nonetheless relevant for a given decision to be taken, such as land planning and public participation regulations.

9. DA 9: Plan the decision stages and timelines. Clarify to what extent and when to carry out the stages of a decision-making process, such as problem and values formulation, the development of alternative solutions, the development of evaluation models, and final recommendations.

10. DA 10: Consider attitudes toward participation and determine the reasons for undertaking participation. Avoid high levels of participation when there seems to be a lack of willingness in the lead agency to consider the input of the stakeholders, because it may lead to their collective disappointment in or disillusionment with the decision-making process.

The steps can also be found in Table A2-1 (Appendix 2) and the corresponding substeps in the author tables (Appendix 1: A1-1–A1-5). Here we would like to point out that all five guides have quite similar views on DA 2, DA 3, and DA 5 and four guides on DA 4 and DA 10. The other steps are either mentioned by only one (DA 7) or two guides (DA 1, DA 6, DA 8, and DA 9). However, even these steps appear complementary with the other guides, and we did not uncover any contradictions. Similarities and differences are further discussed in Appendix 2: Table A2-1.

We also found three additional steps (see Appendix 2: Table A2-1) that we consider optional.

Having said that there are no contradictions, we want to stress that, even when substeps are highly

similar, they should not always be equated. For example, Creighton recommends identifying the decision maker and the stakeholders to be involved, which appears slightly different to Stern and Fineberg's recommendation of determining who is at risk; both these substeps are integrated into our DA 3. The reasons for such small differences include the following:

- All the guides are built on different thematic backgrounds. For example, Stern and Fineberg's guide is specifically developed for risk characterization processes, whereas Creighton proposes steps for participation processes that are not domain-specific.
- The exact focus of substeps, despite their similarities, often varies. In our example, Creighton focuses strongly on finding out the views of the decision makers, whereas Stern and Fineberg appear to be more concerned with the views of all the stakeholders.
- The proposed audiences of the guides are different. For example, Mazri writes on how a consultant and a decision maker can collaborate to develop a productive exchange and design, which differs from Beierle and Cayford, who provide direct advice for lead agencies rather than for consultants supporting lead agencies.
- The meaning of a given step is most precisely understood in the context of the rest of the steps in the same guide. This meaning is necessarily reduced by reconstructing the original steps into new steps.

The implication of these differences for a new guide will be further addressed in our discussion section.

*Stakeholder analysis*

This design phase leads to a more in-depth characterization of the relevant stakeholders and their involvement in the participation process. It is based on a concept that has been extensively described and discussed elsewhere (e.g., Grimble and Wellard 1997, Bryson et al. 2002, Bryson 2003, Mayers 2005) and has been noted for its importance in ensuring informed decision making that is also supported by target groups. As highlighted by Bryson (2003): "Failure to attend to the information and concerns of stakeholders clearly is a kind of flaw in thinking or action that too often and too predictably leads to poor performance, outright failure or even disaster."

All five guides subscribe to the importance of stakeholder analysis in participatory policy making and have adopted elements of it. The core elements they all emphasize are captured in two questions:

1. Which actors should be involved in the decision-making process?
2. What are the actors' interests?

Considered together, the various substeps of the five guides resulted in the following reconstructed steps for the lead agency to take in stakeholder analysis:

1. SA 1: Adjust the team as needed for stakeholder analysis. Check to see whether the initial team from the decision analysis stage may need to be adjusted based on new planning requirements for stakeholder analysis, e.g., bring in social scientists to conduct surveys, people who are familiar with some of the stakeholders or stakeholders themselves.
2. SA 2: Identify the stakeholders and their interests. In water management as in other participation arenas, the stakeholders and their interests should be identified. Various techniques and sets of questions (see "tools") can be used for this. Thus, it becomes possible to develop a more informed view on how far and to whom participation should be extended.
3. SA 3: Decide on stakeholder representation based on clear criteria or strategies. Water managers should reflect on whether participants should be represented by the members of their own group or by surrogates such as attorneys or scientific advisors. Participants may be selected based on socioeconomic criteria, chosen because of their expertise, or self-recruited. These decisions should be made based on the objectives of the process and a few key considerations (see especially Appendix 1:

Table A1-5). Criteria and strategies may need to be clearly documented for procedural transparency.

**4.** SA 4: Determine during which decision phases the affected parties should be involved in the participation process. Given the specific expertise and interests of the various stakeholders, they should be involved in the participation process when their interests and expertise match the requirements of the process, e.g., certain experts in the diagnostic phase, affected water users throughout the process.

**5.** SA 5: Determine the possible levels of stakeholder involvement in the various stages and events of the participation process. Consider appropriate levels of influence, e.g., being informed, being consulted, or being involved in problem solving, for different stakeholders throughout the participation process. This reflection should be based on the stakeholders' levels of interest, their expertise and influence, and the objectives of the process.

**6.** SA 6: Prepare for potential issues and concerns. Try to foresee any issues that may come up in the discussions with the stakeholders so that preparatory work such as studies, policy decisions, and information materials can be done beforehand.

**7.** SA 7: Remove any obstacles to participation. This could include participant training sessions or extra funding if a lack of knowledge or funding is perceived.

**8.** SA 8: Assess conflict and trust levels. In water management, as elsewhere, conflict and lack of trust between stakeholders at different levels may already exist before the process starts. This can have implications for participation design; for example, the lead agency may have to allow for longer and more intensive processes for high-conflict situations or select appropriate tools to manage the situation.

