The Effectiveness of Participatory Environmental Planning

The Case of Water Planning in the US State of Washington and in the German State of Lower Saxony

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Author's Declaration

I prepared this dissertation without illegal assistance. This work is original except where indicated by special reference in the text and no part of the dissertation has been submitted for any other degree. This dissertation has not been presented to any other University for examination, neither in Germany nor in another country.

Jessica Reisert

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Zusammenfassung

Die Einbeziehung einer Vielzahl verschiedener Interessenvertreter im Rahmen der Umweltplanung wird als entscheidender Faktor angesehen, um Lösungen für Umweltprobleme zu finden und umzusetzen. Bewegrund für die Beteiligung verschiedener Interessen ist häufig eine gesteigerte Effektivität der Entscheidungsfindung. Kriterien für die Effektivität sind zum einen die Qualität der Entscheidung und zum anderen die Qualität der Implementierung. Lokales Wissen und Kenntnisse über die Werte und Ansichten und die Akzeptanz der Akteure verbessern die Informationsbasis; diese verbesserte Informationsbasis wirkt sich auf die Entscheidungsqualität aus. Die Implementierungsqualität in partizipativen Planungen wird durch folgende Faktoren beeinträchtigt: Zunahme von Informationen und erhöhtes Umweltbewusstsein der Akteure, Akzeptanz und Identifikation mit der Entscheidung, Ausgleich gegensätzlicher Interessen zur Vermeidung von Rechtsstreitigkeiten und damit verbundenen Kosten und Bildung von Vertrauen zwischen den Beteiligten. Die empirische Untersuchung der Wirksamkeit von partizipativen Prozessen in der Umweltplanung ist jedoch noch unzureichend.

An diesem Punkt setzt die vorliegende Dissertation an und liefert einen Beitrag zur Diskussion über die Effektivität partizipativer Umweltplanung. Untersucht wurden Fallstudien im Bereich der partizipativen Wasserplanung im US-Bundesstaat Washington und im Bundesland Niedersachsen. Grundlage für die Untersuchung der Wirksamkeit bilden die Qualität der Entscheidung (operationalisiert anhand der Berücksichtigung von Meinungen und Vorstellungen verschiedener Interessenvertreter in den Wassermanagementplänen als ein Indikator für die Akzeptanz der Entscheidung) sowie die Qualität der Implementierung (operationalisiert anhand von Wahrnehmungen und Sichtweisen der Beteiligten über umweltrelevante Auswirkungen der partizipativen Wasserplanung).

Die Ergebnisse der Fallstudienanalyse zeigen, dass die Qualität der Wassermanagementpläne in beiden Ländern durch die Berücksichtigung verschiedener Interessen und die Einbeziehung der Ansichten und Werte der Teilnehmer positiv beeinträchtigt wird. Unterschiede zwischen Deutschland und den USA beziehen sich auf die Themen, die die Planungsgruppen diskutierten, auf den Einfluss bestimmter Interessengruppen und auf die Bindungswirkung der Ergebnisse.

Die Untersuchung der Wahrnehmungen der Planungsakteure anhand von Interviews machte eine Verbindung zwischen Prozess, *output* (Wassermanagementplan als Ergebnis der Planung), Implementierung und *outcomes* (umweltrelevanten Auswirkungen der Planung) deutlich. Die Ergebnisse zeigen, dass es wichtig ist nicht nur die Einzelkomponenten eines partizipativen Planungsprozesses wie z.B. die umweltrelevanten *outcomes*, sondern auch den gesamten Prozess sowie die Beziehungen zwischen den einzelnen Elementen und Faktoren zu betrachten. Der Beteiligungsprozess bildete laut Interviewpartnern eine Schlüsselrolle für die erfolgreiche Entscheidungsfindung und Akzeptanz und führte zu Wassermanagementplänen von guter Qualität. *Social outcomes* (Vertrauensbildung, gute Beziehung zu den Behörden, Verständnis für andere Sichtweisen, Berücksichtigung von fachlichem sowie lokalem Wissen, Konfliktlösung) halfen erfolgreiche Pläne von hoher Qualität zu produzieren, (Restaurierungs-)Projekte umzusetzen, neue Anlieger einzubeziehen und als Konsequenz die Umweltbedingungen zu verbessern. Die Umsetzung der Pläne wurde von den Interviewpartnern als erfolgreich angesehen, Gründe waren der partizipative Planungsprozess, eine ausreichende Finanzierung, die Unterstützung der Öffentlichkeit, die kompetente Leitung des Planungsprozesses und die frühzeitige und kontinuierliche Einbeziehung verschiedener Interessen. Verbesserte Umweltbedingungen wurden in den Planungsgebieten festgestellt und häufig mit bestimmten Projekten in Verbindung gebracht.

Jedoch sind diese Verbesserungen schwer zu quantifizieren und könnten auch das Ergebnis früherer partizipativer Planungsprozesse sein. Die Mehrzahl der Interviewpartner erachtet die Ergebnisse partizipativer Umweltplanung dennoch als effektiv um die Umweltbedingungen in den Planungsgebieten zu verbessern.

Summary

The involvement of a wide range of different stakeholders is regarded as crucial to provide and implement solutions to environmental problems. The motivation for participation is often justified by an increase in the effectiveness of decision-making. Two criteria for effectiveness are the quality of the decision, and the quality of the implementation. The quality of the decision in participatory efforts is formed by an improved information base enhanced through local knowledge and knowledge about values, views, and the acceptance of the actors. The quality of the implementation is affected by an increase of information and environmental awareness of the actors, acceptance and identification of the decision, balancing competing interests to decrease legal disputes and associated costs, and the creation of trust between the actors. However, the empirical investigations of the effectiveness of participatory processes in environmental planning are inadequate.

At this point, this dissertation thesis contributes to the discussion about the effectiveness of participatory environmental planning by investigating case studies of participatory water planning in the US State of Washington and the German State of Lower Saxony. The evaluation of the effectiveness of participatory environmental processes was based on the quality of the decision and the quality of the implementation. The quality of the decision was operationalized by the incorporation of stakeholders' views into the final water management plan as an indicator of acceptance. The quality of the implementation is related to stakeholders' perceptions of the environmental outcomes of participatory water planning.

The results of the case study analysis show that the quality of the planning outputs is positively affected through the consideration of different interests and through the incorporation of their perspectives and values. In detail, the following results were generated: the representation of stakeholders was inclusive, comments were for the most part integrated in the final plans, and plans are of relatively good quality according to the selected criteria. Differences between both countries were related to: the key issues that planning groups discussed, the influence of specific stakeholder groups, and the binding character of the results.

The investigation of stakeholders' perceptions of watershed planning in Washington and in Lower Saxony revealed a linkage between process, output, implementation, and environmental outcomes. The findings demonstrate that it is important to look not only at the individual factors of participatory planning processes such as environmental outcomes, but also at the whole process and the relationship between the different factors. The participatory process has played a key role for successful decision-making and acceptance and has led to watershed management plans of good quality according to the interviewees. Social outcomes (building of trust, a good relationship to governmental agencies, understanding of other perspectives, consideration of technical as well as local knowledge, solving of conflicts) have helped to produce high quality successful plans, to implement projects, to involve new landowners, and in consequence to improve environmental conditions. The implementation of plan activities was considered successful by the interviewees due to the participatory planning process, funding, community support, leadership, and early and continued involvement of different stakeholders. Ecological improvements were noticed in the planning areas and were often linked to specific projects. However, improvements are hard to quantify and may also be the result of previous (participa-

tory) efforts. Most of the interviewees consider participatory environmental planning outputs as effective in terms of improving ecological conditions.

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Chapter I: Introduction

1 Participation in Environmental Planning

The involvement of a wide range of different stakeholders is regarded as crucial to provide and implement solutions to environmental problems. This is because the decisions are supported by the public and will thus lead to fewer conflicts (e.g. Beierle and Cayford 2002, Dietz and Stern 2008, Coenen 2009).

Three facts in particular argue the case for participation in environmental decision-making (Beierle 1999):

- The shift of focus from large point sources of pollution to diffuse and widely distributed sources: while regulatory planning instruments have successfully addressed pollution from point sources since the 1970s, enduring environmental problems (e.g. waste and agricultural runoff, soil erosion, and other natural resource degradation) are caused by non-point sources. These problems are not easy to resolve with traditional administrative planning approaches because of the geographically dispersed polluters. At this point, participatory planning allows for a process to mediate a conflict of interests, to find consensus, and to improve environmental quality (Randolph and Bauer 1999, Koontz 2003, Lubell 2004).
- Increasing recognition that experts and lay people bring both valid but very different views and knowledge to the planning process: environmental decision-making requires judgment by the public.
- The public can effectively delay projects with environmental impacts (*cf.* Stuttgart 21[1]) if no participation has taken place: opposition and mistrust of governmental decision-making can be resolved by participation and lead to higher acceptance and legitimacy of decisions.

1.1 Definitions

In this thesis, the term participation is used according to the definition of Newig (2011) and Newig *et al.* (2011): Traditional administrative top-down processes are opened to groups and stakeholders that are not usually involved decision-making. The aim is to improve the acceptance of decisions and the basis of knowledge and values (Newig *et al.* 2011). The focus is on joint problem-solving and decision-making. Elections, initiatives, and grass-roots movements that do not have an influence on the binding effect of future governmental actions are not included (Newig 2011).

Public or citizen participation focuses on the involvement of the general, non-organized public and private individuals.

The term stakeholder includes individual private citizens or individuals representing organizations (including public agencies, private businesses and organizations, and non-governmental organizations) that have an interest in the planning process.

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1 http://www.nytimes.com/2011/05/02/world/europe/02germany.html?pagewanted=1&_r=1&sq=stuttgart%2021%20germany&st=cse&scp=3

Collaborative environmental management is characterized as having a small geographically-based scale, the involvement of everyone (experts and non-experts), consensus decision-making, joint problem-solving, the involvement of agencies as technical advisors, face-to-face, two-way communication, and a facilitator running the process (e.g. Selin and Chavez 1995, Randolph and Bauer 1999, Sabatier *et al.* 2005, Ansell and Gash 2008).

1.2 Levels of Participation

Arnstein's 'ladder of citizen participation' was the first attempt to distinguish between different intensities of participation and includes eight levels from non-participation to alibi-participation to active participation (Arnstein 1969). Figure 1 shows an aggregation in four stages and the respective influence of the public.

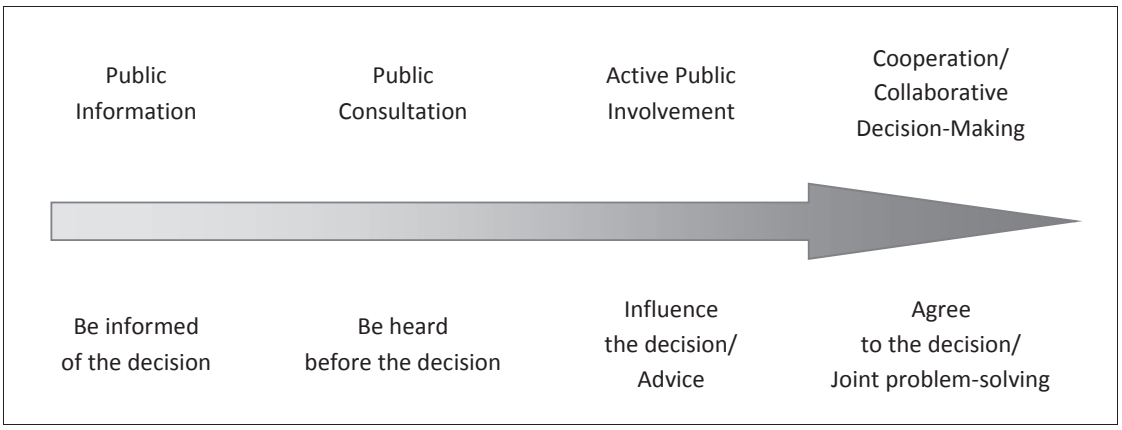

Figure 1: Extent of citizens' power in determining the planning output (on the basis of Selle 1996, Creighton 1999).

1.3 Brief Summary of the Development in Germany (Europe)

The development of public participation in Germany can be divided into different phases:

Emancipatory motivation shaped the environmental movement of the 1960s with the objectives of taking part in decision-making, opening the decision-making processes, and the democratization of the society (von Alemann 1975 in: Newig *et al.* 2011).

The 1970s were characterized by the passing of intensive environmental legislation with sectoral laws (e.g. German Waste Disposal Act (*Abfallgesetz*), German Federal Emission Control Act (*Bundesimmissionsschutzgesetz*), German Federal Nature Conservation Act (*Bundesnaturschutzgesetz*)), by the enactment of the 1975 German Administrative Procedure Act (*Verwaltungsverfahrensgesetz*), and by the expansion and intensive debate on public participation (e.g. early public participation in the Building Law (*Baugesetzbuch*), public participation in environmental impact assessment) (Fisahn 2002). The German Administrative Procedure Act regulates public participation (public comment and consultation) for planning approval procedures (*Planfeststellungsverfahren*). In addition, there are specific regulations for public participation in the sectoral laws (Fisahn 2002).

At the beginning of the 1990s, after the German Reunification, the Law on Accelerated Procedures (*Beschleunigungsgesetzgebung*) slowed down these developments. The accelerated development of infrastructure (and complex private projects) was needed in the new German federal states (*Länder*) to catch up with the old federal states and to make Germany a more attractive location for businesses. The long duration of the approval process was a disadvantage because of the competition with other countries which were faster in approving production facilities. The participation rights were modified by setting participation processes aside, by reducing public hearings, and by cutting time limits (*ibid.*).

At the same time, Principle 10 of the Rio Declaration of 1992 affirmed the importance of participation of all affected citizens in environmental issues[2]. On the European scale, this is also recognized and the UNECE Århus Convention of 1998 declares three pillars of public participation: access to information, public participation in decision-making, and access to the courts in environmental matters. The European Union has implemented the Århus Convention through different directives: the 2003 Environmental Information Directive implements the first pillar, the second pillar is implemented through the 2003 Public Participation Directive. Both contain provisions on access to the courts (third pillar). Furthermore, the Strategic Environmental Assessment Directive of 2001 regulates that the affected public has to be involved early on and effectively in the decision-making processes of certain plans and programs and the 2000 Water Framework Directive (WFD) addresses extensive participation approaches.

The emancipatory motivation of the 1960s is still present, e.g. in the Agenda 21 movement of the 1990s. However, the focus has changed. The main focus is now on the increased legitimacy of decisions and on improved effectiveness (instrumental motives) through participation. Participation serves as a means to ensure acceptance, to include local knowledge and perspectives of various actors and to implement environmental policy goals more efficiently and effectively (Newig 2011, Newig *et al.* 2011).

1.4 Brief Summary of the Development in the US

A similar development of public participation as in Germany has occurred in the US:

In the 1960s and 1970s, a shift of public awareness has taken place. Wilderness and non-consumptive recreation have risen in value and concerns about pollution and toxic chemicals as well as the loss of natural areas and open space through suburban sprawl have increased. This environmental movement has led to the formation of interest groups, to a change of the public's attitude towards government (e.g. dissatisfaction with natural resource management and a growing distrust of the ability of governmental agencies), and to the enactment of several environmental and natural resource laws with new public participation provisions (Wondolleck and Yaffee 2000, Sabatier *et al.* 2005). The 1969 National Environmental Policy Act (NEPA) allows for input from citizens through public hearings and public comments in the environmental impact

[2] "Environmental issues are best handled with participation of all concerned citizens at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided (Principle 10, Rio Declaration)".

statement process. The 1976 National Forest Management Act (NFMA) requires public input in the development, review, and revision of National Forest plans. Since 1990 the US Negotiated Rulemaking Act regulates and provides for participation in environmental decisions.

Since the late 1980s and 1990s, the call for a new style of resource management has increased. A more democratic model should replace the technocratic, top-down, command-and-control decision-model of resource management (Wondolleck and Yaffee 2000). Participatory environmental planning has emerged because of dissatisfaction with ineffective and illegitimate environmental policies (Sabatier *et al.* 2005):

- Federal command-and-control regulations were not successful in reducing pollution from non-point sources;
- Federal environmental legislation tended to focus on one environmental medium or problem; there was a lack of a holistic, integrated approach;
- Resource users felt violated in their property rights by federal decisions;
- The discontent with the situation of the Native Americans; and
- Local knowledge and place-based management was being ignored (*ibid.*).

2 Purpose of the Study, Hypothesis and Research Questions

The motivation for participation is often justified by an increase in the effectiveness and substantial results of decision-making (Selle 1996, Newig 2005). Two criteria for effectiveness are the quality of the decision, and the quality of the implementation. The quality of the decision in participatory efforts is formed by an improved information base enhanced through local knowledge and knowledge about values, views, and the acceptance of the actors. The quality of implementation is affected by an increase of information and environmental awareness of the actors, acceptance and identification of the decision, balancing competing interests to decrease legal disputes and associated costs, and the creation of trust between the actors and the decision-makers (Newig 2005). However, the empirical investigations of the effectiveness of participatory processes in environmental planning are inadequate (*cf.* Brody 2003, Newig 2005). According to Burton (2009) this originates from the fact that "effective participation is […] rarely achieved in practice (p. 271)". Only a few studies take the assessment of effectiveness as an initial starting point (*ibid.*).

At this point, this dissertation thesis contributes to the discussion about the effectiveness of participatory environmental planning by investigating case studies of participatory water planning in the US State of Washington and the German State of Lower Saxony. In this thesis, the first criterion of effectiveness, the quality of the decision, is operationalized by the incorporation of stakeholders' views into the final water management plan as an indicator of acceptance and is examined with the help of case studies (*cf.* Chapter III).

Decisions are better if all alternatives and consequences are assessed and if all available information is used, i.e. ideas and knowledge from the public and other stakeholders are also used. Decisions fulfill the needs and wishes of the public when stakeholders have been involved in identifying those needs, analyzing the problem, planning, and implementing (Coenen 2009).

Therefore, in this thesis the criterion 'quality of implementation' is investigated on the basis of stakeholders' perceptions of the environmental outcomes of participatory water planning (*cf.* Chapter IV).

Prior to this, the requirements placed on participation, i.e. the functions, in environmental planning and their fulfillment are discussed (*cf.* Chapter II). This chapter comprises a literature review and forms the theoretical basis for the subsequent case study analysis. The evaluation of the case studies focuses especially on the function of participation in the rationalization and effectiveness of environmental planning. It is important to keep in mind that both of these functions are linked to other functions (e.g. the emancipation function that allows for increased environmental awareness) and that the implementation of high quality environmental planning outputs (decisions, plans, or programs) and the achievement of environmental outcomes (environmental changes in the real world) might be impossible without the fulfillment of the other functions.

The overall research hypothesis of the thesis is:

Participation in environmental planning leads to environmental outputs of high quality that reflect the views of the participating stakeholders. Participation in environmental planning improves the implementation of these outputs and consequently the environmental outcomes.

The hypothesis has been mainly examined in the context of six participatory water planning cases in the US State of Washington and the German State of Lower Saxony. The following research questions were examined:

Research Question 1: *a) Which stakeholders participated in water planning? b) What influence did those stakeholders have on water plans? c) What is the quality of plans produced through participatory planning? d) What similarities and differences between the US and Germany can be observed?*

Research Question 2: *Are the results of collaborative planning improving environmental conditions?*

3 Research Design

In this section, an overview about the case study approach and the comparative study is given. Chapters III and IV provide more detailed information about the methods applied and a comprehensive description of the selected cases.

3.1 Case Study Approach

The multiple case study approach was selected to guarantee an in-depth investigation of three collaborative watershed planning cases in Washington and three cases of participatory water development planning (*Gewässerentwicklungsplanung*) in Lower Saxony. The aim was to develop an understanding of the context, process and causal linkage between outputs and outcomes (*cf.* Flyvbjerg 2011) as well as to allow for analysis within each case and across cases to understand similarities and differences between them. The case study approach has further allowed for using multiple data sources (literature review, document analysis as well as interviews with

key stakeholders) to make sure that the issue is not only explored from one perspective but rather through a variety of perspectives (*cf.* Baxter and Jack 2008).

3.2 Comparative Study - Washington State (US)/Lower Saxony (Germany)

There is a lack of research on the one hand on comparative studies in the environmental field, on the other hand on the impact of stakeholder participation in Germany. However, Germany is in the process of change, and Lower Saxony represents one of the pioneers in participatory water planning. In Lower Saxony, the Water Act, prior to the implementation of the WFD, included more far-reaching provisions for participation (in comparison with other German federal states) during the formulation of water management framework plans and management plans (*cf.* Muro 2002).

It is worthwhile to compare the early and extensive experiences in participatory processes in environmental policy decisions in the US with the more recent German experiences. There are many assumptions and little evidence for the differences and commonalities between German and American environmental planning, and I hope to make a contribution to the comparative research in this field.

Hansjürgens (2000) provides an approach to explain commonalities and differences of environmental policy in the US and in Germany. In both countries, environmental policy is characterized through regulatory instruments. Bans and rules were effective instruments to manage environmental problems in the early 1970s and to avert danger to people and nature. The different cultural backgrounds in the US and Germany might be helpful to understand the differences between both countries. Cultural factors include all informal institutions such as customs, traditions, norms etc. In American society, normally called civil society, the focus lies on the individual and the protection of their right to freedom. Government actions that limit individual freedoms are partly restricted. This understanding of a protective state is especially reflected in communities where civil society gets together and self-organizes to achieve specific goals. In contrast, German society represents a social state society. Early religious and governmental influences may explain the orientation toward authorities. The strong role of the state has shaped the law and the organization of the German institutions. These cultural differences might explain some differences in environmental policy (*ibid.*):

The strong role of private law in environmental policy in the US can be traced back to the protection of individuals' freedom. The individual citizen has comprehensive possibilities and rights for litigation and to participate in environmental decision-making procedures (Hansjürgens 2000). Although there is a high awareness of environmental issues in Germany, the public's willingness to participate is rather low and early and active involvement within plan development is unusual. In general, participation in formal procedures is restricted to organized groups and specific types of participation. Information and consultation take place late in the process where public influence is limited (Kampa *et al.* 2003). These differences in public participation and litigation are also described in a comparative study of offshore wind energy development in Germany and the US (*cf.* Portman *et al.* 2009).

The influence of environmental organizations in the US seems to be higher than in Germany. The development of environmental NGOs in the US was promoted by the joining of like-minded people (Hansjürgens 2000; *cf.* the anti-sprawl movement, e.g. Bodenschatz and Schönig 2004).

In American society, mistrust of the government and its institutions is present and governmental actions are questioned more often (*ibid.*). In Germany, trust of governmental authorities to manage environmental problems is higher (Kampa *et al.* 2003).

