



Relating Actor Analysis Methods to Policy Problems T.E. van der Lei

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Telli van der Lei

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"Bad science sets out to make a point, looks neither to the left nor to the right but only straight ahead for evidence that supports the point it sets out to make. When it finds evidence it likes, it gathers it tenderly and subjects it to little or no testing." - Mark Vonnegut, The Boston Globe, 10/24/99

Relating Actor Analysis Methods to Policy Problems

Proefschrift

ter verkrijging van de graad van doctor
aan de Technische Universiteit Delft,
op gezag van de Rector Magnificus prof.dr.ir. J.T. Fokkema
voorzitter van het College voor Promoties,
in het openbaar te verdedigen op dinsdag 20 oktober 2009 om 10 uur
door Tellervo Elisheba VAN DER LEI
doctorandus Natuurwetenschappen en Bedrijf & Bestuur
geboren te Helsinki, Finland.

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ISBN 978-90-5638-219-3

Preface

And so here I am writing my preface last, last minute before the thesis goes to the printer. I always enjoy reading the prefaces of thesis' and books. In fact, for a lot of books, it has been the only part I have ever read. I like the little insight into someone's personal life. The texts are often less polished and more informal. Now that I am writing my own, I wonder, how many of them have also been written under great time pressure? Probably a lot of them, as I know very few academics that deliver their texts on time. In this one shot I have at writing this preface, I surely cannot remember all the people that have helped me in my thinking and work regarding this thesis. Now I truly understand why so many people write this sentence this in their preface. If you do not find your name in here it is not because of you but because I had one shot at this and am really trying to stay awake at this point in time.

This research started with the assignment to do 'something' with actors and actor analysis methods. Coming from a very different school of thought I had no idea what actors and actor analysis methods are. After I figured out what actors are and what actor analysis methods are, I wondered why one should apply these methods. As I could hardly find any information on this topic, the theme of this thesis was born. Thanks Wil Thissen my 'promotor' for giving me the chance to figure it out on my own, at times I was frustrated but now I really appreciate the experience. I have always admired the way in which you can analyze texts. Thanks Scott Cunningham my 'co-promotor' for all the out of the box ideas you provide. I always enjoyed our discussions.

Thanks to all the people that allowed me to interview them giving their time and expecting nothing in return. Regarding the first case I would like to thank all nineteen inhabitants of polder Groot Mijdrecht I interviewed and the representative of the Water Board. Regarding the second case I would like to thank Gerrit Buist, an EON representative, an industry expert, Wim Naije, Peter Schansman, Marten Stienstra, and Laurens de Vries.

Thanks to the Delft Research Center Design and Management of Infrastructures for providing part of the funds for this research.

I would also like to thank my peer group: Buyung Agusdinata, Geertje Bekebrede, Igor Nikolic, and Anish Patil. Thanks for taking the time to read numerous draft chapters and papers. Our discussions of each others research were always interesting but it was even better to just talk with you and realize that we were 'all in the same boat.' Geertje, Igor, I really enjoyed our little side project in which we got to know each other even better. I consider you great friends.

Thanks to all the section members, who I will not mention all, it was nice working with you - you are a great team. Thanks Monique van der Toorn-Fennema and Gonny van Werkhoven, for the support, advice, and 'listening ears.' Gonny, I enjoyed working with you on the policy analysis website. Thanks Jill Slinger, the paper we wrote together I still consider the best I've written. Thank you also for your motherly advice, none of my children got a bottle right after birth. Thanks Alexander de Haan, for the policy analysis PhD students research we did. Thanks Pieter Bots, I learned a lot working with you on the Bachelor Project. Thanks Bert Enserink for being the relativist during our work on the issue paper paper. Thanks Geertje Bekebrede, Darby Grande, and Leon Hermans, for the times I shared an office with you.

Thanks to my family and friends, again, too many to mention but all included in this thank you. My sister Anna(-Marie) van der Lei, for your help on the pictures and your cheerful presence. Gerben van der Lei, for well, just being my brother. It is great to see the bond between Mees and Arne. Meike Steenweg for the times you watched Arne. My

father Johan van der Lei, for shedding some light on the PhD process, the times you got my thinking straight and help with formulating parts of this thesis. You are the best ‘paranimf’ I could wish for. My grandfather Pekka Suvanto for your love of science and the stories you made up when I was a child. My grandmother Tellervo Suvanto, you have always corrected every text grandfather wrote. Thank you for teaching me all kinds of practical skills, Finish, and the joy of working. My mother Auli Suvanto, for the pictures you made and the way you trust life. Dear grandmother and mother to you I dedicate this book.

Thanks to my own family Mark, Arne, and Kai. At the end of the day you always put things in the right perspective.

Telli van der Lei
The Hague, September 2009

Summary

Relating Actor Analysis Methods to Policy Problems

For a policy analyst the policy problem is the starting point for the policy analysis process. During this process the policy analyst structures the policy problem and makes a choice for an appropriate set of methods or techniques to analyze the problem (Goeller 1984). The methods of the policy analyst are often referred to as the toolbox or toolkit of the policy analyst. In this metaphor, the toolbox of the policy analyst contains the different methods and techniques that are applied to the diversity of problems for which a policy analysis is needed.

Numerous contemporary policy problems related to public policy, organizational strategy, and organizational change can be characterized as multi-actor problems. Such multi-actor policy problems are characterized by multiple actors with their own perspectives and interests regarding the problem. As a consequence of this multi-actor perspective, the toolbox has been extended with actor analysis methods. That is, actor analysis methods are being applied by policy analysts to analyze multi-actor policy problems. A literature review, however, shows that till now little policy analytic research has paid attention to the suitability of actor analysis methods to this type of problems.

The selection of a specific actor analysis method for a given problem is complicated by the fact that the different methods till now have not been compared to each other for the same multi-actor problems. Most applications reported in scientific literature deal with the application of a single actor analysis method for a problem situation. As a result, we often do not know what the consequences for the analysis of a specific problem would have been if the analyst would have applied another actor analysis method. This research takes up the challenge of investigating the performance of actor analysis methods for multi-actor problems. It aims to develop a framework that can help guide the selection of actor analysis methods for multi-actor policy problems.

Although actor analysis methods are starting to receive attention in the policy analysis literature no clear and agreed upon demarcation of actor analysis methods exists. We therefore find it important to address the question of what constitutes an actor analysis method and what not. We argue that the primary difference between a non-actor analysis method and an actor analysis method is that the method *itself* focuses on the analysis of characteristics of multiple actors. After the demarcation of the field we argue that actor analysis methods can be divided into two groups: actor analysis methods that model multi-actor decision-making, and structural actor analysis methods. Both of these groups are further specified. The actor analysis methods that model multi-actor decision-making can be subdivided into two groups: bottom up and top-down methods. The structural actor analysis methods can be subdivided into structural methods that focus on the actors or on the relationships between the actors.

Because the policy problem is the basis on which the policy analyst selects the methods to analyze the problem, we develop a framework that relates multi-actor problems to actor analysis methods. However, little previous literature is available and therefore we could not rely on the work of others who attempted to develop frameworks that aid in matching multi-actor problems to specific actor analysis methods.

In order to construct our framework we turned to published applications of actor analysis methods. From the categorization of actor analysis methods we selected five actor analysis methods for further study. In order to structure our analysis we viewed the application of an actor analysis method as a modeling exercise and used a conceptual model of the modeling process to study the individual applications of actor analysis methods. The analysis resulted in three types of multi-actor problems for which different actor analysis methods have been applied: conflict, negotiation, and deadlock. These results constitute our framework which shows the types of multi-actor problems and the actor analysis methods that have been applied to these problems.

The types of multi-actor problems were inferred from the descriptions of the problems provided by the individual researchers. This because the researchers themselves do not explain why that particular method was selected for that particular problem. That is, the contemplation of why a certain method would be most suitable for a specific problem is not clearly expressed in literature and is the result of a choice made by an individual researcher.

The framework shows that not all actor analysis methods have been applied to all different types of multi-actor problems (conflict, negotiation, and deadlock). The fact that for a certain category of problems in the available literature a method has not been applied to one of the problems is an interesting observation. This as there does not seem to be a fundamental limitation to the applicability of any of the actor analysis methods to the specific types of multi-actor problems. Not only does literature not clearly specify such limitations, the properties of the methods themselves do not seem to delimit the use of the method.

Another question is, which actor analysis method would be most suitable for a given problem. One might conjecture that some specific properties of methods make that method more suitable for a certain type of problem situation. The notion of a more suitable method assumes that experience is collected which contrasts the results of the various methods when applied to a specific type of problem. The empirical evidence that would provide these properties is however lacking. We therefore conducted two case studies to gather this type of empirical evidence on the methods. These case studies represent two specific real world policy problems to which we have applied multiple actor analysis methods. As a measurement of method performance we chose to use the predictive ability of the methods as a proxy for method performance, i.e., we assessed how well the methods predicted real world events.

Our first case study studied the premise that different methods applied to the same problem will yield different results. One can interpret the framework in such a way that all methods that have been applied to the same problem are equally suitable for that problem and would perform equally well. We thus wanted to apply all methods that according to the literature have been applied to a certain problem to that specific problem. We selected a deadlock problem. For deadlock problems, three actor analysis methods have been used in literature: conflict analysis, transactional analysis, and Q-methodology.

The first case study concerned the possible flooding of part of a polder in The Netherlands called the Groot Mijdrecht polder. For this case Q-methodology identified large disagreement about the policy problem as formulated by the involved authorities. The main result of the conflict analysis was the conclusion that a new process with an open problem formulation, as requested by the inhabitants, was infeasible. Transactional analysis suggests that a possible solution can be found in a new scenario where respect for the landscape is combined with the need to store water. To date no final decision regarding the possible flooding polder has been made. The case is still evolving, and what the final outcome will be regarding the polder is not yet certain. As a result, the current outcome of the case cannot be used as proxy for the performance of the method.

Although the final outcome of the problem situation is not yet known, we could assess the intermediate situation. While we do not yet have the benefit of complete hindsight, at present certain options do not seem to be as likely as they were when we did our analysis. Q-methodology gave a better prediction on the short term than both conflict analysis and transactional analysis. On the longer term transactional analysis came closest to predicting real world events. It is important to underscore that the methods did yield different results and that the selection of methods therefore is far from arbitrary. The conclusion that different methods yield different results is independent of what will be the best performing method. If in future we will have the final outcome, we can then evaluate which of the methods had the highest predictive value.

In our second case study we studied the premise that if a method had not been applied to a problem type yet, it would perform less than a method that had been applied to that problem type. One could argue that when a method has not been applied to a specific type of problem this represents a limitation of that method. On the other hand, we noted that the properties of the methods themselves do not seem to fundamentally prohibit use of a method for any of the problems. We choose to apply a transactional analysis and conflict analysis to a conflict situation. Transactional analysis, according to our literature review, had not yet been applied to a conflict situation before.

The second case study concerned the potential unbundling of the network companies from the large integrated power companies in the Netherlands. The conflict analysis showed that the government had the power to pursue its preferred outcome: the unbundling of the network companies. This corresponds to what happened in reality. The result of the transactional analysis was more nuanced. That is, it suggested an intermediate solution and no complete unbundling. The assumption of the transactional method, that people trade control over issues, was not the most appropriate for the studied conflict situation as in the end no trade was made. We concluded that for this case the conflict analysis was indeed the more suitable method. We also concluded that although transactional analysis had never been used for conflict problems, this method could be used.

The framework developed in this thesis is a first attempt at defining a structure that may help in the selection of actor analysis methods for multi-actor problems. The two cases are a first attempt of applying the methods in the light of the structure of the framework. As the first case is still evolving a final outcome is not known for this case and therefore a best performing method can not be established at this point in time. As a result, we can not relate certain properties of the methods to the differences in the performance of the methods. For the second case this can be done. In this case the best performing method, conflict analysis, was the method that according to the framework was the most suitable method. From a scientific viewpoint, the generalization of the results of a single case to general properties of the methods regarding the problem situations cannot be done. We thus conclude that although we are able to make a framework with the potential to guide the selection of methods, in order to reach this potential it must be substantiated by a larger number of cases all pointing to the same strengths and weaknesses of the methods. Only then can generalization in the form of a more detailed discussion of methods and problems be entertained in a scientifically sound fashion.

In this thesis we proposed to use predictive value as the proxy for method performance. The strengths and weaknesses of the methods are not limited to the predictive value of the methods. Using the predictive ability of the methods to judge performance is a very narrow definition of the suitability of a method. Final judgment on whether a method is suitable can also depend on other issues like the goal of the analysis, the required results and practical considerations.

This thesis thus represents an initial effort in work on a framework that relates methods (and properties of those methods) to types of problems. The major limitation of this thesis is that we can only provide initial, case-based support for our framework. As a result, future comparative research will have to clarify whether this framework will indeed aid in structuring the choices a policy analyst has to make in selecting actor analysis methods when faced with a multi-actor problem.

When contemplating future research, the first issue that needs to be addressed is a further development of our understanding of the relationship between the method selected and the result obtained when dealing with a specific problem. Research dedicated to comparing methods needs to be pursued in order to better understand the characteristics of those methods. As experience with multiple methods applied to the same problem increases, our ability to identify specific characteristics of those methods in relation to the problems will be growing. Ideally, it would result in diagnostic rules that would guide the policy analyst in selecting methods and, maybe even more importantly, interpreting the results of those methods.

One might argue that this type of comparative research is too time-consuming or too expensive. We would argue that if a scientific field is to further develop, a well-grounded understanding of the potential and limitations of the methods used is an absolute requirement. In the absence of that understanding, the decision of the individual policy analyst to apply a method for a specific problem remains a subjective decision – that is, not defended in scientific discourse. Although others might propose different strategies to study the relative merits of methods in relation to problems addressed, we feel that the topic of comparing methods in relation to similar problems must be further pursued. As policy analysts we have to move beyond the casuistry – the use of case histories – that describes single problems and single methods and work on formulating diagnostic rules by comparing the performance of multiple methods to given problems.

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1. Introduction

Policy analysis is an interdisciplinary field that applies a variety of scientific methods and techniques to support policymakers. The field is broad, and includes, in addition to performing a policy analysis for a problem, a range of other domains such as theory development or the evaluation of policy. Although we acknowledge the wide spectrum of the field, in this thesis we restrict policy analysis to a process that is performed for a policymaker in order to communicate policy-relevant knowledge. For this type of policy analysis the *policy problem* is the basis for the policy analysis process; during this process the policy analyst structures the policy problem and makes a choice for an appropriate set of methods or techniques to analyze the problem (Goeller 1984). The methods that the policy analyst may apply are often referred to as the toolbox or toolkit of the policy analyst. In this metaphor, the toolbox of the policy analyst contains the different methods and techniques that support the diversity of problems for which a policy analysis is needed (see Figure 1.1).



Figure 1.1: The policymaker provides a problem to the policy analyst who applies a suitable tool to the problem.

As a consequence of the now popular *multi-actor* perspective, this toolbox has been extended with *actor analysis methods*. That is, it is now widely accepted that 1) views on a given policy problem differ and that 2) decision-making power is often spread amongst multiple actors (*e.g.* Teisman 1992, Van de Riet 2003). This has resulted in the addition of methods to the toolkit that can analyze the multiple actors involved in that situation.

As we will show in the following sections, it is striking that, while the toolbox has been extended with actor analysis methods, little to no research has been done on gathering information on the suitability of these methods for policy problems. The policy analytic literature lacks adequate diagnostics that help determine what methods are needed for what problems. This research tries to make a step in researching the suitability of different actor analysis methods for policy problems in order help guide policy analysts and practitioners in their choice of a suitable actor analysis method for their policy problems.

We first discuss how the multi-actor perspective has affected the way we look at the policymaking process and policy problems. Next, we describe how the multi-actor perspective has changed the policy analysis process and we discuss the various actor analysis methods that have been added to the toolbox of the policy analyst. Subsequently

we will argue that there is a need for more insight into the suitability of actor analysis methods for different multi-actor problems. We end by defining research questions about the suitability of the range of different actor analysis methods and explaining the research approach.

1.1 From a rational single-actor perspective to a multi-actor perspective in the policymaking process

Phase models are the oldest models of the policymaking process. These models divide the policymaking process in a number of clear phases: the agenda setting phase, the specification of policy alternatives, deciding amongst the alternatives, implementing the policy, and evaluating the policy (Brewer and deLeon 1983, p. 18-21; Dunn 1994, p. 15-20). The phase models suggest that a specific series of rational systematic steps is taken to solve policy problems. Although these rational models are still used as normative frameworks, this view of a rational policy process has largely been abandoned and more realistic models of the policymaking process have been introduced.

The development of the notion of public choice in economics (Arrow 1963; Black 1948; Buchanan and Tullock 1962) stressed that policymakers are led by self-interest rather than public interest when deciding on policy. That is, policymakers have their own interests which may deviate from the desires of the general public. From this perspective the idea of a rational government that identifies and decides on the problems that need policy in the best interest of the public could no longer be maintained.

Other models were developed which could better explain the behavior of policymakers in the policymaking process. Models that show how policy problems become an issue on the policymakers' agendas focus more on the *ad hoc* nature of the policymaking process and do not describe it as a rational process. March and Olsen, for example, introduced the garbage can model stressing the randomness of decision-making in universities (Cohen *et al.* 1972). Kingdon adapted their logic for governmental agenda setting for his streams model and introduced the notion of "policy windows" to explain how three streams: problems, solutions and politics, all have to be of interest to the policymakers before a policy issue is put on the agenda and policy is made (Kingdon 1995).

Kingdon's work provides an explanation for how policy problems get onto the agenda and into the policymaking process. Kingdon also considers the policymaking process to be comprised of clearly delineated phases. Kingdon believes that policymaking consists of agenda setting, specifying alternatives, deciding amongst alternatives and implementing the decision (Kingdon 1984 p. 3). Although the attention Kingdon gives to agenda setting provides an extension to the phase model, the phase model itself can not explain why, the initial problem focus shifts during the policymaking process. In order to explain this shift of focus another view of the policymaking process is needed. The rounds model that was developed can be seen as a combination of the phase model and the streams models (Braybrooke 1974; Kunreuther *et al.* 1982; Teisman 1992; Monnikhof 2006). The model attempts to explain why problems and solutions change in a policymaking process.

The rounds model describes the policymaking process as consisting of rounds instead of phases, where each round has its own problem formulation and policy outcome. In each round the policy is debated by a diverse group of policymakers and actors having diverse interests and diffuse resources. In each subsequent round problems and solutions are defined once again (*e.g.* Teisman 1992; Van de Riet 2003). As problems and solutions change from round to round, the outcome of a policymaking process can not be predicted. This view of the policymaking process can explain how policy problems and their

solutions can radically change within a single policymaking process. Today, this model is popular amongst policy scientists in the Netherlands.

The acknowledgement that diverse actors have a stake in the policymaking process has also led to the idea of public participation: involving all actors that have a stake in a certain policy problem in the policymaking process (*e.g.* King *et al.* 1998). The idea is that all who are affected by a decision have the right to be involved in the policymaking process. Participative policy processes are processes in which effort is put into either consulting the public (*e.g.* referenda) or including all relevant actors in the policymaking process (*e.g.* local people and organizations).

In summary, the policymaking process is no longer viewed as a planned rational process but as a process in which dependencies amongst multiple actors are acknowledged and even exploited. This multi-actor view on policy making can also be discerned for policy problems and has influenced views on policy analysis as well. In subsequent sections we will explore these views.

1.2 From unitary problems to multi-actor policy problems

A policy problem is “a perceived gap between a norm or value and an existing or expected situation for which holds that the bridging of the gap is subject to public policy” (Jones 1977; Hoogerwerf 1987; Hisschemöller 1993 p.15). The way this gap is perceived amongst policy analysts has changed from unitary view to a multi-actor perspective. That is, the belief that there is a single problem formulation for a problem is replaced by a view that acknowledges that problem formulations are socially constructed by multiple actors and can change over time.

Kingdon (1995) acknowledges that policy problems or issues are the result of a combination of multiple perspectives. In his view streams of problems, solutions, and politics all need to come together for an issue to get on the agenda of policy makers. Other authors have also discussed the nature of policy problems. Problems are described as “wicked,” “messy,” “swamps,” “complex,” or “unstructured” (Rittel and Webber 1973; Ackoff 1981; Rosenhead 1992; Walker 2000; Mingers and Rosenhead 2004). Often these authors contrast their views on policy problems to “tame,” “simple,” or “structured” problems for which a step by step problem solving approach that results in a single solution to the problem would apply. Below we discuss these views.

Rittel and Webber (1973) call policy problems “wicked” given the diversity of the values that are held by the different stakeholders, therefore there is no single correct problem definition. Wicked problems can not be solved in a linear way as each attempt to provide solutions for wicked problems changes the problem formulation. Ackoff (1981) introduced the term “mess management” for the planning of large interacting policy problems. Ackoff, like Rittel and Webber, acknowledges stakeholder diversity but his focus is on ways of managing these problems (a clinical approach, a research approach, or a design approach). Rosenhead (1992) refers to policy problems as being “swamps.” Swamp conditions for a problem are multiple interdependent actors and high levels of uncertainty. “Unstructured problems” are characterized by “multiple actors, multiple perspectives, incommensurable and/or conflicting interests, important intangibles and key uncertainties (Mingers and Rosenhead 2004, p.531).”

In summary, like the policy making process it is now acknowledged that policy problems are characterized by the involvement of multiple actors. Although separate in this introduction, in practice the policymaking process and the policy problems themselves are closely related and may not even be viewed as separate. Still, both problem definition and problem solution depend on multiple actors that have their own perspectives.