**9.** SA 9: Consider designers' influence on the participation process. When designing and running participation processes, decision makers should ask themselves how much influence they want to exert on the process. They will basically have to find the right mix between generating clarity and structure on the one hand and openness and trust on the other, leaving the process open to be adapted by the participants.

We note that several steps in the stakeholder analysis phase are a reiteration of steps DA 3, DA 4, and DA 5 of decision analysis, except that now the research is done in collaboration with the concerned stakeholders and not merely based on the assumptions of the decision analysis team about stakeholder views.

More often than in the decision analysis phase, several steps are mentioned by only one or a few of the authors. Creighton, for example is the only one who reflects on putting together a specific stakeholder analysis team, although Stern and Fineberg mention this in the participation planning phase below.

Nevertheless, we did not discover substeps in outright contradiction to each other even if the advice on how to implement them differed, e.g., how to determine levels of stakeholder involvement. This "how-to" aspect also involves tools and will be addressed below.

There is one additional step in our stakeholder analysis reconstruction table, which is essentially a repeat of P7, i.e., always remain open to adjusting the process design, so we did not include it in our core steps.

*Participation planning*

The reconstruction of substeps for participation planning proved more complicated than for the two preceding phases. In participation planning, the guides rely on the information gathered in the previous steps and translate this into participation plans. However, the previous steps described in the different guides do not always, as already mentioned with regard to decision analysis, follow the same logic. For some authors such as Creighton, the participation process to be designed consists of various major stages such as fact finding, problem analysis, the search for solutions, etc., as well as participation events that can occur within these stages, such as specific meetings with stakeholders.

Other authors such as Mazri plan directly for single events. Also, the various thematic backgrounds of the authors, e.g., risk analysis, development, the environment, etc., create some differences in the foci of the substeps. We have dealt with these two problems by including the idea of stages as well as events in our new guide and leaving out substeps that seemed to be too domain-specific, classifying them instead as additional steps.

After adjusting for additional steps, participation planning resulted in the following reconstructed steps:

1. PP 1: Define participation objectives for each major stage in the decision-making process. If designers have already defined the major stages of the process (see DA 9), it may make sense at this point to reconsider the objectives of each of these stages in the light of new information that may have surfaced during stakeholder analysis.

2. PP 2: Plan the various interaction events in a logical manner. As well as thinking about the objectives of stages and stakeholder involvement, designers should also reflect specifically on how they plan to sequence the participation events to align with resource constraints, information, and participant needs.

3. PP 3: Identify special considerations that could affect the selection of participation mechanisms. Systematically check how issues such as the technical complexity of the issue, facilitation team skills, or a hostile public could affect your participation planning.

4. PP 4: Match participation mechanisms to planned participation events. Translate the previously gathered information into a design that lists the key decision points; the participation events that will take place for these; the specific participation mechanisms, e.g., open houses, consensus conferences, etc., to be used in these events; the participants and their level of involvement; and the issues to be addressed.

5. PP 5: Write the participation plan. Convert the previous planning into a coherent written plan explaining the political context, the participation activities that will take place, the sequence of the activities and their interrelationships, and the rationale of the planned decision-making process. The ways in which adaptations to the plan may occur should also be outlined.

6. PP 6: Share the plan with the public. Lead agencies should be open to receive feedback to their plan. They can do this in several different ways. Perhaps the most pragmatic method is the one proposed by Creighton and by Stern and Fineberg: Distribute the plan to stakeholders once it is finished and receive feedback on it at the first stakeholder meeting.

7. PP 7: Learn from the design experience and use the knowledge acquired. Lead agencies and their water managers should use opportunities to learn from the design process. For example, they can receive and use feedback either from outside stakeholders or from within the organization concerning the content of the participation plan and the way it was designed.

8. PP 8: Plan for evaluation from the beginning of the participation process. If managers want to continuously improve the process during its implementation and also learn something about the appropriateness of the process as a whole, they should consider what kind of system they can set up to monitor and finally evaluate the participation process.

## Tools for design

The previous subsections have moved from general principles for design through increasingly concrete phases, steps, and substeps. Even more fine-grained advice is contained in the tools that help designers complete the details of their work. We distinguish three different kinds of tools described in the guides: (1) basic tools, (2) tools for matching elements, and (3) finalizing tools.

Basic tools, which include questions and checklists, are used to systematically complete the various steps. All the authors we examined, for most of their steps, furnish specific questions that designers need

to ask. Many of these questions can be found in the explanation columns of the author tables. Creighton in particular as wll as Stern and Fineberg reach a high degree of thoroughness by putting questions and advice into the form of checklists. An example of a question-based checklist that can be used to identify stakeholders is provided in Appendix 5, which also contains an example of an advice-based checklist that can be used to find out more information on stakeholders.

Worksheets, models, and tables are examples of tools for matching elements. During all phases, the guides propose that many of the identified elements be matched up to facilitate the construction of the final plan, e.g., matching selected stakeholders to various levels of participation or stakeholders to discussion issues (see Figs. 3 and 4 as examples).

Ultimately, there are finalizing tools. They serve to integrate all the results from decision and stakeholder analyses with appropriate participation mechanisms and to make the plan. The guides note that there is a challenge for the designer at the end of the design process when many or all of the objectives, context elements, and preplanning steps have been finalized. This challenge consists of relating these numerous elements to adequate participation mechanisms such as citizen juries, public hearings, advisory committees, and modeling sessions. According to all the guides, there is no clear formula for carrying out this activity. Instead, so that they can match them with the many identified requirements, designers are expected to be knowledgeable about the qualities of the numerous participation mechanisms available; Creighton (2005), Mazri (2007), and Stern and Fineberg (1996) describe some of them. However, Creighton and Beierle and Cayford (2002) also offer a few tables in which they link the results of certain design process steps to possible participation mechanisms (see, for example, Table A5-1 in Appendix 5), even though they emphasize that automatisms in choosing tools should be avoided. Once the tools are chosen, they are also to be scheduled in the final participation plan. To allow the capture of multiple elements at once, d'Aquino (2008) offers a multidimensional Excel spreadsheet.