4 Thesis Structure

The thesis is organized into five chapters (I-V). Its core comprises three articles contained in Chapters II to IV that have been submitted or are intended for submission to journals that use the double blind peer review process. These chapters (II-IV) encompass the most relevant research contributions written during the course of my research. They are framed by an introduction (I) and a synthesis chapter (V). In the introduction (I) the research subject, the research questions, and the relevant background information are provided and the settings for the research are outlined. Chapter V draws general conclusions from this thesis and indicates future research needs in the context of participatory environmental planning.

The three articles will be outlined in the following section. I will also state my contributions to the individual articles.

Chapter II: The Functions[3] of Participation in Environmental Planning - A Literature Review and First Steps towards a Research Design: Participation fulfills various functions, e.g. emancipation, control, legal protection, integration, legitimation, rationalization, and effectiveness, but only few empirical studies have been conducted to support these claims. Furthermore, the existing empirical research shows a great variation in criteria and that a systematic approach for evaluation does not exist. The investigation for this paper uses the citizen/government-oriented approach to describe the different functions. Within this framework, existing studies that evaluated one or multiple functions in the context of environmental planning are presented as examples and the applied criteria to analyze the fulfillment of the functions are specified. Finally, an initial starting point for a research design in terms of research questions is provided: To what extent do the different functions apply to single participatory environmental processes? To what extent do different levels of participation provide an advantage or disadvantage to the different functions of participation? To what extent are the proposed criteria suitable for evaluating the different functions in environmental planning? To what extent do various contextual factors of environmental decision-making processes influence the functions of participation?

This manuscript is in preparation for publication (possibly in Environmental Policy and Governance) as 'Reisert, J. The function of participation in environmental planning – A literature review and first steps towards a research design'. The paper is also intended for a contribution to a Symposium on the Environmental Impacts of Direct Democracy which the Environmental As-

[3] The term 'function' is used in the sense of 'purpose' of participation throughout the paper.

sessment and Planning Research Group at the Technische Universität Berlin is planning for March 21-23, 2012. The outputs will be discussed with the scientific community.

Chapters III and IV investigate a part of the functions presented in Chapter II: the rationalization function and the effectiveness function. One emphasis of the actual discussion in participatory environmental planning lies on both.

Chapter III: Stakeholder Influence in Participatory Water Planning in the US and in Germany: The benefits of stakeholder involvement in participatory environmental decision-making processes have been extensively discussed. Debate persists on how to initiate and conduct effective stakeholder participation, and whether stakeholder participation has any influence on planning outputs. A comparative case study of stakeholder involvement in participatory water planning in Washington State (US) and Lower Saxony (Germany) was conducted to address the question of the effectiveness of participation. We found inclusive representation of stakeholders, whose comments were, for the most part, integrated in the final plans, which are of relatively good quality. Differences between both countries were related to the key issues that planning groups discuss, the influence of specific stakeholder groups, and in the binding character of the results.

This article has been submitted to the Journal of Environmental Planning and Management as 'Reisert, J., Ryan, C., and Köppel, J. Stakeholder influence in participatory water planning in the US and in Germany'. J. Reisert conceived the idea for this research, performed the analysis and wrote the article. The co-authors contributed through extensive discussions and comments.

Chapter IV: Do Collaborative Planning Processes Lead to Better Outcomes? – Perception of Stakeholders in Water Planning in the US and in Germany: Many advantages of participatory collaborative planning - compared to administrative planning - are well known, and collaborative planning is often expected to improve environmental conditions. However, little research has been done to examine whether this claim can be confirmed. This article contributes to filling this research gap by investigating the relationship between process, outputs, and outcomes using the examples of collaborative water planning in the US State of Washington and the German State of Lower Saxony. Stakeholders' perceptions of watershed planning in Washington (Island County, Entiat River, and Middle Snake River watershed) and of the Leine River in Lower Saxony were explored. In all cases, a linkage between process, output, implementation, and environmental outcomes was stated by the interviewees. In three cases, social outcomes also influenced implementation, and as a consequence environmental outcomes. These findings demonstrate that it is important to look not only at the individual factors of collaborative planning processes such as environmental outcomes, but also at the whole process and the relationship between the different factors.

This article has been submitted to Land Use Policy as 'Reisert, J. Do collaborative planning processes lead to better outcomes? – Perception of stakeholders in water planning in the US and in Germany'.

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Chapter II: The Functions of Participation in Environmental Planning*

* This chapter is in preparation for publication.

The Functions[4] of Participation in Environmental Planning - A Literature Review and First Steps towards a Research Design

Abstract

Participation fulfills various functions, e.g. emancipation, control, legal protection, integration, legitimation, rationalization, and effectiveness, but only few empirical studies have been conducted to support these claims. Furthermore, the existing empirical research shows a great variation in criteria and that a systematic approach for evaluation does not exist. The investigation for this paper uses the citizen/government-oriented approach to describe the different functions. Within this framework, existing studies that evaluated one or multiple functions in the context of environmental planning are presented as examples and the applied criteria to analyze the fulfillment of the functions are specified. Finally, an initial starting point for a research design in terms of research questions is provided: To what extent do the different functions apply to single participatory environmental processes? To what extent do different levels of participation provide an advantage or disadvantage to the different functions of participation? To what extent are the proposed criteria suitable for evaluating the different functions in environmental planning? To what extent do various contextual factors of environmental decision-making processes influence the functions of participation?

1 Introduction

In light of the current situation in Germany (Stuttgart 21, the phase out of nuclear power), the call for more participation is increasing once again. However, it has still to be clarified if participation is performing its intended functions in the environmental planning process.

Over the last few decades, the traditional top-down approach to decision-making has been replaced more and more by models of cooperative governance, e.g. through various forms of participation. These established types of participation (*cf.* Figure 2) fulfill various functions, for example effectiveness, control, legal protection, integration, rationalization, and emancipation. There is a lot of literature about the requirements placed on participation but only a few empirical studies have been conducted to support these claims (*cf.* Brody 2003, Reed 2008 Burton 2009). While many case studies have investigated several functions, there is still a lack of clarity about the proven benefits of public participation (Rydin and Pennington 2000, Mostert 2005, Özerol and Newig 2008, Regener 2010). There is not yet a generally recognized methodical approach for evaluation (Rowe and Frewer 2004, Martineau-Delisle and Nadeau 2010). Furthermore, the existing empirical research shows that the criteria for success vary widely (Chess and Purcell 1999). Imprecise and inconsistent terminology, as well as the use of very diverse terms, such as ‘purposes’, ‘advantages’, ‘objectives’, ‘benefits’, ‘effects’, ‘impacts’, and ‘goals’, are used to describe the functions required from participatory processes (Martineau-Delisle and Nadeau 2010).

[4] The term ‘function’ is used in the sense of ‘purpose’ of participation throughout the paper.

This paper aims to contribute to fill this research gap. It starts with a brief overview of different types of participation and a description of the various functions required from participation in the context of environmental planning. This is followed by a survey of existing research in the environmental field and criteria to assess several of these functions. In the conclusions section, a starting point for a research design is provided.

1.1 Types of Participation

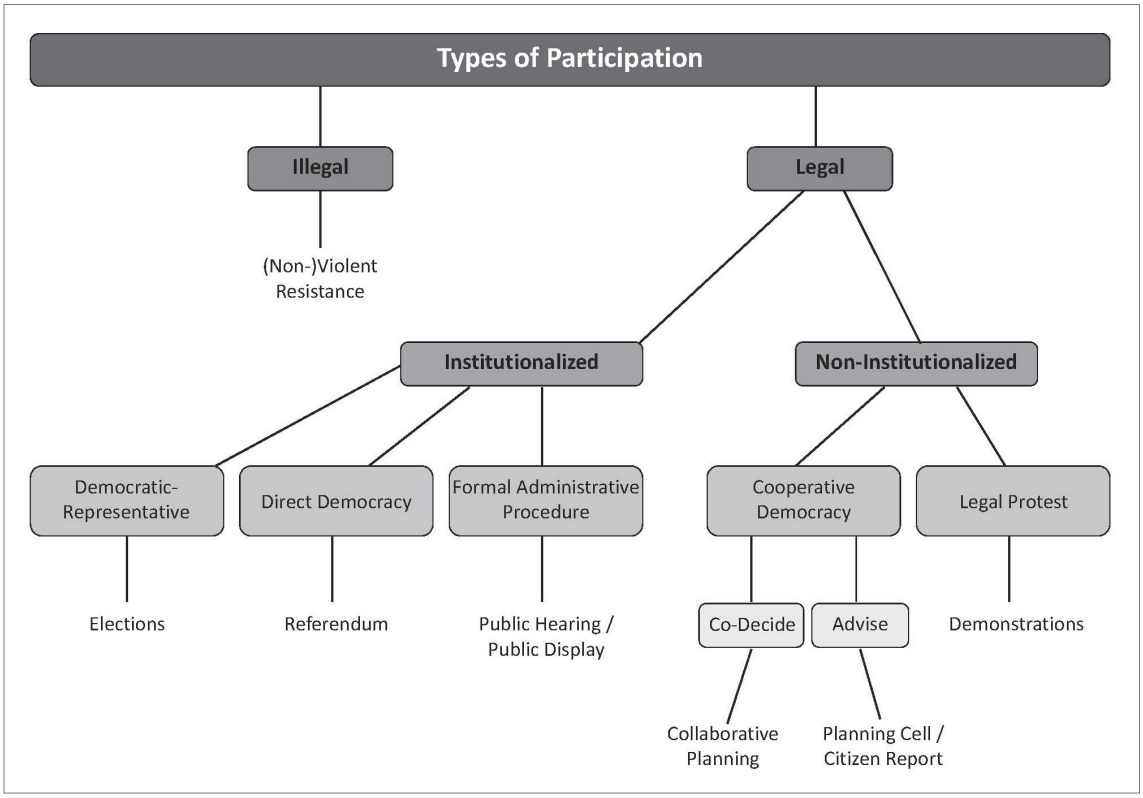

Figure 2: Types of participation (according to Kaase 1995, Roth 1997, Bogumil 2001, Niedermayer 2005, Kost 2010).

Political participation can take many forms: e.g. legal or illegal, institutionalized or non-institutionalized, direct or indirect. As it is impossible to illustrate the wide variety of different types of participation completely, Figure 2 shows an overview. Illegal forms of participation include all violent (and non-violent) activities that violate the law, e.g. civil disobedience (Niedermayer 2005). Legal participation is based on a legal foundation and can be differentiated into institutionalized and non-institutionalized forms. A constitutional basis describes institutionalized participation (Kaase 1995), including public participation in formal administrative procedures (Roth 1997), the attendance of elections as a democratic-representative core element, and the referendum as a direct-democratic instrument (*ibid.*, Niedermayer 2005). Direct democracy describes all procedures that citizens use to decide on political issues or put them on the political agenda (by ballot vote), and that are provided by the constitution and further legislation (Kost 2010). The elements of cooperative democracy are not regulated by law and are voluntary participatory processes that can be direct-democratic at the same time. Different interest groups participate in policy-making and implementation through cooperative problem-solving (Bogumil 2001). The function of the participants can either be advisory (e.g.

planning cells, citizen reports) or they can co-decide (e.g. collaborative planning). A further non-institutionalized type of participation are, for example, legal protests in the form of authorized demonstrations (Niedermayer 2005).

The focus of this paper lies on institutionalized participation in formal administrative procedures and on non-institutionalized cooperative participation in environmental planning.

2 Functions of Participation

The different forms of participation cannot fulfill all functions to an equal measure (Mayntz 1972); moreover, the various functions interact.

In the following, different approaches to categorize the functions that are expected from participatory processes are described: a citizen/government-oriented approach (e.g. Diekmann 1972, Wickrath 1992, Rydin and Pennington 2000), a process/outcome-oriented approach (e.g. Chess and Purcell, 1999), and a normative/instrument-oriented approach (e.g. Dietz and Stern 2008).

The first approach includes: 1) the democratic right to be involved as well as the development of the individual and 2) the effectiveness of policy delivery.

1) The focus lies on the opportunity to access the policy process to articulate values and preferences on policy options. Further, it includes the educative role of participation, the understanding of the participant's own interests, and community development (Diekmann 1972, Rydin and Pennington 2000, Richardson 1983 in: Burton 2009).

2) The emphasis lies on producing better policy outcomes in terms of formulation, implementation, and cost. A primary argument is that participation provides information about preferences or local knowledge. Another argument is avoiding conflicts: early involvement is supposed to minimize disagreements later on. Furthermore, participation is a measure of legitimacy since a broader involvement is assumed to generate policy results of a higher level of consent (*ibid.*).

Chess and Purcell (1999) use the second approach and distinguish between outcome (e.g. better accepted decisions, consensus, education, and improved quality of decisions) and process goals (e.g. fairness, information exchange, group process, and procedures).

Irvin and Stansbury (2004) combine the two approaches and consider process (education, political persuasion, empowerment, and legitimacy) and outcome advantages (breaking gridlocks/achieve outcomes, avoiding litigation costs, and better policy and implementation decisions) for two beneficiaries (citizens and government).

Dietz and Stern (2008) distinguish between normative (political equality, popular sovereignty/self-government, human development) and substantive, instrumental justifications (quality, legitimacy, capacity) for participation. Similar, Richardson (1983 in: Burton 2009) differentiates between individual developmental and instrumental benefits.

As a starting point, the terminology of Wickrath (1992)/Hendler (1977) will be used to describe the different functions required from participation. Certainly, this system has to be verified later on if it is

still valid; Newig (2011b) for example proposes three key discourses that incorporate the other functional areas: emancipation (integration), legitimacy (transparency and control, legal protection), and effectiveness (rationalization).

2.1 Citizen-Oriented Functions

Emancipation

One goal of participation in the 1970s was a redistribution of power. Participation is an element and expression of a functioning democracy (Selle 1996, Bischoff *et al.* 2005). Increased participation can motivate an individual to contribute to the reduction of heteronomy and an extension of self-determination at the same time (Hendler 1977). A more intensive form of participation strengthens individual political decision-making and the responsibility of citizens (as opposed to administrative decision-makers) and the identification with their own environment (Hendler 1977, Selle 1996, Fürst *et al.* 2001, Bischoff *et al.* 2005). Individual responsibility and activity by citizens is promoted by participation through intensive communication to change attitude and behavior. In addition, participants identify with the product of their joint work (collective action) (Selle 1996, Bischoff *et al.* 2005).

However, the emancipatory importance of participation decreases with an increasing number of participants (Hendler 1977).

Control and Transparency

Public control takes place by verifying if all relevant interests have been addressed in the decision-making process (Hellmann 1992/Deppen 1982 in: Fisahn 2002). This can only occur if participation is early and the project had already been in discussion previous to project plans being put on public display (Fisahn 2002). A precondition for effective control is adequate transparency of administrative decision-making.

Legal Protection

Participation is regularized to protect private rights and to identify relevant concerns. If an affected person's individual rights are violated (e.g. property or health) by the governmental decision, they can file an objection or action against the decision. Participation can prevent this.

All legally binding plans are subject to the previous weighing of various interests against one another, including those of the citizens that are affected. The determination of issues and concerns of private and (affected) public parties should happen through research and participation (representation). Participation is regulated in various different environmental and planning laws (Selle 1996, Bischoff *et al.* 2005).

2.2 Government-Oriented Functions

Integration

Participation should have a unifying and community-building function. Early and active participation can counter the alienation process between citizens and administrations through the strengthening of civic loyalty and solidarity with the local community and the political system (Hendler 1977). Webler *et al.* (1995) call it the 'concept of social learning' that "focuses on how structure and activities of [participation] processes can influence the development of individuals (p. 445)" positively and in a

coordinated way. The concept also explores how diverse personal as well as common interests come together to solve a mutual problem. Social learning refers to changes in awareness and a link of private to shared interests. Cognitive enhancement (learning about the problem, possible solutions and consequences, own and others' interests and values, methods, tools, and strategies to reach agreement) and moral development (self-respect, responsibility to oneself and others, understanding others' perspectives, ability to solve conflicts, solidarity with group, ability to cooperate and to solve collective problems) are components of social learning (Webler *et al.* 1995).

Hence, conflict avoidance is another goal of participation: protests and opposition proceedings that delay the planning process can be avoided through early participation. Participation can serve as an early warning system: early information about planning intentions allows the government to find out about potential resistance, so that plans can be amended easily at an early stage and to promote acceptance (Selle 1996, Bischoff *et al.* 2005).

Furthermore, participants identify with the plan and take on responsibility. On the other hand, there is the potential for more intense disputes due to diverse interests and perceptions. These disputes could lead to a decrease in people's willingness to have flexible solutions and to come to a consensus. The administration can avoid this by allowing early and continued participation (Hendler 1977).

Legitimation (Democratic Aspect)

Political decisions can be legitimated by taking wishes, expectations, criticism, and the worries of citizens into consideration (Bischoff *et al.* 2005, Conradi 1977 in: Selle 1996). Public participation can serve as a mechanism for obtaining the agreement of citizens, to make governmental decisions more acceptable, and to increase decision legitimacy (Fürst *et al.* 2001, Dietz and Stern 2008). Decisions that are made with the involvement of those affected are more likely to be acknowledged as binding and valid. However, if special interests control the planning process and general needs are less considered, a reduction of legitimacy occurs. Communication, i.e. convincing and reaching a compromise, which is involved in the participatory process, can serve as an instrument to reach a consensus (Hendler 1977). However, the fact that participation leads to broader agreement and acceptance is still doubted. Balancing individual interests is not possible if parties cannot reconcile their differences. It often comes to protests.

Rationalization

Participation serves to support the administration in decision-making through the acquisition of information or views of those who have to live with the planning results (Deppen 1982 in: Fisahn 2002). However, it is often the case that scientific knowledge is provided by experts, while citizens provide information about local circumstances and conditions. The latter is, however, still in dispute (Mayntz 1972). In any case, the administration learns about judgments and preferences of the public (Fisahn 2002). Participation brings attitudes of citizens and different perceptions together and leads to an agreement on the problem to solve (Selle 1996, Bischoff *et al.* 2005). Lay knowledge could supplement expert knowledge "by providing useful information and new perspectives […] to solve […] environmental problems (López Cerezo and González García 1996, p. 58)". Furthermore, participation is highly dependent on the appropriate access to information that should be "accurate, affordable, accessible, timely, comprehensible and available (Popović 1993, p. 695)". Through the

Environmental Information Act in Germany and the Freedom of Information Act in the US, government is obliged to provide environmental information.

Participation leads not only to more but also to better information for all participating actors. The more interests are considered, the more satisfying the plan will be for all parties (Fürst *et al.* 2001).

According to Dietz and Stern (2008), participation can improve the quality of the decision by the assessment of public values, by taking the local context and behavior of individuals and organizations into consideration, and by utilizing local knowledge that can be used to correct technical and scientific analysis. Further factors that positively influence the quality of the environmental outputs are: inclusion of all interested and affected parties, shared formulation of the problem and design of the process, and a transparent and structured process (*ibid.*).

Furthermore, participation can help to develop an innovative way of handling deficiencies and problems, as well as alternatives to traditional working methods and forms of interaction (Selle 1996, Bischoff *et al.* 2005).

Effectiveness

The effectiveness function of participation is correlated with the rationalization function. Increased acceptance and legitimacy leads to a better quality of plan, the use of local potential, facilitated implementation, and increased satisfaction with planning results (Selle 1996, Bischoff *et al.* 2005). Participation improves the decision-making capacity of the public and of the administration or agency. The process will be smoother through building mutual understanding and trust and the creation of shared interests. Benefits to future decision-making and implementation arise through a strengthened and improved relationship. Improved public education and information increases the general understanding of science. An agency's increased understanding of public concerns provides for more efficient processes in the future (Dietz and Stern 2008). Effectiveness can only be increased if all participants are open to compromise. The administration obtains an overview of potentially affected parties and their rights and can thus avoid litigation. New issues can be considered early on and amendments to plans can be avoided (Hellmann 1992 in: Fisahn 2002). Hence, an accelerated agreement through early participation and collective learning takes place. In contrast, many are of the opinion that participation delays the planning process. This opinion, for example, led to the law on accelerated procedures (Fisahn 2002).

3 Existing Research to Investigate the Validity of the Functions and Criteria Used for Analyzing the Fulfillment of Functions

In the following, existing studies that evaluated one or multiple functions in the context of environmental planning are presented as examples and structured into a framework that was introduced in the previous section. If suitable and available, the criteria used to analyze the fulfillment of functions are specified. After each section, a table summarizes and supplements the evaluation criteria.

In addition, it should be mentioned that this literature review is certainly not complete due to the richness of participatory research and the variety of terms to describe the different functions of participation. In particular, numerous single case studies as well as a few comparative studies of various cases were conducted.

The description of the existing research in this section refers to environmental planning, keeping in mind that there are many additional possible effects, e.g. institutional or private.

3.1 Citizen-Oriented Functions

Emancipation

In a comparative study of four waste management cases in England, Petts (2001) determined a raised environmental awareness: surveys on knowledge improvement before and after the process for example revealed the increased importance of waste reduction and composting.

Similar results were shown by Fraser *et al.* (2006). A comparative study of three cases to identify sustainability indicators in British Columbia (Canada), Kalahari (Botswana), and Guernsey (United Kingdom) determined an increased capacity to manage the environment by sharing and evaluating individuals' knowledge.

Table 1: Criteria to assess the emancipation function of participation.

Function	Attributes	Sources (e.g.)		Indicators	Environmental relevance
Emancipation	Identification with product of joint work	Hendler 1977, Bischoff *et al.* 2005, Selle 1996		Participants' perceptions	Acceptance of environmental planning result and facilitated implementation of environmental measures
	Partial shift of decision-making competence from government to stakeholders and the public	Bischoff *et al.* 2005, Selle 1996	Fitzpatrick and Sinclair 2003	Planning records: possibility to influence agenda, scope Type of decision-making (consensus, majority vote)	Further environmental aspects considered
	Raised awareness and responsibility	Petts 2001, Involve 2005[5]		Pre- and post-process surveys	Raised environmental awareness and responsibility

Control and Transparency

The Sable Gas Panel Review included a document review and semi-structured qualitative interviews to assess opportunities for learning through participation in an environmental assessment of a natural gas project in the Canadian Maritimes. One important issue was the accessibility of the process and of the materials: public hearings were open to all members of the public that wish to participate. However the scheduling of the meetings (during usual business hours) was a barrier to broad-based participation. The perceptions of the presentation of the environmental assessment documentation were very divergent: some participants felt that the documents were very user-friendly; others found

[5] In a UK conceptual study about the true costs of public participation, a literature review on existing research on costs and benefits of participation, a compilation of existing indicators relevant to participation and a proposal for a new framework for assessing costs and benefits was done. The emphasis of this study lies on the economic assessment of participation and is not limited to participatory environmental management or planning processes.

them more challenging and difficult to understand. However, access to all materials was provided (Fitzpatrick and Sinclair 2003).