1.3 The influence of the multi-actor perspective on the policy analysis process

Policy analysts inform the policymaking process by delivering policy relevant information. Policy analysis as we know it today evolved from second World War military decision-making, operations research (OR), system analysis, applied mathematics and engineering (Miser 1980; Majone 1985; Dewar *et al.* 1993; Dunn 1994, p.48.). Policy analysts follow a series of logical steps. What these steps are and the order in which they are to be executed, however, is described differently by different authors (*e.g.* Miser 1980 p. 209; Brewer and deLeon 1983; Wladyslaw and Quade 1985; Dunn 1994; Hillier and Lieberman 1995; Walker 2000; Mayer *et al.* 2004). The multi-actor perspective of the policymaking process influences the way a policy analysis is conducted. In the following sections we will highlight some of the literature on the process of policy analysis.

During the Second World War, policy analysts provided answers to the operational problems of the military (Miser 1980). The period after this war is characterized by the policy analyst providing solutions for the problems of policymakers, using a rational and systematic process (Miser 1980; Hillier and Lieberman 1995; Walker 2000). Walker (2000) for example describes a policy analysis in eight steps: identify problem, identify objectives, decide on criteria, select alternatives, analyze alternatives, compare alternatives, implement chosen alternatives, and monitor and evaluate results (Walker 2000 p. 14). The policy analysis process is a systematic analytical process that shows the policymakers or clients what effects different policy alternatives may have on the studied policy problem. Furthermore, it may deliver an implementable solution to a policy problem. Famous examples of implemented policy analytic solutions are: the blood distribution system for Long Island New York (Brodheim and Prastacos 1979) and deployment policies for the New York firefighting force (Walker 1975).

Another view on policy analysis is linked to the already discussed phase model. In this view policy analysts perform different activities per phase of the policy process for policymakers (Brewer and deLeon 1983; Dunn 1994 p. 15). Dunn (1994) for example describes the policy analysis process consisting out of five activities of policy analysts: problem structuring, policy forecasting, policy recommendation, policy monitoring, and policy evaluation (Dunn 1994, p. 13). These phases correspond to the different phases of the policymaking process (agenda setting, policy formulation, policy adoption, policy implementation, policy assessment). Every policy analysis activity is designed to contribute to a specific part of the policymaking process. Dunn then continues to discuss models and methods that policy analysts may use in the different policy analysis activities. This view is different than the view that provides solutions for the problems of policy makers: the policy analysis itself does not necessarily result in a policy solution. Rather than addressing the overall policy problem, the policy analyst might be involved in only individual phases of the process.

Van de Riet (2003) researches how a policy analysis should be conducted within a multi-actor environment. Van de Riet (2003) argues that the changed focus in the policymaking process, from a rational to a pluricentric one, has created additional conditions for the way in which policy analysis should be performed. She identified three requirements for how a policy analysis may accommodate multi-actor complexity: trustworthy analysis, intertwining interests, and a multi-perspective research focus (Van de Riet 2003, p. 26).

Although Van de Riet acknowledges the multi-actor environment, the perspective on the policy analysis process is rational as she assumes that a single policy analysis is performed that starts with problem formulation and results in a policy solution or recommendation. Shulock (1999) however, shows that increasingly there are multiple policy analyses performed for a single policymaking process. We can see this in practice where it is not uncommon for the stakeholders involved in the policymaking process to

finance their own policy analysis. In light of this Shulock (1999) argues that policy analysis today is more and more about legitimizing the policymaking process than about providing policy solutions.

Instead of providing rational solutions as policy relevant knowledge, policy analysts increasingly perform different supporting activities for the stakeholders involved in the policymaking process. Mayer *et al.* (2004) conceptualize these different activities of policy analysts. They structure the policy analysis field in a single conceptual model that describes six different activities that policy analysts can perform for a client (Mayer *et al.* (2004): research and analyze, design and recommend, clarify values and arguments, advice strategically, mediate, and democratize. It is worth noting that for three of the six activities (clarify values and arguments, mediate, and democratize) the policy analyst himself (or herself) is a part of the policymaking process; this is also called intervention (*e.g.* Rosenhead 1989). In these cases the policymaking process and policy analysis process are not separate processes: they overlap.

In summary, we see that many researchers no longer view policy analysis as a single analytic process in support of a single policymaking process. Instead, different multiple policy analytic activities are performed for the multiple actors involved in a policymaking process.

1.4 Actor analysis methods added to the toolbox

During and just after World War II the policy analysis field relied upon optimization (Miser 1980). As a result, the toolbox consisted of a limited set of tools all reflecting the notion that an optimal solution could be found, and that a relative simple, logical and sequential process was to be applied. With the introduction of new views on policy problems, new methods, including actor analysis methods, were used by the policy analyst and added to the toolbox. Overviews of the tools in the toolbox and classifications of those methods are scarce. Dunn (Dunn 1994), for example, couples different types of methods to the analysis activities policy analysts perform for the different phases of the policymaking process (Dunn 1994, p. 13). Methods that help structure policy problems (*e.g.* argumentation mapping and brainstorming), methods used for forecasting (*e.g.* Delphi technique and regression analysis), methods that recommend policy actions (*e.g.* shadow pricing and objectives mapping), methods that help monitor policy outcomes (*e.g.* control-series analysis and social auditing) and methods that help evaluate policy performance (*e.g.* decision-theoretic evaluation and value clarification). Dunn organizes the different methods in the toolbox by linking them to the activities of the policy analyst in the different phases in the policymaking process.

Miser and Quade (1988) discuss a number of different methods like methods of expert judgment, operational gaming, Delphi inquiries, computer assisted conferencing, social experimentation, quantitative methods, forecasting and scenarios. The contributions in Miser and Quade (1988) focus on when certain methods and techniques are useful for a policy analysis and what they can be used for (*e.g.*, for uncertainty analysis or boundary setting). The methods and techniques are thus discussed from the point of view of when and how they might be used in a policy analysis process. Although Dunn also addresses these issues, he includes a link from the methods to the policymaking process.

Another list of policy analytic methods is provided by Rosenhead (1989 and Rosenhead and Mingers 2001). In his book, Rosenhead acknowledges that various groups of people are involved in a problem, and he proposes methods that enable the researcher to facilitate groups of people involved in the problem – he refers to these as the “problem-structuring methods” (subsequently by others labeled as the “soft operations research methods”). Examples of these methods are strategic options development and analysis

(SODA), hypergames, metagames, and robustness analysis. The work by Rosenhead reflects the growing trend of increased focus on the multi-actor aspect of policy.

Hermans (2005) lists methods that specifically analyze multiple actors and calls these methods “actor analysis models”. His categorization differs from Rosenhead (1989 and Rosenhead and Mingers 2001) as Rosenhead lists methods that allow for joint deliberation on a problem whereas Hermans list methods that analyze the actors themselves. The inventory of methods of Hermans’ (2005) is arranged according to three elements the methods model about the actors. First, methods which analyze actor networks like dynamic access models, configuration analysis, and social network analysis. Second, methods which model the perceptions of actors, like argumentative analysis, narrative policy analysis, and Q-methodology. Third, methods which model the resources and objectives of actors, like conflict analysis and transactional analysis. The list by Hermans is an example of a list that focuses solely on actor analysis methods.

In summary, we see that actor analysis methods have been added to the toolbox of the policy analyst. Unlike traditional techniques such as optimization or system dynamics, these methods allow the policy analyst to analyze the multiple actors that are involved in complex multi-actor problems.

1.5 Research problem: Lack of insight into the suitability of actor analysis methods for multi-actor policy problems

We have shown that policy problems are often characterized by the presence of multiple actors with their own perspectives on the problem. The study of these multi-actor problems requires methods that study the different actors involved in the policy problem. The toolbox of the policy analyst has been extended with methods that can analyze these multi-actor problems by analyzing the multiple actors involved in these policy problems (see Figure 1.2). While policy analytic literature has shown that actor analysis methods can be fruitfully applied to policy problems (*e.g.* Hermans 2004), the literature linking specific tools to specific policy problems has been less well developed (French and Geldermann 2005; Peters 2005).



Figure 1.2: The decision maker has a problem. Multiple actors are involved with their own perspectives on the problem. The policy analyst has a number of tools in his toolkit that could be applied. Which tool must he select?

Policy analysts select an actor analysis method from their toolkit for a policy problem. It is striking that in a field where one is expected to choose the right methods for a problem, little research has paid attention to the suitability of its methods. Most applications reported in scientific literature deal with the application of a single actor analysis method for a problem situation. There is no literature that studies the match between the different possible actor analysis methods and specific dimensions of multi-actor problems. A theoretical or practical framework that can guide the analyst when selecting a method is not available. As knowledge about the suitability of the various actor analysis methods for multi-actor policy problems still needs to be developed, one runs the risk of applying a less suitable method to a problem.

The selection of an actor analysis method for a given problem is further complicated by the fact that the different methods till now have not been compared to each other for the same multi-actor problems. As a result, we often do not know what the consequences for the analysis of a specific problem would have been if the analyst would have applied another actor analysis method. This failure to study the consequences of using different actor analysis methods for the same multi-actor problem creates a dilemma: as the policy analyst can not turn to literature to select an actor analysis method and, moreover, defend that selection when questioned by other researchers. Failure to be able to account for the method selection may be viewed as less scientific or even subjective.

Thus, an analyst confronted with a multi-actor problem does not find appropriate guidance in literature on the suitability of different actor analysis methods for multi-actor problems. This lack of insight in the suitability of actor analysis methods for multi-actor problems is the central issue addressed in this thesis and is reflected in the following main research question of the thesis.

How and to what extent can we provide a framework that guides the selection of actor analysis methods for multi-actor policy problems?

1.6 Research questions and approach

In this thesis we are interested in the suitability of actor analysis methods for multi-actor problems. To answer the overall research question we divided the research into three parts and for each part a distinct research question is answered. Our research sub-questions are thus related to the chosen approach and thus presented together.

1. *What do we consider to be actor analysis methods, what do they do and how do they differ from “single-actor methods” and “non-actor methods”?*

What an actor analysis methods is different for different researchers. No single clear definition exists in the field or the definition that is used is more limited than what we consider actor analysis methods to be. We need insight into what an actor analysis method is before we can say anything about their suitability for certain multi-actor problems. Research question a, therefore, focuses on what we consider actor analysis methods to be.

In order to answer this question we will explore published literature on actor analysis methods and investigate the different views on actor analysis methods of other. We then provide our own definition of actor analysis methods and show how they might be categorized.

2. *How and why are actor analysis methods being applied to policy problems?*

Currently literature provides no framework that can guide the analyst when selecting a multi-actor method for a multi-actor problem. As this type of framework does not exist we need to draw it ourselves. We need insight into the types of multi-actor problems and ways the actor analysis methods are applied to these problems. Research question two focuses on this.

As already mentioned, this type of information is not readily available in literature. Actor analysis methods, however, are used to study multi-actor problems and these applications are recorded in literature. These applications of actor analysis methods contain information on how and why the methods have been used. We therefore turn to published applications of actor analysis methods to answer the research question.

In order to structure our analysis we view the application of an actor analysis method as a modeling exercise. We provide a conceptual model of the modeling process of actor analysis methods and compare the individual applications of actor analysis methods on elements of this process. From the results we construct a simple framework that combines types of multi-actor problems with different actor analysis methods.

3. *Given a policy problem how do different actor analysis methods perform?*

With a framework that combines problems to possible methods, insight into the suitability of the methods can be obtained. That is, for a given problem multiple methods can be applied and assessed on their performance. Research question three focuses on this insight.

We apply multiple methods to two specific multi-actor problems. We choose the predictive potential of the methods as a proxy to measure their performance. This predictive potential of the methods is assessed by comparing the *ex ante* results of the actor analysis methods with how real life events actually evolved.

The overall research approach that is chosen to answer the general research question is inductive and explorative in nature. The first part is both explorative and inductive. It explores the notion of actor analysis methods by studying the available literature on actor analysis methods. The proposed categorization of actor analysis methods is developed by induction. The second part is inductive. In order to develop a framework that guides the

selection of actor analysis methods we analyze published applications of actor analysis methods. The resulting types of multi-actor problems are inductively obtained from the problems described in the papers. The third part, in which two cases are studied, explores the findings from the second part. Two specific cases are set up to study whether the spread of problems versus methods presented in the framework holds in practice. This is done by applying multiple methods for specific problems. By applying multiple methods to a single problem insight can be gained on the performance of the methods relative to one and other.

1.7 Structure of the thesis

Chapter 2 of this book represents part one of the research approach. It seeks to provide a definition and a categorization of actor analysis methods. In order to study the relationship between multi-actor problems and actor analysis methods one must know what actor analysis methods are. The chapter further provides a new categorization of actor analysis methods based on what is modeled by the actor analysis methods.

Chapter 3 represents part two of the research approach. In this chapter we present the result of a literature study of different applications of actor analysis methods. We seek to provide insight into the way different actor analysis methods have been applied.

Chapter 4, 5 and 6 present part three of the research. In Chapter 4 we explain the case study approach. We specify two ways how we study the spread of problems versus methods presented in the framework in practice. Chapter 5 and 6 each treat individual case studies assessing the predictive applicability of different actor analysis methods for a given problem. Chapter 5 describes a case study on the possible flooding of a polder in The Netherlands. In this chapter we study how different actor analysis methods, that have been applied to the given problem situation, perform. Chapter 6 describes a case study on the possible unbundling of the large integrated power companies in The Netherlands. In this chapter we study how a more suitable and a less suitable actor analysis method perform for a given problem.

In Chapter 7 the conclusions of the three parts of our research are repeated and we answer the overall research question. In addition we reflect on the research and address possible future research.

Chapter 2

Exploring the notion of actor analysis methods

2.1 Introduction

Numerous contemporary problems related to public policy, organizational strategy, and organizational change can be characterized as multi-actor problems. Such problems are characterized by: “multiple actors, multiple perspectives, incommensurable and/or conflicting interests, and important intangibles (Rosenhead and Mingers 2001, p 15).” As traditional policy analysis methods and traditional OR methods generally ignore the typical complexities of multi-actor problem situations, they have serious limitations for dealing with such problems. In response, among other things, a variety of *actor analysis methods* have been developed in the past decades and the toolbox of policy analysts has been extended with these methods that help to better understand characteristics of *multiple* actors in policy situations. However, as no clear and agreed upon demarcation of the field exists we find it important to address the question of what constitutes an actor analysis method, in subsequent chapters we investigate then the suitability of some of the actor analysis methods for complex policy problems. We therefore answer the following question:

1. *What do we consider to be actor analysis methods, what do they do and how do they differ from “single actor methods” and “non-actor methods?”*

In this chapter we explain what we mean with actor analysis methods and list some examples of different types of actor analysis methods. Before we do this we discuss what we mean by a method, as multiple interpretations, like technique or tool, are possible. Methods or methodologies are more specific than paradigms or theories but broader than models, tools and techniques. According to Mingers and Brocklesby (1997) “A methodology is a structured set of guidelines or activities to assist people in undertaking research or intervention (Mingers and Brocklesby 1997 p. 490).” To some a method may not be the same as a methodology, however, we use the word method in the same sense as methodology as used by Mingers and Brocklesby (1997) and will therefore use the terms interchangeably. Multi criteria decision analysis (MCDA), for example, is a method. A technique is defined as follows: “A technique is a specific activity that has a clear and well-defined purpose within the context of a methodology (Mingers and Brocklesby 1997 p. 491).” The simple multi attribute ranking technique (SMART) is an example of a MCDA technique. “A tool is an artifact, often computer software that can be used in performing a particular technique (Mingers and Brocklesby 1997 p. 491).” A spreadsheet, for example, in which a SMART is calculated, is a tool. Finally a model is the specific abstraction of part of reality, the result of the application of a method or technique for a specific problem.

Sometimes there is no methodology that accompanies a technique. Dynamic actor network analysis (DANA) is an example of this. It is a technique that maps the

perspectives of different actors and has its roots in actor network theory and causal mapping. When a specific methodology is lacking we have chosen to incorporate the technique. We also leave out paradigms and theories as that aggregation level is not fit for our purposes.

Also we do not presume to cover all actor analysis methods. The goal of the chapter is not to provide a comprehensive overview of all actor analysis methods. Instead the goal is to show what actor analysis methods are and provide examples of different groups of actor analysis methods known to the author.

In Section 2.2 we explore actor analysis methods and non-actor methods. In Section 2.3 existing categorizations of actor analysis methods are discussed and contrasted to the view presented in this chapter. In Section 2.4 we focus on methods of multi-actor decision-making. In Section 2.5 we illustrate actor analysis methods that do not model multi-actor decision-making but instead focus on structural relationships between actors. In Section 2.6 we conclude that the developed perspective on actor analysis methods may be a beneficial one as it allows the mapping of very diverse methods.

2.2 Actor analysis methods and non-actor methods

In this chapter we are interested in the object of study of the actor analysis method. The definition of an actor analysis method for us is a method that allows for the study of some or one characteristic of multiple actors. This definition of actor analysis methods is still broad, but the field is also broad – if indeed we may speak of an actor analytic field. It may even be easier to define an actor analysis method by what it is not. The primary difference between a non-actor analysis method and an actor analysis method is that the method *itself* focuses on the analysis of *multiple* actors. Examples of non-actor methods are climate change models, hydrological models, and also system dynamics and queuing methods. These methods are predominantly used to model systems that are not solely human but have physical elements as well. When human influence is considered this is often an exogenous factor or this influence is modeled as a factor that describes a trend for multiple actors, examples are factors like population growth and income. Of course, non-actor methods can be and are also used to inform a multi-actor decision-making processes and they can contain elements of actors, but the method itself does not specifically focus on the study of characteristics of multiple actors. That is the rationale of the method is not specifically focused towards the study of multiple actors.

This distinction also leaves out most of the collaboration or group support methods and tools. These are methods that aim to improve the functioning of groups of actors. One might think of some types of methods that support groups like the use of ThinkLets (Briggs *et al.* 2003), group model building (Richardson and Andersen 1995; Vennix 1999) or very simple collaborative tools such as email and the phone. The methods and tools do not model characteristics of multiple actors; they are designed to support the interactions of multiple actors. The methods or tools *themselves* do not analyze or model characteristics of multiple actors.

Actor analysis methods are not only applied in multiple application domains like supply chain management, product pricing, investment planning and choice, and transport policy but also in different fields like game theory, management science, economics, artificial intelligence, and machine learning (Van der Lei and Cunningham 2007). As application domains and fields are highly dispersed there is no clearly defined field for actor analysis methods; rather there is a collection of methods applied across fields.

As the application domains and fields are wide our primary focus, and point of departure, is the OR / policy analysis literature. This literature is very diverse as the OR / policy analysis literature by nature already embraces methods from different fields and

domains. We will extend our selection of actor analysis methods beyond the OR / policy domain and will incorporate some of the actor analysis methods from other fields.

Often a distinction is made between hard OR and soft OR. Roughly speaking, hard OR is more quantitative than soft OR; the hard OR methods are precise and transparent but need clear problem formulations. Conversely, the soft OR methods are less transparent and while somewhat intangible they allow the analysis of unstructured problems (Beasley; Rosenhead 1989). A large group of methods that falls under the label of soft OR is the group of problem structuring methods (PSMs) (Rosenhead 1989). Therefore, soft OR and PSM are often used as synonyms. But also outside the soft OR group methods that share the soft OR characteristics have evolved (Grimble and Wellard 1997; Brugha and Varvasovszky 2000; Shaw *et al.* 2004)).

Actor analysis methods fall in both OR categories, within the hard OR section (*e.g.* game theory) and within the PSM part (*e.g.* cognitive mapping). Figure 2.1 represents a Venn Diagram that shows how a small sample of different actor analysis methods are related to the OR methods.

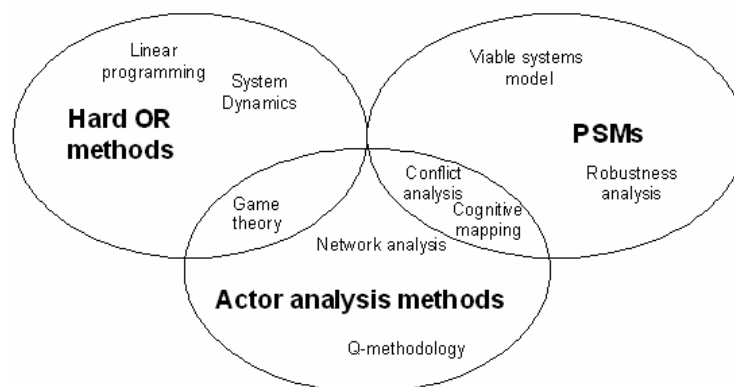


Figure 2.1: Venn Diagram of the place of actor analysis methods in the context of OR methods.

An actor analysis method allows for the study of the characteristics of multiple actors. Linear programming and system dynamics do not study any characteristics of actors and therefore are not actor analysis methods. Game theory belongs to the hard OR group as well as the actor analysis methods group as it is a formal mathematical theory of how actors make decisions in interaction with each other. In the PSM group the viable systems model and robustness analysis are represented as examples of non actor methods. These methods are usually applied in groups of actors; however, the methods themselves do not study actors. Conflict analysis (Howard 1971; Fraser and Hipel 1984) and cognitive mapping (Eden 1988) are both PSMs and also actor analysis methods. Conflict analysis provides insight into the possible strategies of different actors by mapping the options of the actors and generating possible outcomes that are analyzed. Cognitive mapping is used to map the different perceptions that actors have for a problem or issue. Network analysis and Q-methodology are actor analysis methods but do not belong to the different groups of OR methods. Network analysis maps links between actors in order to gain understanding in the relationships of actors. This may be formal links or informal links or membership of specific groups (Scott 1991; Wasserman and Faust 1994). Q-methodology (Stephenson 1935) calculates the aggregate perspectives that actors have regarding a problem or issue.