As can be seen from the author tables, we found that almost every step or substep is linked to specific tools, often in the form of questions or basic tools, but also in the form of the other two types of tools. As previously noted, we cannot present all these tools in this article and advise the reader to refer back to the guides for these. Taken together, these tools create a toolbox from which the designers may select appropriate mechanisms as they construct a participation process, while being guided by the seven principles and the various steps and substeps in the three phases outlined in this section.

## DISCUSSION

### An outline for a scientifically more robust design guide

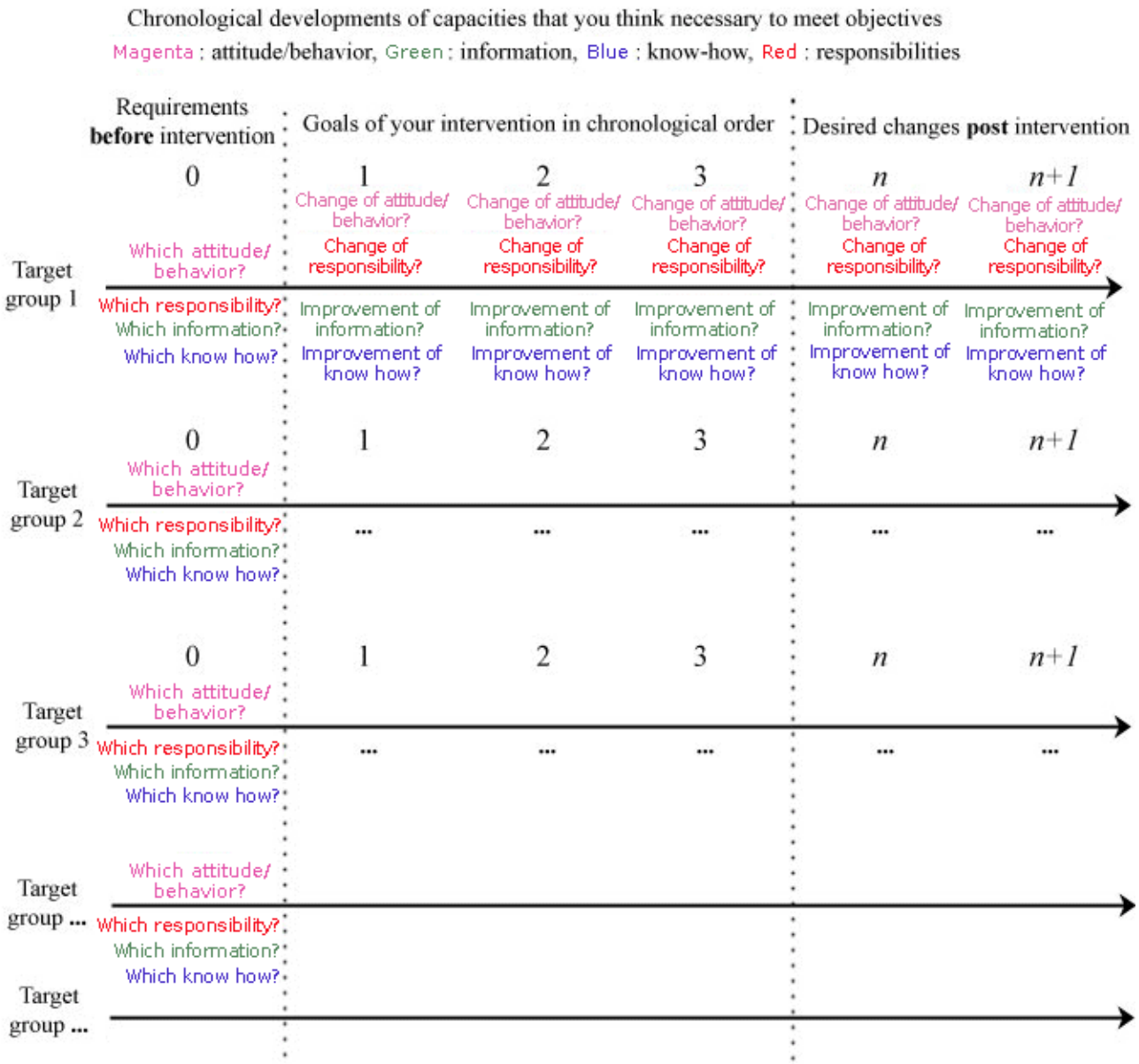
The outline for a scientifically more robust design guide has been presented in the results section and in the form of the various author and summary tables. It consists of the seven principles mentioned above, the steps contained in the tables of the three phases, and the various tools in the original guides. We would like to (re)emphasize certain important features of this new proposed outline for participation design:

- It has wide-ranging applicability. Even though this new guide was constructed from the perspective of natural resources and water management, we speculate that its principles, steps, and tools are applicable in a vast array of public participation situations in multiple domains. This is not in the least surprising, because the guides on which it is based stem from multiple domains.

- It provides broad, as well as detailed, orientation for designers. Because this new guide features principles, phases, steps, substeps, and tools, designers can find general orientation as well as very specific advice on how to proceed in a given situation.