Table 2: Criteria to assess the control and transparency function of participation.

Function	Attributes	Sources (e.g.)		Indicators	Environmental relevance
Control and Transparency	Education about agency decision-making	Beierle and Konisky 1999		Meeting minutes: degree of contribution to discussions regarding procedural matters	Are environmental interests addressed?
	Representativeness (all relevant interests addressed) and social justice (equal access to decision-making)	Carr and Halvorsen 2001, Warburton *et al.* n.d.		Comparing gender composition, age, income, and education level of participants against US census data/population statistics	
	Early participation and access to project information	Fisahn 2002		Planning records	
	Transparent process		Petts 2001	Planning records/agency website: meetings and information open to the public	

Legal Protection

A compilation of all environmental group action lawsuits (*Verbandsklage*[6]) between 2002 and 2006 in Germany was done by Schmidt *et al.* (2007). The data was collected from over 100 umbrella associations of environmental organizations in all federal states. The group action lawsuits accounted for 0.02% of all actions in administrative courts. This result highlights the small importance of the group action lawsuits. A success rate of 40% for the group actions (in contrast to 10% for all other actions) suggests that they are filed only if the actions look promising. Thus, group actions are used purposefully as an instrument to reduce the lack of enforcement of nature conservation law (Schmidt *et al.* 2007, Schmidt 2008). However, a link with the nature of the participation processes would have helped to determine the effects of participation.

[6] The opportunity for officially recognized environmental organizations to file actions (without violation of their own rights) against exemptions from bans and rules in protected areas, against the approval of project plans that have an impact on the environment or that were conducted with public participation.

Table 3: Criteria to assess the legal protection function of participation.

Function	Attributes	Sources (e.g.)		Indicators	Environmental relevance
Legal protection	Representativeness (all relevant interests considered)	Carr and Halvorsen 2001, Abels 2007	Carr and Halvorsen 2001 Abels 2007 Carnes *et al.* 1998	Comparing gender composition, age, income, and education level of participants against US census data/population statistics Analysis of non-participating groups and media reports Mechanisms to attract, engage, and maintain interest	Are environmental interests addressed?
	Reduced litigation	Dietz and Stern 2008, Beierle and Konisky 1999	Coglianese 1997[7]	No. of judicial reviews after completion of the planning process Comparing different participation forms	Environmentally-relevant actions Stable environmental decisions over time should be implemented more successfully (Beierle 1999)

3.2 Government-Oriented Functions

Integration

Regarding social learning, Webler *et al.* (1995) evaluated a cooperative discourse that was used for the siting of a municipal waste disposal facility in Switzerland. Citizen panels composed of representatives of the affected population conducted an impact assessment (human, environmental, and social) and provided recommendations for the siting of the landfill. A stakeholder committee (political actors) provided oversight of the process and the content. The Delphi group of experts assessed the panels' competence. The following aspects facilitated social learning: detailed, but accessible information, site visits, small working groups, repeated meetings over a longer time, opportunity to influence the process, and the responsibility to conduct the impact assessment.

[7] Coglianese (1997) showed that against the results of participatory rulemaking lawsuits are filed more often. He did an empirical assessment of the impact of negotiated rulemaking (by all federal agencies in the US between 1983 and 1996 but with a focus on 12 cases for the US Environmental Protection Agency) on the demanded benefits of reducing time and decreasing judicial challenges compared to conventional rulemaking. Criteria used were the difference in time between the date of announcement of a rulemaking process and the date of publication of the final rule in the Federal Register; and the litigation rate of (negotiated) rules. The investigated cases of regulatory negotiation failed to achieve the claims. The reasons could be: 1) Negotiated rulemaking may create new conflicts because only a limited range of groups participate and because the consistency of final rules with negotiated agreements is not always given; 2) Even if consensus is reached, the lead agency must provide for public and other agency comments on the consensus agreement that may change the proposed rule; 3) The success of conventional rulemaking through other methods of negotiation (public hearings and meetings, advisory committees).

Table 4: Criteria to assess the integration function of participation.

Function	Attributes	Sources (e.g.)		Indicators	Environmental relevance
Integration	Political capital	Innes and Booher 1999, Beierle 2002		Meeting minutes and planning documents: Agreements among parties Joint efforts to solve controversial issues	Agreements over environmental problems and solutions
	Social capital[8]	Involve 2005, Rydin and Pennington 2000	Involve 2005, Rydin and Pennington 2000 Innes and Booher 1999	Participants' perceptions: New relationships Level of trust; Meeting minutes and planning documents: Sharing of information, Discussion of conflicting topics, Mutual problem-solving, Shared knowledge, Less adversarial attitude towards other perspectives	Trust in institutions helps to solve environmental problems (Beierle 1999)
	Social learning (cognitive enhancement and moral development)	Webler *et al.* 1995		Detailed and accessible information, Site visits, Small working groups, Repeated meetings over a longer time, Opportunity to influence the process, Responsibility to conduct the impact assessment	Knowledge about environmental problems and possible solutions; Ability to solve environmental problems, to understand others' (environmental interest's) perspectives
	Conflict avoidance	Bischoff *et al.* 2005, Selle 1996		Media reports: protests, administrative appeals	Less environmental conflicts Stable environmental decisions over time should be implemented more successfully (Beierle 1999)
	Identification with plan	Hendler 1977, Bischoff *et al.* 2005, Selle 1996		Participants' perceptions	Acceptance of environmental planning result and facilitated implementation of environmental measures

Legitimation (Democratic Aspect)

In a meta-analysis of 40 cases in North America and Western Europe, Newig and Fritsch (2009b) found that a higher acceptance of environmental decisions is achieved through participation. Although a detailed coding scheme with context, process, output, and outcome variables was used, no criteria were presented.

[8] Criteria of social capital could be difficult for measuring because a single participatory process might be insufficient to affect social capital (Involve 2005).

Table 5: Criteria to assess the legitimacy function of participation.

Function	Attributes	Sources (e.g.)		Indicators	Environmental relevance
Legitimacy	Legitimacy of process/decisions	Carnes *et al.* 1998		Participant's perceptions	Facilitated implementation of environmental decisions
	Pre-existing conflicts reduced	Dietz and Stern 2008, Beierle and Konisky 1999	Involve 2005, Carnes *et al.* 1998	Participant's perceptions; Absence of litigation and hostility	Fewer environmental conflicts Stable environmental decision over time should be implemented more successfully (Beierle 1999)
	Reduced mistrust among participants (agency capable to serve/value public's interests, confidence in agency's technical abilities)	Dietz and Stern 2008, Beierle and Konisky 1999, Beierle 1999	Warburton *et al.* n.d., Involve 2005, Carnes *et al.* 1998	Pre- and post-process participant s' and wider public's perceptions; Documented responsiveness of lead agency to public/stakeholder comments and suggestions; Absence of litigation and hostility	Agency able to serve/value environmental interests; confidence in agency's technical abilities concerning environmental issues
	Accepted decisions	Dietz and Stern 2008	Carnes *et al.* 1998	Amount of opposition to implementation of the decision (letters to local media supporting or opposing) Consensus-based decision	Acceptance of environmental planning result and facilitated implementation of environmental measures
	Reduced litigation	Dietz and Stern 2008, Beierle and Konisky 1999	Coglianese 1997	No. of judicial reviews after completion of the planning process; Comparing different participation forms	Environmentally relevant actions Stable environmental decision over time should be implemented more successfully (Beierle 1999)
	Participants and wider public concerns addressed in analysis	Dietz and Stern 2008, Beierle and Konisky 1999		Comparing meeting minutes and planning documents	Participants' environmental concerns addressed

Rationalization and Effectiveness

Mohai (1987) investigated how public input influenced the US Forest Service's decision-making in the designation of wilderness areas. Public input was analyzed by counting the number of signatures for a designation of a specific area. He identified a strong relationship between the designation of an area as 'wilderness' or 'non-wilderness' and the public's votes for or against the designation. Further, public input seems to be more influential than the rational planning process on the decision. The rational planning process included an evaluation of the areas in terms of renewable and non-renewable resource potential and wilderness quality indicators. However, the Forest Service was not as responsive to written comments of environmental groups regarding the designation of a wilderness area (*ibid.*).

An empirical analysis of environmental mediation was conducted by Sipe (1998) to investigate whether mediation resulted in higher settlement and compliance rates than conventional forms of

dispute negotiation. He examined 21 mediated and 125 non-mediated cases at the Florida Department of Environmental Protection between 1988 and 1990 over a five-year period for each case. Sipe amended existing evaluations (*cf.* Bingham 1986/Buckle and Thomas-Buckle 1986/McEven and Maiman 1981/Schultz 1990 in: Sipe 1998) by including a control group of conventional dispute resolution (unassisted negotiation, litigation), by including time, and by conducting a more comprehensive statistical analysis. As result, the settlement rate of mediated cases was higher, but the compliance rate was similar to conventionally settled cases. A reason for the latter could be that the mediator is not present during implementation and compliance (Sipe 1998).

Petts (2001) evaluated the effectiveness of deliberative processes (community advisory committees and citizens' juries) using the example of four waste management cases in England. Decision-makers recognized a new relationship with the public, better informed decisions, and the ability to make complex and difficult decisions through participatory processes. Regarding the environmental relevance of these results, greater support for waste minimization and recycling instead of landfills or incinerations could be shown. Consensus decision-making led to legitimacy and was only possible through the development of trust and respect for different values.

In a meta-analysis of 239 cases of public participation in environmental decision-making, Beierle and others identified benefits of stakeholder involvement including the contribution of new information and ideas (e.g. goals and priorities for environmental restoration) and high-quality decisions. Pollution-related as well as natural resources management cases and various types of participatory processes (from public meetings to stakeholder negotiations) were investigated with the result that more intensive processes produced decisions of high-quality (Beierle 2000, Beierle and Konisky 2001, Beierle 2002, Beierle and Cayford 2002).

Leach *et al.* (2002) evaluated 44 watershed partnerships in California and Washington using a combination of interviews, surveys, and document analysis (watershed plan, meeting minutes) on the basis of six criteria: perceived effects on watershed condition, perceived effects on human and social capital, level of agreement reached, restoration projects, monitoring projects, and education and outreach projects. They suggested that participatory planning processes do not avoid serious, important topics nor do they produce insignificant results.

An evaluation of process, effects, and outputs of participatory growth management in Queensland, Australia using content analysis of plans and reports, interviews and surveys with government staff, demonstrated the importance of participatory planning outputs (and the process) for effective implementation. Purchase of land under a regional open space program, new land acquisition programs, and participation in a voluntary land conservation program were determined as measures for effective "changes on the ground (Margerum 2002, p. 186)".

In an evaluation of local ecosystem management plans in Florida, Brody (2003) showed that broad representation of stakeholders is not the crucial factor for high-quality plans, but the inclusion of specific groups such as resource-based industries (e.g., agriculture, forestry), utilities, or environmental organizations can augment knowledge of critical habitat or make environmental data and expertise available to the larger group. He used a plan coding protocol (criteria are included in Table 6) to evaluate the plan quality, a survey of planning directors to measure planning capacity (e.g. number of staff members writing the plan), and interviews with staff members to measure characteristics (level, timing, extent) of participation processes.

Burby (2003) found similar results in a study of hazard mitigation planning (content analysis of comprehensive plans and interviews with staff members) in Washington and Florida where broad involvement - but especially of environmental or property owner groups - led to stronger plans and implementation.

Fraser *et al.* (2006) analyzed the impact of participatory processes in three case studies in British Columbia (Canada), Kalahari (Botswana), and Guernsey (United Kingdom). In all cases, a recent shift from top-down to bottom-up approaches had taken place, the purpose of participation was to identify sustainability indicators, and stakeholder involvement resulted in community empowerment (*cf.* p. 35) and in generating more comprehensive lists of indicators that allowed for more accurate assessment of environmental issues.

A meta-analysis of 40 cases in North America and Western Europe determined that stronger environmental standards of policy decisions can be achieved through participation (*cf.* p. 38, Newig and Fritsch 2009b).

Regener (2010) investigated if the public is bringing new aspects into the planning process in the context of strategic environmental assessment of local land use plans and which factors influenced the public participation. Environmental organizations primarily provided information that led to amendments of the scope of investigation and the environmental report. In contrast, the public, which submitted many more comments, had a greater influence on modifications to land use plans. The study shows that participation optimized the planning process and the environmental assessment, especially if participation happens early, in the form of a public meeting (in addition to the public display of the planning documents), in the planning area, and in the case of the NGOs if they are included right at the beginning of the process.

However, the literature is thin regarding whether higher quality environmental decisions actually result from participatory processes (Beierle 2002, Brody 2003, Reed 2008, Newig and Fritsch 2009a).

There is still no clarity as to whether the involvement of different stakeholders leads to stronger environmental decisions or rather to a weakening of environmental standards. Does local knowledge improve the basis of information or are environmental decisions reliant on complex technical knowledge that is only provided by experts (*cf.* Newig 2011a)?

Initial attempts to assess environmental outcomes of participatory planning were made by Leach *et al.* (2002) conducting a meta-study of watershed management partnerships in California and Washington. They used proxy measures as perceived improvements on watershed conditions, restoration projects implemented, monitoring projects, and education and outreach projects. The following findings were generated: the older the watershed partnership, the more improvements are perceived by the participants and the more projects are implemented. According to the partnerships' participants, the most effectively addressed problems are conflicts among stakeholders, threats to species and habitat, and impaired water quality.

In a second evaluation Leach and Sabatier (2005) analyzed the relationship between outputs and outcomes, especially the influence of trust and social capital, based on Leach *et al.* (2002). They detected a strong relationship between trust or restoration projects and perceived effects. Trust could

however have produced a halo effect[9] on the perception of participants about improved watershed conditions.

Meyer and Konisky (2007) analyzed the local implementation of wetland protection projects in Massachusetts. Environmental outcomes were determined by reduced wetland disturbance. Communities that adopted local wetlands regulations generated quantitatively and qualitatively 'better' environmental outcomes (i.e. fewer disturbances to wetlands resources) than communities without wetlands regulations.

An outcome evaluation by Ferreyra and Beard (2007) researched the Maitland Watershed Partnership in Southwestern Ontario, Canada, with respect to intended and unintended impacts of the partnership on water quality and quantity. Indicators were changes in E. coli, nitrate, total phosphorus, heavy metals, and PCB levels. On-the-ground projects and educational outreach may assist to improve water quality but provincial and municipal monitoring programs are not designed to reveal a linkage between partnership's actions and water quality.

Fritsch and Newig (2007) conducted a meta-analysis of stakeholder involvement and stated that participation weakened the quality of environmental decisions compared to top-down outputs. However, stakeholder involvement improved the effective implementation of the decisions. Thus, Fritsch and Newig concluded that "the implementation of an average output is far better than a weak or non-implementation of a potentially high-quality output (2007, p. 11)".

Mandarano (2008) developed an evaluation framework to assess collaborative environmental planning outputs and outcomes and tested it on the New York-New Jersey Harbor Estuary Program. Her study found that "the collaborative process was the key factor that (p. 466)" led to learning and in consequence to actions which produced environmental outcomes (restoration projects implemented, land protected from development, changes in environmental parameters, and perceptions of improved environmental quality). Two factors made mainly a contribution to collaborative outcomes: 1) the quality of the outputs and 2) the availability of resources (funding and technical knowledge).

[9] Participants in time and labor-intensive participation processes may tend to exaggerate the success to economize their effort (Coglianese 2003). Furthermore, stakeholders may think more positively about the results if trust was built among the group members. This phenomenon is called halo effect (Leach and Sabatier 2005).

Table 6: Criteria to assess the rationalization and effectiveness function of participation.

Functions	Attributes	Sources (e.g.)		Indicators	Environmental relevance
Rationalization	Higher plan quality	Carnes *et al.* 1998 Brody 2003		Judgment of participants Plan coding protocol: Factual basis Goals and objectives (clearly specified, measurable objectives) Inter-organizational coordination and capabilities Regulatory tools, incentive-based tools, other strategies Implementation (designation of responsibility, provision of technical assistance, identification of costs/funding, clear timetable, monitoring)	Concerning environmental issues
	Participants and wider public) concerns addressed in analysis	Dietz and Stern 2008, Beierle and Konisky 1999		Comparing meeting minutes and planning documents	Including environmental concerns
	Additional information considered	Dietz and Stern 2008, Beierle and Konisky 1999, Beierle 2002	Carnes *et al.* 1998	Changes made because of involvement	Additional environmental information
	Access to information	Popović, 1993		Information available (e.g. online), timely, in a comprehensible manner	Access to environmental information
	Improved technical analysis	Dietz and Stern 2008, Beierle 1999, Beierle 2002	Carnes *et al.* 1998 Abels 2007, Koontz 2003, Mandarano 2008	Changes made because of involvement; Improvement of scientific validity with involvement; Scientific peer review (meeting content requirement, inclusion of additional suggested items, policy recommendations, incorporation of consensus-based science, justification of actions/clear approach for implementation, approval by consensus-based process)	
	Generation of innovative ideas for solving problems	Dietz and Stern 2008, Beierle 2002, Beierle and Konisky 1999		Meeting minutes and planning records	Generation of innovative ideas for solving environmental problems
	Intellectual capital (understanding of others' views, shared production of scientific material)	Innes and Booher 1999	Carnes *et al.* 1998	Documents identifying concerns and responses	Common understanding and acceptance of ecological value (Mandarano 2008)
	Capacity for future decisions Better informed public about relevant environmental, social,	Dietz and Stern 2008, Beierle 2002	Petts 2001	Methods used to inform the wider public, e.g. information booklet, interviews with and information through the media;	Capacity for future environmental decisions through gained environ-

Functions	Attributes	Sources (e.g.)		Indicators	Environmental relevance
	scientific issues (access to scientific knowledge through technical training, consultants, technical advisory committees)		Petts 2001, Warburton *et al.* n.d. Fitzpatrick and Sinclair 2003	Methods used to inform the participants, e.g. presentations, seminars, site visits, group discussion, videos, information packs; Pre- and post-process surveys about knowledge improvement; Contribution of produced material to future research/projects (online search)	mental knowledge
	Mutual understanding, trust, improved relationships	Dietz and Stern 2008	Involve 2005, Rydin and Pennington 2000	Participants' perceptions: new relationships, level of trust	Trust in institutions helps to solve environmental problems (Beierle 1999)
	Raised awareness	Involve, 2005		Pre- and post-process surveys	
Effectiveness	Capacity for future decisions Better informed public about relevant environmental, social, scientific issues (access to scientific knowledge through technical training, consultants, technical advisory committees)	Dietz and Stern 2008, Beierle 2002	Petts 2001 Petts 2001, Warburton *et al.* n.d.	Methods used to inform the wider public, e.g. information booklet, interviews with and information through the media; Methods used to inform the participants, e.g. presentations, seminars, site visits, group discussion, videos, information packs; Pre- and post-process surveys about knowledge improvement	Capacity for future environmental decisions through gained environmental knowledge
	Cost-effectiveness (expenditure of resources (time and money) by all participants)	Beierle and Konisky 1999	Involve 2005	Staff time spent for the participation process, training, writing reports Staff expenses spent for travel, overnight stays, child care etc., for training courses; Administration costs for phone calls, mailing, copying, printing; Costs for external trainers, consultants, event costs (catering, equipment etc.); Participant's expenses spent for travel, overnight stays, child care etc.; Participant's time spent for the participation process, training; Less staff time/staff time spent dealing with conflicts (complaints, objections, campaigns etc.); time spent to make decision	
	Reducing time	Coglianese 1997		Difference in time between date of announcement and final approval of governmental decision, comparing less/more intensive participation	Implementation of environmental decisions and measures can start earlier
	Implementation of results of process	Carnes *et al.* 1998		Funding Enforcement	Implementation of environmental decisions and

Functions	Attributes	Sources (e.g.)		Indicators	Environmental relevance
				Schedule Restoration of environmental quality Responsibility	measures
	Reduced litigations	Dietz and Stern 2008, Beierle and Konisky 1999	Coglianese 1997	No. of judicial reviews after completion of the planning process; comparing different participation forms	Environmental relevant actions Stable environmental decision over time should be implemented more successfully (Beierle 1999)
	Environmental outcomes		Conley and Moote 2003, Lubell *et al.* 2005 Koontz and Thomas 2006 Conley and Moote 2003, Lubell *et al.* 2005 Conley and Moote 2003 Koontz and Thomas 2006	Pre- and post-project monitoring data for several years; Impacts of various external variables: e.g. changes in precipitation, upstream practices as closing of a plant or fencing of a stream; Perceived changes in environmental quality (surveys, interviews); Changes in land cover (remote sensing), in biological diversity (ecological studies), and in environmental parameters (ecological studies)	

In some cases, rather conceptual analyses were conducted.

Carnes *et al.* (1998) developed a set of indicators for evaluating the success of public participation. The success attributes and indicators were generated in cooperation with various stakeholders of US Department of Energy environmental restoration and waste management processes and through a literature review. Some of these indicators are included in the tables Table 3, Table 5, and Table 6.

Carr and Halvorsen (2001) operationalized three (out of seven) of Poisner's (1996) criteria for assessing the effectiveness of participatory processes:

- Representativeness of participants: participants should represent the demographic composition of the region. This can be investigated by comparing gender composition, age, income, and education level (and / or political persuasion, status as opinion leader, length of residence) of participants against US census data.
- Discussion of common good (i.e. larger community-wide needs): statistical analysis (correlations) of meeting records can reveal the search for integrated solutions instead of competing individual interests and the awareness of a connection between natural resources and the community's well-being.
- The identification of values and beliefs helps to form an individual's own position. Understanding other people's beliefs can lead to information exchange and discussion of community-wide values. Statistical analysis (stepwise regression analysis) of meeting records can be used.

4 First Steps towards a Research Design

To what extent do the different functions apply to single participatory environmental processes?

The studies described here demonstrate a predominantly positive picture of the functional fulfillment of participation. However, there are also opposing assumptions. The main focus of research in environmental planning in the last few years has been on the functions of rationalization and effectiveness (especially environmental outcomes). Thus, the reviewed findings are not universally valid. Empirical research results are still fragmentary. Case studies predominate that have only evaluated a selection of the functions. Approaches to investigate a higher number of cases and a wider range of functions are made through several meta-analyses (case survey method). This systematic evaluation and statistical analysis of existing single case studies (primarily qualitative data) should be continued in order to assess if all functions are fulfilled to an equal measure within a single participation process or if some are of special relevance (*cf.* Beierle and Cayford 2002, Newig 2011a, 2011b). However, meta-analyses are qualitatively limited since the quality of the material used depends on the quality of data that the case study author collected (Beierle and Konisky 2000, Beierle and Cayford 2002). Generally, the focus should lie on studies with a broader design since many case studies with a few cases that have only partially addressed a selection of functions have been already conducted.