2.3 An additional view on actor analysis methods

Little has been done so far to characterize the actor analysis methods field. There have been some reviews of actor analysis methods but few have tried to get grip of what actor analysis methods actually are. What characterizes many of the reviews is that they keep to their application field (Grimble and Wellard 1997; Mingers and Rosenhead 2004) or to a single method or set of similar techniques (Brugha and Varvasovszky 2000; Bryson 2004).

Others have taken the challenge to map a broader spectrum of actor analysis methods (Hammond 1996; Hermans 2005). Hermans (2005) is interested in the way actor analysis methods may help to understand the policy making process. He classifies three main theoretical perspectives on multi-actor policy making. The perspectives focus on actor networks, the perceptions of actors, and on the resources and objectives of actors. He then places the actor analysis methods in the theoretical perspectives. Social network analysis and configuration analysis are examples of methods that belong to the network perspective. Q-methodology and dynamic actor network analysis (DANA) belong to the perspective that focuses on the perceptions of the actors while metagame analysis and transactional analysis are examples of methods that focus on the resources and objectives of actors.

Another classification is proposed by Hammond. Hammond's (1996) is interested in what way political actors can be modeled with purposive mathematical methods of decision-making. He classifies the formal mathematical decision-making methods into four classes with the help of two types of assumptions about the individual actor. These assumptions regard the computational power of the actors and the amount of information available to the actors. The four classes are as follows. Methods belong to class one if the actors have unlimited computational powers and all information to make individually optimal decisions like the perfect rationality models. Methods belong to class two if the actors have unlimited computational power but limited information available like imperfect information models or decision-making under uncertainty. Class three and four are both characterized by methods that assume the actors have limited computational powers. In class three the actors have free access to perfect information like boundedly rational models with perfect information. In class four the actors have limited access to information like boundedly rational models with imperfect information, or little access to information.

Hermans (2005) categorizes the actor analysis methods according to theory. While a number of actor analysis methods are based on theory other have evolved from practice like simulation gaming. Or like Q-methodology where the development of a new mathematical method has proven to be helpful analyzing shared perspectives in groups (Stephenson 1935). Hammond's categorization has a more narrow focus than the categorization by Hermans as he solely focuses on purposive mathematical methods of decision-making. The advantage of Hammond's classification is that the categories are neatly described. Most methods that Hermans lists under the network and perceptions perspective are not categorized by Hammond as the methods themselves do not model decision-making of multiple actors but describe characteristics of multiple actors.

Depending on the research purpose what is considered an actor analysis method differs. Our view is based on what is modeled by the methods: decision-making or structure. We make a distinction into two different kinds of groups of actor analysis methods. First, actor analysis methods that allow an analyst to model decision-making – methods that say something about the possible choices or resolutions that actors will or can take – and call these *methods of multi-actor decision-making*. Second, actor analysis methods that study the relationships or associations between actors; we call these *structural actor analysis methods*. We do not mean to cover all actor analysis methods but want to provide insight into the possible variety of actor analysis methods. Although

some researchers may even not see the distinction between decision-making and structure as for them decision-making happens on structures or leads to specific structures (Nouweland 2003; Lieberman *et al.* 2005).

2.4 Methods of multi-actor decision-making

As explained above, we distinguish two groups of actor analysis methods: multi-actor decision-making methods and structural actor analysis methods. In this section we explore the notion of multi-actor decision-making methods. Much in the same as we contrasted non-actor methods and actor analysis methods, the difference between single-actor decision-making methods and multi-actor decision-making methods can help the understanding of multi-actor decision-making methods. We first will explain what we consider single actor decision-making and single-actor decision-making methods before we elaborate on multi-actor decision-making methods.

2.4.1 Single-actor decision-making and methods with a single-actor decision-making view

There is a difference between decision-making of a single actor and multiple actors. Single-actor decision-making refers to decisions made by a single decision-making unit. This unit, the decision-maker, can represent a person or organization that acts as a solitary decision-making unit. A simple model of single-actor decision-making is that when confronted to choose amongst alternative courses of action the decision-maker generally 1) gathers information (input), 2) applies a decision rule to the information to process the input which, 3) results in a decision (output). We represent this rather simply as input, process, and output in Figure 2.2 where the box can be seen as the “brain” of the actor.

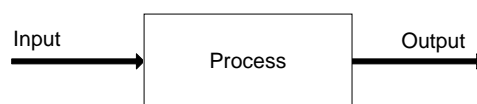


Figure 2.2: Single actor decision-making.

We can translate this very simple human decision-making perspective to methods that choose a best alternative regarding a decision problem and call these methods single-actor decision-making methods. We view a single-actor decision-making thus in three elements input, process output. The input is the input regarding the decision problem that is needed for the method, the process is the rationale of the method, and the output is the decision the method suggests results regarding the problem. Examples of methods that have a single actor decision-making perspective are for example: the multi criteria decision analysis (MCDA) method SMART (Simple Multi Attribute Ranking Technique) and decision trees.

SMART is used to assist in a choice for a decision alternative based on a number of criteria. For the SMART model the inputs are the different alternative, criteria and their weights. The decision rule or process is to choose the alternative (*e.g.* bridge or tunnel) where the weighted sum of the scores on the criteria (*e.g.* cost, environmental impact, and time) is the highest. The output is thus the best scoring alternative.

The decision tree technique maps different decisions and shows the expected utility for the different alternatives (French 1990). Decision trees are made in order to identify the most desirable strategy for a specific goal. The tree consists out of decision nodes where different decisions branch of and chance nodes where the chance of certain events

occurring branch of. A decision tree usually has no converging branches which may cause it to grow big quickly. At the end of the branches the outcomes are represented with their “pay off.” Usually these pay offs represent a certain monetary value as decision trees most often are made for investment problems.

A single actor decision-making method prescribes a best alternative or outcome for a decision problem from a single actor perspective. MCDA and the decision tree are seen as examples of single-actor decision-making methods as the methods suggest a best alternative or solution from a single perspective on the problem. The methods *themselves* do not incorporate separate characteristics of multiple actors instead the focus on the problem and model it in a single perspective.

2.4.2 Methods of multi-actor decision-making

As the name already suggests, multi-actor decision-making concerns situations in which decision-making power is spread amongst multiple actors and the system outcome is determined by interaction of multiple actors. Multi-actor situations are characterized by distributed decision-making. Multiple decision-making units may have an influence on the decision outcome, like people in a meeting, the players in a game of chess, bidders in an auction, and negotiations between diplomats. No single actor has the control over the decision as the actors are mutually dependent (*e.g.* Lindblom 1973; Rosenhead 1992; Teisman 1992). Multi-actor decision-making takes place in a lot of situations: political decisions, projects or alliances between firms.

Multi-actor decision-making methods therefore focus on the actors that are involved in a decision problem. Given the nature of multi-actor problems it is no longer sufficient to study the problem through a single specific lens like single-actor decision-making methods do. A method is needed that allows for the study of the multiple actors involved. Different methods of multi-actor decision-making exist and we distinguish two types of methods of multi-actor decision-making discussed in the subsequent sections.

Bottom up methods of multi-actor decision-making

For bottom-up methods of multi-actor decision-making the outcome or decision is *emergent*; each individual optimizes its own process which then leads to a collective outcome or decision. That is, the collective outcome is the result of individual decision makers assumed to be acting in pursuit of their own goals (see Figure 2.3). The bottom up analogy is chosen as multiple individual decision lead to a collective system outcome. Voting is an empirical example of this type of decision-making. Individual decisions on candidates lead to a collective outcome on, for example, the number candidates of different parties in the parliament. Again, we refrain from the goal of the method or its purpose.

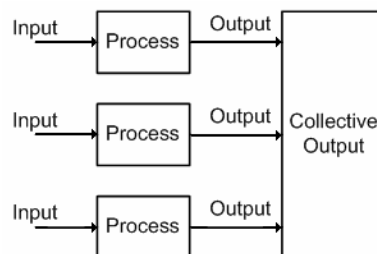


Figure 2.3: bottom up multi-actor decision-making.

In other situations there is interaction between the actors as actors may decide on a collective outcome in multiple rounds or during a negotiation process. A real life example: when planning a date for a meeting every actor may propose a date and after all

dates have been proposed actors will examine these and decide on a final date. During the negotiation process the input and process of the actors is updated (*e.g.* Kolb 1984, Argyris and Schon 1996). This interaction may be visualized as a repeated series of Figure 2.3 where the collective output provides new input for the actors.

Bottom-up multi-actor decision-making methods are, for example, agent-based modeling, simulation gaming, and drama theory where agent based modeling and simulation gaming may be viewed as meta models in comparison to drama theory as they are on a higher aggregation level and encompass multiple methods. Agent-based modeling is done to simulate the actions and interactions of autonomous individuals called agents in order to assess their effects on the system as a whole. Agent-based models (Wooldridge and Jennings 1995) are predominantly applied in artificial intelligence and computer science. Agent-based modeling has become popular in order to simulate overall system behavior that includes the interactions of individual actors. Each actor has its own input, decision rule, and output. The combined output of the agents is the overall system behavior. Often the simulation of decision-making happens in rounds where all actors have a chance to act. After a single round there is a system outcome and then a new round starts. After a number of rounds the behavior of the system may be sufficiently stable to choose to stop running the model (Wooldridge 2002).

Simulation gaming is a bottom-up multi-actor decision-making method as it uses real life actors to simulate system behavior. Simulation gaming for policy making problems, also called policy exercises (Duke and Geurts 2004), can be used as a tool to learn about interaction of humans with the system (Ryan 2000). Gaming itself is broader and can be used for other purposes that have nothing to do with learning about how humans behave and is mostly done for recreational purposes. Roughly speaking there are two types of games: games of progression and emergence games (Juul 2005). Games of progression like a puzzle, lead to a fixed outcome – a completed picture. With games of emergence, like chess, the rules of the pieces interact leading to different outcomes each time the game is played. Gaming, for policy analytic purposes, belongs to this second group (Ryan 2000; Duke and Geurts 2004). With simulation gaming human actors interact with each other and the system of interest making the outcome of the game emergent. These games are seen as representations of complex systems (Salen and Zimmerman 2003; Juul 2005). For simulation games the validity of the model of the context or system of interest is important as the actors must perceive the simulated environment as a good representation of the real environment. The power of simulation games lies in the debriefing session (Ryan 2000) where actors are asked to reflect on the simulation.

Drama theory is a method that supports human actors to solve conflicts. The conflict that is studied is presented with vignettes (Bryant 2002); pieces of paper that describe the actions (called options), possible future outcomes, and the preferences of the actors involved. Note that in contrast to the agent-based methods and simulation gaming the physical environment of the actors is not modeled. With the vignettes the actors start the negotiations. However, the preferences of the actors involved may lead to situations where the preferences of the actors do not match; these situations are called dilemmas. The objective of drama theory is to come to a resolution of a policy problem by solving all dilemmas. Dilemmas are solved by allowing actors to change their preferences and actions in a very specific way (Howard 1994a; Howard 1994b). Drama theory is a bottom up multi-actor decision-making method as the options and preference changes are unique for a group of players leading to unique outcomes.

Agent-based modeling differs from simulation gaming and drama theory as these methods focus on the simulation of the interaction of human actors with the system of interest whereas the actors of agent-based models are automated agents. The goal of all methods is to learn how the interaction of agents affects the (possible) behavior of the system. As human actors are part of the simulation in drama theory and simulation

gaming, the human actors directly experience how their actions may influence the system outcome.

Top down methods of multi-actor decision-making

Top down decision-making methods model the collective decision process. These methods have rules for the exact interaction of the actors and focus less on the rules of the actors themselves which is the focus of the bottom up methods. The top down analogy is chosen as the way the actors interact is fixed. Contrary to the bottom up multi-actor decision-making methods every time a model is run with the same input the exact same output will be returned, therefore, emergent outcomes are not possible. Of course the models of individual analysts may differ resulting in different outcomes for the same problem and noise or chance can be included in these models to create some variance in the outcomes, but the main characteristic of these methods is that the rules that govern the collective process are fixed by the method. A visualization is represented in Figure 2.4.

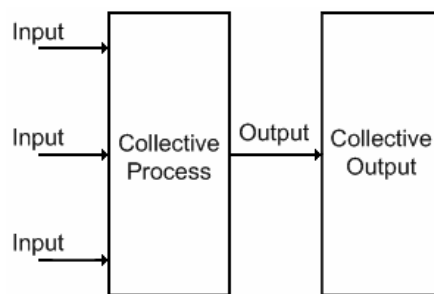


Figure 2.4: top down multi-actor decision-making methods.

Methods that model multi-actor decision-making with a fixed collective decision rule are, for example, game theory, metagames/ conflict analysis, and transactional analysis.

Game theory evolved after the publication of the book *Theory of Games and Economic Behavior* by Von Neumann and Morgenstern in 1944. Game theory provides a framework for the study of the (strategic) decisions of multiple actors (e.g. Fudenberg and Tirole 1991, Waldman and Jensen 2001, Osborne 2002) and is used to provide insight into two kinds of decision-making: cooperative decision-making and non-cooperative decision-making. Especially the non-cooperative decision-making has received attention in the academic literature as it is able to prescribe decisions in more detail while cooperative game theory studies and describes the game at large by studying the influence of different types of rationality for the actors. For both cooperative decision-making and non-cooperative decision-making the rationality assumptions are deductive, that is top-down.

Originally game theory assumed perfectly rational decision makers; each player then knows every move that has been made by other players before taking action. The information structure of a game is then called that of “perfect information.” Over time different solution concepts of games have evolved that have permitted the modeling of, for example, incomplete information, pseudo-players, and limited rationality.

A game-theory model describes all possible outcomes of the actions the players may take. Each combination of possible individual actions of each player thus represents a possible outcome of the game. These outcomes have different value for the players. If perfect rationality is assumed then each player will play in a way that maximizes the value of the outcome of the individual player.

The objective of metagames/conflict analysis is to analyze the strategic power of different actors in a decision-making situation. The concept of metagames was developed

by Howard (1971) and the method has its roots in game theory. The way the game is built, however, is different from game theory. In a classic game theory model, the outcomes for the players need to be known in advance. In the prisoner's dilemma, for example, for each of the players the outcomes are known if they confess to the crime or keep silent. Metagames are built with the analysis of options method. With this method, the outcomes are constructed from the options of the different actors. The outcomes are all possible combinations of the options minus the infeasible outcomes removed by the analyst. Because the outcomes are constructed with the analysis of options methods the information demand for the modeler is lower than that of classical game theory. Conflict analysis extends the concept of metagames by adding several solution concepts for solving the game. These solution concepts resemble different types of possible behavior or rationality of the actors involved (e.g. Fang *et al.* 1993, Kilgour *et al.* 2005).

Transactional analysis is based upon Coleman's social theory (1990) which takes micro-economic thought as a starting point and translates it to social systems. The idea is that actors exchange power and control over issues in stead of money for products. The objective of transactional analysis is to calculate what the 'best' collective decision in a problem situation will be. For this purpose transactional analysis calculates the optimal division of control and interest over the issues in a problem situation for all parties. The optimal division of control and interest is a clearing of all excess control that actors have over certain issues. This excess control is traded for more control over issues that interest actors.

Transactional analysis differs from conflict analysis and game theory. With transactional analysis the actors need each other to reach an outcome. Game theory and conflict analysis are more strategic as they focus on the possibilities of the individual actors, although this may vary depending on the solution concepts chosen. All methods however have the same purpose as the bottom-up methods. That is, to learn about the possible behavior of the actors in the system.

We would like to note that the division made between the bottom up methods and the top down methods is not absolute as methods may be used in various ways. One can for example model an agent-based model in a way that it results in the same outcomes as a game theoretic model of the same problem (Axelrod and Hamilton 1981). While this is possible it is not the primary focus of agent-based modeling. Agent-based models are applied when one is interested in possible system behavior one is not interested in a specific outcome.

2.5 Structural actor analysis methods

In the previous part we focused on actor analysis methods that model decision-making. We now turn to actor analysis methods that analyze (elements of) the structure of the multi-actor situation. We call these methods structural actor analysis methods. In policy analytic literature it is suggested that actors involved in policy problems are linked to each other in a network (e.g. Powell 1990; Klijn and Koppenjan 2000; Bruijn and Heuvelhof 2002). This view on actors is a structural view (see Figure 2.5). It is about how the views of and relationships between actors influence their behavior. Studying the structural characteristics of groups of actors may therefore provide insight into their behavior.

Given the previous discussion on single actor and multi-actor methods one would expect single actor structural methods. The term structural, however, already implies the study of characteristics of multiple actors. Some methods may however be used in a single actor way. It is, for example, possible to make a cognitive map (e.g. Eden 1988)

that captures the perspective of a single actor on a problem. These applications however are not the prevailing way of applying these methods for policy problem support.

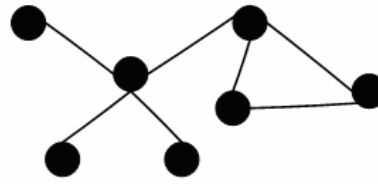


Figure 2.5: A representation of a network of multiple actors where the actors are the nodes and the relationships the links.

Structural actor analysis methods analyze multiple actors but the methods *themselves* do not model the decision-making of actors – the analysis is fixed to a certain point in time. Examples of these actor analysis methods are: (social) network analysis, dynamic actor network analysis, Q-methodology, and stakeholder analysis techniques.

Roughly speaking there are two types of structural actor analysis methods. First, methods that focus on the actors themselves. These are methods that analyze characteristics of the actors like their perspectives, interests, or resources. Second, methods that analyze the relationships between the actors. These are methods that focus on what the link is between the actors like values, friendship, kinship, or trade. Social network analysis belongs to the second group and DANA, Q-methodology, stakeholder analysis techniques, and conjoint analysis belong to the first group.

Social network analysis (Scott 1991; Wasserman and Faust 1994) makes use of graph theory to describe the relationships between actors – the network of actors. The actors are represented by the nodes and the relationships by the links. As said the relationships may represent a number of different things as: values, friendship, kinship, or trade. Social networks therefore are multi-dimensions. For research purposes often a single type of relationship is studied. This is also partly due to the fact that graph theory is unable to handle multidimensional networks.

DANA (Bots *et al.* 1999) is a descriptive actor analysis method that allows for the modeling of the perspectives of individual actors (*e.g.* Hermans 2004) which can then be compared. The method combines ideas of network theory and causal modeling in a formal conceptual language. This language may be used to map the different perspectives of the actors under study. The technique allows for a number of queries to be run on the resulting maps of the individual actors helping the analyst to increase its knowledge on the studied actors.

Q-methodology is a statistical tool, whereas DANA focuses on the individual perspectives, its objective is to detect shared views and preferences in groups of actors (Stephenson 1953; Brown 1980; McKeown and Thomas 1988). These groups often include 20 to 60 actors although deviations from both extremes are possible. The shared preferences of the actors are found through, first, identifying individual actor's perceptions and preferences by a survey and/or interviews, and second, applying an inverted factor analysis to the gathered individual perceptions. The method has predominantly been applied in medical science but has increasingly been applied to policy related issues. The method has for example been useful in detecting the alternative frames actors have on policy problems (Eeten 2001).

Stakeholder identification grids are a simple descriptive way to map different actors. Actors may, for example, be mapped by their interests, resources, or power (Bryson 2004). These techniques offer a snapshot, an idea, of the stakeholders under study and allow the analyst to make meaningful groups of actors. This way of categorizing actors is

much less formal than the previous methods therefore stakeholder identification grids are often referred to as being “quick and dirty.” The techniques are simple and easy to use but lack analytic depth.

Conjoint analysis is a method that allows for the assessment of the attributes that people appreciate about a product (Hair *et al.* 2006). This method is used for marketing purposes in order to design products to the needs of the users but has been receiving increasing attention in for example environmental policy evaluation (Alriksson and Oberg 2008)

By looking at the structural characteristics of the actors the structural actor analysis methods provide explanations about the (possible) behavior of the actors in the system under study. Structural actor analysis methods may focus on the actors or on the relationships between the actors. Again a division in methods is not absolute, some methods, like DANA, may fall into both categories. DANA models the perspectives of the individual actors but it is also used to show how the perspectives of the different actors differ or are connected by liking the individual perspectives.

2.6 Conclusions

No clear and agreed upon demarcation of the actor analysis field exists. This chapter therefore set out to answer the following research question: *What do we consider to be actor analysis methods, what do they do and how do they differ from “single actor methods” and “non-actor methods?”* We showed that it is easier to identify what actor analysis methods are not instead of what actor analysis methods are. We defined an actor analysis method as: a method that allows for the study of some or one characteristic of *multiple* actors. After having defined what we consider actor analysis methods to be we categorized examples of these methods. We distinguished two types of actor analysis methods: actor analysis methods that describe multi-actor decision-making and structural actor analysis methods (see Figure 2.6). The actor analysis methods that describe multi-actor decision-making can be subdivided into two groups: bottom up and top-down methods.