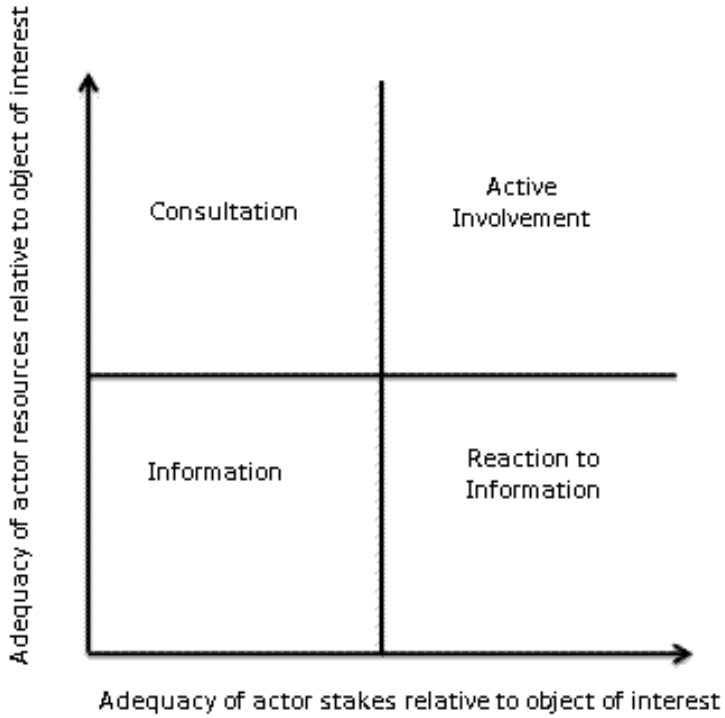
- It increases the involvement of stakeholders. One feature of this guide is that, throughout the design process, the involvement of stakeholders is gradually broadened. Although responsible managers may start the decision analysis phase all by themselves, they will gradually involve more people. At the end, the plan is submitted to as many interested and affected parties as possible. The participation design process is itself a participatory process.

**Fig. 3.** Example: Matching potential stakeholders to process objectives.




- It is pragmatic. The new guide does not propose participation for all situations but only when it is really required and desired. It encourages designers to use certain types of participation in difficult design contexts such as high technical complexity, but to drop participation when the commitment of key decision makers is lacking.
- It is iterative. The guide features iterativeness as an important principle of design. This means that, despite a certain sequential logic, each step from each phase may be included and repeated later at any point through the design. We have tried to graphically represent this in Fig. 2, which is a model for the new

**Fig. 4.** Determining levels of involvement by matching stakeholder resources to levels of interest.




guide. It shows the three phases and the names of all the steps for each phase. The circles and arrows indicate the iterative nature of the design process among phases and also within phases.

- It is adaptive. Iterativeness implies that there is a continuous adaptation of the design process as new information appears and that development of the final plan through the participation process is also possible.

## Potential weaknesses of this outline

The proposed outline can serve as the basis for the development of a fully fledged guide. It can only be preliminary in nature because of the chosen method and the space limits of this article. Some of the following points are likely to warrant additional work.

*Small research base*

We used only a small research base. It may be said that to choose only five guides limits the robustness of the new guide. Nevertheless, we strongly feel that for a first comparative effort of this kind the result is sufficiently instructive. More guides may be added in the future.

*Subjectivity in the definition of substeps and principles*

It was impossible to avoid some subjectivity in the definition of substeps and principles. Even though we followed a clearly defined methodology to deconstruct steps and to reconstruct substeps and

principles, we chose to what extent we deconstructed steps and also how exactly we reconstructed substeps and principles, as carefully justified in our author tables. This means that our outline is a possible one, but certainly not the only one, that could result from such a comparison. Further investigation of other possible recombinations may lead to fruitful results for improving the new guide, and we therefore invite debate and discussion on this subject to develop this important area between research and practice.

*Some uncertainty about the absence of contradictions*

The absence of contradictions remains problematical. Our results do not show any significant contradictions between any substeps or principles across the different guides, even though we recognize some tensions. However, we cannot be sure of this result, because some guides do not focus on some of the steps contained in some of the other guides. For example, SA 7 in stakeholder analysis, i.e., remove any obstacles to participation, includes an often discussed issue in participation processes: To what extent should participants be supported with additional funds? The answers are not easy, and it is not so clear what, for example, Beierle and Cayford would have to say about this. Therefore, our outline has to live with a caveat on robustness for those reconstructed steps and principles in those cases in which only a few or one author contributes to this step or principle. We would therefore invite further discussion on this issue, especially with but not limited to the authors of the different guides.

*Loss of some of the inherent logic of each guide*

Our outline had to sacrifice some of the inherent characteristics of the five separate guides. Stern and Fineberg's work, for example, focuses on risk characterization, and the new outline is wider and at the same time less specific. Mazri provides advice for the situation of an analyst and a decision maker interacting to design a participation process, and our advice is intended specifically for the manager of a lead agency. Creighton gears his guide toward a series of participatory events involving distinct stages, whereas Beierle and Cayford design for a one-off event. Our result is an integration of these various logics into a new logic, namely an outline that can be the basis for designing participation processes in various domains, that provides guidance to the lead agency, and that considers participation a long-term process involving multiple events.

*Simplifications concerning the lead agency*

Our model foresees a lead agency that initiates the design process and later will be responsible for implementation. In reality, there may sometimes be more than one lead agency, for example, when exploring transboundary water management issues. However, we did not choose to dwell on what happens and what needs to happen within the design team, although we touch upon this in DA 1 and SA 1. Daniell et al. (K. A. Daniell, I. White, N. Ferrand, I. S. Ribarova, P. Coad, J. Rougier, M. Hare, N. A. Jones, A. Popova, D. Rollin, P. Perez, and S. Burn, *unpublished manuscript*) focus more directly on some of these aspects.