To what extent do different levels of participation provide an advantage or disadvantage to the different functions of participation?

Future research should include studies that compare different types of participation to analyze whether different levels of involvement provide a benefit or disadvantage to specific functions of participation.

Beierle (1999) suggests hypotheses about the linkage of several functions to different participatory mechanisms, e.g. public comments and hearings ought to achieve the rationalization and effectiveness function. These should be broadened to include the missing functions and verified by future research. Furthermore, the combination of different mechanisms should be tested to determine if and how a range of functions could be achieved.

To what extent are the proposed criteria suitable for evaluating the different functions in environmental planning?

The easiest way to evaluate whether participation performs its intended functions seems to be based on participants' perceptions (e.g. Carnes *et al.* 1998, Petts 2001, Susskind *et al.* 2003, Agger and Löfgren 2008, Martineau-Delisle and Nadeau 2010).

However, Coglianese (2003) argued that participant satisfaction is not a useful criterion to evaluate the success of participatory processes. It cannot be equated with the quality or effectiveness of environmental decisions. Satisfaction may be based on the least common denominator of the group on the one hand; on the other hand participants consider a decision-making process often as more successful if it was time and labor intensive. Furthermore, since the participants are not the only affected people by the policy decision, participants' satisfaction is only a partial representation and the broader public is not considered.

In contrast, Martineau-Delisle and Nadeau (2010) propose to include participants' perceptions more often, since the views of participants can improve the assessment of participation.

Similarly, Agger and Löfgren (2008) argue that democratic assessment should concentrate on making judgments of the state of democracy based mostly on stakeholders' perceptions. They refer to Lord's (2004) perspective of democratic evaluation that is often related to the: "felt relationship between rulers and the ruled: whether they feel they have a right to public control which they exercise as equals (p. 14)". Still, stakeholders' perceptions can only be an indirect measure and should be complemented with direct and objective measures (Koontz and Thomas 2006).

Since some of the proposed criteria in Tables Table 1 to Table 6 were derived from single case studies or studies that were not environmentally relevant, a verification of the proposed criteria is necessary if they are to be qualified for evaluating the different functions in environmental planning.

A combination of different research methods (triangulation or multi-method design) seems to be a promising approach according to Grunenberg (2011). Different theoretical perspectives or various kinds of data can be applied. The overall picture of the object of investigation will be improved due to different perspectives.

To what extent do various contextual factors of environmental decision-making processes influence the functions of participation?

According to Beierle and Cayford (2002) and Delli Carpini *et al.* (2004), many contextual factors influence the functions and impact of participation: nature of the issue, purpose of participation, problem complexity, who participates, quality of pre-existing relationships, the institutional settings, the information provided, prior beliefs, substantive outcomes, geographic scale, and real-world conditions. The interaction of these and other factors should be a primary research goal. In particular, more research on the links between participation, implementation, and benefits for environmental quality is needed.

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Chapter III: Stakeholder Influence in Participatory Water Planning in the US and in Germany*

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Stakeholder Influence in Participatory Water Planning in the US and in Germany

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Abstract

The benefits of stakeholder involvement in participatory environmental decision-making processes have been extensively discussed. Debate persists on how to initiate and conduct effective stakeholder participation, and whether stakeholder participation has any influence on planning outputs. A comparative case study of stakeholder involvement in participatory water planning in Washington State (US) and Lower Saxony (Germany) was conducted to address the question of the effectiveness of participation. We found inclusive representation of stakeholders, whose comments were for the most part integrated in the final plans, which are of relatively good quality. Differences between both countries were related to the key issues that planning groups discuss, the influence of specific stakeholder groups, and in the binding character of the results.

Keywords: participatory water planning; stakeholder influence; plan quality; Washington State; Lower Saxony

1 Introduction

Participatory planning emerged as new paradigm in environmental management in the 1980s and 1990s (Lubell *et al.* 2002). In contrast to centralized command-and control environmental policies of the 1970s, participatory planning is thought to facilitate consensus and cooperation among competing interests (Lubell 2004). Furthermore, it attempts to eliminate the shortcomings of other participation forms (e.g. public information and consultation) that may have less influence on decision-making (Innes and Booher 2000). It is widely accepted that stakeholder and public involvement is an important part of effective natural resource planning (*cf.* Renn *et al.* 1995, Beierle and Cayford 2002, Brody 2003, Kovalev *et al.* 2007, Dietz and Stern 2008, Kovalev *et al.* 2009, O'Faircheallaigh 2010). However, the benefits of participation as they relate to the quality of decisions have rarely been tested (Reed 2008, Newig and Fritsch 2009b). The purpose of our comparative study is to contribute to this research gap. Using cases of water planning in the US State of Washington and the German state of Lower Saxony, we examined the effectiveness of stakeholder participation with respect to accepted best practices in participation, as well as the plan quality. After a discussion of existing research in the field of participatory planning and introducing the comparative study, the research methods and the case studies are presented. Next, the results are shown and discussed. Finally, conclusions for both countries are drawn.

1.1 Stakeholder Participation

Political participation by stakeholders is a rich and broad field, including elections, legal and illegal protest forms, initiatives and referenda, public participation during formal administrative procedures, and collaborative processes. Furthermore, various levels of participation have been

differentiated, ranging from information to consultation to cooperation (*cf.* Arnstein 1969, IAP2 2007, Arbter *et al.* 2008). In this study, we focus on organized participatory planning processes in environmental decision-making that are defined by an extensive and early involvement of stakeholders, efficient information exchange in the form of two-way communication, the expectation that all participants take an active part in shaping the planning documents, and a consensus oriented decision process (Randolph and Bauer 1999, Rowe and Frewer 2000, Ansell and Gash 2008). Participatory planning is characterized by a sharing of power and a joint responsibility among all participants for success as well as for failure. Stakeholders are those that have an impact on the environment as well as those that may be affected by the planning (Selin and Chavez 1995, Randolph and Bauer 1999). In the context of this study, stakeholders are individual private citizens or individuals representing organizations (including public agencies, private businesses and organizations, and non-governmental organizations), that have an interest in the planning process.

1.2 Effectiveness of Stakeholder Participation

Motivation for conducting stakeholder participation is often justified by an anticipated increase in the effectiveness of decision-making (Selle 1996, Wondolleck and Yaffee 2000, Newig 2005, Newig and Fritsch 2009b). Criteria for effectiveness can include the quality of the decision and the quality of implementation of the decision. The latter is not a focus of this study. The quality of the decision in participatory efforts is thought to be improved by a better information base due to local knowledge and knowledge about values, views, and the acceptance of the actors (Newig 2005). Decisions in environmental planning are assumed to benefit from local knowledge about issues that concern local actors because those closest to a problem often have the best understanding of it (López Cerezo and González García 1996, Rydin and Pennington 2000, Steele 2001).

Few studies take on the assessment of effectiveness as a focal point (Burton 2009). In a meta-analysis of 239 cases of public participation in environmental decision-making, Beierle and others identified benefits of stakeholder involvement including the quality of decisions (Beierle 2000, Beierle and Konisky 2001, Beierle and Cayford 2002). Leach *et al.* (2002) have suggested that participatory planning processes do not avoid serious, important topics nor do they produce insignificant results (*ibid.*). An evaluation of process, effects, and outputs of participatory growth management in Queensland, Australia demonstrates the importance of participatory planning outputs (and the process) for effective implementation (Margerum 2002). In an evaluation of local ecosystem management plans in Florida, Brody (2003) showed that broad representation of stakeholders is not the crucial factor for high-quality plans, but the inclusion of specific groups such as resource-based industries (e.g., agriculture, forestry), utilities, or environmental organizations can augment knowledge of critical habitat or make environmental data and expertise available to the larger group. Burby (2003) found similar results in a study of hazard mitigation planning in Washington and Florida where broad involvement - but especially of environmental or property owner groups - leads to stronger plans and implementation. In a meta-analysis of 40 cases in North America and Western Europe, Newig and Fritsch (2009c) found that higher acceptance and stronger environmental standards of policy decisions are achieved through participation. However, the literature is thin regarding whether higher quality environmental decisions actually result from participatory processes (Beierle 2002, Brody 2003, Reed 2008,

Newig and Fritsch 2009b). According to Dietz and Stern (2008), factors that positively influence the quality of environmental outputs are: inclusion of all interested and affected parties, shared formulation of the problem and design of the process, and a transparent and structured process (*ibid.*). Participatory planning often leads to compromises between competing interests (Newig and Fritsch 2009b), and there is concern that important substance, as well as plan quality, may get lost during consensus decision-making processes (Connick and Innes 2003).

Disagreements in the literature about the impacts of participatory planning are still present and need further research (Koontz and Thomas 2006, Dietz and Stern 2008). For example, research about how particular key factors (early and continued participation, representation, objectives, facilitation, and local knowledge) may lead to higher quality decisions in different socio-cultural and biophysical contexts is needed (Reed 2008).

1.3 Introducing the Comparative Study

Our on-going study of participatory water planning processes in Washington, US and Lower Saxony, Germany presented an exceptional opportunity to conduct a comparative case study to increase our understanding of stakeholder participation in water planning in both countries. In this paper, we address the following research questions: 1) which stakeholders participated in water planning? 2) What influence did those stakeholders have on water plans? 3) What is the quality of plans produced through participatory planning? 4) What similarities and differences between the US and Germany can be observed?

There is a lack of research on the impact of stakeholder participation in Germany in comparison to the US. However, Germany is on the move, and Lower Saxony represents one of the pioneers in participatory water planning. Common trends in democratic, industrialized nations allow for comparison: a more decentralized planning process, a shift from binding mandates to a more advisory status, an increased relevance of public participation, and a shift from command-and-control regulation to negotiation (Alterman 2001 cited Schmidt and Buehler 2007).

In the last few years, participation by different stakeholders has gained a special significance in the sustainability strategies of the European Union and its member states, including Germany (Säck-da-Silva and Bruns 2008). The understanding of participation developed from the new governance discourse of a more efficient and effective governing that forms in addition to the legitimizing and emancipatory motives of participation of the 1960s and 1970s (Feindt and Newig 2005). In connection with the inclusion of participation in European law, it is evident that participation has experienced an institutionalization in the field of environmental and sustainability policy. Inspirations for these European developments were the US Negotiated Rulemaking Act of 1990, Principle 10 of the Rio Declaration of 1992, and the Århus Convention of 1998. In 2000, the European Water Framework Directive (WFD) was enacted. This directive prominently addresses participation approaches that exceed the traditional forms of public information and hearing (Fisahn 2004, Feindt and Newig 2005, Newig and Fritsch 2009a). However, the WFD does not contain concrete regulations on designing this more active involvement; it is left to the member states (Leinweber 2008, Laskowski 2010). In Germany, the Federal Water Act (FWA) provides the framework for implementation of the WFD, and state water laws substantiate this framework. Because the instruction to regularize active participation is absent in the FWA (Las-

kowski 2010), the state water acts are formulated very differently and active involvement is seldom encouraged (Leinweber 2008). One example is Lower Saxony, where area-cooperations (*Gebietskooperationen*) contribute to drafting the water management plans on the local level (Borowski *et al.* 2008, Kastens and Newig 2008). However, more recent area-cooperations were not selected for investigation because we needed completed management plans whose implementation has started to allow for further research on the outcomes of participatory planning (*cf.* Chapter IV). In addition, comparability with the Washington cases is very important. Participation in the area-cooperations is restricted to representatives of different regional organizations, e.g. water management, nature conservation, or agriculture (Borowski *et al.* 2008, Kastens and Newig 2008). The water development plans (*Gewässerentwicklungspläne*) we selected are more open to non-organized participants, making them most comparable to cases in Washington. Both have comparable approaches towards the planning process.

In the United States, experiences with participatory planning processes have existed since the 1970s. In the field of water management, a shift from traditional, technocratic planning (with public participation through public hearings and comment periods) to a more collaborative and holistic approach has occurred in the past 25 years (Sabatier *et al.* 2005). While regulatory planning instruments – also in Germany - have successfully addressed pollution from point sources since the 1970s, enduring environmental problems (e.g. waste runoff, soil erosion, and other natural resource degradation) are often caused by non-point sources. These problems are not easy to resolve with traditional command-and-control regulation because of multiple actors and geographically dispersed activities. Instead, participatory planning lends itself to improve comprehensive environmental quality (Randolph and Bauer 1999, Koontz 2003, Lubell 2004). Because of these early and extensive experiences with participatory processes in environmental policy decisions, a comparison of the more recent German experiences with the United States is worthwhile. There are many assumptions and little evidence for the differences and commonalities between German and American environmental planning, and we hope to make a contribution to the comparative research in this field. We selected Washington State because of existing cooperation among the authors, its existing participatory water planning policies and processes, and its challenging planning debates related to growth, water quality, water quantity, and other ecological concerns.

2 Research Methods and Approach

To analyze the effectiveness of participatory planning, we focused on the criterion of decision quality, operationalized by the incorporation of stakeholders' views and acceptance into the final plans as an indicator. Data were compiled from six cases of participatory water planning in Washington State, US, as well as in Lower Saxony, Germany (Figure 3). The case study approach was selected in order to investigate the phenomenon of participatory planning groups in depth and within its real-life context (Yin 2009).

Figure 3(a-b): Location of the Washington watersheds (a) and of the Lower Saxony Leine River (b).

2.1 Data Collection and Analysis

The primary data sources were documents from planning units. We conducted content analysis of completed watershed management plans, planning unit meeting minutes, comments to the plan, and responses to comments. Content analysis involves identifying patterns of responses and major themes (Patton 2002). Systematic coding frameworks are used to analyze the entire qualitative data set, and then sorted and organized codes into thematic groups (Rubin and Rubin 2005).

The documents were analyzed and coded with respect to:

- start and end of plan development phase
- first meeting dealing with plan development
- final plan approved by working group (Germany)/county (US)
- number of individual participants
- total number of individuals:
- per type of stakeholder: city, county, regional, state, federal government, non-government (among others environmental groups, water management, agriculture, public), tribes, consultants
- per meeting
- inclusion of statutory/suggested contents in the plan
- comments of the different stakeholders on the draft/final plan

To determine if the views and perspectives of participants were reflected in the final plan, a coding approach was defined to indicate whether the content of the comment could be found in the draft and final plan (examples in Table 7). Each comment was coded in terms of the type of comment, as well as the organization or the stakeholder that made the comment.

Table 7: Examples for the classification of the comments.

category	definition	example - comment	
Views reflected	Content of comment could be found in the plan	We should maintain activities that increase ground water storage [Entiat River, landowner].	Final plan: The CCCD [Chelan County Conservation District] […] should assure that a study or studies be completed to explore surface water and ground water storage options and identify potential locations either on the surface or in subsurface confined or unconfined alluvial aquifers (9-8).
Views not reflected	Content of comment could not be found in the plan But often discussed in the planning unit sometimes reasons why not integrated	He stated that the planning unit should develop a catalogue of well information […]. The catalogue would connect information with existing geology, track water levels using existing well log. This plan is low cost but needs the support of willing landowners. Well drillers would also need to be consulted [Middle Snake River, consultant].	[There was discussion regarding the necessity of collecting this information. Collection of the data will be part of the implementation plan.]
Question/ clarification	Questions or explanations that help to understand the topic or problem	Are those estimates generated with real data, or computer generated data? (Entiat River, citizen)	Answer of the consultant: We are using both real data and computer modelling to generate our estimates […]. The computer models include the real data we've collected.

For selected stakeholders in each case study, the nature of their comment(s) was analyzed. For example, based on the topic and intent, each comment was attributed to one of the following 'comment type' categories: water quality, water quantity, nature conservation, land/water use, or general.

The plan quality was assessed by applying a limited selection of indicators suggested by Margerum (2002), Koontz (2003), and Mandarano (2008). Few criteria for the evaluation of participatory output quality are described in the literature (Mandarano 2008), but those include:

- clear goals
- consensus-based science
- meeting content requirement (US)/recommendations (Germany)
- inclusion of additional suggested items
- justified actions/clear implementation approach
- number of policy recommendations
- plan approved by consensus

The data were evaluated with the aid of descriptive statistical methods such as one- and two-dimensional frequency distributions and diagrams.

3 Study Area and Cases

3.1 Case Selection

All watersheds in Washington State that participated in planning under the Watershed Planning Act with an approved watershed management plan (a total of 26) were initially contacted with a request for planning documents that could not be found on the websites for the watersheds. About one third of the planning units provided acceptable documents that could be used for analysis. Three cases - one in South-eastern Washington (Middle Snake River), one in Central Washington (Entiat River), and one in Western Washington (Island County) - were chosen because they provided geographic diversity, had final plans, had finalized a detailed implementation plan, and had started the implementation phase.

In Germany, we selected three Lower Saxony water development plans of the Leine River (Lower, Middle, and Upper Leine) upon the recommendation of a staff member of the State Agency for Water Management, Coastal Defense and Nature Conservation whose records were comprehensive and whose plans were of good quality according to the 'Instructions for preparing a water development plan' (Sellheim 1996).

3.2 Case Descriptions

Washington State

In 1998, the Washington State Watershed Planning Act was passed, which provided a framework for a voluntary and participatory watershed planning process. Washington State is divided into 62 broad watershed management areas, and planning takes place on the basis of these major areas. The planning process is divided into four different phases that include mandatory and optional elements (see

Table 8). If a planning unit decides to participate in the program and accept planning money from the state, then all counties, the largest city or town, and the largest water purveyor in the watershed, and representatives of the public and tribes are required to be invited to participate, but participation is voluntary. Normally, additional interest groups are invited and involved. Decision-making occurs either through consensus of all members of the planning unit, or through consensus of governmental members and majority vote of non-governmental participants. After the final plan is approved by the planning unit and reviewed by the Washington State Department of Ecology and by tribal government (if participating), an administrative process may be started by the county that may result in approval of the plan by majority vote. If approved by the county, the watershed management plans are legally binding for all state and county agencies that were members of the planning unit and were involved in the decision-making process (90.82 RCW).

Table 8: Planning phases and plan contents (Sellheim 1996, 90.82 RCW, Jürging and Strotdrees 2004).

Washington State watershed planning	Lower Saxony water development planning
organization of the planning unit and determination of the scope of planning (phase I)	status quo assessment interfering factors adverse effects of the stream and the floodplain
watershed assessment (phase II)	objectives and action plan catalogue of concrete measures
watershed plan development (phase III) mandatory elements: water quantity and management of water resources (projects) optional elements: water quality, habitat and instream flow	
watershed plan implementation (phase IV)	implementation of individual measures

The Island County watershed (53,872 ha) is composed of Whidbey and Camano Island located in the Puget Sound. The main water source is groundwater, surface water is limited. Because the islands are located in the rain shadow of the Olympic Peninsula, precipitation varies. Another problem is seawater intrusion because some aquifers are linked to the saltwater of Puget Sound. The Water Resource Advisory Committee functions as the planning unit, and is made up of twelve citizens appointed by commissioners, supported by technical advisors. The committee was planning from September 2002 to June 2005 (WRAC 2005). Issues of concern in the Middle Snake River watershed (582,748 ha) include water quality (temperature, sediments, fecal coliform) and water quantity (limited instream flow and ground water). 43% of the watershed is used by agriculture. The plan development phase took from November 2004 to August 2007 (HDR 2007). The Entiat River watershed (123,687 ha) belongs to the Upper Columbia River System. Most of the land in the watershed is covered with forest managed by the US Forest Service and used for recreation. The main use of water in the watershed is for orchards and grazing and takes place in the lower part of the valley. The planning unit worked on the plan development from January 2002 to September 2004 (CCCD 2004).

Lower Saxony

Water development plans (*Gewässerentwicklungspläne*) are prepared within the Lower Saxony River Program of 1992, a financial support program of the Lower Saxony Water Management and Nature Conservation Administration. The aim of the program is the restoration and conservation of natural structure, dynamics, and functioning of Lower Saxony's stream landscapes through appropriate restoration measures. For this reason, the River Program contributes to the implementation of the European Water Framework Directive (WFD) (Sellheim and Kairies 2002, Sellheim 2006, NLWKN n.d.). There is no legal requirement directing the organization of the planning process (or for the preparation and the contents of the water development plans) but there are recommendations by the Lower Saxony Agency for Water Management, Coastal Defense and Nature Conservation (see

Table 8). Lower Saxony water development plans are prepared in the context of voluntary interdisciplinary working groups composed of environmentalists, land users, local nature conservation and water protection agencies, and other stakeholders (e.g. water maintenance associations), with the aim of the broadest public involvement possible in order to incorporate specific local knowledge and interests. Stakeholders are invited to participate by the responsible agency. The decision-making process in Lower-Saxony occurs by consensus or majority vote. However, the final plan is not approved by governmental agencies. The Lower Saxony water development plans are regarded as conceptual frameworks and are not legally binding (Sellheim and Kairies 2002, NLWKN n.d.). Furthermore, water development plans can be used to contribute to the aim of the WFD by representing a component of the river basin district management plans.

The Leine River is located in North-western Germany and runs through the Weser Leine Hills and then through a fertile plain south of Hanover, the Calenberger Boerde. The most serious problems are the numerous barriers (dams) in the river that prevent the passage for migrating fish (e.g. salmon and trout). The approach to the plan development was as following and applies in the main for all the Leine River working groups: the consultants worked out a draft version of the development objectives and proposals of actions incorporating the working and discussion results of the group. Every member then had the opportunity to comment on that draft. These encouragements as well as concerns were the basis for the review of the draft document that was available for written comments. These statements are part of the final plan at the Middle and Upper Leine and illustrate consensus as well as conflict of the planning process (Jürging and Schmida 2004). At the Lower Leine River (6,105 ha), a steering committee made up of governmental and non-governmental representatives structured the planning process. Three working groups accompanied the planning process. They met monthly for almost two years from November 2001 to October 2003. An agricultural pilot project went along with the planning process at the Lower Leine River. The goal was to determine an action plan for future agricultural use of the floodplain, taking social aspects of concerned farmers into account (Jürging and Strotdrees 2003). At the Middle Leine River (2,235 ha), a voluntary working group accompanied the planning process between May 2002 and February 2004. The Upper Leine River (4,205 ha) planning process is incorporated in a regional management project for flood protection. A voluntary working group conducted the planning process from January 2002 to December 2002 (Jürging and Schmida 2002).

4 Results and Discussion

4.1 Participation and Representation

Figure 4(a-f) represent the mean number of participants per meeting and interest group, and the distribution of the total number of participants as a percentage per planning unit/working group. The figures include people that only came once to a meeting as well as different members of the same organization.