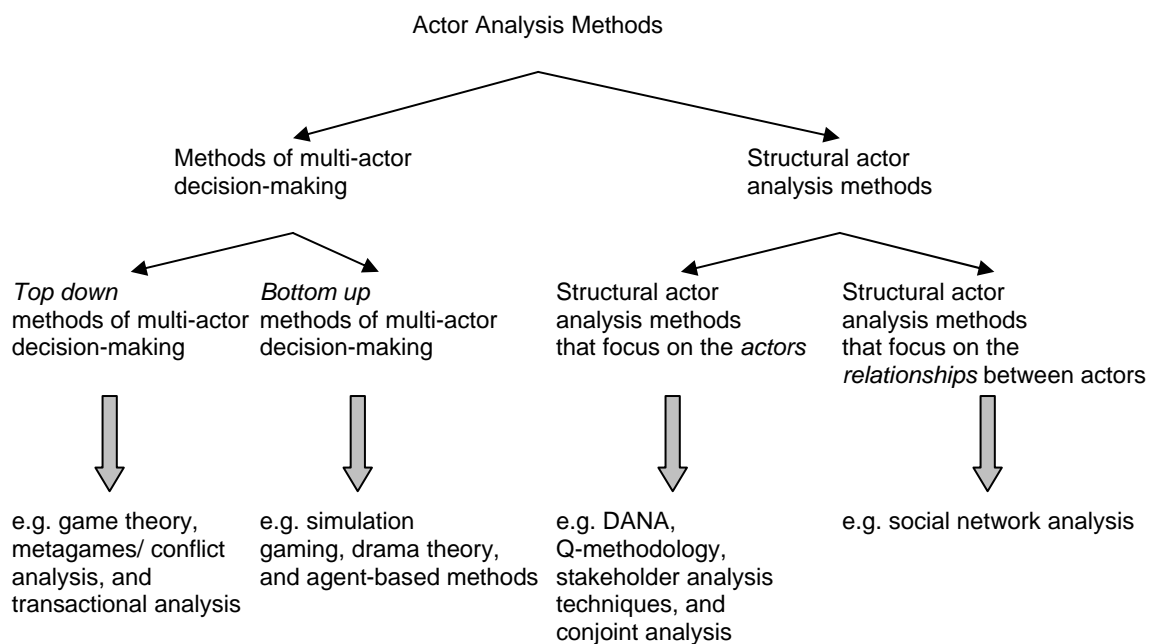


Figure 2.6: Types of actor analysis methods.

When we look at recent policy analytic literature we see that the interest in actor analysis methods follows naturally from the pluricentric view on policy making and policy problems. We noted, however, that there are little reviews of actor analysis methods that surpass the single field boundary. A negative explanation for this would be that broad overviews of actor analysis methods are not interesting and few researchers are interested in overviews of actor analysis methods that have their origin in various fields. A contrasting view would be that there are not many interdisciplinary fields like the policy analysis field that, by nature, have an interest in different types of methods and that therefore these reviews are lacking.

We found two reviews of actor analysis methods (Hammond 1996, and Hermans 2005). Depending on the research purpose what is considered an actor analysis method differs. Both reviews contain a more narrow selection of actor analysis methods. None of the categorizations of methods in the reviews was made from our perspective on what is modeled by the methods: decision-making or structure. We can however identify the categories of the other researchers in our categorization. Hammond's (1996) perspective on purposive models of actors is represented in the group labeled methods of multi-actor decision-making. What is also worth noticing is that while the way of categorizing is different from Hermans (2005) the three groups of actor analysis methods he distinguishes are present. The group of methods that Hermans did not list is the bottom up methods of multi-actor decision-making category. It would be interesting to see what potential theory on multi-actor policy-making could be matched with this category.

After we defined what actor analysis methods are we categorized these methods. As noted earlier, our categorization is different from the Hammond (1996) and Hermans (2005) as it focuses on what the method itself models and not what mathematical principle or policy theory it adheres to. That is, we focused on what characteristics of multiple actors are modeled (and simplified) by the methods irrespective of the mechanisms and theory they adhere to. We have shown that the developed categorization fits a larger number of methods than the ones made by Hammond and Hermans. However, we have presented a perspective on what we consider actor analysis methods to be. This perspective is not comprehensive but is an additional perspective next to the other perspectives and aims in helping to better establish the field of actor analysis methods. Further research is required; both to further specify the definition of actor analysis methods and to better understand the methods that could comprise the field.

Chapter 3

Exploring the use of actor analysis methods¹

3.1 Introduction

In the introduction we argued that there is a lack of knowledge on the suitability of different actor analysis methods for multi-actor policy problems. This is peculiar as it is expected of policy analysts to be able to link the right models to a policy problem. The policy analytic approaches that start with a focus on the problem (Dunn 1994, Walker 2000) emphasize the importance of choosing the right approach and modeling method for a given problem situation. In this chapter we identify the policy problems that actor analysis methods can be applied to, and discuss how the actor analysis methods are being applied to these problems. The research question answered in this chapter is the following:

2. *How and why are actor analysis methods being applied to policy problems?*

As argued in the introduction the literature on the selection of actor analysis methods is virtually non-existent. Therefore we have chosen to analyze different actor analysis method applications as reported in literature. We have chosen to compare different applications of metagames/conflict analysis, hypergames, drama theory, Q-methodology, and transactional analysis as reported in scientific literature (see Chapter 2 for a short description of the methods).

The list of studied actor analysis methods contains representatives of “structural actor analysis methods” as well as “multi-actor decision-making methods” – our primary categories of actor analysis methods. Metagames/conflict analysis, hypergames, drama theory, and transactional analysis are representatives of the multi-actor decision-making methods category developed in Chapter 2. Metagames/conflict analysis, hypergames, drama theory all belong to the same family of methods. That is, these methods share similarities and have their roots in game theory. Transactional analysis is a separate method that has its roots in micro economic theory. As representatives of the structural methods Q-methodology and DANA were chosen. Q-methodology and DANA are both separate methods. Q-methodology (Stephenson 1935) is mainly used in sociology and psychology but has evolved as a method to measure perspectives of actors in a number of different fields including policy analysis (*e.g.* Van Eeten 2001). DANA has its roots in causal mapping and network theory (Bots *et al.* 1999). Although DANA was chosen to be included in the analysis during the analysis we found out that it was not possible to pursue the analysis for DANA as at the time of analysis too few applications of the method had been published in either journal papers or books.

¹ Major portions of this chapter appeared as Van der Lei and Thissen (2008).

Two of the four developed subcategories in which the primary categories have been subdivided are represented. That is, the chosen sample of actor analysis methods contains top down methods of multi-actor decision-making and a structural actor analysis method that focuses on the actors. Bottom up multi-actor decision-making methods and structural actor analysis methods that focus on relationships between the actors are not represented. Partly this is because the finer categorization of methods was developed when the case studies were well on their way. More importantly, methods like agent-based models and simulation gaming would have taken too much time to apply as a consequence the number of actor analysis method applications and cases in this thesis would have been lower.

The remainder of the chapter is organized as follows. In Section 3.2 we lay out the analysis approach we used and derive five elements from the modeling cycle that are important for actor analysis methods. In Section 3.3 we present our findings regarding the five criteria and show how diversely actor analysis methods are applied. In Section 3.4 we answer the research question and propose guiding principles for the choice of actor analysis method.

3.2 Analysis approach

An actor analysis method creates a model of a unique problem situation. This model results from the way the specific method allows for the structuring of the problem. Actor analysis methods have a specific way they model the problem situation and therefore when an actor analysis method is applied a specific world view is applied on the problem situation. Following this line of reasoning, Mingers and Brocklesby (1997) and Mingers (2003) find that it is useful to think about the suitability of operations research (OR) methods. Mingers and Brocklesby (1997) and Mingers (2003) have developed a framework that provides insight into different OR method paradigms on a meta-level. Mingers introduces a matrix that allows the mapping of four attributes of OR/MS methods on three levels (the social, personal, and physical level). The matrix maps what the operations research methods appreciate, analyze, assess and what action the method brings forth on the three levels.

Mingers' matrix allows for the mapping of all management science methods such as system dynamics, mathematical programming, cognitive mapping, and soft systems methodology. It can therefore provide clues for the combination of hard and soft methods. The framework has its roots in Jackson and Key's 'System of Systems Methodologies' (Jackson and Keys 1984). As we are interested in how and why the selected actor analysis methods are applied in practice and do not want to adhere to predefined categories of assumptions of the methods themselves as they may not correspond with practice. In order to structure our analysis we view the application of an actor analysis method as a modeling exercise but will leave out the modeling steps that are not relevant for applying an actor analysis method. An analysis of the different modeling steps per application then results in an overview of how and why different actor analysis methods have been applied.

Operational research/systems literature has some classic texts on the practice of (mathematical) modeling. Hillier and Lieberman for example describe the modeling process consisting of six phases (Hillier and Lieberman 1995, Ch. 2). In the first phase the problem of interest is defined and relevant data is gathered. Second, a mathematical model is formulated to represent the features of the problem situation. Third, mathematical solutions from the model are derived. Fourth, the model is tested for validity and refined. Fifth the model is prepared for regular use or implementation. Sixth, the model is used regularly as intended, *e.g.* as part of a decision support system. The fifth

and sixth phases of Hillier and Lieberman do not match well with how actor analysis methods are applied. Actor analysis methods are usually used for learning in specific situations and hardly ever are used routinely. Another classic text by Miser and Quade (1988) shows considerable overlap although in the fourth phase they add to validating a model that a good model should also be verifiable. Verifying means testing whether the method models what you intend to model, and validation relates to the credibility of the model as a representation of the relevant real-world phenomena (Miser and Quade 1988, p.207-208). A mathematical model can be verified by setting some of the data input to extreme values or testing the model with sample data. This is done to see if the model reacts in the intended way. Actor analysis methods can typically not be verified like mathematical models as they are usually assumed to apply for a single, unique problem situation. Actor analysis methods are chosen for the type of problem structuring they allow. We therefore decided to omit verification, but, instead, include the justification of the modeling method chosen as an essential element of the modeling process.

Based on these texts we constructed a simple conceptual model (see Figure 3.1). The model consists of five elements: problem, approach of modeling process, results, method choice, and validation. The elements in the rectangles, problem, approach of modeling process, and results, correspond with phases 1, 2, and 3 of Hillier and Lieberman (1995). Instead of model formulation we call phase two “approach of modeling process” to also include the type of actions taken to make the model. Phase four is represented in the figure as validation. We leave out phases 5 and 6 of Hillier and Lieberman (1995) as they do not apply for AAM. The justification of the modeling method chosen is represented as method choice.

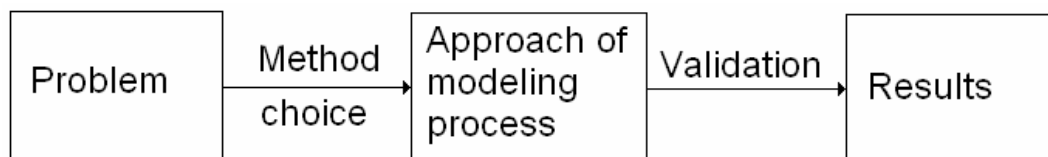


Figure 3.1: simple conceptual model of the modeling process.

Based on the simple conceptual model above we analyzed the applications of the actor analysis methods for information on:

1. the nature of the problem situation.
2. the approach and way of working in the modeling process.
3. the results of the AAM application.
4. why the particular method was chosen –its justification.
5. the way the results were validated.

The analysis of the papers was a two-step approach. First, the material was analyzed by looking at how the authors addressed the five elements. This resulted in short summaries of the different individual papers (see Appendix 1). Second, the short summaries were compared and categories were made for all the elements except method choice. The categories follow the authors’ intentions but some interpretation was done on our part. For example, the statements of the authors about the nature of the problem situation are categorized into three different types of problems: conflict, negotiation, and deadlock. These words *conflict*, *negotiation*, and *deadlock* are explicitly used by some authors while others do not label the problem situation in a single word. In the latter cases we interpreted the nature of the problem situation from the description of the authors.

We found 19 publications, 15 journal papers and four book chapters, which describe applications of metagames/conflict analysis, hypergames, drama theory, Q-methodology, and transactional analysis (see Table 3.1). All suitable journal papers found in the

international citation databases of the Web of Science are included. The book chapters and Noaks *et al.* (2003) were obtained via colleagues.

Papers that apply an actor analysis method in combination with another method are not considered. In these papers the methods together serve a single purpose which makes it hard to evaluate the individual application on the five criteria. See Munro and Mingers (2002) for an overview of combinations of OR methods that practitioners make. Examples of omitted combinations are: Losa and Belton (2006) who combine drama theory and MCDA to make an integrated framework for multi-actor multi-criteria decision aid; and Schlange (1995) who combines a systems thinking approach with a metagame analysis. Another group that was not included were publications that mathematically prove the actor analysis method or other wise make additions to it (*e.g.* Coleman 1990; Howard 1994a; Howard 1994b). Also papers that applied Q-methodology for other purposes than policy decision-making purposes were not taken into account.

The journal papers and book chapters are relatively evenly spread over the years although the applications of hypergames are predominantly from the eighties. Every method has been applied by multiple researchers although Bryant is an author of both drama theory papers: (Bryant 2002) and (Bryant and Darwin 2004). Also the references for drama theory are few compared to the other methods which have an average of four to five references. This is probably due to the fact that drama theory is a relatively “young” method.

Table 3.1: Overview of analyzed publications.

Method	Author	Journal or Book title
Drama theory	Bryant, J. W. (2002)	<i>European Journal of Operational Research</i>
Drama theory	Bryant, J. W. and J. A. Darwin (2004)	<i>European Journal of Operational Research</i>
Hypergames	Bennett, P. G. and M. R. Dando (1979)	<i>Journal of the Operational Research Society</i>
Hypergames	Bennett (1980)	<i>European Journal of Operational Research</i>
Hypergames	Bennett, P. G. <i>et al.</i> (1980)	<i>Journal of the Operational Research Society</i>
Hypergames	Said, A. K. and D. A. Hartley (1982)	<i>Journal of the Operational Research Society</i>
Meta games / Conflict analysis	Fraser N. and K. Hipel (1980)	<i>Journal of the Operational Research Society</i>
Meta games / Conflict analysis	Benjamin C. M. and Powell C.A. (1990)	<i>Information and Decision Technologies</i>
Meta games / Conflict analysis	Klein, J. H. (2000)	<i>Omega, International Journal of Management Science</i>
Meta games / Conflict analysis	Hermans L. and P. W. G. Bots (2002)	<i>Games in a World of Infrastructures, Simulation games for Research, Learning and Intervention</i>
Meta games / Conflict analysis	Noakes, D. J. <i>et al.</i> (2003)	<i>Fisheries Management and Ecology</i>
Q-methodology	Barry, J. and J. Proops (1999)	<i>Ecological Economics</i>
Q-methodology	Brewer, G. A. <i>et al.</i> (2000)	<i>Public Administration Review</i>
Q-methodology	Van Eeten, M. J. G. (2001)	<i>Journal of Policy Analysis and Management</i>
Q-methodology	Webler T. <i>et al.</i> (2001)	<i>Environmental Management</i>
Transactional analysis	Pappi, F. U. and D. Knoke (1991)	<i>Policy Networks, Empirical Evidence and Theoretical Considerations.</i>
Transactional analysis	Rojer, M. (1999)	<i>Rationality and Society</i>
Transactional analysis	Timmermans, J. S. and G. E. G. Beroggi (2000)	<i>Safety Science</i>
Transactional	Timmermans, J. S. (2004a)	<i>Purposive Interaction in Multi-Actor Decision</i>

analysis		<i>Making, Operationalizing Coleman's Linear System of Action for Policy Decision Support</i>
Transactional analysis	Timmermans, J. S. (2004b)	<i>Purposive Interaction in Multi-Actor Decision Making, Operationalizing Coleman's Linear System of Action for Policy Decision Support</i>

3.3 Findings

Below we discuss the overall observations of the analysis of the sample per element of the conceptual model.

3.3.1 Problems actor analysis methods are applied to

The problems analyzed with actor analysis methods occur in different domains. The nature of the problems also differs. In the studied papers the actor analysis methods are applied in the following domains: labor policy, health care planning, infrastructure planning, water management, intra-organizational conflict, ex post war situations, soccer hooliganism, and forest management.

To further characterize the nature of the problems we follow the qualifications given by the authors and categorized them into three types. First the deadlock situation where actors find themselves locked in a situation that is no longer progressing. The actors are now looking for a way out (*e.g.* Timmermans and Beroggi 2000; Noakes *et al.* 2003). The purpose of application of the actor analysis method is then to get new information that might help the debate (Timmermans and Beroggi 2000) or explain why the situation is like it is (Noakes *et al.* 2003). Second, the problem can be a conflict situation. In a conflict situation the actors are opposed to each other and want to win the fight instead of coming to a shared solution (*e.g.* Bennett and Dando 1979; Klein 2000). The purpose of an actor analysis method application is then to provide strategic advice to the parties (Klein 2000) or provide an explanation for the situation (Bennett and Dando 1979). Third, the situation can be characterized by actors willing to negotiate. The purpose of application of an actor analysis method then is to get people to reach some kind of resolution (*e.g.* Bryant 2002) or insight into possible outcomes (Hermans and Bots 2002). We note that the classification into three types is not exclusive: for example, a conflict situation might also be in a deadlock. In these situations we have focused on the predominant situational characteristics as stated by the authors of the papers or as interpreted from the text.

Table 2 provides an overview of the different problem situations for the individual papers. Drama theory appears to be the only method that has been applied to a single problem type, i.e., a negotiation situation. Some of the applications of Q-methodology and transactional analysis do not fit into one of the identified problem natures. First, Barry and Proops (1999) can not be mapped because they try to identify how people think about environmental problems. Second, Brewer *et al.* (2000) look for different perceptions on public service motivation. Third, the main goal of Pappi and Knoke (1991) is to compare labor policy issues in the US and Germany. Fourth, Timmermans' (2004a) objective was to test the transactional method in a real world policy setting. All of these papers have an objective that is not directly linked to solving the problem of the actors involved. The objective of the study is broader and not specific for the situation. Overall drama theory and transactional analysis seem to be applied for negotiation situations. Hypergames seem to be applied for conflict situations. Q-methodology for deadlock and metagames / conflict analysis lies in between (see Table 3.2).

Table 3.2: Problem, approach, and results of the different studies.

Method	Author	1) Nature of problem	2) Approach	3) Result
Drama theory	Bryant, J. W. (2002)	Negotiation	Intervention	Descriptive
Drama theory	Bryant, J. W. and J. A. Darwin (2004)	Negotiation	Intervention	Descriptive
Hypergames	Bennett, P. G. and M. R. Dando (1979)	Conflict	Desk research	Prescriptive
Hypergames	Bennett P.G. (1980)	Negotiation/ Conflict	Desk research	Prescriptive
Hypergames	Bennett, P. G <i>et al.</i> (1980)	Conflict	Desk research	Prescriptive
Hypergames	Said, A. K. and D. A. Hartley (1982)	Conflict	Desk research	Descriptive
Meta games / Conflict analysis	Fraser N. and K. Hipel (1980)	Conflict/ Negotiation	Desk research	Prescriptive
Meta games / Conflict analysis	Benjamin C. and C. Powell (1990)	Negotiation	Desk research	Descriptive
Meta games / Conflict analysis	Klein, J. H. (2000)	Conflict	Desk research	Exploration/ Descriptive Prescriptive
Meta games / Conflict analysis	Hermans L and Bots P.W.G. (2002)	Negotiation	Intervention	
Meta games / Conflict analysis	Noakes, D. J. <i>et al.</i> (2003)	Deadlock	Desk research	Prescriptive
Q-methodology	Barry, J. and J. Proops (1999)	-	Desk research	Descriptive
Q-methodology	Brewer, G. A. <i>et al.</i> (2000)	-	Desk research	Descriptive
Q-methodology	Webler T. <i>et al.</i> (2001)	-	Desk research	Descriptive
Q-methodology	Van Eeten, M. J. G. (2001)	Deadlock	Desk research	Descriptive
Transactional analysis	Pappi, F. U. and D. Knoke (1991)	-	Desk research	Descriptive
Transactional analysis	Rojer, M. (1999)	Negotiation	Desk research	Prescriptive
Transactional analysis	Timmermans, J. S. and G. E. G. Beroggi (2000)	Deadlock	Intervention	Descriptive
Transactional analysis	Timmermans, J. S. (2004a)	-	Desk research	Descriptive
Transactional analysis	Timmermans, J. S. (2004b)	Negotiation	Intervention	Descriptive

3.3.2 The modeling approaches of actor analysis methods

The actor analysis methods have a predefined set of rules on how to make models of the problem situation. As this structure is relatively fixed the most variance in the approaches followed can be found in the type of information that is used as input for the actor analysis methods. We distinguish two different approaches for the actor analysis methods: desk research (*e.g.* Bennett *et al.* 1980; Noakes *et al.* 2003) or intervention (*e.g.* Timmermans and Beroggi 2000; Timmermans 2004 b; Bryant and Darwin 2004). With an intervention the analyst usually facilitates the decision makers and the decision makers learn about the decision environment in the form of a workshop. Thus, the primary information comes directly from the actors and the actors as a group are involved in the modeling process. With desk research the information usually comes from publicly

available reports sometimes supplemented with interviews. In this case the analyst primarily learns about the decision environment and then communicates the results of the study. This reporting can be made to a client or group of actors. The case where the analyst interviews multiple individual actors, as in the case of Q-methodology, is seen as desk research as the analysis of the input data is done without the actors being present.

Table 3.2 shows the individual approaches for the reported applications and shows that desk research outnumbers intervention. From the analyzed actor analysis methods Q-methodology and hypergames were not applied as an intervention.

3.3.3 Results of applications of actor analysis methods

Below we summarize some of the insights mentioned in the papers that were a result of applying the actor analysis methods (see Appendix 1). The reported applications of drama theory resulted in more insight into mutual dependencies of actors, reduction of conflicts, and more collaboration amongst the parties involved. The applications of hypergames resulted in insight into different perspectives, a good simplification of the problem, allowed for a logical choice to be made, helped provide hypotheses about people, and modeled the interaction of people in a helpful way. The applications of metagames resulted in insight into possible strategic behavior, helped finding counter intuitive outcomes, helped finding a compromise, and simulation of the course of events. The applications of Q-methodology in a better ability to make informed policy decisions, understanding of different discourses that take place, and help in framing a problem. The applications of transactional analysis resulted in insight into mutual dependencies, insight into control of actors and simulation of real world events. These results show considerable overlap: the applications of drama theory and transactional analysis both provide insight into mutual dependencies. Insight into different perspectives can be gained with the help of both Q-methodology as well as hypergames.