*Some practical points*

On a practical side, because this was never intended to be anything more than an outline, it requires further development. In particular, the design tools should be catalogued and linked to steps in which they are useful. Participation mechanisms such as citizen juries, open space processes, and modeling sessions should be explained, and their advantages and disadvantages discussed. When more space is available, it would equally be useful to integrate the reconstructed steps in our results section with the descriptions in the author tables to enable the reader to move from the general to the detailed in a coherent text.

## Addition of this article to the literature

The second main question of this article was: What can the knowledge contained in the craft guides add to what is mentioned in the scientific literature? The latter, as we noted in the introduction, contains much valuable information for designers, namely discussions of the potential benefits of participation as well as examples and ideas of how participation and participatory mechanisms can be evaluated (Rosener 1978, Lynn and Busenberg 1995, Webler et al. 1995, Petts and Leach 2000, Bellamy et al. 2001, Carr and Halvorsen 2001, Beierle and Cayford 2002, van Asselt and Rijkens-Klomp 2002, Irvin and Stansbury 2004, Rowe and Frewer 2005, Midgely et al. 2007). Besides operational reflections and case studies on stakeholder analysis, it is especially the research on criteria for good or

effective participation processes (Webler 1995, Rowe and Frewer 2000, Syme and Nancarrow 2002, Marks 2004, Rowe and Frewer 2004) that should be of interest to designers. For example, Rowe and Frewer (2000), who developed nine criteria for effective participation processes that include such elements as the representativeness of the selected participants and the lack of bias in the process, suggest that their criteria can be used not only to evaluate processes but also "a priori to ensure the effectiveness of an exercise *application*" (Rowe et al. 2001). Similarly, Webler (1995) proposed criteria to ensure a good participation process, which are presented as a comprehensive set of detailed rules and subrules specifying the two major concepts of "fairness" and "competence."

Nevertheless, because of their ideal nature, none of these principles should be imposed on every possible participation process. In some contexts, for example, one with a skeptical decision maker, a less than ideal process may be required (see Rowe et al. 2001, Webler and Tuler 2001, Webler and Tuler 2006). It is here that the outline can take designers a step further because the principles and steps that are suggested in it deal with the issue of how to design participation in a pragmatic way (cf., for example, the advice to take into account political realities). Thus, the outline presented here does not set cornerstones for an ideal process but makes various processes possible in different contexts. It is up to the designers to make choices that can be supported in a specific context.

In reality, this means that, in some circumstances, lead agencies may opt for fully fledged ideal processes. In other circumstances, such as in certain cultural or political contexts, less developed participation processes may be warranted, and in yet other contexts the agency may decide to drop participation altogether because there is no corresponding political will or simply no interest on the part of the public.

Our article thus addresses another important question in the scientific literature on participation (Rowe and Frewer 2004): What process should be chosen in which context? There have been attempts to answer this question by systematically listing possible contexts and relating them to mechanism types (Rowe and Frewer 2005). We propose a different path. Instead of trying to systematize contexts and possible responses, we are attempting to provide a scientifically robust means for practitioners to allow them to construct an appropriate process in a large variety of contexts, i. e., a more robust design guide.

Our response to the question of what process in what context is thus different from the response of Rowe and Frewer. Whereas the latter attempt to develop a system of categories that ultimately will require the natural resources manager to match given context categories to given mechanisms, we are encouraging managers to follow an iterative and adaptive learning path throughout design and thus, together with the stakeholders, to develop an appropriate process. The principles, steps, and substeps presented here provide the means for this.

By doing this, we have also linked the craft literature more closely to the scientific debate on participation. Nevertheless, more work on bridging this gap is still required. To do so, it may be valuable to compare larger ranges of design guides.

Furthermore, it would be necessary, for purposes of a fruitful science/practice dialogue, to take a fresh look at both theories (for overviews, see Webler 1999, Delli Carpini et al. 2004, Klinke 2009) and empirical literature related to public involvement and investigate how the various practical recommendations of the new guide match those. This comparative work would fulfill Webler's (1999) demand to "justify prescriptions" and would be a task for another article.

Equally in this direction and as a next step, we hope that it may be possible to use empirical methods to test the validity of the experiential knowledge presented in design guides and our more robust guide outline in a range of different contexts, including for water and natural resources management.

## CONCLUSION

In this article, we have looked at a particular gap in the research on participation processes, namely, the question of how participation processes in water management, natural resources management, or elsewhere should be designed. We have shown that a considerable body of practitioner literature exists that deals with this question, but that this literature rarely finds its place in the academic debate. Our article is an attempt to challenge this division

because of the importance of the question for the successful implementation of participation processes and thus, arguably, also for the governance and sustainability of social-ecological systems.

We have based our contribution on a review of five selected design guides that were analyzed and compared for similarities, complementarity, and contradictions. We found a mix of similar and complementary elements that led us to present an outline for a new guide containing concrete design principles, phases, steps, substeps, and a few design tools.

This outline takes the current scientific discussion on participation an important step further because it offers a new systematic approach to addressing the question of how to design a process in a given context.

However, this outline also needs to be fleshed out. Besides linking more design tools to the substeps, and possibly further elaborating the explanations of the substeps, it also requires application in actual water management or other natural resources management or participation fields. By doing so, we will be able to check for any potential inherent contradictions in the outline and adjust for any superfluous or additionally required steps or principles.