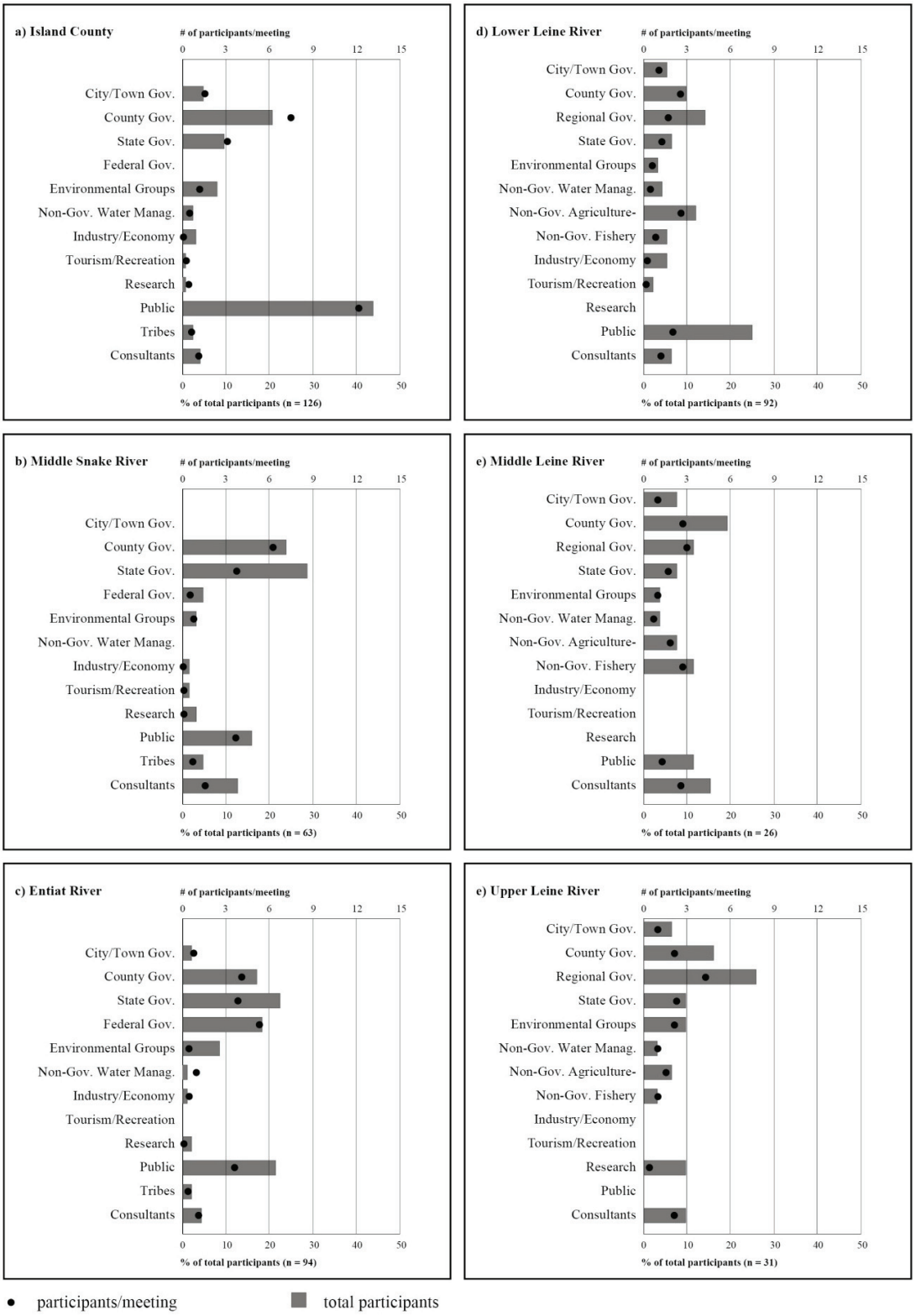

Figure 4(a-f): Total number of participants and average number of participants per meeting.

In Island County (Figure 4(a)) more participants were non-governmental, with a considerable number of citizens. This can be explained by the composition of the Water Resource Advisory Committee that functions as planning unit and consists of two-thirds citizen members (WRAC 2005). In the Middle Snake watershed (Figure 4(b)), more than half of the participants came from the governmental sector, namely from the county government (Conservation Districts, County Commissioners) and from state environment or natural resource agencies (Washington Departments of Fish and Wildlife (WDFW) and Ecology). Significant areas of the Middle Snake watershed (e.g. Tucannon River, Grande Ronde River subbasin) are managed by the WDFW (HDR 2007). Participants from city or town governments were missing, even though participation by these representatives is mandatory. According to the watershed coordinator (personal communication, 17 Jun 2009), they were invited but decided not to participate actively in the planning process. The largest non-governmental group was the public. In the Entiat watershed (Figure 4(c)), the highest number of participants came from the government. The federal government is represented by the US Forest Service, who manages the majority of lands in the watershed as forest reserves (CCCD 2004). Many participants also came from the public.

At the Lower Leine River (Figure 4(d)), most of the participants were non-governmental with a major portion of farmers as part of the public and agricultural organizations. 95% of the Leine floodplain is used by agriculture, and the high amount of participating farmers can be explained by the agricultural pilot project that accompanied the planning process. At the Middle Leine River (Figure 4(e)), governmental and non-governmental members were almost balanced. Public (i.e. mostly farmers and fishers) represent the most numerous non-governmental stakeholder group. At the Upper Leine River (Figure 4(f)), most participants were governmental and the largest group came from the regional government, especially from the water management department. Citizen members and individual farmers did not participate since organized interest groups were only invited (facilitator, personal communication, 19 Feb 2010).

In summary, the planning group sizes varied from 26 to 126 members. The representation differs but was generally inclusive, which is important to achieve legitimacy (Dietz and Stern 2008). In the Middle Snake case the required city or town government was missing and in the Upper Leine case the public was missing. In comparing both countries, only a few notable differences were observed: the public and county government are more often represented in all Washington cases. On the one hand, this result confirms the often expressed opinion that the American civil society is more active. On the other hand, this indicates a local process as required by the Watershed Planning Act. In Lower Saxony, the federal government is missing because water development planning is a state program and federal jurisdiction (e.g. federal waterway) has not been affected. Instead, regional government participated which initiated the planning process. Organized agriculture and fishery groups only participated in Germany.

4.2 Stakeholder Influence in Plan Development

We were interested in understanding more about the nature of stakeholder comments, and whether their comments were reflected in the final plan documents (as an indicator of influence on plan contents).

In the Island County (Figure 5(a)) watershed, within the group of governmental participants, comments came mostly from the county government, which was well represented. Most of the

county comments that dealt with water quantity and general topics were not addressed in the final plan. They were made by County Commissioners and could not be integrated because they were made too late in the process, at a time when the draft was prepared to be approved by the county. Citizens in Island County made most of the non-governmental comments. Their perspectives on general topics were incorporated completely into the final plan. Within the group of governmental participants in the Middle Snake watershed (Figure 5(b)), comments came mostly from state and county agencies that also had the most participants. The integrated state agencies' views dealt primarily with water quantity. Tribes made approximately the same amount of comments as all governmental participants together, but had only few individual participants. This active involvement rests on the long history of Native Americans in the area. The Nez Perce Tribe owns ceded lands and has treaty fishing rights for these areas (HDR 2007). Half of non-governmental (mostly landowners) perspectives were not reflected in the final plan and these comments dealt primarily with water quantity, allocation limits, and off stream wells. Even though the plan addressed water quantity, there was a controversial discussion about reservations of permitted exempt wells that could not be completely addressed in the final plan. State government in the Entiat (Figure 5(c)) watershed made most of the comments that dealt in general with water quantity. More than half of their comments could be retrieved in the final plan. All of the comments that were not found in the final plan dealt with water quantity, especially with setting minimum instream flows and the exact values. One-third of all the Entiat comments were questions or clarifications, and most of these came from non-governmental participants (mostly landowners), and dealt with various problems of water quantity, e.g. the gain/loss study and setting minimum instream flows. A major topic of all comments was also water quantity, half of those comments were considered. It is not surprising that water quantity and instream flow were important topics for the state government because the Department of Ecology has the authority to adopt instream flow rules.

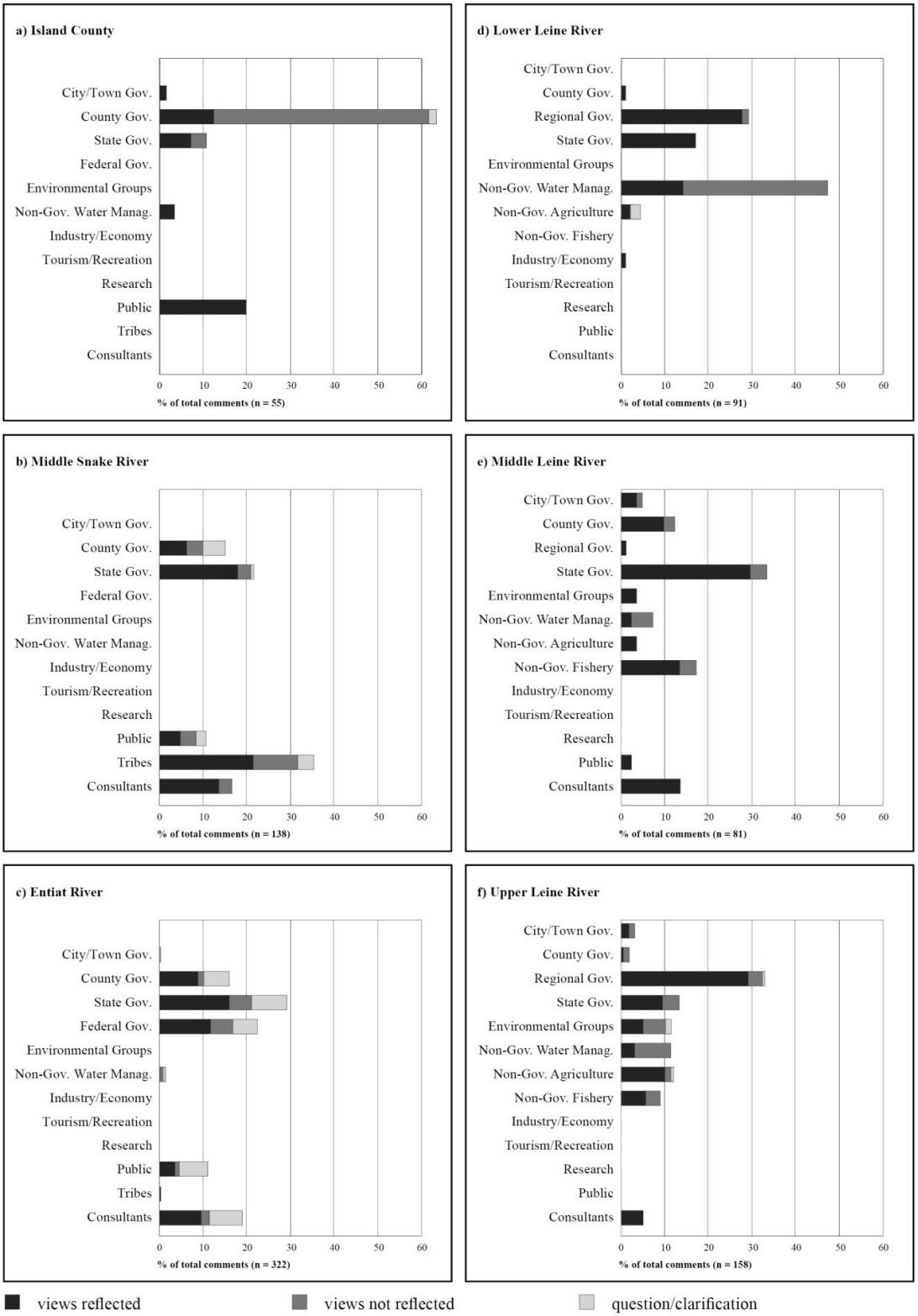

Figure 5(a-f): Who made comments and what happened with the comments?

At the Lower Leine River (Figure 5(d)), farmers made no comments at all, even though many of them participated. One explanation could be that farmers felt well represented by the Associa-

tion of Farmers. According to a key stakeholder, the perspectives of farmers are well reflected in the final documents (personal communication 17 May 2010). Non-governmental stakeholders made slightly more comments than governmental participants. Almost half of the comments came from the non-governmental water management group that played a small role in the total number of participants. Most of that group's comments dealing with general and water quality topics were not reflected in the final plan because they were made too late in the process. At the Middle Leine River (Figure 5(e)), most comments came from the state government (Lower Saxony Office for Water Management and Shore Protection) with only few participants. Most of the state positions related to water quantity and land or water use could be located in the final plan. At the Upper Leine River (Figure 5(f)), the regional government had the most participants and made most of the comments. This could be due to the fact that the planning process was integrated in a regional management project. Most of regional government's perspectives were found in the final documents, and they addressed general, water quality and quantity topics. Almost all of non-governmental agriculture's views (two-thirds of them dealt with water quality, one-third with land/water use) could be located. More than two-thirds of non-governmental water management's and almost half of environmental groups' comments were unconsidered.

For all cases, the number of comments ranged from 52 to 322, and not all groups that attended the meetings contributed actively to the plan in the form of comments. In all cases, except for the Lower Leine, more comments came from governmental than non-governmental participants. Within the non-governmental participants in the Washington cases, the public made most of the comments. In all Washington watersheds and at the Lower Leine, environmental groups made no comments at all. The public did not comment on the draft or final plan in the Lower Leine. In general, perspectives of stakeholders were reflected in the water management plans. The integration of comments was similar regarding governmental and non-governmental participants. If comments were not integrated in the final plan, there appear to have been good reasons. Many comments of the Leine water maintenance association were not integrated into the plan. Often the comments were formulated imprecisely, were vaguely defined, corresponded to other planning phases, or were made too late. Similarly, in Island County the Commissioners' comments were made when the final draft was ready for approval. The lateness of comments is surprising, since both stakeholder groups were participants and should have been well aware of deadlines. General and water quantity were the most discussed topics, and comments that dealt with land/water use, or water quality were most frequently reflected in the final plan.

4.3 Plan Quality

We were interested in assessing several 'quality' metrics for plans produced by the planning units, relying on recent literature (Margerum 2002, Koontz 2003, Mandarano 2008). While this is not an entirely comprehensive approach, we were interested in applying a focused selection of the most relevant indicators to analyze plan quality. We used indicators that could be applied to the planning documents, since we did not have interview data. Using this set of indicators, the following results were generated (Table 9):

Table 9: Criteria of plan quality (Margerum 2002, Koontz 2003, Mandarano 2008).

	Island County	Entiat River	Middle Snake River	Lower Leine River	Middle Leine River	Upper Leine River
Clear goals	✓	✓	✓	✓	✓	✓
Consensus-based/ majority voting science	✓	✓	✓	✓	✓	✓
Meeting content requirement/ recommendations	✓	✓	✓	✓	✓	✓
Additional suggested items	none	all	all	n/a	n/a	n/a
Justified actions/ clear implementation approach	✓	✓	✓	✓	✓	✓
Number of policy recommendations	16	46	234	113	45	47
Approved by consensus/ majority vote	✓	✓	✓	✓	✓	✓

In all cases, the plans are of good quality as far as the selected criteria are concerned: all documents incorporate clear goals and consensus-based or majority voting science, the findings justify actions or identify a clear approach for implementation, and all documents are approved by a consensus-based or majority voting process. In Washington, the required plan elements were included according to the guidelines of the Watershed Planning Act (WPA). The number of included optional elements suggested by the WPA ranged from none to all. The Island County watershed plan describes complex issues related to water management (e.g. seawater intrusion, water supply) and strategies and recommendations for adequate water supplies. The implementation plan proposes concrete actions to reach the watershed plan objectives and therefore facilitate implementation. The watershed plan of the Middle Snake River watershed identifies key planning issues for water quantity, instream flow, water quality, and habitat, strategies and tools for addressing these issues, and management objectives. The plan formed the scientific basis for implementation. The plan of the Entiat River watershed includes water quantity, instream flow, water quality, and habitat actions and strategies to preserve or improve environmental conditions in the watershed, a description of existing conditions and limiting factors, and recommended actions to address these issues. In Lower Saxony, all plans met the recommendations of the responsible authority. The quality of the Leine River water development plans in form of development objectives as framework for actions and a concrete program of recommended actions laid the foundation to implement projects.

Most of the stakeholder comments were reflected in the final plans, indicating that stakeholders do in fact influence the outputs from participatory planning efforts. The consideration of the different interests seems to positively affect the planning results. Both the analysis of the planning documents according the selected criteria and the perceptions of key stakeholders (*cf.* Chapter IV) indicate that the participatory planning approach has led to water management plans of good quality that lay the foundation for implementation.

5 Discussion and Conclusion: Cultural and Historic Forces Shape Participatory Planning Processes

Our study indicates that stakeholder participation is inclusive, and that stakeholders who participate do have influence on the content of final watershed plans. In addition, the plans produced are of relatively high quality. Differences between countries relate to the types of issues addressed in plans, the influence of government, the level of involvement of the public in planning, and the binding nature of the final plans.

5.1 Different Focal Points Drive the Discussion

The intensive discussion about water quantity in the Washington State cases may be due to cultural, or historic reasons, as well as a reflection of current management challenges. During the settlement of the western US in the nineteenth-century, the early settlers and treaty tribes got first-use rights that are now recognized as 'senior' water rights. Newer, 'junior' rights are not served until the demand of the senior rights is satisfied (Hoering 2006). In times of water shortage, junior water right holders may not receive all (or any) of their water allocation. In more recent decades, Washington State has faced severe droughts, the listing of endangered species that rely on specified water quantities in stream, and increased population growth and development, all of which place increasing demands on the limited and scarce water resource. The water quantity problem may have been an important incentive for particular stakeholders to participate in water planning, in particular because water quantity is one of the required planning elements that planning units must address.

The German cases are not facing the same intensity of demands for the water resource because the natural local conditions for agriculture are as beneficial that irrigation is not much needed for example. Therefore, water quantity was not a topic that was discussed more than the other topics in the German cases. Further, the degree of faith in the governmental administration may be higher and can be traced back to the Prussian administration system of the seventeenth- and eighteenth-century. The German water law dates back to the Middle Age. The distribution of water happens according to Art. 33 Federal Water Act: the minimum instream flow has to be maintained.

5.2 Influence of Various Interest Groups

Although governmental participants were well-represented and also made many comments in all cases, the integration of their comments is similar when compared to non-governmental participant comments. This may be an indication that government organizations are not 'dominating' participatory planning processes as many have feared. Alternatively, it could be that the processes we examined were well managed by outside facilitators, and this served to moderate the influence of the government as Chess *et al.* (2000) have proposed. However, government's influence on participatory planning becomes apparent through other facts (*cf.* Koontz 2006): both processes were initiated by state departments, in Lower Saxony by the precursors of the Agency for Water Management, Coastal Defense and Nature Conservation and in Washington State by the Department of Ecology. The Washington Watershed Planning Act prescribes which participants are required at a minimum, and that state agencies are required to assist the

planning units. However, in all Washington cases the invitation of the participants occurred on a very broad basis. In Lower Saxony, the processes are coordinated in different ways by the former regional government (Middle and Upper Leine) or by the Hildesheim County (Lower Leine) which all hired a facilitator. At the Upper Leine River, the regional government invited only specific stakeholders after the 'principle of delegation'. Therefore, few direct landowners participated, the communities were represented by the building departments, and the farmers by the Chamber of Agriculture and the Association of Farmers (facilitator, personal communication, 19 Feb 2010). At the Lower Leine, the invitation of participants was very broad, e.g. every farmer in the Region was invited. In Washington, all case studies are coordinated by a lead agency: in Island County the Department of Health, in the Middle Snake watershed the Asotin County Public Utility District, and in the Entiat watershed the Chelan County Conservation District. There are differences in both countries about the final approval of the plans: the last word on what to include lays in Germany with the working group, in contrast to the US where the County Commissioners have the final authority to approve or disapprove the plan. However, the commissioners can only make suggestions what to include or amend to get the final approval.

The fact that most of the tribal government comments could be located in the planning documents is not surprising, in particular because of the powerful position of the tribal nations in the process: "The Department of Ecology is required to consult with [a]ffected tribes before they can approve watershed plans […] [and] to coordinate with tribal treaty rights before they implement plans (representative of Yakama Nation, personal communication, 26 Jun 2009)".

The often expressed opinion that the American civil society is more active compared to Germany seems to be affirmed by a higher level of representation and active participation of the public in all Washington cases.

5.3 Binding Character of Outputs from Participatory Planning

In Washington, all three water management plans have been adopted by the local jurisdictions, and are legally binding for state and county agencies. However, implementation of the plans is subject to financial and technical resources, as well as political constraints. In Lower Saxony, the water development plans are not legally binding. They are conceptual frameworks that can be used by local administrations as basis for further planning, e.g. compensation measures. However, the implementation of these results in other plans or programs depends primarily on the willingness of the policy-makers. For example, the case of the Lower Leine was exceptionally successful because of the commitment of one community's director (*cf.* Chapter IV). Even if the requirements are different in both countries, the implementation depends not only on the legal binding character, but on political willingness as well as financial and technical feasibility.

While our comparative case study analysis shows that stakeholder participation is effective regarding the decision quality criteria by Newig (2005), additional research is necessary to generalize and validate our assumptions. Since it was not our primary research goal to explain for example why participating stakeholders made no comments (e.g. environmental groups), why certain stakeholder comments were included or not, or the power relationship among participants, we did not have data that would allow us to do so. However, we included some

speculations on these topics. Here, further research is needed, e.g. in-depth interviews with key stakeholders.

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Chapter IV: Do Collaborative Planning Processes Lead to Better Outcomes?

– Perception of Stakeholders in Water Planning in the US and in Germany*

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Do Collaborative Planning Processes Lead to Better Outcomes? – Perception of Stakeholders in Water Planning in the US and in Germany

Abstract

Many advantages of participatory collaborative planning - compared to administrative planning - are well known, and collaborative planning is even expected to improve environmental conditions. However, little research has been done to examine whether this claim can be confirmed. This article contributes to filling this research gap by investigating the relationship between process, outputs, and outcomes using the examples of collaborative water planning in the US State of Washington and the German State of Lower Saxony. Stakeholders' perceptions of watershed planning in Washington (Island County, Entiat River, and Middle Snake River watershed) and of the Leine River in Lower Saxony were explored. In all cases a linkage between process, output, implementation, and environmental outcomes was stated by the interviewees. In three cases, social outcomes also influenced implementation, and as a consequence environmental outcomes. These findings demonstrate that it is important to look not only at the individual factors of collaborative planning processes such as environmental outcomes, but also at the whole process and the relationship between the different factors.