The results of the applied actor analysis methods may further be categorized into two purposes: a descriptive and a prescriptive purpose. The descriptive studies aim at framing a decision problem – explaining the situation (*e.g.* Pappi and Knoke 1991; Klein 2000; Timmermans 2004). The prescriptive studies aim at finding normative solutions to a decision problem (*e.g.* Green 2002; Noakes *et al.* 2003). This boundary can be vague from time to time since all models used to design solutions have a descriptive part. Table 2 shows the categorization for the individual papers.

Two methods, Q-methodology and drama theory, have been used for description only and other actor analysis methods have been used for both descriptive and prescriptive purposes. For Q-methodology this is inherent to the method as it is a descriptive statistical method. Drama theory, however, could potentially be used in a prescriptive sense although the method has limited normative ability (Bennett 1998, p. 480). We however did not find any papers that applied drama theory in a prescriptive sense. Metagames can serve descriptive and prescriptive purposes. Noakes *et al.* (2003) study the salmon farming aquaculture expansion conflict. The model shows that it is in the interest of the provincial government not to make a decision regarding the conflict. This prescriptive result is validated by the authors by comparing the result to what actually happened – the moratorium on salmon fishing was not lifted for several years. Benjamin and Powell (1990) provide an analysis of the USSR grain trade negotiations. The results are descriptive as the purpose of the study is to see how well the metagame approach can describe the negotiations. A paper that is both descriptive and prescriptive is that of Klein (2000). Klein (2000) applies metagames to find out what a conflict between two divisions in a not-profit organization is all about. Throughout the whole modeling process he lists the insight he gained about the two parties involved in the conflict. Because the preferences of one the parties are uncertain Klein introduces the notion of storytelling to

get insight into the possible behavior of one of the parties. The analysis is intended as a description of a variety of possible future events –a purpose for which scenarios are often used as well. This might be characterized as explorative/descriptive.

Overall, Table 3.2 shows that a very diverse array of actor analysis methods applications exists and that actor analysis method are not applied for a single problem nature, purpose, or in a single approach. We can not say that there seems to be a single best way to select an actor analysis method for a certain problem as there is much variety between the combinations of problem nature, approach, and results. The applications of the actor analysis methods seem to be very much tailored to the specific situation that is analyzed.

3.3.4 Why the actor analysis method was chosen

We searched the papers for arguments on what the modeling intention was, and why the specific method was chosen (see Table 3.3 for a summary and Appendix 1 for more details). Although most papers refer to the problems as being complex or unstructured this is hardly ever the stated reason why the actor analysis method is applied. Statements related to the decision-making situation usually address the presence of multiple actors or the collective nature of the decision (*e.g.* Timmermans and Beroggi 2000). Hypergames, for example, are described as to provide more conceptual complexity because of the different perspectives it can deal with (Bennett *et al.* 1980). Thus the methods are expected to be able to handle complex problems the reason why they are applied is most often not the complexity of the problem situation.

The most common reason stated to apply the actor analysis method is that the actor analysis method allows for a way of modeling that has not been done before or deviates from current practice (see Table 3). Metagames are, for example, frequently contrasted to game theory as being a more tractable approach. Also applying an actor analysis method in a new way or testing an actor analysis method are reasons often mentioned for applying the actor analysis method. For the new ways of applying the method it is interesting to see what is different and if the method is used differently from its objectives (see Table 3.3). Klein (2000) adds to the metagame approach by telling stories since a preference ordering of the outcomes could not be established with confidence for one of the actors. The story-telling helped to search for reasons for particular outcomes to occur. Hermans and Bots (2002) apply the metagame to see if it is a method that is suitable to support a participatory stakeholder analysis. Although the application was considered as a success, he concludes that an incomplete game, informal power, and unknown options may have hampered the intervention. In this particular case the design was different from the more common desk research. In both cases the new way of applying the method did not change the objective of the method –to provide strategic insight– but instead added to the variety of settings in which the method can be applied.

Table 3.3: Reasons for choosing an actor analysis methods and ways actor analysis methods are validated.

Method	Author	4) Reasons for choosing method	5) Validation
Drama theory	Bryant, J. W. (2002)	Test of method	Participant comments
Drama theory	Bryant, J. W. and J. A. Darwin (2004)	Contrasted to other method(s)	Participants comments
Hypergames	Bennett, P. G. and M. R. Dando (1979)	Contrasted to other method(s)	Real life events
Hypergames	Bennett (1980)	Contrasted to other method(s)	Real life events
Hypergames	Bennett, P. G. <i>et al.</i> (1980)	New application area	Validation of input data

Hypergames	Said, A. K. and D. A. Hartley (1982)	Contrasted to other method(s)	Real life events
Meta games / Conflict analysis	N. Fraser and K. Hipel (1980)	Upcoming tool for the application area	Validation of input data
Meta games / Conflict analysis	C. Benjamin C. and Powell (1990)	Test of method	Real life events
Meta games / Conflict analysis	Klein, J. H. (2000)	New way of applying the method	Real life events
Meta games / Conflict analysis	Hermans L. and Bots P.W.G. (2002)	New way of applying the method	Participant comments
Meta games / Conflict analysis	Noakes, D. J. <i>et al.</i> (2003)	Contrasted to other method(s)	Real life events
Q-methodology	Barry, J. and J. Proops (1999)	Insight into domain under study	Validation of input data
Q-methodology	Brewer, G. A. <i>et al.</i> (2000)	Previous research on the topic is inconclusive	Validation of input data
Q-methodology	Webler T. <i>et al.</i> (2001)	Good tool for purpose	Validation of input data
Q-methodology	Van Eeten, M. J. G. (2001)	Contrasted to other method(s)	Validation of input data
Transactional analysis	Pappi, F. U. and D. Knoke (1991)	Contrasted to other method(s)	Validation of input data
Transactional analysis	Rojer, M. (1999)	Test of method	Real life events
Transactional analysis	Timmermans, J. S. and G. E. G. Beroggi (2000)	Problem situation	Participants comments
Transactional analysis	Timmermans, J. S. (2004a)	Test of method	Validation of input data
Transactional analysis	Timmermans, J. S. (2004b)	Test of method	Participant comments

3.3.5 Validation of actor analysis method results

Validation refers to what has been done to judge the relevance of the model and its results to the real world situation, where one important aspect is the degree of belief in the application. One large distinction can be made here between the validation of desk research and the validation of an intervention. Researchers mostly refer to real life events or the input data when validating desk research (see Table 3.3). The validation of an intervention is done by looking at the sense of ownership / responses of the people that have participated in the intervention. Bryant and Darwin (2004), for example, validate their drama theory approach with comments from the participants. When the result of the actor analysis method is based on an intervention with real actors the result of the actor analysis method relates closely to what the actors have learned and experienced. Measuring this learning therefore is an important indicator of success and this measure of success can be interpreted as a measure of validity. None of the authors report considerations about evaluating the validity and added value of the results in advance. Bryant and Darwin, for example, do not provide criteria on which they test the validity of their approach. The validation of the contribution of the technique is therefore a loose collection of (positive) remarks of the participants. The fact that most researchers in the field do not deal explicitly with evaluation and validation issues has been noted before (*e.g.* Hämäläinen 2004; White 2006).

3.4 Conclusion

We analyzed 19 papers of applications of five different actor analysis methods. In order to answer the research question below we analyzed the papers on five important elements of the modeling cycle: “problem,” “method choice,” “approach of modeling process,” “validation,” and “results” (see Figure 3.2 for a summary of the found categories). We now answer the second sub question of the thesis: *How and why are actor analysis methods currently applied?*

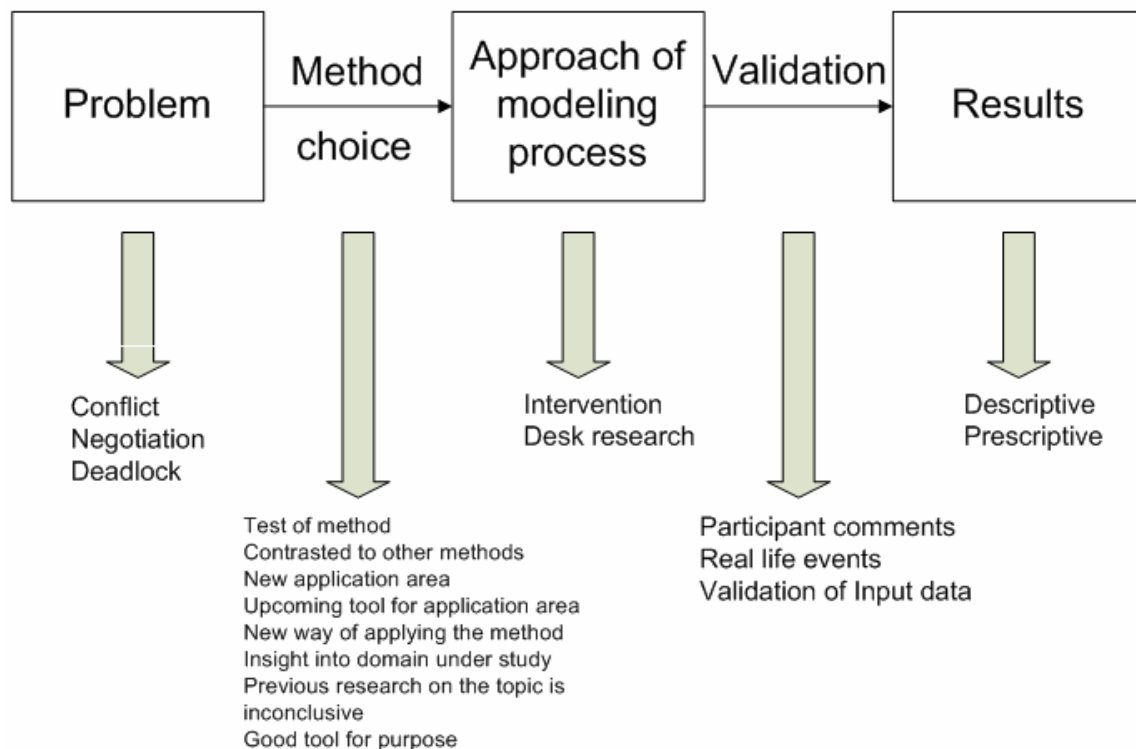


Figure 3.2: Overall findings for the different elements of the conceptual model.

3.4.1 How actor analysis methods are applied

In order to understand *how* actor analysis methods have been applied we look at the elements “approach”, “validation” and “results.”

Although most actor analysis methods can be applied in an intervention setting, the dominant modeling approach for the selected actor analysis method is desk research. In fact, in most analyzed papers the largest part of the text focused on the way the approach was designed. Overall the findings show that the field of actor analysis methods is still developing as most authors seem to be exploring the utility and advocating the methods. Less attention is given to the validation of actor analysis methods. The result of an actor analysis method can be either descriptive or normative. Overall the outcomes are regarded as a positive contribution to the goal of the research. Less attention, however, is paid to how these positive results are validated.

There thus is a large variety in actor analysis method applications as all theoretically possible combinations of approach and results occurred in the sample. Obviously not all types of validation apply for the different approaches as participant comments are only used as a way of validating an intervention approach. Tables 3.4 and 3.5 summaries of the different approaches that were found.

Table 3.4: Overview of designs for intervention.

Approach	Validation	Result analysis	Nature of problem	Method
Intervention	Participant comments	Descriptive	Negotiation	Drama theory Transactional analysis
Intervention	Participants comments	Descriptive	Deadlock	Transactional analysis
Intervention	Participant comments	Prescriptive	Negotiation	Meta games / Conflict analysis

Table 3.5: overview of designs for desk research

Approach	Validation	Result analysis	Nature of problem	Method
Desk research	Real life events	Prescriptive	Conflict	Hypergames Meta games / Conflict analysis
Desk research	Real life events	Prescriptive	Deadlock	Meta games / Conflict analysis
Desk research	Real life events	Prescriptive	Negotiation	Hypergames Transactional analysis
Desk research	Real life events	Descriptive	Conflict	Hypergames Meta games / Conflict analysis
Desk research	Real life events	Descriptive	Negotiation	Meta games / Conflict analysis
Desk research	Validation of input data	Prescriptive	Conflict	Hypergames Meta games / Conflict analysis
Desk research	Validation of input data	Prescriptive	Negotiation	Meta games / Conflict analysis
Desk research	Validation of input data	Descriptive	Deadlock	Q-methodology

3.4.2 Why actor analysis methods are applied

In order to understand *why* actor analysis methods have been applied we look at the elements “method choice” and “problem.” Relatively little is said about why a specific method was applied for the specific problem situation. Most authors contrast the method to what usually is done and focus on explaining the method and illustrating its usefulness (see Figure 3.2). This may also be the result of the type of documentation we have analyzed: the research goal is often not to study the policy problem itself. Very generically we can make a distinction between methodological reasons and domain reasons. Methodological reasons are: tests of method, contrasts with other methods, and new means of applying the method. Domain reasons are: new application areas, specific insights into the domains under study, showcasing an upcoming tool for the application

area, previous research on the topic is inconclusive, good tool for purpose, or the problem situation. A shortcoming of the literature is its failing to address the suitability of the problem for the method.

Practitioners however do need to be able to explain to their clients why a particular actor analysis method was chosen. The lack of reasons for applying an actor analysis method that are directly connected to the policy problem makes it hard for the practitioner to judge the added value of a specific method.

The “problem” category is of more help in understanding for what policy problems actor analysis methods are applied. As we showed the nature of the problem situation can be described as that of deadlock, conflict or negotiation. Table 3.6 maps what methods have been applied to what problems. The table shows that although a large number of methods have been applied in different problem situations some situations are dominant for certain methods. Drama theory and transactional analysis seem to be used mostly for negotiation situations. Hypergames are used for conflict situations. Q-methodology has been used for deadlock situations. Metagames/conflict analysis can not be related to a single problem situation and have been applied in all situations.

Table 3.6: The different problems and the actor analysis methods that have been applied to these problems.

Method	Hypergames	Meta games/ conflict analysis	Q-methodology	Transactional analysis	Drama theory
Problem					
Conflict	X	X			
Deadlock		X	X	X	
Negotiation	X	X		X	X

3.4.3 Discussion of the resulting framework

It is important to note that our literature analysis is just a snapshot in time – it is quite possible that in coming years the methods will be applied to the whole range of problems. However, the fact that in the available literature for a certain type of problem a method has not been applied is in itself an interesting observation. It begs the question whether some inherent limitation of the methods prevents that method from being applied to this type of problem. In other words, are the fundamental limitations of the method the cause of the fact that the methods have never been used in literature for that particular type of problem?

Although future research will have show whether the methods are applied to the various types of problems, we do want to point out that there does not seem to be such a fundamental limitation to the applicability of the methods to a specific type of problem. Not only does literature not clearly specify such limitations, the properties of the methods themselves do not seem to prohibit use of that method. For example, in Q-methodology the focus of the method is on a detailed understanding of the various perspectives of the actors involved – Q-methodology does not in itself make any assumptions on the category of problem to be studied. Likewise, drama theory or transactional analysis could be, in principle applied to any type of problem – irrespective of the nature of that problem.

Another question is, which method would perform the best and therefore would be most suitable. The notion of a better performing method assumes that experience is collected that contrasts the results of the various methods when applied to a specific type of problem. We argue (see Introduction) that this type of comparative research is lacking. One might conjecture that some specific properties of methods make that method more suitable for a certain type of problem situation. The empirical evidence that would provide authority to that position is, at present, wanting. The current available literature

first and foremost represents the final choices of analysts when faced with problems; the fact that the papers do not explain why that particular method was selected for that particular problem underscores that the choice was, in all likelihood, not based on a clear and comparative study of the potential of these methods. Therefore, the contemplation of why a certain method is suitable for a specific problem remains the result of a choice made by an individual researcher that, till now, is not objectively expressed in literature.

3.4.4 Limitations and further research

We have shown how a framework based on a modeling perspective can help clarify how and why different actor analysis methods are applied. Implicitly we assume that all applications described in literature are successful applications that have been applied correctly. As most of the authors seem to be advocates of the methods this might be a problem. However, they are also the only true experts on the methods.

The number of applications is limited. However, these are all applications we could find at the time for the chosen actor analysis methods. It is thus possible that more combinations of problem and method are possible in future.

Also the sample of actor analysis methods is limited. For further development of the field of actor analysis methods analyses like this could be applied on more and different actor analysis methods. This could also lead to a better characterization of types of problems in which actor analysis methods have been applied as we have only focused on a narrow subset of actor analysis methods.

Another extension would be to include applications of actor analysis methods in consultancy in the evaluation. However, consultancy reports generally have a strong “sales” and outcome-oriented character, are biased towards the client, and are not subjected to reviews and independent assessments. To assess this material in the right way both the satisfaction of the client needs to be measured and additional research into the motivations for choice of the method is needed, through an extensive set of interviews.

Chapter 4

Analyzing actor analysis method performance

4.1 Introduction

While policy analytic literature has shown that actor analysis methods can be applied to multi-actor policy problems (*e.g.* Hermans 2005) we argued that the literature which links policy problems to specific tools has been less well developed. The goal of this chapter is to explain the research approach for the third research question:

3. *Given a policy problem how do different actor analysis methods perform?*

Comparative research that measures the performance of different methods is needed when we want to gain insight into the suitability of different methods for specific problems (see 3.4.3). By applying different actor analysis methods to a single problem data is generated on how different methods perform under the same circumstances. A disadvantage of the “single problem - single method” custom is that it makes comparative evaluation of the methods very hard as the problems, the way the methods are applied, and the definition of method performance all differ. In our approach we have chosen to fix the problems, the way the methods are applied, and the way performance is measured. What differs is what methods are applied. The subsequent sections elaborate the approach.

Section 4.2 provides the criteria on which two cases have been chosen. Section 4.3 specifies two premises that follow from the developed framework and specifies the combinations of problem and methods that have been chosen for analysis. Section 4.4 argues how the nature of the policy problems is determined for the cases. Section 4.5 illustrates how method performance is measured. Section 4.6 illustrates how the actor analysis methods are applied and explains the methods that will be applied in subsequent chapters in more detail. The conclusions, Section 4.7, shortly summarize the chosen approach.

4.2 The selection criteria for the studied cases

Real world policy problems were chosen as cases for this thesis. The cases had to meet the following criteria:

- The policy problems in the cases had to be multi-actor problem so that the actor analysis methods might be applied. In effect this meant that the cases had to involve a policy problem that had multiple actors involved.
- The cases had to deal with a policy problem related to infrastructure.

- Sufficient information had to be available on the preferences and behavior of the actors regarding the policy problem so that it could be *a priori* defined as a conflict, deadlock, or negotiation setting (see Section 4.4).
- There also had to be sufficient available data for the input needed for the different actor analysis methods: background data represented in research reports, media coverage, and data on different policy options and issues.
- The cases had to be available for study. This is an important aspect as the cases were done *ex ante* (see Section 4.5). Therefore it was necessary to find cases where a policy decision had not been made but was going to be made in a reasonable amount of time.

Given these criteria one water related case and one energy related case were chosen.

4.3 Studied combinations of problems and methods

As argued above, the chosen research approach is to apply multiple methods to a given policy problem. The previous chapter resulted in a framework that shows for different problem types what actor analysis methods have been applied (see Table 4.1). This framework is our starting point for the selection of our combinations of problem and actor analysis methods.

Table 4.1: Different types of problems and the actor analysis methods that have been applied to the problem situations.

Method	Hypergames	Meta games/ conflict analysis	Q-methodology	Transactional analysis	Drama theory
Problem					
Conflict	X	X			
Deadlock		X	X	X	
Negotiation	X	X		X	X

There are a number of ways that we could interpret the developed framework. We have chosen two interpretations of the framework that we pose as premises. The subsequent paragraphs illustrate these two premises.

Table 4.1 shows that multiple methods have been applied to the same type of problem. One might argue that based on literature, these methods are all suitable for that type of problem situation. That is, the analyst could, based on available literature, select one of these methods to study that type of problem. The underlying assumption is that all methods perform equally well for a given problem and thus yield the same results. If methods can be interchanged without consequences, the analyst can just select his or her favorite method without running the risk of obtaining a less suitable result. The premise is that the result of the method is independent of the method selected.

The first case study addresses this premise that different, potentially suitable, methods applied to the same problem will yield different results. We chose to explore transactional analysis, conflict analysis, and Q-methodology for a deadlock situation. As Table 4.1 shows in literature transactional analysis, conflict analysis, and Q-methodology all have been applied to a deadlock situation.

Table 4.1 also shows that not all methods have been applied to each problem type. As argued in Section 3.4.3, the properties of the methods themselves, however, do not seem to fundamentally prohibit the applicability of the methods for any of the problems. One could argue that the fact that a method has not been applied to a specific type of problem does represent a limitation to the suitability of that method for that given type of problem. That is, the table represents some common knowledge regarding the performance of the

methods for a given problem not previously explicated in literature. Interpreted in this way the table, for example, suggests that transactional analysis is a less suitable method for a conflict situation. The premise is the fact that if in literature a method has not been used to study a certain type of problem that this represents some kind of limitation of that method in light of the type of problem.

The second case study addresses this premise that a method that has not been used for a certain type of problem is less suitable than a method that has been applied for that type of problem. That is, the performance of the not yet applied method will be lower than the one that has already been applied. We chose to apply a conflict analysis and transactional analysis for a conflict situation. As Table 4.1 shows transactional analysis has not been applied to a conflict situation and conflict analysis has. For this we explore if conflict analysis is a more suitable method for a conflict situation than transactional analysis. The choice of methods was somewhat arbitrary; potentially Q-methodology could have been chosen as a “wrong” method and hypergames as a “right” method. Drama theory could not be applied as the stakeholders could not be contacted to participate.