The tests of the outline would thus form a part of the "concise research agenda for the field [of participation]" that was requested by Webler (1999), who explicitly called for cooperation between theory and practice, noting that "[p]ulling together the multitude of strands that presently make up the field and weaving them into patterns or fabrics of understandings will demand cooperation and collaboration by both scholars and practitioners." Even though some scholars have responded to Webler's call to develop their own research agenda (Rowe and Frewer 2004), the specific request to combine theory and practice in research seems to have evoked little response. We are proposing this new way to cross-fertilize craft and science.

*Responses to this article can be read online at:*
*http://www.ecologyandsociety.org/vol15/iss3/art1/responses/*

**Acknowledgments:**

*Part of this work was financially supported by the European Commission, 6th Framework Program, AquaStress Project, Contract No. 511231-2 (GOCE) and NeWater Project, Contract No. 511179 (GOCE). The contents of this paper are the sole responsibility of the authors and can under no circumstances be regarded as reflecting the position of the European Union. Special thanks to Pieter Bots, Sabine Moellenkamp, and two anonymous reviewers for their useful comments on the earlier versions of this article.*

## LITERATURE CITED

**Abelson, J., P.-G. Forest, J. Eyles, P. Smith, E. Martin, and F.-P. Gauvin.** 2003. Deliberations about deliberative methods: issues in the design and evaluation of public participation processes. *Social Science & Medicine* **57**:239-251.

**Alff, U., P. Ay, and E. Bauer.** 1999. The end of participation? A contribution to the state of the discussion. *Beraterinnen-News* **1**:17-19.

**Agrawal, A.** 2003. Sustainable governance of common-pool resources: context, methods, and politics. *Annual Review of Anthropology* **32**:243-262.

**Arnstein, S. R.** 1969. A ladder of citizen participation. *Journal of the American Institute of Planners* **35**(4):216-224.

**Barreteau, O., P. W. G. Bots, and K. A. Daniell.** 2010. A framework for clarifying "participation" in participatory research to prevent its rejection for the wrong reasons. *Ecology and Society* **15**(2): 1. [online] URL: http://www.ecologyandsociety.org/vol15/iss2/art1/.

**Beierle, T. C., and J. Cayford.** 2002. *Democracy in practice: public participation in environmental decisions*. Resources for the Future, Washington, D.C., USA.

**Beierle, T. C., and D. M. Konisky.** 2000. Values, conflict, and trust in participatory environmental planning. *Journal of Policy Analysis and Management* **19**(4):587-602.

**Bellamy, J. A., D. H. Walker, G. T. McDonald, and G. J. Syme.** 2001. A systems approach to the evaluation of natural resource management initiatives. *Journal of Environmental Management* **63**:407-423.

**Bleiker, H., and A. Bleiker.** 1994. *Citizen participation handbook for public officials and other professionals serving the public.* Eighth edition. Institute for Participatory Management and Planning, Monterey, California, USA.

**Bots, P. W. G.** 2007. Design in socio-technical system development: three angles in a common framework. *Journal of Design Research* **5** (3):382-396.

**Brett, E. A.** 1996. The participatory principle in development projects: the costs and benefits of cooperation. *Public Administration and Development* **16**:5-19.

**Bryner, G.** 2001. Cooperative instruments and policy making: assessing public participation in US environmental regulation. *European Environment* **11**:49-60.

**Bryson, J. M.** 2003. *What to do when stakeholders matter: a guide to stakeholder identification and analysis techniques.* Georgetown University, Public Policy Institute, Washington, D.C., USA.

**Bryson, J. M., G. L. Cunningham, and K. J. Lokkesmoe.** 2002. What to do when stakeholders matter: the case of problem formulation for the African American Men Project of Hennepin County, Minnesota. *Public Administration Review* **62**(5):568-584.

**Carr, D. S., and K. Halvorsen.** 2001. An evaluation of three democratic, community-based approaches to citizen participation: surveys, conversations with community groups, and community dinners. *Society and Natural Resources* **14**(2):107-26.

**Chess, C., and K. Purcell.** 1999. Public participation and the environment: Do we know what works? *Environmental Science & Technology* **33**(16):2685-2692.

**Cleaver, F.** 1999. Paradoxes of participation: questioning participatory approaches to development. *Journal of International Development* **11**:597-612.

**Coglianese, C.** 1997. Assessing consensus: the promise and performance of negotiated rulemaking. *Duke Law Journal* **46**:1255-1349.

**Creighton, J. L.** 2005. *The public participation handbook: making better decisions through citizen involvement.* Jossey-Bass, San Francisco, California, USA.

**d'Aquino, P.** 2007. Empowerment and participation: How could the wide range of social effects of participatory approaches be better elicited and compared? *ICFAI Journal of Knowledge Management* **5**(6):76-87.

**d'Aquino, P.** 2008. Fiches de travail pour construire une démarche participative. [online] URL: http://www.lisode.com/images/MD/fiches_daquino.pdf.

**Daniell, K. A., I. White, N. Ferrand, I. S. Ribarova, P. Coad, J. Rougier, M. Hare, N. A. Jones, A. Popova, D. Rollin, P. Perez, and S. Burn.** 2010. Co-engineering participatory water management processes: insights from Australian and Bulgarian interventions. *Ecology and Society* **15**, *in press*.

**de Bruijn, H. and E. ten Heuvelhof.** 2002. Policy analysis and decision making in a network: how to improve the quality of analysis and the impact on decision making. *Impact Assessment and Project Appraisal* **20**(4):232-242.