Keywords: collaborative water planning; stakeholders' perception; social and environmental outcomes

1 Introduction

Koontz and Thomas (2006) see the 21st Century as the era of collaborative planning and decision-making, following a 20th Century of administrative environmental planning. In the US, this change can be observed especially in the field of water planning. In 1998, the Washington State Watershed Planning Act was enacted, for example. The Watershed Planning Act provided a framework for a voluntary and collaborative watershed planning process that included the development of a watershed management plan and the implementation of actions. At the same time, participatory planning approaches exist in Germany e.g. in the area of water development planning (*Gewässerentwicklungsplanung*). Within the Lower Saxony River Program of 1992, voluntary interdisciplinary working groups prepare water development plans.

Despite research in the area of collaborative management, little is known about the actual impacts on the environment (Koontz and Thomas 2006, Thomas 2008, Munoz-Erickson *et al.* 2010). Beierle and Cayford (2002) stated that the relationship between participation, implementation, and improvements of environmental conditions should be a high priority research topic.

The question of whether collaboration leads to better environmental conditions remains unanswered because environmental outcomes are hard to assess (Thomas 2008). While regulatory planning instruments have successfully addressed pollution from point sources since the 1970s, enduring environmental problems (e.g. waste runoff, soil erosion, and other natural resource degradation) are caused by non-point sources. These problems are not easy to resolve with traditional administrative planning approaches because of geographically dispersed polluters. At

this point collaborative planning allows for a process to mediate conflicts of interests, to find consensus, and to improve environmental quality (Randolph and Bauer 1999, Koontz 2003, Lubell 2004).

The purpose of this study is to contribute to the ongoing exploration of the relationship between collaborative outputs and environmental outcomes. The overall research question is: Are the results of collaborative planning improving environmental conditions?

I use the analytical framework (in a modified form) developed by Mandarano (2008) to investigate cases of collaborative water planning in the US and in Germany. The evaluation framework "includes measures to identify and evaluate outputs and outcomes as well as the apparent causal linkages between process, outputs, and outcomes (*ibid.*, p. 458)". Despite the call to concentrate on environmental outcomes, this study analyzed outputs as well as outcomes to gain knowledge about factors that influence environmental outcomes to make a contribution to close this research gap in collaborative planning (Kenney 2000).

This article proceeds with a description of the development and the characteristics of collaborative environmental planning and an extended discussion of existing research about output and outcome evaluation. The next sections describe the methodological approach and the study context for this comparative case study research. Subsequently, the results from the analysis of the American and German cases are presented and discussed. Finally, a flow diagram represents the relationship between process, outputs, and outcomes for the selected cases in the last section.

1.1 Characteristics and Development of Collaborative Planning

Collaborative water planning emerged from alternative dispute resolution (Snow, 2001) as a new paradigm in environmental management in the 1980s and 1990s (Lubell *et al.* 2002). In contrast to centralized command-and control environmental policies of the 1970s, collaborative planning is thought to facilitate consensus and cooperation among competing interests (Lubell 2004). Furthermore, it attempts to eliminate shortcomings of other participation forms (e.g. public information and consultation) that have less influence on decision-making (Innes and Booher 2000). It is widely accepted that stakeholder and public involvement is an important part of effective natural resource planning (e.g. in terms of adoption of policies and quality of plans through local knowledge and trust, Brody 2003). The benefits of public involvement have been much appreciated, as O'Faircheallaigh (2010) showed in a comprehensive overview for public participation in environmental impact assessment and policy making. However, the debate continues regarding how to undertake participation, and a number of problems remain associated with the key issue of how to pursue effective participation (Brody *et al.* 2003, Dietz *et al.* 2008, O'Faircheallaigh 2010).

Collaborative planning is characterized by an extensive and early involvement of stakeholders, efficient information exchange (Randolph and Bauer 1999, Rowe and Frewer 2000) in the form of two-way communication, and a consensus oriented decision (Ansell and Gash 2008). Collaborative planning efforts are characterized by a sharing of power and a joint responsibility of all participants for success as well as for failure (Selin and Chavez 1995, Randolph and Bauer 1999), i.e. non-governmental stakeholders are responsible for policy outcomes and participate in deci-

sion-making as well (Kovalev *et al.* 2007, Ansell and Gash 2008, Kovalev *et al.* 2009). The aim of collaborative processes is that different stakeholders work together to lead to better decisions and implementation (Wondolleck and Yaffee 2000) and to resolve disputes before they go to the court.

1.2 Output and Outcome Evaluation

Following the definition of Koontz and Thomas (2006) "Outputs are the plans, projects, and other tangible items generated by collaborative efforts. Outcomes are the effects of outputs on environmental […] conditions (*ibid.*, p. 113)".

Linking output and outcome is one of the most challenging ways to assess the effectiveness of environmental governance because of the lack of methods to evaluate outcomes (Hendricks *et al.* 2009), for example. Further challenges include:

1) monitoring data: to determine environmental outcomes pre- and past-project monitoring data for several years are needed (Conley and Moote 2003, Lubell *et al.* 2005)

2) long time horizons between implementation and changes in the environment: measurement needs to start before implementation (Koontz and Thomas, 2006), demonstrable environmental changes do not appear until years or decades (Conley and Moote 2003)

3) impacts of various external variables on the environment should be considered (*ibid.*, Lubell *et al.* 2005): e.g. changes in precipitation, upstream practices as closing of a plant or fencing of a stream (*ibid.*) that are not associated to the collaborative process.

The crucial point whether collaborative planning leads to better environmental outcomes is the success of the implementation (Thomas 2008). Participation can prevent implementation problems (Bulkeley and Mol 2003 in: Fritsch and Newig 2007). Important factors that influence the implementation of projects include the partnership age and the amount of funding to realize actions (Lubell *et al.* 2005).

Measures for environmental outcomes can be perceived changes in environmental quality (surveys, interviews, Conley and Moote 2003), changes in land cover (remote sensing), in biological diversity (ecological studies), and in environmental parameters (ecological studies, Koontz and Thomas 2006).

Still, stakeholders' perceptions can only be an indirect measure of improved environmental outcomes (*ibid.*). Participants in time- and labor-intensive collaborations may tend to exaggerate improved outcomes to economize their effort (Coglianese 2003). Furthermore, stakeholders may think more positively about environmental improvements as result of their outputs if trust was built among the group members. This phenomenon is called halo effect (Leach and Sabatier 2005). Therefore, it is important to complement these subjective measures with direct and objective measures (Koontz and Thomas 2006).

Initial attempts to assess environmental outcomes of collaborative planning were made by Margerum (2002) analyzing a growth management program in Australia. Purchase of land under

a regional open space program, new land acquisition programs, and participation in a voluntary land conservation program were determined as measures for "changes on the ground (p. 186)".

Leach *et al.* (2002) conducted a meta-study of watershed management partnerships in California and Washington. They stated that environmental outcomes cannot be measured directly because of the lack of objective data (pre-project and post-project monitoring). Instead proxy measures as perceived improvements on watershed conditions, restoration projects implemented, monitoring projects, and education and outreach projects were used. The following findings were generated: the older the watershed partnership the more improvements are noticed by the participants and the more projects are achieved. However, partnerships more likely implement those restoration projects that are easier to carry out. According to the partnerships' participants, the most effectively addressed problems are conflict among stakeholders, threats to species and habitat, and impaired water quality. Thus, partnerships give attention to serious problems. This finding suggests that the widely held belief that consensus-based planning approaches are only addressing uncontroversial issues and are therefore producing ineffectual agreements is not completely accurate.

In a second evaluation Leach and Sabatier (2005) analyzed the relationship between outputs and outcomes, especially the influence of trust and social capital, based on Leach *et al.* (2002). They detected a strong relationship between trust or restoration projects and perceived effects. But trust could have produced a halo effect on the perception of participants about improved watershed conditions (see above).

Meyer and Konisky (2007) analyzed the local implementation of wetland protection projects in Massachusetts. Environmental outcomes were determined by reduced wetland disturbance. Communities that adopted local wetlands regulations generated quantitatively and qualitatively 'better' environmental outcomes (i.e. fewer disturbances to wetlands resources) than communities without wetlands regulations.

An outcome evaluation by Ferreyra and Beard (2007) researched the Maitland Watershed Partnership in Southwestern Ontario, Canada, with respect to intended and unintended impacts of the partnership on water quality and quantity. Indicators were changes in *E. coli*, nitrate, total phosphorus, heavy metals, and PCBs levels. On-the-ground projects and educational outreach may add to improve water quality but provincial and municipal monitoring programs are not designed to reveal a linkage between partnership's actions and water quality.

Fritsch and Newig (2007) conducted a meta-analysis of stakeholder involvement and stated that participation weakened the quality of environmental decisions compared to top-down outputs. However, stakeholder involvement improved the effective implementation of the decisions. Thus, Fritsch and Newig concluded that "the implementation of an average output is far better than a weak or non-implementation of a potentially high-quality output (2007, p. 11)".

Mandarano (2008) developed an evaluation framework to assess collaborative environmental planning outputs and outcomes and tested it on the New York-New Jersey Harbor Estuary Program. Environmental outputs were a habitat study, priority habitat lists and maps, and a compensatory mitigation white paper. Outcomes are restoration projects implemented, land protected from development, changes in environmental parameters, and perceptions of im-

proved environmental quality. Her study found that “the collaborative process was the key factor that (p. 466)” led to learning and in consequence to actions which produced environmental outcomes. Two factors made mainly a contribution to collaborative outcomes: 1) the quality of the outputs and 2) the availability of resources (funding and technical knowledge).

2 Material and Methods

A case-study approach was undertaken to apply the modified framework of Mandarano (2008). Case studies are well suited to understand contemporary processes in their context (Yin 2009). Data collection for the case study included semi-structured interviews with key informants and supplemental document review of watershed management plans, detailed implementation plans, and other reports.

Three watershed planning cases in the US State of Washington and water development planning processes at the Leine River in Lower Saxony, Germany were selected. The evaluation framework is illustrated in Figure 6.

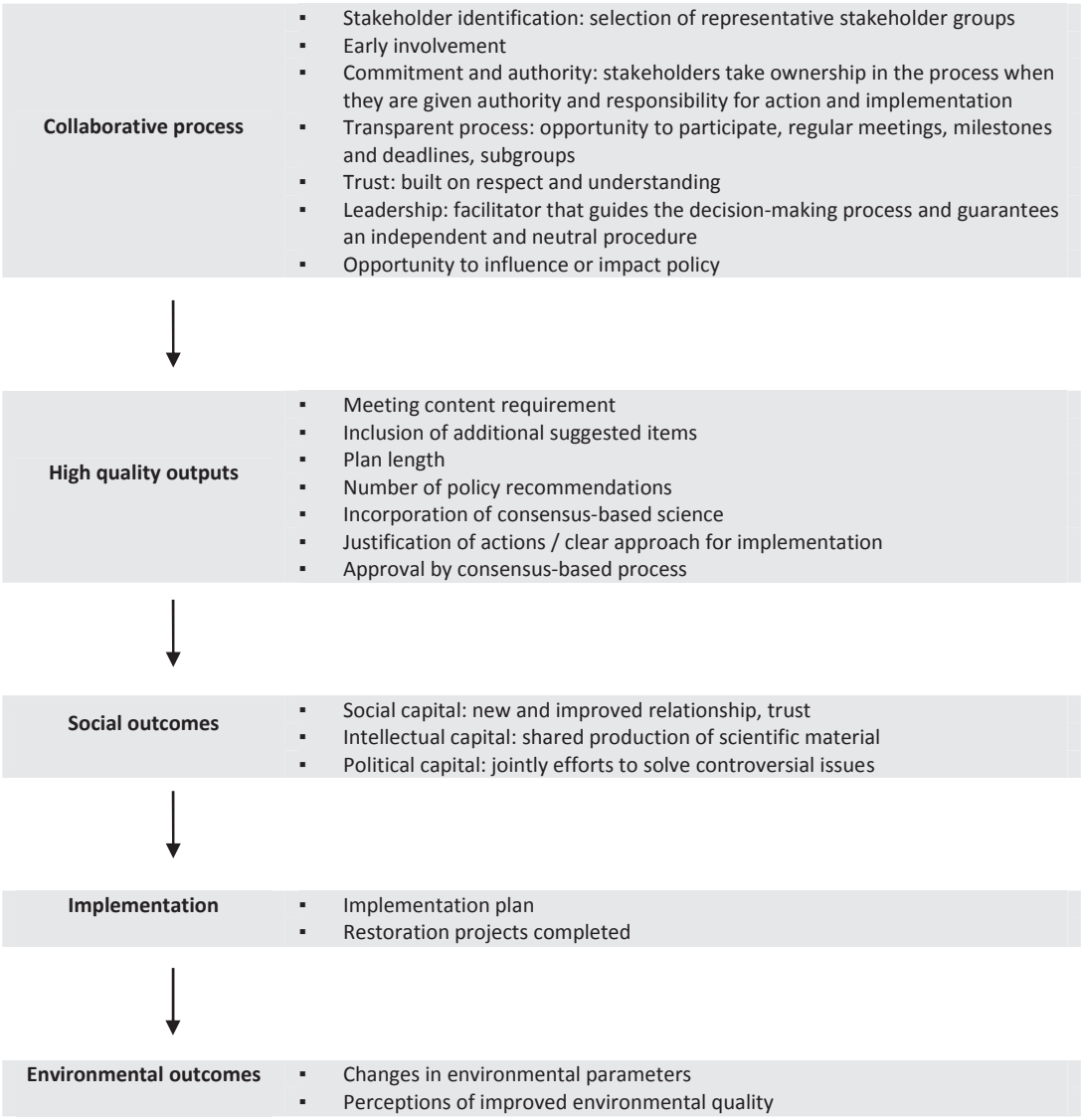

Figure 6: Evaluation framework (Mandarano 2008, modified; additional sources: Innes and Booher 1999, Randolph and Bauer 1999, Rowe and Frewer 2000, Koontz 2003, Irvin and Stansbury 2004).

Mandarano's framework was modified by replacing the process criteria with those from Innes and Booher (1999), Randolph and Bauer (1999), Rowe and Frewer (2000), and Irvin and Stansbury (2004), by adding output criteria from Koontz (2003) and the implementation step. I did not include her social outcome criteria 'innovation' and 'institutional changes' and modified the measures for environmental outcomes by moving 'restoration projects completed' to the implementation and by removing 'land protected from development'.

The aim of the interviews was to identify estimations and experiences of planning participants. Interviews took place in Washington during the months of June and July 2009 and in Germany during February and May 2010 using an open standardized questionnaire. They lasted an average of 30 minutes, with the shortest interview lasting 15 minutes and the longest lasting 1 hour. When possible, interviews were done in person; however, two interviews took place via telephone.

Participants were selected based on their ability to provide in-depth information on the planning process and project implementation within their watershed due to their personal or professional experiences (key role). Interests represented included government agencies, environmental organizations, representatives of agriculture, water management, and the public (Table 10). The Washington tribes are involved because they are especially interested in salmon protection and restoration. They are traditionally fishing salmon and their right to fish is protected by treaties.

In each case, the different interests were interviewed to get a comprehensive and detailed idea of the participants' perceptions on the outcomes of collaborative planning. Those questioned via interviews were those deemed to be active members of the planning units. More specifically, research subjects were preferably participating in the plan development as well as the implementation phase. However, a limitation of the study is that not all members of the particular planning group were interviewed.

All participants gave me their consent that I am allowed to use their citations, the name of their organization and their job title.

Table 10: List of stakeholders that were interviewed.

Island County	Watershed planner - Island County Health
	Water Resource Advisory Committee – citizen member
	Town of Coupeville – Public Works
Middle Snake	Planning coordinator - Asotin County Public Utility District
	Columbia Conservation District
	Fisheries Biologist - Pomeroy Ranger District – US Forest Service
	Washington State Department of Ecology
	Asotin County Commissioner
	Landowner
Entiat	Watershed coordinator - Cascadia Conservation District
	Chelan-Douglas Land-Trust
	Chelan County – Natural Resources
	City of Entiat – Public Works
	Yakama Nations
Leine River	Lower Saxony Water Management, Coastal Defense and Nature Conservation Agency (NLWKN) – Lower and Upper Leine
	Gronau Community – Lower Leine
	Ornithological Association Hildesheim – Lower Leine
	Farmer – Lower Leine
	Facilitator - Engineering Office AGWA – Lower, Middle, and Upper Leine

The interviews were recorded, transcribed and sent to the interviewees for correction and comments. They were analyzed using the software ATLAS.ti. This involved coding the data and identifying themes with categories (Appendix, Table 12). The codes were developed from the questionnaire as well as from the responses of the interviewees. Only the codes for the social outcomes were borrowed from Gruber (1994 in: Innes and Booher 1999) since no specific questions about this issue were asked. The topics covered by the interview questions included the plan development phase (missing stakeholders, consideration of comments, loss of contents through consensus), the progress and achievements of the planning unit, the plan implementation (influence on decision, facilitations and challenges, success, monitoring), ecological

improvements in the area, and the link between these improvements and the results of the collaborative planning.

3 Study context

In Washington, three cases - one in the South-East (Middle Snake River), one in Central Washington (Entiat River), and one in the West (Island County) were chosen. These cases represent watersheds that have geographic diversity, have final plans, had started the implementation phase, and had finalized a detailed implementation plan. In Germany, I selected three Lower Saxony water development plans of the Leine River (Lower, Middle, and Upper Leine) upon the recommendation of a staff member of the State Agency for Water Management, Coastal Defense and Nature Conservation whose records were comprehensive and whose plans were of good quality according to the 'Instructions for preparing a water development plan' (Sellheim 1996).

Figure 7(a-b): Location of the Washington watersheds (a) and of the Lower Saxony Leine River (b).

3.1 Case Descriptions

Washington State

Island County (WRIA 6) is composed of Whidbey and Camano Island located in the Puget Sound. The main water source is groundwater recharged only by rainfall – surface water is limited. Since the islands are located in the rain shadow of the Olympic Peninsula precipitation varies whereas the central parts are drier than North and South. Another problem is seawater intrusion because some aquifers are linked to the saltwater of Puget Sound (WRAC 2005). In June 2005, the Water Resource Management Plan was adopted by the Island County Commissioners and in December 2006, the detailed implementation plan (DIP) was completed. In Island County, key plan actions for implementation were: monitoring and protection for seawater intrusion; water system coordination, assistance to the Washington State Department of Ecology (DOE) on new water rights applications; protecting aquifer recharge areas by Low Impact Development practices; and eval-

uation of water reuse opportunities (DOE n.d.). But it is very difficult to assess the implementation success since monitoring data are not available because of a budget cut at the county that had to remove the hydrogeologist. The following actions have been accomplished to date: installation of additional monitoring wells; DOE mapping project that links water systems and water rights (2007), Emergency planning for potable water supplies (2009); help to DOE to revise state law and allow for rainwater rooftop collection (2009), feasibility study of reclaimed water projects in the Town of Coupeville and in the Penn Cove Water and Sewer District (2008).

The Middle Snake River watershed (WRIA 35) is situated in the southeast corner of Washington. 43% of the watershed is used by agriculture. Issues of concern are water quality (temperature, sediments, and fecal coliform) and water quantity (limited instream flow and ground water, HDR 2007). The following agreements were reached: the watershed plan of August 2007 and the detailed implementation plan of September 2008. Main focuses of the DIP are the coordination with fish habitat improvement strategies in the Snake River Salmon Recovery Plan, groundwater investigations, improvement of water quality and water conservation, and legislative changes to revise relinquishment (statutory forfeiture of a water right) and riparian stockwater law. The following projects were implemented in the first year: irrigation efficiency project, streambed assessment on the Tucannon River, and instream habitat assessments on six streams (DOE n.d.).

The Entiat River (WRIA 46) in Central Washington belongs to the Upper Columbia River System. Most of the land in the watershed is covered with forest managed by the US Forest Service and used for recreation. The main use of water in the Entiat watershed is for orchards and grazing and takes place in the lower part of the valley (CCCD 2004). The planning unit completed the first watershed management plan that included instream flow recommendations in May 2004 (adopted September 2004) and their detailed implementation plan in February 2006. The DIP identifies water resource management and habitat and water quality implementation actions (CCCD n.d.).

Lower Saxony

The Leine River is located in North-western Germany and runs through the Weser Leine Hills and then through a fertile plain south of Hanover, the Calenberger Boerde. One of the gravest problems are the numerous barriers (dams) in the entire river that avoid the passability for migrating fishes (e.g. salmon and trout). Three water development plans were accomplished at the Leine River: at the Lower Leine in 2003, at the Middle Leine in 2004, and at the Upper Leine in 2002. A problem is the implementation of these action programs since the funding was limited to the completion of the above mentioned planning documents. Therefore, implementation has not been organized by a coordinated overarching level but has taken place through local engaged communities, landowners, or compensation measures. However, it is very difficult to track these activities.

4 Results

In this section, the results of the case study are presented following the evaluation framework illustrated in Figure 6. The main focus of the study is on the examination of stakeholders' perceptions of the collaborative process, outputs, and outcomes.

4.1 Collaborative Process

In a previous analysis of these water management cases (*cf.* Chapter III), an evaluation of the collaborative planning processes during the plan development phase was undertaken according to the criteria represented in Figure 6. The goal of the first study was to analyze the impact of stakeholder participation as indicated by the integration of their concerns into water management plans. In all cases – except for the Upper Leine – participation was early, open, and represented all affected stakeholders that were willing to participate. These findings are supported by the interviewees: specific groups of stakeholders were only missing sporadically. If someone was mentioned, often the group was invited but did not come to the meetings. The landowners in the Upper Leine case were an exception. They were only represented by the Association of Farmers and by the Chamber of Agriculture Hanover and were not invited in person (facilitator, pers. comm.).

Meetings for all cases were guided by formal agendas and were recorded in meeting minutes. Important decisions and documents were ratified by the group. The comments of all participants were adequately considered, according to the interviewees. Nobody remarked on a loss of content through consensus but a few saw the general risk:

> If an issue is brought forward by any one individual that the rest of the group didn't understand, or support, there wasn't really a vehicle that provided for some type of 'minority report'. I do think that any issues that were truly critical did get addressed, if for no other reason than the proponent was passionate enough to keep the issue in front of the group (Middle Snake, Asotin County Commissioner).

> The potential is there, so it's important for whoever is leading the group discussions to ensure that all interests are represented and heard. And it's important for the members to speak up for those other interests if the facilitator is not doing that job. In the long run, everyone's best interests are served if everyone feels like they participated (Entiat, Yakama Nations).

Interview participants were asked to answer the questions: How would you describe the progress and achievements of your watershed planning unit? How do you assess the success of the collaboration process? Do you think this progress would have occurred without a collaborative watershed planning approach?

As stated by the respondents, the success of the collaboration comes to the force through a sophisticated plan and implementing projects. Reasons for the progress are first and foremost the integration of different ideas and visions, community support, consensus on decisions, and early or continued involvement of stakeholders.