4.4 The analyzed problem situations

4.4.1 How are the problem situations determined?

For the two cases the problem situation had to be determined. The problem categories in the cases were identified much in the same way as was done for the analysis in Chapter 3. In Chapter 3 we looked at the information that the authors of the papers provided on the problem situation and the preferences of the actors. When preferences were opposed we labeled the problem situation as a conflict situation. In a conflict situation the actors are opposed to each other and want to “win the fight” instead of coming to a shared solution. When preferences were not rigidly fixed we labeled the problem situation as a negotiation. Although preferences might be opposed, the negotiation situation is characterized by actors willing to negotiate to reach some kind of resolution. The deadlock situation is somewhat different and is described by actors that are unwilling to make a decision or help to move a policy process forward.

The analysis of the problems described in the research papers is largely the same as the analysis of the problems for the real world cases. In the research papers the available information is stylized – the problem is presented in a simplified way, and the assessment was based on what the researchers wrote on the problem. Although the information on the problem in the papers is sparse, the information can be viewed as the most important information on the policy problem. For the cases multiple documents were analyzed in order to underpin why the case belongs to a certain type of problem. For the cases it is therefore a requirement that there is enough information on the preferences and the behavior of the actors to make the assessment of the nature of the problem possible.

4.4.2 The polder Groot Mijdrecht case: an example of a deadlock situation

In 2005 the Province of Utrecht issues an exploratory research report on the future of a polder called Groot Mijdrecht located in the centre of the Netherlands (Provincie Utrecht and AGV 2005). The results of the report indicated that the water management of the polder should drastically be changed as on the long term the lowering of the surface water was no longer possible. Several strategies were developed but a single strategy, flooding the polder to create a lake, seemed to be pursued by the Province of Utrecht. Inhabitants of the polder by large did not share the problem perspective, opposed to the advocating of a lake, and also opposed to the way the process was managed.

The whole process peaked at a meeting of the council of the Province of Utrecht on 5 February 2007 that received national media attention. During this meeting it was acknowledged that the inhabitants had not been treated correctly in the decision-making process. It was decided that a working group consisting out of members of the province, the responsible municipality, and inhabitants would re-examine and where necessary extend the presented facts. This working group had to report by 1 November 2007 after which a new policy would be developed for the polder.

The problem can be described as a deadlock situation. The decision of the provincial council on 5 February 2007 shows that new information was needed in order to move the process forward. This was done by forming a working group that had to re-examine the facts. This problem also has elements of a conflict situation. That is, the interests of the actors involved are very opposed; the inhabitants want as little changes in the polder as possible but the provincial government seems to want drastic measures. The situation however was largely characterized by inaction of the actors. The inhabitants had quit the participatory process for the polder and the provincial government did not want to admit to the conditions that the inhabitants had put forward. The inhabitants could not rejoin the process without any of the demands being met. Rejoining without any compromises from the part of the Province of Utrecht would seem as an acknowledgment of the policy problem. On the other hand if the provincial government had agreed to the demands of the inhabitants it would have acknowledged the fact that the inhabitants had not been treated democratically. Thus neither the provincial government nor the inhabitants wanted to take action.

4.4.3 The network unbundling case: an example of a conflict situation

In 2004 the Dutch Ministry of Economic Affairs fears that the public values related to the energy industry are at risk and declares that it wants to unbundle the network companies, which distribute electricity over the low-voltage net, from the large integrated power companies. The large integrated companies protest arguing that this would severely reduce employment in the sector if the government would pursue unbundling and furthermore that it would make the part of the company that is left over after unbundling more vulnerable for foreign takeovers.

The problem in this case can be described as that of conflict. This because the parties had very opposing interests and were talking to each other via the media and research reports. The problem took place at national political level. In this situation the actors communicated via the media and via different lobbyists, own preferences had to be sold and the alleged dangers of the opposing views explained. A deadlock situation seemed unlikely as new information was constantly provided by the different parties through different research reports to influence each other and public opinion. A negotiation situation also seemed unlikely as the interests in this case were very opposed and there was hardly any middle ground; the government wanted to unbundle and the large integrated power companies did not want this to happen in any form. In this situation negotiations for the standard compromise solutions, such as voluntary codes of conduct or covenants, could not have taken place.

4.5 How actor analysis method performance is measured

4.5.1 How is performance evaluated for single actor analysis methods?

Performance is as a measure of success, does the actor analysis method result in the wanted results. Most often a method is said to perform well if the resulting model is valid

– or one might say if the resulting model is positively evaluated (*e.g.* Hodges 1991; White 2006). But also a bad or invalid model may in certain circumstances result in useful results (*e.g.* Phillips 1984). Although we do acknowledge this it is no part of our research interest.

In Chapter 3 we showed that the studied actor analysis methods are validated through participant comments, real world events, and validation of input data. White, for example, adds experimental settings, simulations, and group discussions to this list (White 2006). Some evaluation methods are more rigorous than others and each of them have their advantages and disadvantages. Retrospective reflections, for example, are subject to bias from the researchers involved in the study while experimental settings might not reflect reality sufficiently. The type of validation also depends on the type of research one wants to pursue. Action research, for example, demands other forms of validation than desk research (*e.g.* Eden 1995). Conscious evaluation of actor analysis methods however remains rare (see also Chapter 3). A good example is Joldersma and Roelofs (2004) who studied the added value of a single actor analysis method in a gaming/simulation where half of the time a cognitive group map was made while the other times this was not done. They found that the actor analysis method only had a positive effect when people are willing to exchange information.

4.5.2 How is performance evaluated in studies where multiple methods are compared?

In this thesis we research the suitability of different actor analysis methods for a given problem. We want to know how different methods perform when compared to each other, the better performing method is then the more suitable method. A way of testing the suitability of the methods is to apply multiple methods on a single policy problem. In this way the performances of the different methods can be compared and assessed for the type of problem. This type of research has not systematically been done for actor analysis methods.

This type of comparative research is more common for multi criteria decision analysis (MCDA) methods. MCDA methods are a group of methods that are also widely applied to policy problems. It is also a method that is widely used by policy analysts. Although the method can be used to highlight different perspectives of actors by calculating different sets of weights for the policy alternatives; the method itself does not take the rationality of multiple actors into account.

The field of MCDA, however, is much better defined than that of actor analysis methods. For MCDA methods, contrary to actor analysis methods, an accepted categorization of methods exists. There are three known groups of MCDA methods: value function methods, goal and reference point methods, and outranking methods (Belton and Stewart 2002).

Also in the field of MCDA there is knowledge about the circumstances in which different methods perform well. There have been a number of studies that compare different MCDA methods for a single problem and recently a comparison of these studies has been published (Mysiak 2006). These studies primarily focus how different ways of preference ranking affects the preferred outcome. The comparison is thus mostly made on a mathematical basis. The way MCDA methods are compared however can not be translated to actor analysis methods as actor analysis methods do not have the same type of outcomes. Q-methodology for example results in different perspectives while conflict analysis results in different scenarios. Also the variety of actor analysis methods is large and not all actor analysis methods are based on mathematical equations. While the notion of applying multiple methods to a single problem is useful, another means of performance is needed in order to be able to compare the actor analysis methods.

Another study was done by Green (2002) who compares the results of game theory, role play, and unaided judgment to the decisions actually made by the actors in real life. He thus measures performance as the predictive value of the method. He finds that role play outperforms game theory but that game theory does better than unaided judgment. Green used six different problem situations, four of which had been previously used by other researchers. The game theory solutions were obtained by asking game theory experts to analyze the situations whereas the role play and unaided judgment forecasts were mostly obtained via university students.

The disadvantage of this type of study is that a lot depends on the quality of the descriptions, and knowledge of the participants. Game theory, for example, is particularly demanding of participant knowledge. This type of research is not possible for this thesis as knowledgeable students and experts are lacking. The methods that are studied in this thesis are not taught in our university to our students and not applied widely enough to involve a large enough group of experts.

4.5.3 How we evaluate the performance of multiple actor analysis methods

For this thesis we have chosen, like Green (2002), to evaluate the performance of the different actor analysis methods on how well the results reflect real world events. In stead of using already existing situation descriptions we have chosen to focus on *ex ante* instead of *ex post* policy problems. In *ex post* policy studies the researcher runs the risk of manipulating the outcomes of the methods to fit real world events. When a study is done *ex ante* this risk is minimalized.

Ex ante does not constitute a “silver bullet.” *Ex ante* reduces the risk of researcher bias in the analysis stage because the outcome is not yet known. As the saying goes, hindsight is no substitute for insight. A major disadvantage introduced by *ex ante* methodology is the fact that policy problems may take a long time to reach a final conclusion – if at all.

A second major disadvantage is the fact that *ex ante* supposes a complete definition of the outcomes in an early stage of the problem. If new developments change the solution space of the problem it is quite feasible that the researcher (and the methods) did not foresee these new developments as a result the original solution space may not contain the final outcome. These types of unexpected developments can occur any time one applies a method with the intention of forecasting. Therefore it may be necessary to monitor and adapt to significant changes in for example: the amount of involved actors, new issues brought to table, and changes in the problem formulation.

We view the predictive ability of the method as a useful proxy to measure performance. Of course we acknowledge that the performance of a method does not solely lie in its predictive value; as described above, there are many ways of evaluating the performance of a method. The focus on predictive ability is a research choice we have made and the results thus only apply for this small dimension of performance.

The predictive ability of the method is also a proxy that can be used for the chosen actor analysis methods. In this thesis we have chosen to apply the actor analysis methods conflict analysis, transactional analysis and Q-methodology. Both conflict analysis and transactional analysis are validated by comparing them to real world events (see Chapter 3). That is, the performance of the actor analysis methods is measured by comparing them to how they reflected the decisions made in reality regarding the problems. Transactional models are even believed to produce accurate and reliable predictions of multi-actor problems (Bueno de Mesquita 2003). Therefore we believe that measuring the performance of these methods by their predictive ability is possible.

Q-methodology, which is applied in the water case, is different. The method is descriptive as it describes the core perspectives of the actors in a group. There are no

actions modeled of the actors. However, in this case a committee had to re-examine the problem situation after which the provincial government would decide on a course of action. The role of this committee in fact was to describe the situation and show where new information was needed. Thus in this case a comparison between the result of the method and real world events is possible when the results of the method are compared to the findings of the committee. For Q-methodology we thus do not focus on the predictive value of the method but instead on its descriptive value. In the following sections we will explain the methods in more detail.

4.6 How are the actor analysis methods applied

4.6.1 Metagames/conflict analysis

The objective of metagames/conflict analysis is to analyze the strategic power of different actors, often about 2 to 5, in a decision-making situation. The concept of metagames was developed by Howard (1971) and the method has its roots in game theory. The way the game is built, however, is different from game theory. In a classic game theory model, the outcomes for the players need to be known in advance. In the prisoner's dilemma, for example, for each of the players the outcomes are known if they confess to the crime or keep silent. Metagames are built with the analysis of options method. With this method, the outcomes are constructed from the options of the different actors. The outcomes are all possible combinations of the options minus the infeasible outcomes removed by the analyst. From these outcomes the equilibrium outcomes are obtained. Because the outcomes are constructed during the analysis the information demand is lower than that of classical game theory. Conflict analysis extends the concept of metagames by adding several solution concepts for solving the game. These solution concepts resemble different types of possible behavior (rationality) of the actors involved (Fang *et al.* 1993).

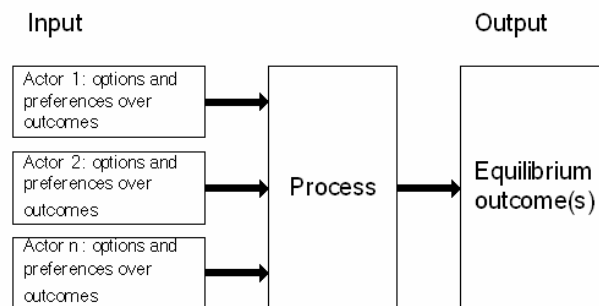


Figure 4.1: Data needs and output for conflict analysis.

Figure 4.1 shows that the data needed for the conflict analysis are the actors, the options, and the preferences over the outcomes of the actors. The output that is returned is the equilibrium outcome for that problem.

In practice the analyst first assesses what actors will be analyzed. Second the analyst gathers the options the different actors have. All possible combinations of options are then calculated and called scenarios. In a third step the analyst removes infeasible scenarios from the game. These are scenarios that are logically impossible or scenarios of which the analyst knows that they would never occur. In a fourth step the analyst assesses the preferences of the actors over the scenarios. He constructs a preference order of the scenarios for each actor. In the fifth step, resembling the process step in Figure 4.1, the analyst calculates the equilibrium outcomes. This can be done for various types of rationality (Fang *et al.* 1993, Kilgour *et al.* 2005).

4.6.2 Transactional analysis

Transactional analysis is based upon Coleman's social theory (1990) which takes micro economic thought as a starting point and translates it to social systems. The idea is that actors exchange control over issues instead of money for products. Roughly ten actors are used in most studies. Actors thus control certain issues and are interested in certain issues. The objective of transactional analysis is to calculate what the best collective decision in a problem situation will be. For this purpose transactional analysis calculates the optimal division of control over the issues in a problem situation for all parties. The optimal division of control is a clearing of all excess control that actors have over certain issues. This excess control is traded for more control on issues that interest the actors.

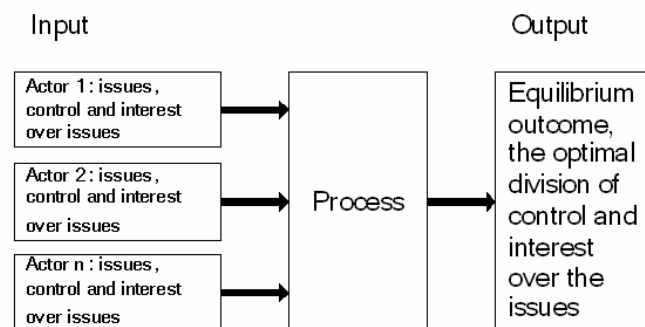


Figure 4.2: Data needs and output for transactional analysis.

Figure 4.2 shows the data needed concerning the transactional analysis. The inputs are the actors, issues, the interests of the actors over the issues, and the judgments about control over the issues. The output that is returned is the optimal division of control for the issues.

In practice the analyst first assesses what actors will be analyzed. Second the analyst gathers the issues the different actors have. In the third step the analyst assesses the control and the interests the actors have regarding the issues. These result in two matrices, one with the amount of control each actor has over each issue and one with the amount of interest each actor has regarding each issue. These preferences regarding the issues can be gathered in different ways, from literature or by directly asking the actor involved. In a fourth step, resembling the process step in Figure 4.2, the analyst calculates the equilibrium outcome; the outcome where control and interest is optimally spread over the actors.

4.6.3 Q-methodology

Q-methodology is a statistical tool and its objective is to detect shared views and/or preferences in groups of actors (Stephenson 1953; Brown 1980; McKeown and Thomas 1988). The method finds the different underlying perceptions that people have in a discourse. This is interesting for problems where the debate is polarized and where the involved actors seem to be opposite to one and other (Van Eeten 1999). Today a lot of problems are portrayed in this way; you are either for or against. Examples include the expansion of the national airport Schiphol, the European constitution, or the extraction of gas from the Wadden Sea.

Q-methodology was invented by the British physicist and psychologist William Stephenson (1935). The method has predominantly been applied in medical science but

has increasingly been applied to policy related issues. The method has for example been useful in detecting the alternative frames actors hold on policy problems (Van Eeten 2001).

Q-methodology is not a single method but a group of different statistical techniques like factor analysis, cluster analysis, and regression analysis. Q-methodology consists of three steps: the selection of a sample of statements from a debate, the sorting of these statements by a group of respondents, the analysis of the data and the interpretation of the resulting perspectives.

In the first step a group of arguments is generated from the debate to represent the whole debate. Arguments typically are statements about the studied subject like: “the future of the polder has to be decided in dialogue with the inhabitants of the polder.” It is important to capture the full breath of the arguments used by the actors in the debate.

In the second step a group of respondents is asked to arrange the arguments in a normal distribution. These groups often include 20 to 60 actors although deviations from both extremes are possible. The distribution that a single person makes is called a Q-sort and represents the perspective of that person on the research subject. The respondents should be representative of the different positions taken in the debate. Enough respondents are needed to create different perspectives that can then be compared with each other (Brown 1980). Which proportion of the respondents studied falls into a certain perspective is not important for Q-methodology. These two steps prepare the input in a way that it can be processed (see Figure 4.3).

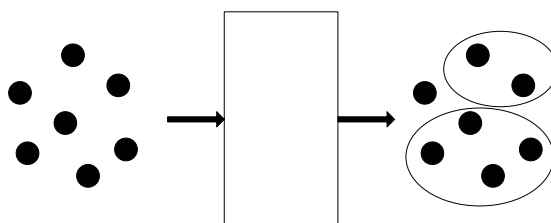


Figure 4.3: Data needs and output Q-methodology.

In the third step the shared perspectives, called factors, are calculated. The individual Q-sorts can be compared with each other through cluster analysis, factor analyses, and correlation. These techniques look for patterns between individual Q-sorts. In this study a principal component factor analysis is used to construct the underlying perspectives. These perspectives have the same form as the individual Q-sorts and are constructed from the Q-sorts that resemble that perspective the most. The constructed perspectives are then interpreted by the analyst.

4.6.4 Chosen approach for data collection in the water case

The case did not allow for a group intervention as the governmental stakeholders, though approached, were not willing to participate in any way; therefore, desk research was selected for the methods used. The dominant source of information is that from the province. This could bias the analysis towards the perspective of the province. We found that desk research was possible because of the large amount of media attention the issue received that allowed other actors to put forward their views and preferences.

There are a number of different equilibrium solutions possible for the scenarios of a conflict analysis. We applied conflict analysis according to (Fraser and Hipel 1984) where a scenario is considered an equilibrium solution when no actor (except the one's

perspective we take) can play an option in such a way that the outcome would be different. Likewise Coleman (1990) provides a number of extensions to his basic transactional model. We apply Coleman’s basic model described in Coleman (1990 p.681-687). For Q-methodology we used the principal components factor analysis provided in the software package PQMethod by Peter Schmolck which is a modification of the QMethod program developed by John Atkinson at Kent State University in 1992.

4.6.5 Chosen approach for data collection in the energy case

The chosen approach for conflict analysis and transactional analysis is desk research; an intervention setting with all actors being present was not possible as the actors, like the Minister of Economic Affairs, would not have participated. The input for the methods was thus gathered from literature. This conflict was heavily publicized and local media and newspapers were regularly publishing opinions of the different actors involved. During the time of analysis, end of 2004 and the beginning of 2005, a lot of reports were ordered from different research institutes (*e.g.* KPMG, ECN, KEMA, CPB, Energieraad, Wetenschappelijk Instituut voor het CDA) to prove or disprove effects of the unbundling measure. Therefore, a lot of information was available to study since different issues regarding the conflict were well studied and commented by popular media, consultants, government research institutes and industry.

The application of conflict analysis and transactional analysis are the same as described in Section 4.6.4. We applied conflict analysis according to Fraser and Hipel (1984) and transactional analysis according to Coleman (1990 p.681-687).

4.7 Conclusions

In this chapter we have specified the research approach for the following research question: *Given a policy problem how do different actor analysis methods perform?* In our approach we have chosen to fix the problems, the way the methods are applied, and the definition of success. What differs is what methods are applied. Figure 4.4 summarizes the approach.

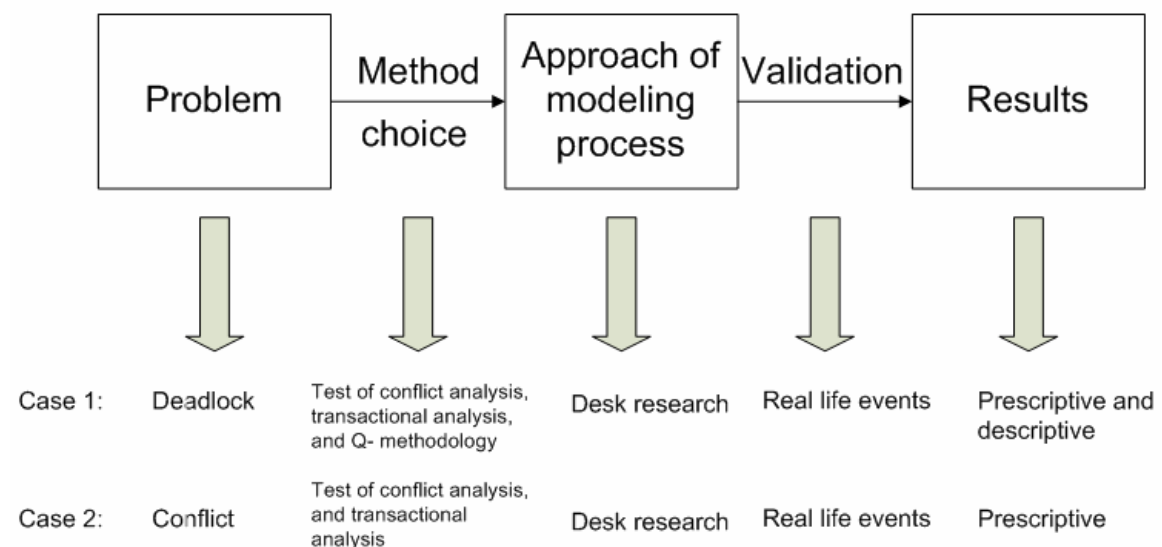


Figure 4.4: Research approach per case.

In order to answer the research question we have chosen two cases to which different actor analysis methods will be applied. The two cases assess two interpretations of the developed framework posed as premises. In the first case we apply the actor analysis methods conflict analysis, transactional analysis and Q-methodology to a deadlock situation. Our research interest is to see if different, potentially suitable, methods applied to the same problem will yield different results. In the second case transactional analysis and conflict analysis are applied to a conflict situation. Our research interest here is to see if a method that has not been applied to a specific problem situation before performs less than a method that has been applied to that problem situation. As a proxy of method performance we chose the predictive ability of the methods. Chapters 5 and 6 describe how the chosen actor analysis methods performed for the given problems in the two cases. In our concluding Chapter 7 we discuss the findings of the case studies in light of the developed framework.