**Delli Carpini, M. X., F. Lomax Cook, and L. R. Jacobs.** 2004. Public deliberation, discursive participation, and citizen engagement: a review of the empirical literature. *Annual Review of Political Science* **7**:315-344.

**Doppler, K., and C. Lauterburg.** 2000. *Managing corporate change.* Springer, Berlin, Germany.

**Edelenbos, J.** 1999. Design and management of participatory public policy making. *Public Management Review* **1**(4):569-576.

**Enserink, B., M. Patel, N. Kranz, and J. Maestu.** 2007. Cultural factors as co-determinants of participation in river basin management. *Ecology and Society* **12**(2): 24. [online] URL: http://www.ecologyandsociety.org/vol12/iss2/art24/.

**European Union (EU).** 2002. *Guidance on public participation in relation to the Water Framework*

*Directive: active involvement, consultation, and public access to information.* EU, Brussells, Belgium.

**Eversole, R.** 2003. Managing the pitfalls of participatory development: some insight from Australia. *World Development* **31**(5):781-795.

**Fiorino, D. J.** 1990. Citizen participation and environmental risk: a survey of institutional mechanisms. *Science, Technology & Human Values* **15**(2):226-243.

**Grimble, R., and K. Wellard.** 1997. Stakeholder methodologies in natural resource management: a review of principles, contexts, experiences and opportunities. *Agricultural Systems* **55**(2):173-193.

**HarmoniCOP.** 2005. *Learning together to manage together: improving participation in water management.* [online] URL: http://www.harmonicop.info/HarmoniCOPHandbook.pdf.

**Höppner, C., Frick, J., and M. Buchecker.** 2003. Assessing psycho-social effects of participatory landscape planning. *Landscape and Urban Planning* **83**:196-207.

**Irvin, R. A., and J. Stansbury.** 2004. Citizen participation in decision-making: Is it worth the effort? *Public Administration Review* **64**(1):55-65.

**Johnson, C. A.** 1997. Public participation and sustainable development: counting the costs and benefits. *TDRI Quarterly Review* **12**(2):25-32.

**Klinke, A.** 2009. Deliberate transnationalism—transnational governance, public participation and expert deliberation. *Forest Policy and Economics* **11**:348-356.

**Laird, F. N.** 1993. Participatory analysis, democracy, and technological decision making. *Science, Technology & Human Values* **18** (3):341-361.

**Lynam, T., F. Bousquet, P. d'Aquino, O. Barreteau, C. Le Page, F. Chinembiri, and B. Mombashora.** 2002. Adapting science to adaptive managers: spidergrams, belief models, and multi-agent systems modeling. *Conservation Ecology* **5** (2): 24. [online] URL: http://www.consecol.org/vol5/iss2/art24/.

**Lynn, F. M., and G. J. Busenberg.** 1995. Citizen advisory committees and environmental-policy: what we know, what's left to discover. *Risk Analysis* **15**(2):147-62.

**Mansuri, G., and V. Rao.** 2004. Community-based and -driven development: a critical review. *World Bank Research Group* **19**(1):1-39.

**Marks, J. S.** 2004. Negotiating change in urban water management: attending to community trust in the process. [online] URL: http://www.wsud.org/downloads/Info%20Exchange%20&%20Lit/WSUD_04_Conf_Papers/WS040098.PDF.

**Mayers, J.** 2005. *Stakeholder power analysis.* International Institute for Environment and Development, London, UK.

**Mazri, C.** 2007. *Apport méthodologique pour la structuration de processus de décision publique en contexte participatif; le cas des risques industriels majeurs en France.* UFR Sciences des Organisations, Université Paris Dauphine, Paris, France.

**Micherner, V. J.** 1998. The participatory approach: contradiction and co-option in Burkina Faso. *World Development* **26**(12):2105-2118.

**Midgley, G., J. Foote, A. Ahuriri-Driscoll, and D. Wood.** 2007. Towards a new framework for evaluating systemic and participative methods. [online] URL: http://journals.isss.org/index.php/proceedings51st/article/view/778.

**Miskowiak, D.** 2004. Crafting an effective plan for public participation. [online] URL: http://www.uwsp.edu/cnr/landcenter/Publications/PublicParticipation.pdf.

**Mumford, E.** 2003. *Redesigning human systems.* Information Science Publishing, Hershey, Pennsylvania, USA.

**Nelkin, D., and M. Pollak** 1979. Public participation in technological decisions: reality or grand illusion? *Technology Review* **8**:55-64.

**O'Connor, R., M. Schwartz, J. Schaad, and D. Boyd.** 2000. State of the practice: white paper on public involvement. AID04: Committee on Public Involvement in Transportation. Chicago, Illinois, USA.

**OECD.** 2001. Engaging citizens in policy-making: information, consultation and public participation. [online] URL: http://www.oecd.org/dataoecd/24/34/2384040.pdf.

**Ostrom, E.** 1990. *Governing the commons: the evolution of institutions for collective action.* Cambridge University Press, New York, New York, USA.

**Pahl-Wostl, C., P. Kabat, and J. Möltgen, editors.** 2007. *Adaptive and integrated water management: coping with complexity and uncertainty.* Springer, Berlin, Germany.

**Pahl-Wostl, C., E. Mostert, and D. Tábara.** 2008. The growing importance of social learning in water resources management and sustainability science. *Ecology and Society* **13**(1): 24. [online] URL: http://www.ecologyandsociety.org/vol13/iss1/art24/.

**Petts, J., and B. Leach.** 2000. *Evaluating methods for public participation: literature review.* Environment Agency Rio House, Bristol, UK.