All interviewees responded that the collaborative approach was essential to be successful. In Island County, especially, stakeholder involvement and the integration of different ideas were the factors where they get their success from:

> I think you need to have a collaborative approach with local agencies, with tribes, with all the environmental groups to be successful, to integrate all the visions together and to collaborate that way (Island County, watershed planner).

In the Middle Snake watershed, the local involvement was in particular important to get the plan implemented:

> Currently, this is the most effective planning process that I have been exposed to. [...] There are a lot of good plans but if you do not have the local involvement to it, you cannot getting it implemented (Middle Snake, Columbia Conservation District).

In the Entiat case, at the beginning of the collaborative planning, the hostility against government was high because "Ecology [Washington State Department of Ecology] was forcing stream regulations [and] WDFW [Washington State Department of Fish and Wildlife] is enforcing in the mid '80s, […] early '90s fishing regulations, much more aggressively (Entiat, Cascadia Conservation District, pers. comm.)". Without the decision-making by citizens and the local support the Entiat community would not have succeed.

> So, that really put the community on the defenses. If they had not been able to be part of the decision-making process I do not believe it would have worked (Entiat, Cascadia Conservation District).

> I think that some kind of collaborative locally supported approach is the real key. If the local folks don't see the benefit, they are not likely to support the effort. If full local support can be achieved, that is the first step to getting some kind of plan adopted (Entiat, Yakama Nations).

At the Leine River, the integration of different ideas was also a key factor of success.

> *Unter dem Strich [war der Prozess] erfolgreich, weil man […] das Gefühl hatte, es wird von allen mitgetragen, dadurch dass jeder die Möglichkeit hatte sich einzubringen.* (The process was successful because we had the feeling that everybody is backing the plan. This is because everybody had the possibility to play a part in.) (Leine, NLWKN)

> *Durch die ganzheitliche Betrachtung aller Problemstellungen konnte das ‚Schubladendenken' aufgebrochen werden. Die unterschiedlichen Akteure erhielten Einblick in die Probleme der anderen.* (The 'stereotyped thinking' could be broken up through the comprehensive view of all problems. The different actors have gained insight into the problems of the others.) (Lower Leine, Gronau Community)

> *Auf örtlicher Ebene gab es eine gute Zusammenarbeit mit den Naturschutzleuten, der Prozess wurde konstruktiv begleitet von beiden Seiten.* (There was a good cooperation with the nature conservation on the local level. The process was conducted by both sides.) (Lower Leine, farmer)

The data show that the collaborative process has played a key role for a successful decision-making and acceptance of the different stakeholders in the selected cases.

4.2 High Quality Outputs

The plan quality was also determined in a previous work (*cf.* Chapter III) by indicators according to Koontz (2003): meeting content requirement, inclusion of additional suggested items, plan length, and number of policy recommendations. As Koontz (2003) stated, the page length is only a "rough 'quantity' indicator (p. 23)". However, a higher number of pages can indicate more sophisticated plans because the contents can be discussed in more detail. In all cases, the plans are of good quality as far as the selected criteria are concerned. Considering additionally Man-

darano's (2008) criteria (*cf.* Fig. 1), all documents incorporate consensus-based science, the findings justify actions or identify a clear approach for implementation, and all documents are approved by a consensus-based process. Many interviewees of the case studies speak of sophisticated plans.

The Island County watershed plan describes complex issues related to water management (e.g. seawater intrusion, water supply) and strategies and recommendations for adequate water supplies. The detailed implementation plan (DIP) proposes concrete actions to reach the watershed plan objectives and facilitate therefore the implementation.

> I am really proud of the plan. I think we did an outstanding, excellent work. I think that is very valuable to the county. We are still using parts of it in the implementation (Island County, Water Resource Advisory Committee).

> The watershed plan put together a pretty good piece of work (Island County, Town of Coupeville – Public Works).

The watershed plan of the Middle Snake River watershed identifies key planning issues for water quantity, instream flow, water quality, and habitat, strategies and tools addressing these issues, and management objectives. The plan formed the scientific basis for the DIP.

> The plan is getting credits for a lot of success, things that were accomplished, things that were identified, or things that were being funded by outside sources. […] It is a good plan because it stepped from other programs that also were based on citizen involvement processes (Middle Snake, Columbia Conservation District).

> The progress of the planning unit basically is […] coming up with a coordinated plan […] (Middle Snake, Washington State Department of Ecology).

The plan of the Entiat River watershed includes water quantity, instream flow, water quality, and habitat actions and strategies to preserve or improve environmental conditions in the watershed; a description of existing conditions and limiting factors, and recommended actions to address these issues. The plan laid the foundation for the DIP that facilitated the implementation of projects.

> The planning unit developed this great plan (Entiat, Chelan County Natural Resources).

> Because the tribe supported the original plan, we used the consultation process to help convince DOE that the Entiat plan was sound. […] The plan is good enough and sound enough that the folks that are up there are able to look at it and use it to guide them where they want to go (Entiat, Yakama Nations).

The quality of the Lower Leine River water development plan in form of development objectives as framework for actions and a concrete program of recommended actions helped in the Gronau Community to implement projects.

> *Der im Zuge des GEPL angewandte kooperative Planungsansatz hat eindeutig zu unerwartet guten Ergebnissen geführt.* (The collaborative planning approach has led to unexpected good results.) (Lower Leine, Gronau Community)

Durch die große Beteiligung sind ganz sicher viel mehr Ideen vorgetragen, diskutiert und dann in den Plan aufgenommen worden. […] das Ergebnis - mehr als 100 Vorschläge für naturnähere Gestaltung des Flusses und unmittelbarer Nachbarflächen - ist eine gute Grundlage für die Gewässerentwicklung. (Much more ideas could be brought forward, discussed, and then incorporated into the plan through the large participation. The result – more than 100 recommendations for a nature-oriented formation of the river and the immediate neighboring areas – is a good basis for water development.) (Lower Leine, Ornithological Association Hildesheim)

Über ein Thema wird viel breiter diskutiert, wir lernen viel darüber wie man Dinge betrachten kann, die nicht nur fachlich sind, und wie man besondere Gegebenheiten berücksichtigen muss. Planung gewinnt an Qualität dadurch. (We discussed a topic much more expanded, we learned how to look at things that are not only technical and how to consider special conditions. Thus, planning gains quality.) (Leine, faciliator)

Both the analysis of the planning documents according the selected criteria and the interviewees' perceptions have indicated that the collaborative planning approach has led to water management plans of good quality.

4.3 Social Outcomes

During the interviews no specific questions concerning social outcomes were asked. But many interviewees provided information indirectly.

Social outcomes can be described as "social, intellectual, and political capital (Gruber 1994, p. 5 in: Innes and Booher 1999)".

Social Capital

Social capital comprises the building of stronger relations and trust that establishes real communication (sharing of information) and discussion of conflicting topics, learning from each other, mutual problem-solving, shared knowledge, and less adversarial attitude towards other perspectives (Innes and Booher 1999). Connick and Innes (2003) stated that at the beginning of their reviewed collaborative processes stakeholders represent often opposing opinions or even have brought an action against someone, and over time they get to know each other and feel empathy with each other's interests.

Except for the Island County watershed, many interview participants of the case studies mentioned the building of trust answering the other questions. There was not much trust in state and federal agencies by the local communities at the beginning of the planning processes. But trust and good relationship have developed over time and helped to make the partnership successful, to implement projects, to reach the participation of new landowners, and to improve environmental conditions (through further intermediate steps).

The author found examples of communication and sharing of information and knowledge in all of the cases. Especially landowners provided valuable information:

When we went to get rainfall data we determined that the county never had got around measuring rainfall. But who did it? The farmers, they had a hundred years worth of information. We

> gathered all that, averaged it and that is really the data base for precipitation (Island County, Water Resource Advisory Committee).

But the problem was that the agencies had to accept this local knowledge:

> The other challenge is where we do not have the data we do have a lot of local knowledge, landowner knowledge and the resistance by the state agencies to respect and accept that local knowledge (Middle Snake, Asotin County Commissioner).

Intellectual Capital

Intellectual capital involves an understanding of other's views and a shared production of scientific material (Innes and Booher 1999) and leads to a common "understanding and acceptance of the ecological value (Mandarano 2008, p. 463)" of the watershed.

Several interviewees of the studied cases referred the good quality of the developed plans. Reasons were the cooperation of technical and local knowledge and the increased awareness of other perspectives. The plans are getting acknowledgement from local, state, and federal agencies.

> […] we brought a couple of our hydrologists and some other folks and gave them the opportunity to look at the plan purely from a technical scientific background […]. We were fairly well satisfied with what that group came up with a watershed plan.

> The plan is good enough and sound enough that the folks that are up there are able to look at it and use it to guide them where they want to go (Entiat, Yakama Nations).

Political Capital

Political capital includes joint efforts to solve controversial issues (Innes and Booher 1999).

In Island County, references to political capital were not provided during the interviews.

At the Middle Snake River, in particular the controversy between the landowners and the technical specialists could be terminated.

> We get also a few tensions every now and then and we really try to address both sides […]. The 'tension' is often between the landowners and technical people! They (land managers) don't always want to make changes in how they operate... The idea being that they've done it that way for years and if it was good enough for their grandparents why not now? We, the technical science background folks, have to show them how they will either profit or be able to show them enough benefit to get them to make changes in operating procedures that may be environmentally better.

> A good example of this: taking cattle out of the riparian! Moving the cattle away from the water doesn't always appeal to the manager... Once you show them the savings in erosion and vegetation recovery to the habitat they change their minds... I know that sounds simple, but all the other factors in riparian recovery benefit the landowner! Initially they see a lot of extra trouble to make the changes (Middle Snake, Pomeroy Ranger District – US Forest Service).

At the Entiat River, the relationship between all the groups - but especially toward the governmental agencies – are less adversarial through the collaborative process.

> I think that we came a long way because when I first started it was kind of a gun battle between one of the orchardists and the fisheries people. And that is what kind of got us started to work on a watershed plan, […]. One of the main reasons that a lot of the landowners work on it is because they shut down the fishing on the rivers here and we wanted to be able to fish our rivers again. So, we wanted to help get that back. As we started doing these projects it has been hard to get WDFW [Washington Department of Fish and Wildlife] and NOAA [National Oceanic and Atmospheric Administration] Fishery to allow some of these fishing. We finally get a couple of opportunities last year on the Entiat and we are fishing salmon right now again. That would never have happen to be years back without what we have been doing (City of Entiat - Public Works).

> But as a group I think that they see some other benefits because they are an established group that is shown that they can work together and come up with these plans. They have been able to use that reputation to kind of influence like the WDFW to kind of help them get some fishery back into that system (Entiat, Yakama Nations).

At the Leine River, through the collaborative planning approach established trust and the integrated consideration and joint discussion of problems helped to solve the conflict between the water power operators and the fishermen. Reason for this dispute was the fish that was killed by the water power plants. The opponents were able to accept the views of the other side and to look for solutions (Lower Leine, Gronau Community, pers. comm.).

> *Es wurde eine breite Vertrauensbasis unter den Beteiligten geschaffen. Auf dieser Basis konnten Ergebnisse erreicht werden, die vorher nicht möglich waren, z.B. die Kontroverse zwischen den Fischereiverbänden und den Wasserkraftbetreibern.* (A foundation of mutual trust has developed between the participants. Results that were not possible before could be reached on this basis, e.g. the controversy between the fishermen and water power operators.)

> *Wichtig und erfreulich für die Umsetzung war, dass ganze Interessenlagen wirklich nach Lösungen suchten, z.B. Wasserkraftbetreiber und Sportfischer […] waren bereit auch die Interessenlage anderer Disziplinen zumindest aufzunehmen.* (Important and pleasant for the implementation was that whole interest groups really looked for solutions, e.g. the water power operators and the fishermen were at least willing to accept the interest of other disciplines.) (Lower Leine, Gronau Community)

4.4 Plan Implementation

The projects named during the interviews were divided into four types of implementation projects (*cf.* Leach and Sabatier 2005):

- abatement or prevention of point or nonpoint sources of pollution
- modification to instream flows or water allocation
- stream channel projects (restoration of vegetation , morphology, or biota)
- changes in land use designations (through purchase, easements, and zoning)

In Island County, actions to modify water allocation were primarily implemented as stated by the interview partners: installation of monitoring wells, facilitation of low impact development, education and outreach (water conservation), emergency water plan, permit system to allow for

rainwater catchment. One project (code changing to incorporate seawater intrusion) to prevent pollution was mentioned.

In the Middle Snake watershed, the focus of implementation was on stream channel projects to protect, to improve, and to restore instream habitat and to protect riparian vegetation. The watershed group was realizing many salmon restoration projects because of funding opportunities through the Snake River Salmon Recovery Board (Salmon Recovery Planning) and the Bonneville Power Administration (Fish and Wildlife Program, sub-basin planning). Furthermore, changes of farming practices and land use changes were implemented to prevent soil erosion and nonpoint source pollution. Storm water and groundwater work, assessing minimum instream flows, and water quality improvements actions were implemented to modificate instream flows and water allocation.

According to the Entiat watershed participants, all four types of projects were realized: stream flow projects, a consolidation program to conserve water (converting surface users to wells, consolidate irrigation didges, irrigation upgrade), monitoring, landowner outreach and education, and habitat protection and restoration projects (salmon recovery, water quality improvements, land acquisition, conservation easements, reconnecting old channel, opening up the flood plain).

At the Lower Leine River, many projects were implemented in the Gronau Community because of the director's commitment, e.g. stream channel projects (riparian plantings, the passability of water power plants, and the resettlement of salmon) and pollution prevention through land use changes.

In all cases, the selection of implementation items was carried out by priority in the first instance and then by funding and realizibality.

Almost all had the feeling that they and the entire planning group had an influence on the planning and decision-making process.

Success, Facilitation, and Challenges of Implementation

In general, most of the respondents sense the implementation of plan activities as successful. Predominantly, they consider that collaborative planning facilitated the plan implementation. Table 11 lists those factors (according to mentioned frequency) that affect positively or negatively the implementation of projects as per interviewees.

Table 11: Factors facilitating or challenging project implementation, listed according to mentioned frequency.

Facilitations		**Challenges**
Collaborative planning		Missing funding
Funding	Community support	Legal procedures
Leadership	Early/Continued involvement	Bringing in new landowners/Availability of area

Monitoring

In Island County, a seawater intrusion monitoring was implemented after the watershed plan. A monitoring well network was both already in place and linked to the watershed plan, i.e. additional wells were installed as result of the plan.

In the Middle Snake watershed, fish monitoring for both adults and juveniles on Asotin and Tucannon River (Washington Department of Fish and Wildlife), habitat restoration monitoring (salinity, temperature, stream shade, intensively monitoring watershed on the Asotin, US Forest Service), instream flow gages, and water quality monitoring are conducted.

At the Entiat River, monitoring in form of stream flow gages, temperature, fish (productivity, abundance, diversity and distribution of salmon), and water quality monitoring is in place.

The problem in all Washington watersheds is that there is not enough funding to conduct sufficient monitoring or to analyze the collected data.

At the Leine River, a specific monitoring that resulted from the water development plan is lacking but gauges established under the European Water Framework Directive exist.

4.5 Environmental Outcomes

Island County participants did not notice specific environmental improvements but they perceive that it is happening and will happen because of education and outreach for on-site system, non-point pollution, and water conservation and through a new seawater policy and critical area restrictions on building. They did not implement typical restoration projects since they did not address the optional elements habitat, water quality, and instream flow.

Middle Snake watershed interview participants listed improvements to the fisheries, the water quality, the sediment, and the riparian zones to the question 'Have you noticed ecological improvements in your watershed?' Partially, they combined these improved ecological conditions with projects, e.g. riparian plantings, fencing of stream corridors, creating pools, changes of farming practices, or with monitoring results, e.g. the sediment monitoring by the US Forest Service (USFS).

> When we create more pools we are going to affect the stream temperature and that may increasing the shade directly, we are changing the habitat (Middle Snake, Pomeroy Ranger District – US Forest Service).

A representative of the Columbia Conservation District stated that these improvements are "very hard to quantify yet".

The Middle Snake interviewees believe that these environmental improvements are linked to the efforts of the watershed planning group but at the same time they hold precursor groups also responsible for.

> They are linked to the resource efforts overall. But again: the plan takes credits for things that were previously done funded by outside programs (Middle Snake, Columbia Conservation District).

All the respondents in the Middle Snake watershed affirmed the question if they think that the results of the watershed group are effective in terms of improving environmental conditions of the watershed. The following factors make a contribution: the ability to build trust and credibility between landowners and resource agencies, local knowledge, education, and implemented projects.

> The watershed group has been a big part of the other planning process for the better part of 8 - 10 years, so yes they have been very effective in improving conditions throughout all the watersheds. Local elected officials and landowners who understand resource conditions and concerns has helped the collaborative process and resulted in complex resources issues being addressed and completed (Middle Snake, landowner).

Changes in ecological conditions in the Entiat River watershed are improvements to the sediments, the riparian zone, the water quality, the stream flows, the channel complexity, and to the fisheries. But most of them think "it is not measurable at this time (e.g. Chelan-Douglas Land-Trust, pers. comm.)".

> I think it is probably too soon to tell because we are not implementing projects on the large scale for two years, four years. I think it will take some time to see what effect we will have (Entiat, Chelan County Natural Resources).

They also link these enhancements with implemented projects: forest road decommissioning, relocating, and eliminating, fencing of the stream, riparian plantings, stream flow and salmon restoration projects.

All of them believe that there is a relationship between improved ecological conditions and the results of the planning group because they selected the specific implementation projects according to their anticipated effects in the environment. The Director of Chelan County Natural Resources made a good point that external factors could impair all the restoration efforts.

> Specific activities are all at least linked to expected ecological benefit. At our work with irrigators the ecological benefit is less use of irrigation water and more instream flow. Working with instream structures, the ecological hope is that this increases fish habitat, improves fish numbers (Entiat, Cascadia Conservation District).

> I believe based on the decisions that we made to identify the actions. We had certain amount of information to identify the appropriate actions. I think we did all this properly. Then it is the question does it really work? But that may not be decided by what happened in the Entiat necessarily. There may be climate patterns, there may be other things happening in the river that confound what we are trying to do in the Entiat (Entiat, Chelan County Natural Resources).

Furthermore, some of the interview partners determined a shift in the awareness of the environment within the community that inure to the benefits of the stewardship of the land.

> But also I think that we are seeing without a doubt a different ethic within our community as far as stewardship of the land becomes a goal (Entiat, Chelan-Douglas Land-Trust).

> But like our planning that we are doing making people more aware of practices that they are doing. But that is a slow conversion to actual see the effects.

> Just by making the landowners aware of what we are doing, the information we are getting out to all the landowners that live along the river, I think everybody is more aware and more careful. I think that all is going to help in a long term (City of Entiat - Public Works).

Environmental improvements at the Leine River noticed by the interviewees are improvements in the fisheries, to the water quality, and to the channel complexity. They also link those to specific projects, e.g. the passability of water power plants, waste water treatment plant for a paper mill, reduced maintenance activities, removing shoreline stabilizations. Some of these projects were implemented before the water development plan (e.g. waste water treatment), others resulted from the plan (e.g. passability of water power plants, reduced maintenance activities, removing shoreline stabilizations). The director of the Gronau Community observed that a broad mutual trust has developed through the planning process that facilitated the implementation in his community.

> *Die Leine soll durchgängig werden, um den Leinelachs wieder anzusiedeln. […] In diesem Jahr wird die letzte der acht Wasserkraftanlagen umgerüstet, spätestens nächstes Jahr ist die Leine für Wanderfische flussaufwärts wieder durchgängig.* (The Leine River should be passable to resettle salmon. The last of eight water power plants will be rebuilt this year. The Leine will allow the fish to migrate upstream by next year.)

> *Dies [ökologische Verbesserungen] galt aber auch schon für die Zeit vor dem GEPL (Bau der Kläranlage der Papierfabrik Alfeld), der Lachs und andere Fische sind Indikatoren für gute Wasserqualität.* (Environmental improvements could be already noticed prior to the water development plan through the construction of a waste water treatment plant for the paper mill Alfeld. The salmon and other fishes are indicators for good water quality.) (Lower Leine, Gronau Community)

> *Verbesserungen ja, z.B. durch reduzierte Unterhaltungsmaßnahmen entstehen neue Uferabbrüche, neue Kies- und Schlammbänke.* (improvements yes, e.g. new bank erosions and new gravel and mud banks are forming through reduced maintenance activities) (Lower Leine, Ornithological Association Hildesheim)

> *An Steinschüttungen, die jetzt abbrechen, findet laufend eine Entwicklung statt.* (A development is taking place on an on-going basis at rock fills that are breaking.) (Lower Leine, farmer)

> *Seit Anfang/Mitte der 90er Jahre wird die Unterhaltung stark zurückgefahren. Wir können nachweisen, dass nach den Kriterien der Struktutgütekartierung Verbesserungen bzw. Strukturen neu entstanden sind bzw. immer wieder umgewandelt werden. Diese Veränderungen gehen ganz klar in Richtung strukturelle Vielfalt in der Dynamik des Gewässers.* (Since the early/mid-1990s, the maintenance activities are reduced severely. We can provide evidence that improvements or new structures have emerged or are transformed consistently according to the criteria of the structural mapping method. These changes benefit the structural diversity in the dynamic of the river.) (Lower Leine, faciliator)

All participants responded very carefully to the question about the linkage between the outputs and outcomes. Although, ecological improvements were noticed in the watersheds (water quality, more richly structured riparian zones, return of salmon, development of self-steering processes in the river), they are difficult to determine because the implementation started as recently as a few years ago. On the other side, these improvements are probably the result of

previous planning groups' or other efforts. But in general, most of the interviewees think that the outputs of collaborative planning are effective in terms of improving environmental conditions.

The focus of this article is to analyze the perceptions of stakeholders regarding the outcomes of collaborative water planning. A further step would be to proof these perceptions with objective monitoring data that exist at different locations, e.g. in the US at the USFS or the Washington Department of Fish and Wildlife and in Germany within the European Water Framework Directive. However, an analysis and interpretation of these data is missing so far or is too laborious to undertake within this research.

5 Discussion and Conclusion

Following the proposal of Mandarano (2008) the perceptions of the interview participants were investigated with respect to linkages between process, outputs, and outcomes and confirmed with other information (if available and possible) of the planning groups (e.g. reports, monitoring data).

The linkage of planning outputs and perceived environmental outcomes are described in (Figure 8) below: The assessment of the collaborative planning's effectiveness can only be carried out if the individual aspects are not examined isolated but in connection with each other. It is important to look at the success of the collaborative planning process as a whole package of various factors.

In all Washington cases, the high quality water management plans formed the scientific basis for watershed restoration and protection and revealed a need for action. The detailed implementation plan (DIP) facilitated the implementation of specific projects and resulted in 'on the ground' improvements. At the Leine River, the process was slightly different since the collaborative planning process was terminated with the completion of the water development plan. The implementation is bound to outside efforts.