Chapter 5

The case polder Groot Mijdrecht

5.1 Introduction

This case study is an analysis of the deadlock situation regarding the water problems of the Groot Mijdrecht (GM) polder in The Netherlands. The goal of the case is to compare the performance of the actor analysis methods conflict analysis, transactional analysis and Q-methodology for a deadlock situation. (For a short description of conflict analysis and transactional analysis see Chapter 4.) In Chapter 3 it was shown that all three methods have been applied to a deadlock situation in the literature. The purpose of this case is to see if different actor analysis methods which can potentially be applied to a deadlock situation will yield different results. If methods can be interchanged without consequences, the analyst can just select his or her favorite method without running the risk of a different outcome or a 'wrong' outcome. We cannot take for granted that different methods applied to the same problem will yield a different result. In this chapter we want to test this premise.

The GM polder is a case involving the potential reflooding of a polder in The Netherlands. The case of the Groot Mijdrecht polder was chosen because the process was in a deadlock situation. The provincial government was convinced that the current state of the water management in the Groot Mijdrecht polder was no longer sustainable and was considering flooding the land to create a lake. The inhabitants of the polder participated in the decision-making process but felt forced to quit negotiations for reasons explained later in the chapter. The inhabitants of the polder successfully lobbied the provincial council. The provincial government was ordered by the provincial council to install a committee to reexamine the facts. New information was thus needed to move the process forward.

In Section 5.2 we describe the background of the deadlock and describe the events in the Groot Mijdrecht polder. Section 5.3 discusses the application of conflict analysis, transactional analysis and Q-methodology. Section 5.4 discusses the results of the three actor analysis methods. Section 5.5 discusses the validity of the case study. Section 5.6 presents the case conclusions regarding the suitability of conflict analysis, transactional analysis and Q-methodology for the deadlock situation.

5.2 Case background

In 2005 the Province of Utrecht published an exploratory research report (Provincie Utrecht and AGV 2005) on the future of a polder called Groot Mijdrecht located in the centre of the Netherlands. The results of the research indicated that the management of the polder should drastically be changed. The polder is a deep subsiding polder that lies about 6 meters below sea level. The lowering of the surface water to follow the land subsidence is no longer possible on the long term. Several strategies have been explored

ranging from doing nothing to raising the level of the polder with dirt, to flooding the polder in such a way that a lake is created.

The outer shape polder somewhat resembles an hourglass (see Figure 5.1). The Groot Mijdrecht polder is one of the deeper polders in The Netherlands; it is about 2000 hectares. The Northern part is surrounded by a lake on the right and pastures. The Southern part is surrounded by the urban areas of Mijdrecht on the left and Vinkeveen on the right. The northern part is sparsely populated while the south includes an industrial area and an urban area.

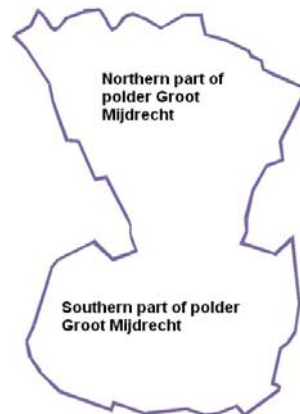


Figure 5.1: The contour of the polder Groot Mijdrecht located in the center of the Netherlands adapter from (Onderzoekscommissie Water en Bodemdaling Groot-Mijdrecht Noord 2007).

Inhabitants of the polder do not agree that the management of the polder must be changed. The inhabitants question the validity of the research which underlies the decision to change the water management of the polder. The inhabitants are under the impression that the province *a priori* prefers the option of flooding the polder. Inhabitants have participated in the participatory project but withdrew from the process for a number of reasons. First, the inhabitants find that the chairman that led the negotiations between the province, inhabitants and the municipality is biased towards flooding the polder. During the meetings and in the media he was advocating radical changes in the polder, in essence thus the flooding of the polder, as the only realistic option (AD Groene Hart 2006; Pronk 2006). Second, the decision-making power of the inhabitants was unclear. While they were allowed to participate in the process, it was uncertain as to how their input would be weighed. The inhabitants requested to have some funds of their own to commission research that would not involve experts from the involved public authorities (Nieuwe Meerbode 2006a). Third, the inhabitants felt that the research reports were biased towards the flooding of the polder as this was the only strategy that scored on all criteria. The underlying reports and a separate expert consultation done by the provincial council were not made public, making it impossible to track any tradeoffs or choices that might have been made. The inhabitants first wanted to talk about measures that could preserve the current landscape, which in their opinion had not been done, before talking about drastic strategies like flooding (Nieuwe Meerbode 2006a). These were the main reasons and demands the inhabitants put forward when they quitted the negotiations.

The whole process peaked at a meeting of the parliament of the Province of Utrecht on 5 February 2007 which received national media attention. During the meeting the Senate of the Province of Utrecht wished to decide that further surface water lowering in the GM polder would be prohibited. Legally the Province of Utrecht is entitled to decide upon the water levels, nonetheless, it was highly unusual for the Province of Utrecht to show special interest in the water level in the polder. Usually a water plan is made in which the water management including the water levels are planned for a large area. This water plan is made by the water board. The role of the province is usually then to approve

this plan. With a prohibition on the lowering of the water level the Province of Utrecht wanted to force a solution direction for the polder, it wanted to show that the future of the polder is a future where the polder is made more wet (De Ronde Vener 2007).

However, during this meeting the provincial council acknowledged that the inhabitants had not been treated appropriately in the decision-making process. Also it was decided that further lowering of the surface water would not be done before the problem was made clearer. A working group consisting of members of the province, the responsible municipality, and the inhabitants was formed which would re-examine and where necessary extend the presented facts. This working group had to report by 1 November 2007 after which a new policy would be developed for the polder.

The problem in this situation may be described as a deadlock. Clearly new information was needed in order to move the process forward. This was done by the forming a working group that had to re-examine and possibly extend the facts. Through this working group the inhabitants would be involved again in the process.

The working group, however, never got installed. The policy making process caused severe distrust amongst the inhabitants concerning the involved public authorities. A working group consisting out of members of the province, the responsible municipality, and inhabitants was found not workable (Postma 2007). Therefore it was decided that a committee of water experts, mostly academics, under supervision of an ex-minister would re-examine the presented facts. This solution was accepted by all parties. The committee presented its findings in December 2007 (Onderzoekscommissie Water en Bodemdaling Groot-Mijdrecht Noord 2007).

5.2.1 Problem perception of the Province of Utrecht for the Groot Mijdrecht polder

The GM polder can be divided into two parts: a northern part that is sparsely populated with 111 households and a southern part with an industrial zone and housing. The problem formulation of the Province of Utrecht focuses on the whole GM polder while the investigated strategies solely apply to the northern part. During the decision-making process this caused a lot of confusion. The title of the second research report (Provincie Utrecht and AGV 2006) refers solely to the northern part of polder, while the water management problems are described for the whole polder and also the newsletters refer solely to the northern part of the polder (*e.g.* Provincie Utrecht 2005e). These publications gave people the impression that it was only the northern part of the polder in which the water management problems were manifested. However this is not true as the in the whole polder the water problems occur and in addition to that it is the constructed area in the southern part of the polder which has problems draining away the excess water (Provincie Utrecht 2004b). However, it seems logical that the choice to focus on the northern part, with relatively few inhabitants, is a lower cost option, but this was not acknowledged by the Province of Utrecht at the time. In the remainder of the chapter we will use GM polder to mean the whole polder and Groot Mijdrecht Noord (GMN) polder to mean the northern part of the polder.

The problem formulation of the Province of Utrecht for the Groot Mijdrecht (GM) polder can be summarized in five different elements that affect the water management of the polder. These are: percolating water, polluted water, subsidence, flooding, and water storage (Provincie Utrecht and AGV 2005, Provincie Utrecht and AGV 2006). The province of Utrecht leads the policy making process in the GM polder and is part of a larger project management team. The project management, as a group, subscribes to the same view and consists out of the Province of Utrecht, the municipal government of De Ronde Venen, the water board, and Habiforum. We discuss each of these five elements in turn.

Percolating water

Each year 47 million m³ of water is pumped out of the GM polder of which 5 million m³ comes from precipitation (Provincie Utrecht and AGV 2005 p. 3). The remaining 42 million m³ water is ground water that flows from the surroundings and the hinterland to the polder. In the GM polder this ground water surfaces as percolating water; 33 million m³ comes through wells (Provincie Utrecht and AGV 2006 p. 19). Wells are weak spots in the ground where the counter pressure of the ground is too low compared to the ground water pressure. As water flows from high areas to low areas, an important cause of the ground water flow is the water level difference of the low GM polder compared to the higher surrounding polders and Vinkeveen lakes. In the current situation the water level difference of the polder with the Vinkeveen lakes is about 4.5 meters (Provincie Utrecht 2005 b p. 25). The percolation is viewed as a problem as the pumping of the water from the GM polder costs a considerable amount of money.

Polluted water

The percolating water in the GM polder is phosphate rich and slightly brackish because the water passes through a 6000 years old sea deposition (Provincie Utrecht and AGV 2005 p. 16). For ecosystems a continuous salt concentration is not a burden but a changing salt concentration is. In dry periods the water in the Amstelland outlet largely consists out of water that comes from the polder Groot Mijdrecht. This causes an increase in the salt concentration of the outlet water (Provincie Utrecht and AGV 2006 p.14). When this water is led into surrounding polders, there too the salt concentration is heightened.

The seepage water from the Vinkeveen lakes next to the GM polder is supplemented by water from the Vinkeveen outlet. This Vinkeveen outlet is fed with water which in dry periods mainly consists out of water from the polder Groot Mijdrecht (Provincie Utrecht and AGV June 2005 p. 18). To summarize roughly, the salt water that is pumped out of the GM polder is returned to the lakes next to it and then seeps back into the polder again. This pumping around of water is labeled as the water engine.

Subsidence

Another phenomenon in the polder Groot Mijdrecht is the subsidence of the land. This subsidence is based on ground level measurements and estimated to be 6 mm per year for the southern part of the GM polder and 9 mm per year for the northern part (Province of Utrecht and AGV 2005 p. 14 and p. 29).² As the ground subsides the difference between the ground level and the water level, the reclamation, has become smaller. To keep the current reclamation, the water level should follow the subsidence. A further lowering of the water level in the polder Groot Mijdrecht increases the difference with the water level with the Vinkeveen lakes, where the decision has been made not to lower the water level. Although the amount of percolating water in the polder has been constant over the years is it to be expected that a larger level difference will cause more seepage (Provincie Utrecht and AGV 2005 p. 29).

Flooding

With heavy rainfall 10 ha (Provincie Utrecht and AGV 2006 p. 20)³ of the GM polder does not comply with the legal norm for flooding of grassland (once every 10 years).⁴

² Although different sources from the Province give different numbers for this subsidence: 5 – 9 mm per year (Province of Utrecht June 2005), 8 mm per year (Provincie Utrecht and AGV 2006 p. 11 and p. 18), 5 – 10 mm per year ('Wat zullen we doen met Groot Mijdrecht Noord' 2005), and 5 – 9 mm per year (Provincie Utrecht 2005e).

³ On page 15 of this report this number is used for the northern part of the GM polder.

This amount of hectares is about 0.5% of the total polder Groot Mijdrecht.⁵ As a consequence of climate change it is expected that heavy rainfall will occur more frequently. The project management expects that in 2025 more than 100 ha of the northern part of the GM polder will not meet the norm (Provincie Utrecht and AGV 2006 p. 15).

Water storage

The regional shortage of water storage is also seen as a water problem (Provincie Utrecht and AGV 2006 p. 15). In the area there is a need for space where water can temporarily be stored in case of very wet circumstances. This regional storage, also called disaster storage, is needed less than once every 100 years. A polder on the north side of the GM polder in another province is currently designated for such storage. In this polder the houses are not built in the polder but on the surrounding dike; occasional flooding of the polder would thus leave the houses dry. The province argues however that new developments in the GM polder may offer opportunities for regional water storage.⁶

Developed strategies

During the process six different strategies have been developed to solve the water problems of the GM polder (Provincie Utrecht and AGV 2006). These strategies however focus solely on the northern part of the polder. The strategies are:

1. *Do nothing*: The further execution of the local peat plan (see strategy 2) is stopped, except from some running projects (the dephosphorisation installation for the Vinkeveen lakes and a local nature project in the north of the polder will be finished). For the water management this brings no changes.
2. *Plan for local peat land*: This strategy entails the continuation of the current policy for the polder. It provides in the construction of swamp nature in the east part of the GM polder for which the water level will be raised with 50 cm. The west part of the polder will serve agricultural purposes until at least 2012.
3. *Techniques*: The plan for the local peat land will be executed, furthermore the pressure is taken from underneath the ground by actively pumping ground water out of the GMN polder. Part of the ground water is extracted for drinking water and the rest is pumped back to the Vinkeveen lakes. From the perspective of the province not all water problems will be solved with this option as some subsidence and flooding will remain.
4. *Heighten*: The land in the whole polder is raised with 2.5 meters of sand. To make this strategy affordable large scale housing projects need to be established in the polder. This plan solves a lot of the water problems but does not allow for water storage.
5. *Grow along*: This has the same effect as the next strategy, “lake.” Nevertheless the realization of this strategy is in 50 years as the water level is raised slowly over the years to allow the swamp planned for the east part of the GM polder to grow along with the water level.

⁴ In the Dutch language there are different words for heavy flooding: “overstromen” and light flooding “water overlast.” With light flooding rainwater is not pumped out in time which causes puddles to form on the land. We use flooding to mean light flooding.

⁵ When the existing plans are executed, the GM polder complies with the norms for flooding. This however depends on the future subsidence of the land. The flooding in the surrounding polders will not comply with the norms given existing plans (Provincie Utrecht and AGV 2005 p. 23)

⁶ This effectively means a lake in the north of the GM polder as the lake is the only strategy that scores positive on the criterion of water storage. In the exploratory research report water storage in case of disasters is not mentioned. The report does note that a lake in the north of the GM polder or in a polder south of the GM polder may serve as a buffer in dry and wet periods (Provincie Utrecht and AGV June 2005 p. 28).

6. *Lake*: This foresees in the raising of the water level with at least two meters resulting in the polder lying four meter below sea level. The water level of the lake may fluctuate between four and three meters below sea level. In the eastern part of the polder swamp nature is created by digging up soil in the west and heightening in the east.

Table 5.1 provides an overview of the effects of the different strategies and shows that the “grow along” and “lake” strategy score positively on all problem elements. The effects are estimated on a three point scale, - means negative influence, 0 means no influence, and + means positive influence, as precise values are unknown. The subsidence is presented for the east and west of the GMN polder.

Table 5.1: Effects strategies on elements of problem.⁷

Strategies	Do Nothing	Local peat plan	Techniques	Heighten	Grow along/ Lake
Problem elements					
Percolation	-	0	+	+	+
Polluted water	-	0	+	+	+
Subsidence (east/west)	-/-	-/+	0/+	+/+	+/+
Flooding	-	0	0	+	+
Water storage	-	-	-	-	+

The different strategies are also represented in Figure 5.1. On the top the strategies that have most impact on the appearance of the polder. At the bottom are the strategies that have the lowest impact on the current appearance of the polder. The local peat plan also has considerable impact on appearance because of the peat land that is created in the polder. This plan is already current policy and an anticipated change in the appearance of the polder. Current dwellings/households may stay in the polder, thus minimizing the impact upon the inhabitants.

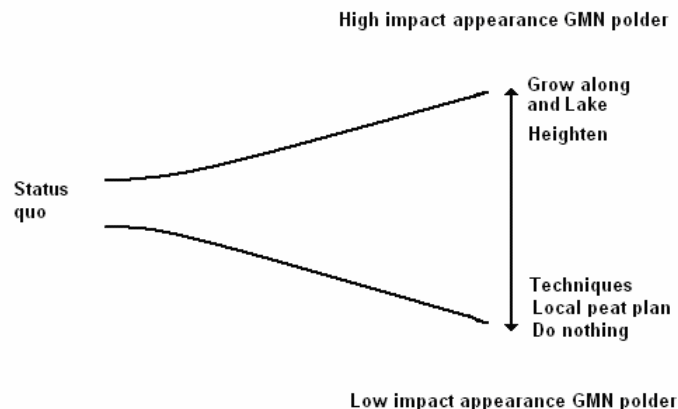


Figure 5.1: Different possible strategies.

⁷ The data for percolation and polluted water are estimated on the basis of the research report (Provincie Utrecht and AGV 2006). The data for subsidence, flooding, and water storage are taken from the assessment of the effects of the strategies (Provincie Utrecht and AGV 2006)

5.2.2 Process and involved actors

The process is being led by a project management group in which different authorities are represented. These are: the province of Utrecht, the local municipal government, the local water board, and a knowledge consortium called Habiforum. The province of Utrecht however is the leader of the process. The formal relations between the different actors involved in the process are represented in Figure 5.2.

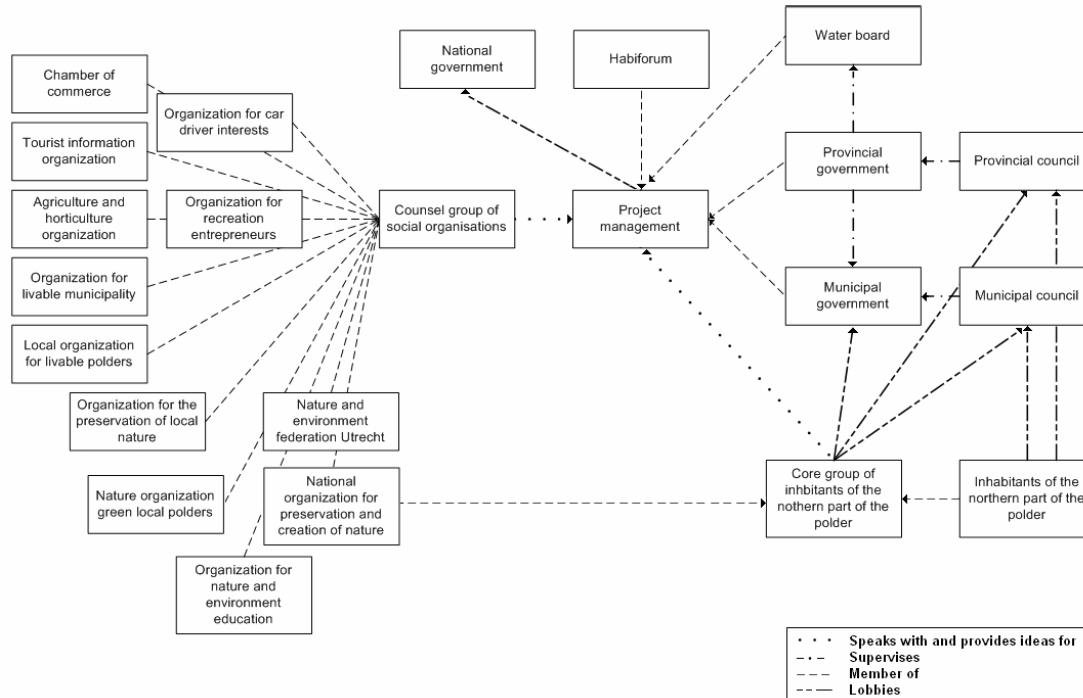


Figure 5.2: Formal stakeholder relationships for the GM project.

Figure 5.2 shows the formal relationships of the actors involved in the process. The project management consists of civil servants from all involved authorities and is led by the province. The project management reports to the responsible person from the provincial government. The goal of the project management is to manage the project by providing information and guarding the project plan. Especially the members of the Province of Utrecht and Habiforum, have actively been lobbying the government and advocating the project in order to get money for the project. Examples are tours of the prime minister and the prince in the area (De Ronde Vener 2006 b; Witte Weekblad 2006; AD Groene Hart 2007; Hoogendoorn 2006a).

The provincial government is the project leader and is fairly powerful as it also supervises the water board and the municipal government. For the municipal government this supervision is primarily a financial supervision. The water board can be seen as an executor body. However these authorities do have their own responsibilities and decision-making power.

Habiforum is a knowledge consortium that is part of the project management. The goal of Habiforum is twofold. First to allow for a learning process of the involved authorities (Provincie Utrecht 2005b) and second to guard the independence of the process by for example chairing the meetings with the different groups of actors that are involved in the process (Provincie Utrecht 2005b).

The municipal government is a member of the project management as the polder falls within the borders of the municipality. The municipal council supervises the municipal government and can be influenced by the inhabitants.

There are two actors that are involved in the process that are no members of the project management: the sounding board group of social organizations, and the core group of inhabitants. These actors have had meetings with the project management, and have provided ideas for solutions for the water problems (Provincie Utrecht 2005a; Provincie Utrecht 2005c; Provincie Utrecht 2005d). These actors are part of the process but have no decision-making power regarding the choice of solution for the water problems (Provincie Utrecht 2005a).

Process time plan

The process started officially in April 2005 (Provincie Utrecht 2005b). At this time the results of the initial problem exploration were known (Provincie Utrecht and AGV 2005) as in May 2005 inhabitants of the *northern* part of the GM polder were invited to a public meeting. At this meeting the inhabitants were informed that the GM polder has a big water management problem for which a lake would be the best option. The meeting served as a kick off meeting to involve the public and at the meeting inhabitants were asked to volunteer for the core group of inhabitants (Provincie Utrecht 2005a).