**Portland Development Commission.** 2007. Public participation manual: Public Affairs Department. [online] URL: http://www.pdc.us/pdf/public-participation/public-participation-plans/public-participation-manual.pdf.

**Renn, O.** 2001. The need for integration: risk policies require the input from experts, stakeholders and the public at large. *Reliability Engineering and System Safety* **72**:131-135.

**Robson, C.** 1993. *Real world research; a resource for social scientists and practitioner-researchers.* Blackwell, Oxford, UK.

**Roche, S.** 2003. Geographic information and public participation; research proposal from a French perspective. *URISA Journal* **15**:41-48.

**Rosener, J. B.** 1978. Citizen participation: Can we measure its effectiveness? *Public Administration Review* **38**:457-463.

**Rowe, G., and L. J. Frewer.** 2000. Public participation methods: a framework for evaluation. *Science, Technology & Human Values* **25**(1):3-29.

**Rowe, G., and L. J. Frewer.** 2004. Evaluating public participation exercises: a research agenda. *Science, Technology & Human Values* **29** (4):512-556.

**Rowe, G., and L. J. Frewer.** 2005. A typology of public engagement mechanisms. *Science, Technology & Human Values* **30**(2):251-290.

**Rowe, G., R. Marsh, and L. J. Frewer.** 2001. *Public participation methods: evolving and operationalizing an evaluation framework; final report to the Department of Health and Health and Safety Executive.* Institute of Food Research, Norwich, UK.

**Stern. P. J., and H. V. Fineberg, editors.** 1996. *Understanding risk: informing decisions in a democratic society.* National Academy Press, Washington, D.C., USA.

**Steyaert, S., and H. Lisoir.** 2005. *Participatory methods toolkit: a practitioner's manual.* [online] URL: http://www.viwta.be/files/handboek.pdf

**Straus, D.** 2002. *How to make collaboration work; powerful ways to build consensus, solve problems, and make decisions.* Berret-Koehler, San Francisco, California, USA.

**Syme, G. J., and B. E. Nancarrow.** 2002. Evaluation of public involvement programs: measuring justice and process criteria. *Water* **29** (4):18-24.

**Syme, G. J., and B. S. Sadler.** 1994. Evaluation of public involvement in water resources planning: a researcher-practitioner dialogue. *Evaluation Review* **18**(5):523-542.

**U.S. Department of Energy.** 1999. *How to design a public participation program.* Office of Intergovernmental and Public Accountability, Washington, D.C., USA. [online] URL: http://cooperativeconservation.gov/get-involved/DOEHowtoGuide.pdf.

**U.S. Environmental Protection Agency.** 1996. *RCRA public participation manual.* Office of Solid Waste, Permits Branch, Washington, D.C., USA. [online] URL: http://www.epa.gov/osw/hazard/tsd/permit/pubpart/manual.htm.

**Van Asselt, M. B. A., and N. Rijkens-Klomp.** 2002. A look in the mirror: reflection on

participation in integrated assessment from a methodological perspective. *Global Environmental Change* **12**(3):167-184.

**Vic Roads.** 1997. *Community participation: strategies and guidelines.* [online] URL: http://www.vicroads.vic.gov.au/NR/rdonlyres/5712AAF3-910F-4EDA-A753-8B45820CC52D/0/consultationguidelines.pdf

**Von Korff, Y.** 2007. *Re-focusing research and researchers in public participation.* [online] URL: http://www.lisode.com/images/publications/refocusingresearchyvk.pdf

**Webler, T.** 1995. "Right" discourse in citizen participation—an evaluative yardstick. Pages 35-86 *in* O. Renn, T. Webler, and P. M. Wiedemann, editors. *Fairness and competence in citizen participation—evaluating models for environmental discourse.* Kluwer Academic, Dordrecht, The Netherlands.

**Webler, T.** 1997. Organizing public participation: a review of three handbooks. *Human Ecology Review* **3**(1):245-254.

**Webler, T.** 1999. The craft and theory of public participation: a dialectical process. *Journal of Risk Research* **2**(1):55-71.

**Webler, T., H. Kastenholz, and O. Renn.** 1995. Public participation in impact assessment: a social learning perspective. *Environmental Impact Assessment Review* **15**:443-463.

**Webler, T., and S. Tuler.** 1999. Integrating technical analysis with deliberation in regional watershed management planning: applying the National Research Council approach. *Policy Studies Journal* **27**(3):530-543.

**Webler, T., and S. Tuler.** 2001. Public participation in watershed management planning: views on process from people in the field. *Human Ecology Review* **8**(2):29-39.

**Webler, T., and S. Tuler.** 2006. Four perspectives on public participation process in environmental assessment and decision making: combined results from 10 case studies. *Policy Studies Journal* **34** (4):699-722.

**Wiedemann, P. M., and S. Femers.** 1993. Public participation in waste management decision making: analysis and management of conflicts. *Journal of Hazardous Materials* **33**:355-368.

**Appendix 1.** AUTHOR TABLES

*Please click here to download file 'appendix1.pdf'.*

**Appendix 2.** RECONSTRUCTION TABLES

*Please click here to download file 'appendix2.pdf'.*

**Appendix 3.** PRINCIPLES OVERVIEW TABLES

*Please click here to download file 'appendix3.pdf'.*

## **Appendix 4.** SUMMARY OF PRINCIPLES

*Please click here to download file 'appendix4.pdf'.*

**Appendix 5.** EXAMPLES OF TOOLS

*Please click here to download file 'appendix5.pdf'.*