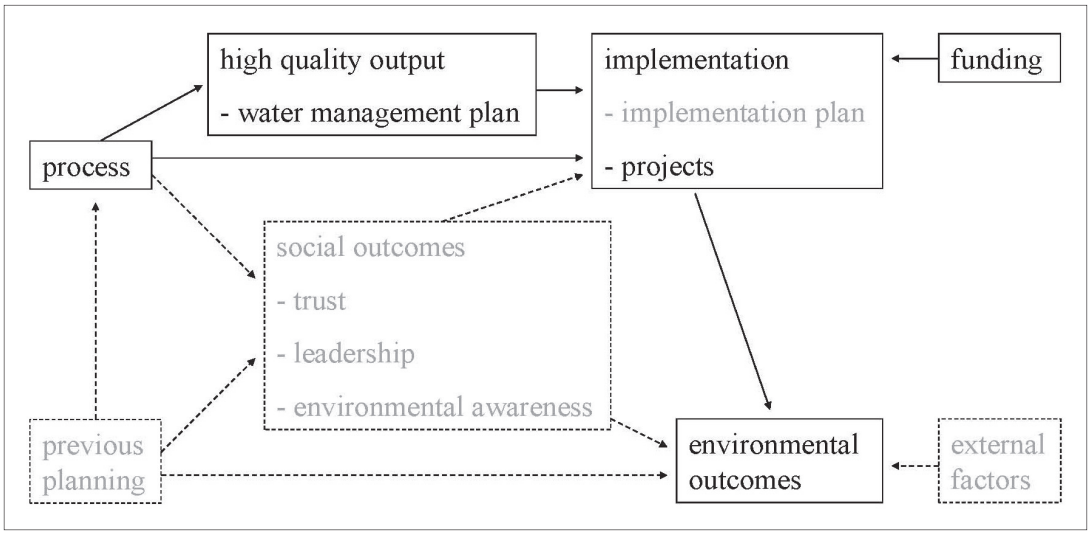

Figure 8: Relationship between process, outputs, and outcomes. The black solid lines and small boxes apply to all examples. The gray dashed lines and boxes apply only to some of the cases as described in the text.

In Island County, only the linkages between the black boxes could be located through the interviewees. However, the interviewees could not give specification of perceived environmental outcomes but they think that they happen.

In the Middle Snake River watershed, the collaborative process provided additionally for trust and leadership. These social outcomes helped to implement projects. Based on the DIP projects were implemented. Several Washington Department of Ecology (DOE) publications ('Transforming watersheds' of 2005 and 2008) are documenting watershed actions, e.g. an irrigation efficiency project, riparian buffers (livestock exclusion fencing, plantings), changes in farming practices, instream habitat restorations, and the reactivation of the floodplain. Some of these projects were implemented prior to the DIP. The publications also describe the achieved improvements: reduced water consumption, enhanced instream flow, returning of native vegetation, cooler water, reduced erosion, sedimentation, and pollution, state water quality standards met, improved fisheries and habitat (DOE publication 'Transforming watersheds' 2005, 2008). Previous planning benefits the process, social as well as environmental outcomes, according to the interviewees.

In the Entiat River watershed, interview participants drafted a comprehensive picture of the relationship between process, outputs, and outcomes: the collaborative process and previous planning provided for social outcomes (trust, leadership, and environmental awareness) that had on the one hand a positive impact on plan implementation. The DIP facilitated the implementation of projects: e.g. installation of instream structures, groundwater irrigation wells, riparian planting, installation of fencing, reactivation of floodplain that are documented by the Entiat watershed annual report Vol. I 2008. Furthermore, environmental goals are mentioned in this annual report but no statements of their achievement: improved habitat, improved fishery, increased instream flow, improved water temperature and quality (Entiat watershed annual

report Vol. I 2008). Improvements in the fishery could be proved by US Forest Service Steelhead Spawning Surveys (2008) and US Fish and Wildlife Service Spring and Summer Chinook Spawning Ground Surveys (2007). On the other hand, environmental awareness influenced the stewardship of the land. Further, the group is aware of the fact that external factors may also affect environmental outcomes.

A similar picture is drawn by the interviewees of the Lower Leine River. However, previous planning did not play a role as well as social outcomes had no direct effect on environmental conditions.

Partially, these perceptions could be proved by reports and monitoring data. The Island County and Entiat River watersheds are now in their last funded year of implementation. The funding for the Middle Snake watershed will end in 2012. There is hope that further monitoring data are available in the future and that they will be analyzed and interpreted to confirm the present findings.

The data from Washington and Lower Saxony showed that collaborative planning is effective in implementing projects and improving environmental conditions, according to the interviewees. In all cases, the success of the planning group came into notice through a sophisticated plan and implementing projects. Furthermore, the collaborative process was the relevant parameter to succeed (in addition to funding, community support, leadership, and early and continued involvement of stakeholders, see Table 11). Trust and improved relationships helped additionally in the Middle Snake and Entiat watershed and at the Leine River to realize actions and as result to improve environmental conditions. The interview partners of these three cases have associated the observed improvements to specific projects.

Future research on collaborative environmental outcomes should concentrate on completing the subjective measures of stakeholders' perceptions with direct and objective measures. Therefore, it is important to be able to access pre- and past-project monitoring data.

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Chapter V: Synthesis and Outlook

1 Introduction

In this thesis, one important function of participation, i.e. the effectiveness, was examined using examples of participatory water planning in the US State of Washington and in the German State of Lower Saxony. The evaluation of the effectiveness of participatory environmental processes was based on the quality of the decision (rationalization function) and the quality of the implementation. The quality of the decision was operationalized through the incorporation of stakeholders' views into final plans. The quality of the implementation is related to perceived environmental outcomes.

The overall research hypothesis of the dissertation is:

Participation in environmental planning leads to environmental outputs of high quality that reflect the views of the participating stakeholders. Participation in environmental planning improves the implementation of these outputs and consequently the environmental outcomes.

In this chapter, the research questions posed at the beginning (in Chapter I) as well as aspects that could not be addressed in Chapters III to IV are discussed.

2 Stakeholder Influence in Participatory Water Planning in the US and in Germany

Research Question 1: *Which stakeholders participated in water planning? What influence did those stakeholders have on water plans? What is the quality of plans produced through participatory planning? What similarities and differences between the US and Germany can be observed?*

The results of the plan analysis in Chapter III show that the quality of the planning outputs is positively affected through the consideration of different interests and through the incorporation of their perspectives and values. In detail, the following results were generated:

1) The representation of stakeholders was inclusive,

2) Comments were for the most part integrated in the final plans,

3) Plans are of relatively good quality according to the selected criteria.

Differences between both countries were related to:

4) The key issues that planning groups discussed,

5) The influence of specific stakeholder groups, and

6) The binding character of the results.

1) Except for the Upper Leine where only representatives of organized stakeholder groups were involved in the planning process, all other planning groups were open to everyone. If

specific groups of participants were missing, they had been invited but decided not to participate.

2) Not all of the groups that attended the meetings contributed actively to the plan development in the form of comments, e.g. environmental groups. Except for the Lower Leine, the most comments were contributed by governmental participants. No remarkable differences were found between the amount of integration of governmental and non-governmental comments. There were good reasons if comments were not integrated, e.g. lateness of comments.

3) In all cases, plans are of good quality according to the selected criteria:

   - Clear goals,
   - Science approved by consensus/majority vote,
   - Meeting content requirement/recommendations,
   - Clear implementation approach,
   - Approved by consensus/majority vote.

4) Water quantity was the topic most discussed in all Washington cases. This reflects current management challenges (drought, listing of endangered species, population growth) as well as cultural or historic forces (senior water rights). At the Leine River in Lower Saxony, all topics were discussed in equal measure and water shortage is not a problem since the natural local conditions are beneficial.

5) In all Washington cases the public was represented more often and made most of the non-governmental comments compared to Lower Saxony. The assumption that the American civil society is more active may apply in the examined cases.

6) The Washington water management plans are legally binding for state and county agencies after adoption by local jurisdictions. The Lower Saxony water development plans are not legally binding but present conceptual frameworks that can be used as basis for further planning.

During the research for Chapter III additional questions have arisen which could not be addressed because of the chosen research approach or missing data. Speculations have been made for some circumstances in Chapter III, but an affirmation of the extent to which they apply is missing and has to be proven by further examination, e.g. through in-depth interviews or surveys with all participants.

In the case of the Upper Leine for example, the general public was excluded from the process, instead representatives of stakeholder groups were involved in the planning process. Although this fact does not seem to have an effect on the plan substance or on the topics discussed during the plan development phase, a more detailed investigation would still be interesting. What difference does it make for the participatory process that the general public is missing? Does it influence the implementation of the planning results more than in the other cases?

In the case of the Lower Leine, farmers and environmental groups participated in the planning process but they did not make any comments on the plan. The same applies to the environmen-

tal groups in the Entiat River and Middle Snake River watershed. Why did not they participate actively, especially considering they all had the opportunity? Which kinds of impacts result? The plan quality and the content of the discussions do not seem to be influenced.

Some stakeholder groups, the Leine water maintenance association and the Island County commissioners, were not able to submit comments in time. Why did they submit their contributions to the plans so late although both groups were participants and should have been well aware of the planning process and associated deadlines?

Some of these open questions were addressed in interviews with key informants of each planning group (*cf.* Chapter IV).

Furthermore, the question arises as to what Germany can learn from the US or vice versa? The results on the influence of stakeholders on participatory outputs seem to be very similar: plans are of good quality, views of the stakeholders are mostly reflected in the final plans (if not, good reasons are provided), the selection of participants is representative, and there is a high acceptance of the planning results (*cf.* Chapter IV).

Differences are rather to be found in the implementation: in the US, funding of the implementation is part of the state program and facilitates the realization of projects. However, ultimately, their success is determined by community commitment (*cf.* Gronau community in the Leine River case). Political leadership, willingness, and support are the deciding factors since the challenges and aids during implementation are similar in both countries. Thus, the provision of sufficient funding for implementation is helpful for successful participatory planning.

3 Do Collaborative Planning Processes Lead to Better Outcomes? – Perception of Stakeholders in Water Planning in the US and in Germany

Research Question 2: *Are the results of collaborative planning improving environmental conditions?*

The investigation of stakeholders' perceptions of watershed planning in Washington and in Lower Saxony revealed a linkage between process, output, implementation, and environmental outcomes. The findings demonstrate that it is important to look not only at the individual factors of participatory planning processes such as environmental outcomes, but also at the whole process and the relationship between the different factors. In three cases, social outcomes also influenced implementation, and as a consequence environmental outcomes. The participatory process has played a key role for successful decision-making and acceptance and has led to watershed management plans of good quality according to the interviewees. Social outcomes (building of trust, a good relationship to governmental agencies, understanding of other perspectives, consideration of technical as well as local knowledge, solving of conflicts) have helped to produce high quality successful plans, to implement projects, to involve new landowners, and in consequence to improve environmental conditions. The implementation of plan activities was considered successful by the interviewees due to the participatory planning process, funding, community support, leadership, and early and continued involvement of different stakeholders. The main challenges are missing funding, legal procedures, the involvement of new landowners

and the availability of areas. Ecological improvements were noticed in the planning areas and were often linked to specific projects. However, improvements are hard to quantify and may also be the result of previous (participatory) efforts. Most of the interviewees consider participatory environmental planning outputs as effective in terms of improving ecological conditions.

The research of Chapter IV provided an analysis of stakeholders' perceptions regarding the outcomes of participatory environmental planning. The next logical step would be to prove these perceptions with objective monitoring data that currently only partly exist for the investigated cases (available reports and data confirm the perceptions). Therefore, the monitoring data from both before and after the project are exceptionally important to assess the success of participatory planning related to environmental benefits.

If monitoring data is available which confirms that the environmental conditions have improved in the period following the completion of the water management plan and once implementation has started, cause-and-effect chains could be helpful to assess if these improvements are the result of participatory planning outputs. Similar to Bader (2005), an assessment of the courses of effect could be carried out as following:

- Starting from the participatory environmental output, i.e. the proposed measures and restoration projects, and further impact factors, e.g. framework requirements,
- Several steps of causes and effects are run through, and
- Result in environmental outcomes.

Cause-and-effect chains are used to illustrate these logical sequences of multiple impact steps and their causal connections.

Figure 9 illustrates an example of a cause-and-effect relationship: Starting with the shortcomings in the watersheds, the causes of these shortcomings (and external influencing factors) that are affecting the status of the water, and potential polluters are described. During the participatory planning process, outputs are generated in collaboration with the potential polluters. The outputs are in the form of management and implementation plans that include measures and projects to benefit environmental conditions in the watershed and help to reach environmental outcomes. External factors have also to be considered.

Detailed cause-and-effect chains could be established for the causal connections between polluters, measures, and environmental outcomes within the participation process.

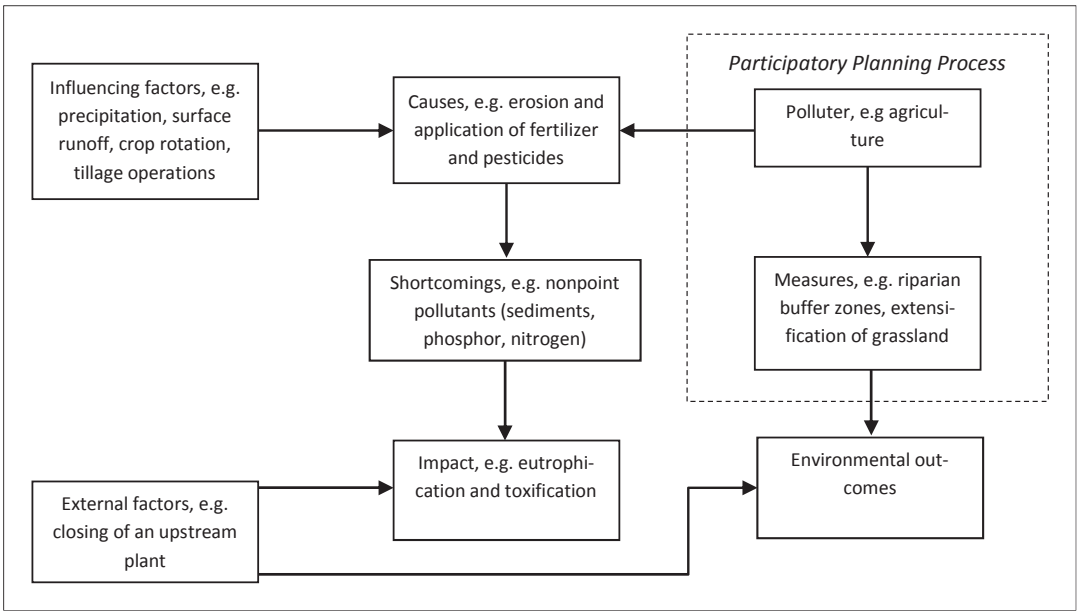

Figure 9: Example of a cause-and-effect relationship.

Further proposals for evaluating the relationship between outputs and outcomes in participatory environmental planning are made in the following literature.

The evaluation of governance processes and their environmental consequences should be a combination of outcome-oriented and process-oriented approaches according to Rauschmeyer *et al.* (2009). Each approach has methodological weaknesses but they cancel each other out, e.g. insights into the process can reduce uncertainty between outputs and outcomes (*ibid.*). Outcome-oriented evaluation includes an analysis of direct outputs and their consequences and is often applied within the DPSIR (driver-pressure-state-impact-response) analytic framework, an iterative cycle. The major challenge here is the uncertainty about causal linkage because of different spatial scales, long time horizons, and external factors. Process-oriented evaluation assumes that good processes add to good governance by improving output quality through sharing information and knowledge, by facilitating implementation through legitimization, and by openness and participation. Challenges are that the process evaluator is always part of the process and that the identification of the process for investigation is complicated because of different parallel processes at the same time at different levels and in different sectors (*ibid.*).

Thomas (2008) stated that "we know much about the state of the environment; but relatively little about how specific policies, programs, and governance systems affect environmental conditions (*ibid.*, p. 4)". Important for the output-outcome evaluation are time-series data that are available before the participatory process to serve as a benchmark for improvements and that are available for long time horizons to allow outputs to have effects on environmental conditions. Another important point is the consideration and distinction of external factors that may affect environmental conditions. He proposes quasi-experimental, case-study, and statistical designs as research methods (*ibid.*).

Quasi-experimental designs have one disadvantage compared to classic experimental methods: they lack random assignment. Although this puts the validity at risk, it can be compensated by applying multiple techniques. Remote sensing and Mill's method of difference seem to be suitable tools according to Thomas (2008). Remote sensing monitoring data have been available since the 1970s, i.e. before many participatory planning processes started; they are collected on a regular basis, and are qualified for measuring environmental changes. Mill's method of difference (or the most-similar method) allows for a comparison of matched cases that only vary in one variable, e.g. the form of participation. Quasi-empirical designs can show causal effects, i.e. whether environmental outcomes are linked to participatory processes (*ibid.*).

Case studies can show the causal mechanisms between variables in logic models, i.e. why environmental outcomes are linked to participatory processes. They are suitable "for demonstrating the causal mechanisms leading from input to process to output to outcome (*ibid.*, p. 12)". Logic models (Figure 10) specify what to measure and the expected causal relationship between variables and the effects:

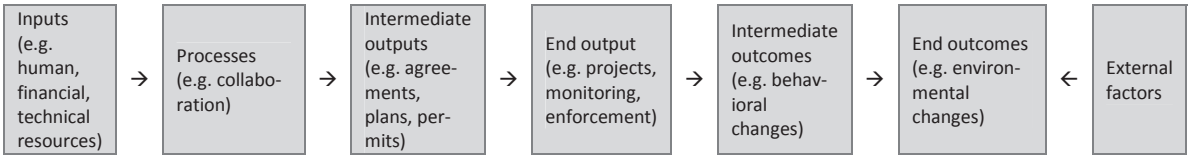

Figure 10: Logic model

Statistical designs can be used to support the above mentioned methods by providing "supporting evidence of causal mechanism (*ibid.*, p. 12)". However, they can only test correlations between variables, not causation (*ibid.*).

Meta-analyses (or case survey method) can be used to evaluate existing single case studies systematically and statistically regarding the environmental outcomes of participatory governance (*cf.* Newig 2005, Fritsch and Newig 2006, Fritsch and Newig 2007). Many case studies already exist that could be evaluated in a meta-analysis that use coding schemes on the basis of existing hypotheses from literature to incorporate results from single case studies (*cf.* Beierle and Cayford 2002, Newig and Fritsch 2009). This approach allows many case studies to be compared and qualitative data to be statistically analyzed. However, meta-analyses are qualitatively limited since they are dependent on the quality of the data collected in the single case studies (Grunenberg 2011).

4 Outlook

The literature review in Chapter II ('The Functions of Participation in Environmental Planning') reveals that in Germany, most literature on the functions of participation is more than 10 to 20 years old and that there are only a few actual empirical studies that investigate the fulfillment of functions in the context of environmental planning. In contrast, research in the US has continued. Therefore, there is a basic need for research in Germany. The literature review has shown that the functions of participation (*cf.* p. 31) are not discussed in equal intensity and that empiri-

cal research results are still fragmentary. In particular, the following questions arise: What functions (besides the rationalization and effectiveness function) are actually addressed by participation in environmental planning processes? What functions are of special relevance in environmental planning? What type of participation facilitates in particular what function? Is there a difference between the various types or levels of participation (*cf*. p. 2)?

One possible research approach would be to carry out a classification of the functions through a Delphi expert group (e.g. scientific experts and facilitators of participatory planning processes). The Delphi method is a systematic multi-level survey technique (including feedback) that assesses if consensus about a specific topic prevails in a group of experts (*cf.* Häder 2009). In a first step, the importance of the functions in participatory environmental planning could be rated from a scientific and practical perspective via online survey. Experts would then assess hypotheses in two or more stages. Responses from the previous stage would be summarized and circulated to the experts for further clarification and refinement. The Delphi method is intentionally designed to avoid the influence of dominant groups. However, the absence of discussion can lead to misjudgment since deficits of knowledge cannot be offset. In addition, the development of innovative ideas and solutions as a consequence of different disciplines working together does not happen.

Then, the hypotheses that were developed in consequence of the Delphi expert group could be evaluated in a comprehensive empirical study taking the criteria proposed in Chapter II and different intensities of participation into consideration. It should first be assessed as to whether the proposed criteria are useful and qualified for evaluating the selected functions in the environmental context.

In general, a combination of different research methods (triangulation or multi-method design) seems to be a promising approach according to Grunenberg (2011). Different theoretical perspectives or various kinds of data can be applied. The overall picture of the object of investigation shall be improved due to different perspectives.

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Appendix

Table 12: Overview over categories and codes.

categories	codes
missing stakeholders	water tourism
	landowner; farmer
	logging industry
	environmental group
	construction
	city
	NOAA fishery
adequately considered comments	yes
loss of content through consensus	no
	potential is there
achievements/success of collaboration	sophisticated plan
	implementing projects
	integration of different ideas/visions
	very successful
	community support
	consensus on decisions
	early/continued involvement of stakeholders
	leadership
	recognition from others
	cooperation
	funding
	previous planning
	better outcome
	voluntary effort
	decision-making by citizens
	knowledgeable & well versed group
	environmental improvements
	landowner support for projects on their land
	support from governmental agencies
	inclusive process
	trust
	most effective
implementation projects	abatement or prevention of point or nonpoint sources of pollution
	modification to instream flows or water allocation
	stream channel projects (restoration of vegetation , morphology, or biota)
	changes in land use designations (through purchase, easements, and zoning)
selection of implementation items	priority
	funding
	realizibality
influence on decision	interviewee
	entire watershed planning unit
facilitation of implementation	collaboration
	funding
	community support
	leadership
	early/continued involvement of stakeholders
	support from governmental agencies
	knowledgeable & well versed group
	staff resources
	technical knowledge
	cooperation
	landowner support for projects on their land
	consistency with other processes

	previous planning
	recognition from others
	compensation in money
	communication
	consensus on decisions
	voluntary effort
challenges of implementation	missing funding
	bringing in new landowners/availability of areas
	legal procedure
	hostility against state
	integration of different ideas/visions
	leadership
	acceptance of local knowledge by state
	monitoring
	missing data
	missing experience
	more complicated projects
	staff resources
	technical knowledge
success of implementation	very successful
	funding
	measured by monitoring
	community support
	collaboration reduces costs
	landowner's satisfaction
	recognition from others
	environmental improvements
	integration of diff. ideas/visions
	landowner support for projects on their land
environmental improvements	fishery
	water quality
	habitat
	stream flow
	through riparian plantings
	through reduced maintenance activities
	sediment
	riparian zone
	through fencing of stream corridor
	channel complexity
	water temperature

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