It was planned that in the summer of 2005 the project management would speak with the core group of inhabitants while at the same time research on different strategies would take place (Provincie Utrecht 2005b). Although after 4 meetings the core group of inhabitants stopped the negotiations in October 2005 (Van Rooy *et al.* 2006), as they found the process subjective and the urgency of the problem unclear (Nieuwe Meerbode 2006a). A sounding board group of social actors was also created to think along with the project management about different possible strategies. It was planned that in the winter of 2005 one or more alternatives would be chosen to be further elaborated and that in February 2006 the provincial government would propose a definitive strategy to the provincial council. This strategy would then be specified with a “plan study” in November 2006. Realization was foreseen for 2020 (Provincie Utrecht 2005b). The whole process from informing inhabitants, researching alternatives, until choosing an alternative and having this alternative elaborated on was thus planned in less than 2 years. Clearly the project management did not make this process plan as in February 2007 no strategy had been chosen.

5.3 Selection of actors for conflict analysis and transactional analysis

For both conflict analysis and transactional analysis the key stakeholders, or critical actors, are needed. In general the published applications of conflict analysis do not focus on the way the core stakeholders are identified. For transactional analysis this is also lacking although a positive exception is Timmermans (2004b) who uses the Delphi technique for one of his cases. The Delphi technique, however, is inapplicable for this case as the stakeholders themselves do not participate in the study. Therefore, we chose to do a stakeholder identification exercise (Koppenjan and Klijn 2004) to arrive at the key stakeholders in this case. The key stakeholders for the case are the Dutch “national government,” the project group represented by the “provincial government,” the “provincial council,” and the “inhabitants.” The inhabitants are a compound actor consisting of the core group of inhabitants as well as the people living and working in the polder. These four actors were used for the conflict analysis, but as transactional analysis can handle more actors we chose to broaden the analysis and analyze all individual members of the project group: the provincial government, municipal government, the water board, and Habiforum. We also added the municipal council.

The data needs about the stakeholders for the transactional analysis are the *issues*, and judgments about *control* and *interests* over the issues (see Chapter 4 for a more detailed explanation of the method). For transactional analysis the issues of the stakeholders are

gathered from arguments of the actors published in the media. The interest and control over the issues are quantified by the analyst that has interpreted the statements made in media by the actors.

The data that is needed on the stakeholders for the conflict analysis are the *options* of the stakeholders and the *preferences* of the stakeholders over the outcomes/scenarios the method develops (see Chapter 4 for a more detailed explanation of the method). For conflict analysis the options of the stakeholders were gathered from literature; the preference ranking of the scenarios for the different stakeholders was inferred by the analyst on the basis of the available documentation.

Since stakeholder analyses are snapshots, representing a fixed moment in time; the preferences as modeled by the analyst will also be static. It is therefore necessary to mention that this case study work was performed mid 2007.

5.4 Conflict analysis applied

5.4.1 Options for the actors

National government

The national government has reserved money to invest in the Green Heart, an area that purposively is relatively sparsely populated, lying between the larger cities of the Netherlands Amsterdam, The Hague, Rotterdam, and Utrecht. The money should be invested in multifunctional projects, projects which enhance the local economy as well as the environment. One of the action points of the policy is “a new future for our reclaimed land” and the GM polder project is listed in the policy document as an icon project (VROM 2006). A total of 635 million Euros has been reserved by the national government for investments in the Green Heart and the GM polder project hopes to receive 275 million Euros (VROM 2006).

Provincial government

As noted the provincial government is responsible for spatial development at the provincial level therefore the provincial government is responsible for the GM polder project. The GM project is a candidate for the millions that the national government is spending on spatial development. However, the national government has not decided on how much it wants to spend and on which projects. The provincial government has to lobby the national government in order to get money.

The six water management strategies are six possible options for the provincial government. To keep the amount of options down, four of the six strategies are not represented as options as it seems that the provincial government would never pursue them. First and second, the strategies “heighten” and “techniques” seem too expensive to pursue compared to the strategy “lake.” The strategy Heighten costs 580 million Euros to realize and has yearly costs of 19 million Euro. The strategy Techniques costs 100 million Euros to realize but has high yearly costs of 103 million Euros. The costs to realize a lake are 340 million Euros with yearly costs of 18 million euro (Provincie Utrecht 2006). Third, the time scale of the “Grow Along” strategy seems too long as it does not fit in the time span planned for the project also the strategy has not received much attention. However, the costs of the strategy are similar to the lake strategy. Fourth, the “Local Peat Plan” strategy in effect is the same as the strategy “do nothing” as this plan is current policy and there is very little chance that all activity in the polder will be stopped. Therefore not playing any options is seen as the continuation of current policy. That is, the strategy do nothing is seen as the execution of the local peat plan strategy.

The inhabitants have been very much opposed to how the provincial government has portrayed the water management issues in the polder. They feel that there is no problem with water management. That is, the water management problems as described by the project documents are not shared by the inhabitants (Hoogendoorn 2006b). An example is the subsidence of the polder, inhabitants argue that the ground under their houses should have subsided considerably during the years but many claim that they have never needed to top up their yards (Pronk 2007). As the inhabitants do not share the problem perception of the provincial government they feel that the water management issues have not been well researched. They feel that the documents have been written as advocacy documents for the creation of the lake (De Ronde Vener 2006a). To accommodate the inhabitants the provincial government has two options: it could restart the process with a more open problem formulation, or it could issue more research on the water management problem.

Inhabitants

The inhabitants have two options. First, they can go to court when a decision for a solution not supported by the inhabitants is made. Second, the inhabitants may lobby the provincial council. In the past they have seen success as the amendment of the provincial council was made in favor of the inhabitants. It literally states that the inhabitants have not been treated well (Provinciale Staten 2007). In a case where the inhabitants do not play any options the inhabitants approve of the process that the provincial government suggests.

Provincial council

The provincial council supervises the provincial government. In the case of GM polder the provincial council has stated that inhabitants should become reinvented in the process. The provincial council finds that there should be adequate support from the inhabitants for any decision (Provinciale Staten 2007). The provincial council would also like to know how provincial government is going to pay for the intended project. The options the provincial council has are to approve of plans for the polder of the provincial government, or to amend plans of the provincial government. In the second case the option “approve plans of provincial government” is not played.

Table 5.2: Table of options for conflict analysis.

Stakeholder	Options
National government	1. Provide money for project
Provincial government (GS)	2. Lobby for money from national government
	3. Pursue lake
	4. Restart process with open problem formulation
	5. Issue more research on water problem
Inhabitants	6. Go to court
	7. Lobby provincial council
Provincial council	8. Approve plans of provincial government

5.4.2 Feasible scenarios and preferences over scenarios

Table 5.2 states the options for the conflict analysis. In order to be able to assign preferences for the different scenarios the infeasible outcomes first have to be removed. Every possible combination of options is a potential scenario. Since there are eight options held by the actors there are $2^8 = 256$ possible scenarios in total. In Appendix 2.2.1 the infeasible scenarios are illustrated. After removing the infeasible scenarios 16 feasible scenarios are left.

Table 5.3 shows the scenarios after the infeasible scenarios are deleted. A ‘1’ means the option is played and a ‘0’ means an option is not played.

Table 5.3: Overview of the feasible scenarios.

Actor	Option	Scenarios															
National government	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
Provincial government	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
inhabitants	6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Provincial council	8	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
Decimal		98	99	102	103	106	107	110	111	226	227	230	231	234	235	238	239

Table 5.3 shows that the provincial government will never accept an open problem formulation as there are no scenarios where option four is played. Also the provincial government will always pursue the options “lobby the national government” and “pursue lake”. This is an interesting result; the provincial government will always pursue a lake as this is a project that is eligible for funding from the national government. The inhabitants will always lobby the provincial council as this option is always played. Overall the inhabitants prefer that the polder is left alone. However, the scenarios where the provincial government does nothing have all been marked as infeasible illustrating change in the management or appearance of the polder. There is also no scenario where the process is restarted with an open problem formulation. The best scenarios the inhabitants can pursue are the scenarios where the national government provides no money for the project and/or where the water problems are further researched. This is interesting as the inhabitants seem to have predominately lobbied the provincial council. This suggests that the inhabitants should also be lobbying the national government, or seeking to influence independent research bodies.

Table 5.4 shows the preference ranking of the different actors. For convenience the scenarios are translated into decimals to be able to present the preferences order of the different actors for the scenarios in a single table (Table 5.4). The complete argumentation can be found in Appendix 2.2.2.

Table 5.4: Preference ordering of scenarios.

Actor	Preference
National government	226, 227, 234, 235, 230, 231, 238, 239, 98, 99, 106, 107, 102, 103, 110, 111
Provincial government	227, 235, 231, 239, 226, 234, 230, 238, 99, 107, 103, 111, 98, 106, 102, 110
Inhabitants	107, 111, 106, 110, 98, 102, 99, 103, 234, 238, 226, 230, 235, 239, 231, 227
Provincial council	234, 238, 235, 239, 227, 231, 226, 230, 107, 111, 99, 103, 106, 110, 98, 102

5.4.3 Results of conflict analysis

There are a number of different equilibrium solutions possible for the scenarios of a conflict analysis (Fraser and Hipel 1984). Here a scenario is considered an equilibrium solution when no actor (except the one's perspective we take) can play an option in such a way that the outcome would be different. In this way the conflict analysis may provide insight into strategic behavior since an actor may not play an option if it enables another actor to alter the outcome.

Table 5.5: Equilibrium scenarios for conflict analysis.

Stakeholder	Option	Scenario	
		Scenario 107 No government money and additional research	Scenario 235 Government money and additional research
National government	1. Provide money for project	0	1
Provincial government	2. Lobby for money from national government	1	1
	3. Pursue lake	1	1
	4. Restart process with open problem formulation	0	0
	5. Issue more research on water problem	1	1
	Inhabitants	6. Go to court	0
Provincial council	7. Lobby provincial council	1	1
	8. Approve plans of provincial government	1	1

In this case there are two equilibrium scenarios which are represented in Table 5.5. The difference between the two equilibrium scenarios is that in the first no money is provided by the government and in the second the government does provide the money for the project. The scenarios further show that the provincial government will issue more research on the water problems in the polder: if they do not do this the inhabitants would most likely go to court to contest the legitimacy of the policy project. Issuing more research prevents this measure. Issuing more research on the water problem is also strategic with regard to the provincial council, the council has a preference for solving the water problems but can not approve of them when the inhabitants seriously oppose as the council represents the inhabitants of the province. Thus issuing more research also prevents the disapproval of the plans by the provincial council.

5.5 Transactional analysis

5.5.1 The issues of the actors

Table 5.6 presents the issues for the actors in the transactional analysis. These issues were gathered from literature. Although every actor has a degree of control and interest over all issues, the issues are best explained from the viewpoint of the actors that are most interested in these issues.

Table 5.6: Actors and issues for the transactional analysis.

Stakeholder	Issue
National government	Multifunctional Green Heart
Provincial government	Water storage Prestige
Municipal government	Housing
Inhabitants	Security and Continuity Process objectivity and Process transparency Respect for landscape
Water board	Percolating water, Polluted water, Subsidence, and Flooding (Water management)
Municipal council	A supported solution
Provincial council	A supported solution
Habiforum	Successful learning process

National government

The issue of the national government is a multifunctional Green Heart. The national government has reserved money to invest in the Green Heart that lies between the cities of Amsterdam, The Hague, Rotterdam, and Utrecht. The money should be invested in multifunctional projects, projects that enhance the local economy as well as the environment. One of the action points of the policy is “a new future for our reclaimed land” and the GM polder project is listed in the policy document as an icon project (VROM 2006). A total of 635 million Euros has been reserved by the national government for investments in the Green Heart and the GM polder project hopes to receive 275 million Euros (VROM 2006).

Provincial government

The main issue for the provincial government is water storage. Due to legislation from the national government the provincial government is looking for places for water storage in the province of Utrecht (Provincie Utrecht 2004a). Another issue is prestige. The possible realization of a lake is costly and also the area involved is substantial 2000 hectares.

Municipal government

Officially the municipal government has not made a statement regarding its preferred strategy for the polder. But an issue of interest that can be identified for the municipal government is that of housing. The municipal government is responsible for local spatial development which includes housing. Building houses however brings in considerable funds; the municipality sells the land the houses are built on and also gains households that pay local taxes. Housing in the municipality is scarce due to its closeness to a number of large cities and still relatively green environment it is a favored location to move to. Because the municipality draws people from the cities the prices are high, too high for local youth that has increasing problems finding suitable housing. However, the municipality can not just built more houses to accommodate the demand as it is bound to a “zero migration balance” which means that new housing projects are allowed only to compensate for the natural increase of the population. For a large project like the one planed for the GM polder exceptions might be made as the lake strategy includes the building of 2500 houses (Provincie Utrecht 2006). This is positive for the municipality as these houses are planned in addition to the ones that are planned to compensate for population growth.

Inhabitants

The inhabitants are angry that again plans are being made for the GM polder. This because negotiations for nature in the eastern part of the polder have just resulted in

policy until 2012. This renewed focus on the polder has influenced people's sense of security as the future of the polder remains unknown (Nieuwe Meerbode 2007). Also the new focus on the polder 'locks' the area and affects the continuity of life as houses are hard to sell and companies do not know whether to invest or not (Nieuwe Meerbode 2007).

The focus group has quit negotiations with the project group as they did not support the problem definition and found the process subjective. They argue that the chairman of the meetings is a supporter of building houses on water and therefore will not be objective (Nieuwe Meerbode 2006a). It is the opinion of the core group that the process has not been transparent. The underlying research documents that have been used for the two research reports on the polder were not made public (Nieuwe Meerbode 2006a). Also the core group was denied funds of their own for research (Nieuwe Meerbode 2006a). Furthermore they want that the current landscape is respected as a technical report suggests that the polder can be kept green (Nieuwe Meerbode 2006a).

Water board

The main issue of the water board is the water management. The water management contains the elements: percolating water, polluted water, subsidence, and flooding described in Section 5.2.1. These elements influence each other and are therefore not seen as separate issues.

Municipal council and provincial council

The provincial and municipal council are the monitoring bodies for the provincial government and the municipal government. They are chosen by the inhabitants of the municipality and the inhabitants of the province and thus represent their interests. The main issue of the municipal council and the provincial council therefore is a supported solution (Provinciale Staten 2007).

Habiforum

A successful learning process is the most important issue. A Habiforum expert has been hired to lead the (learning) process of the authorities constituting the project management (Provincie Utrecht 2005b). The learning objectives, if there are any, have not been made public. Habiforum has organized reflective meetings and a master class with predominantly provincial people that have a relationship with the project (Van Rooy *et al.* 2006). Also an account of the events of the process and some learning points related to it has been published (Van Rooy 2007).

5.5.2 Interest and control quantified

Tables 5.7 and 5.8 describe the *status quo* of February 2007. Table 5.7 represents the interests and Table 5.8 represents the control of the actors over the issues. The numbers in the tables only have meaning relative to one and other.

The values of interest matrix were obtained by the analyst, who assessed the interest rank and the direction of the interest according to the scale used in Timmermans (2004 a p.91) (see Table 2.1 in the Appendix 2). These values were translated into single numbers according to Timmermans (2004a, p.91) and the matrix was standardized for the issues in the table of interest. The control matrix is filled for the actors on a nine point scale as described in Timmermans (2004a, p. 89-91) (see Table 2.2 in the Appendix 2) although the assessment was done by the analyst and not the involved stakeholders.

Table 5.7: Table of interest in issues.

Actor	Nat Gov	Prov Gov	Mun gov	Prov council	Mun council	Water Board	Inhab	Habi	Total
Issue									
Multifunctional green heart	0.13	0.11	0.08	0.08	0.08	0.09	0.02	0.09	0.68
Water storage	0.12	0.14	0.10	0.08	0.08	0.09	0.02	0.09	0.72
Prestige	0.12	0.14	0.08	0.08	0.08	0.15	0.02	0.15	0.81
Security and Continuity	0.07	0.08	0.08	0.08	0.13	0.09	0.17	0.09	0.79
Process objectivity	0.07	0.08	0.08	0.12	0.08	0.09	0.17	0.09	0.79
Process transparency	0.07	0.08	0.08	0.12	0.08	0.09	0.17	0.09	0.79
Respect for landscape	0.07	0.08	0.08	0.08	0.08	0.02	0.17	0.02	0.59
A supported solution	0.12	0.08	0.08	0.14	0.15	0.09	0.15	0.04	0.84
Water management ⁸	0.07	0.08	0.08	0.08	0.08	0.17	0.09	0.09	0.74
Housing	0.07	0.08	0.15	0.08	0.08	0.02	0.02	0.09	0.59
Successful learning process	0.07	0.08	0.08	0.08	0.08	0.09	0.02	0.16	0.67
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	8

The table of interest shows that the issues “a supported solution” and “prestige” are the issues the actors are most interested in, closely followed by “security and continuity,” “process objectivity,” and “process transparency.” This is interesting as the whole problem is put forward as a water problem. The research reports predominantly focus on the issues “water management” and “water storage.” It thus seems that these issues are very important for the actors even more important than the issues that represent the problem according to the province.

Table 5.8: Table of control over issues.

Actor	Nat Gov	Prov Gov	Mun gov	Prov council	Mun council	Water Board	Inhab	Habi	Total
Issue									
Multifunctional green heart	0.32	0.18	0.11	0.11	0.04				1.00
Water storage	0.10	0.17	0.10	0.24	0.07	0.11	0.11	0.04	1.00
Prestige	0.27	0.12	0.04	0.19	0.12	0.10	0.17	0.03	1.00
Security and Continuity	0.20	0.28	0.12	0.12	0.08	0.04	0.19	0.04	1.00
Process objectivity	0.05	0.32	0.09	0.14	0.05	0.08	0.08	0.04	1.00
Process transparency	0.05	0.33	0.10	0.24	0.05	0.09	0.05	0.23	1.00
Respect for landscape	0.05	0.33	0.10	0.24	0.05	0.10	0.05	0.10	1.00
A supported solution	0.24	0.24	0.14	0.10	0.07	0.10	0.03	0.07	1.00
Water management ⁹	0.05	0.24	0.08	0.14	0.08	0.08	0.24	0.08	1.00
Housing	0.30	0.22	0.09	0.09	0.04	0.13	0.09	0.04	1.00
Successful learning process	0.28	0.21	0.14	0.14	0.14	0.03	0.03	0.03	1.00
Total	1.90	2.55	1.24	1.54	0.76	1.10	1.12	0.78	11.00

⁸ The water management issues are: percolating water, polluted water, subsidence, and flooding

⁹ The water management issues are: percolating water, polluted water, subsidence, and flooding

The issue that is of least interest is housing. This is also interesting as it is the issue the municipal government is most interested in. The municipal government has a very specific interest and this issue is of little interest to other actors.

The table of control over issues (Table 5.8) shows that the provincial government is the actor with the most control followed by the national government and provincial council. The inhabitants and the municipal government and water board have about the same amount of control. The municipal council and Habiforum have the least amount of control.

The national government has most control over the issues a “multifunctional green heart,” and a “supported solution.” As project leader the provincial government has most control over the process expressed in the issues “process objectivity,” and “process transparency.” The issue the municipal government control most is “water management” but all members of the project management besides Habiforum have this amount of control. It shows that the municipal government although it has a considerable amount of control does not control a specific issue like the national government and provincial governments do. The issues that the provincial council has most control on are “water storage” and “process transparency” reflecting the power it has on the decisions of the provincial government and the process. The provincial council needs to approve all plans of the provincial government and has the power to ask for more information. The issue that the water board controls most is “water management” although the provincial and municipal government have the same amount of control on this issue. The inhabitants have most control over the issue a “supported solution:” this control is as much as that of the provincial government.

What is worth noticing in Tables 5.7 and 5.8 is that the national government is mostly interested in the issue it has most control over: a multifunctional green heart. This as the national government has reserved considerable funds for projects that contribute to a multifunctional green heart.

Table 5.9: Table of equilibrium control.

Actor	Nat Gov	Prov Gov	Mun gov	Prov council	Mun council	Water Board	Inhab	Habi	Total
Issue									
Multifunctional green heart	0.24	0.26	0.14	0.12	0.06	0.10	0.02	0.07	1.00
Water storage	0.21	0.33	0.11	0.11	0.06	0.09	0.02	0.07	1.00
Prestige	0.19	0.31	0.09	0.11	0.05	0.14	0.02	0.10	1.00
Security and Continuity	0.14	0.19	0.10	0.12	0.10	0.10	0.19	0.07	1.00
Process objectivity	0.13	0.18	0.09	0.18	0.06	0.09	0.18	0.07	1.00
Process transparency	0.13	0.18	0.09	0.18	0.06	0.09	0.18	0.07	1.00
Respect for landscape	0.16	0.23	0.12	0.14	0.07	0.02	0.23	0.02	1.00
A supported solution	0.19	0.17	0.09	0.19	0.10	0.09	0.15	0.03	1.00
Water management ¹⁰	0.14	0.20	0.10	0.12	0.06	0.18	0.11	0.07	1.00
Housing	0.17	0.24	0.21	0.15	0.08	0.03	0.03	0.09	1.00
Successful learning process	0.16	0.23	0.11	0.14	0.07	0.12	0.03	0.15	1.00
Total	1.86	2.53	1.22	1.58	0.76	1.06	1.18	0.80	11.00

¹⁰ The water management issues are: percolating water, polluted water, subsidence, and flooding

5.5.3 Results transactional analysis

Table 5.9 presents the results of the transactional analysis. The table of equilibrium control shows that after the trading the actors have approximately the same amount of total control in the table of equilibrium control as they have in the table of control, although the control over the individual issues differs.

The solution is characterized by the inhabitants having more control over the issues of their interest but losing control over the issues: multifunctional green heart, water storage, prestige and a successful learning process. The provincial government receives more control over these issues in the equilibrium situation. The water board receives more control over the water management in the equilibrium situation but loses control over water storage. The national government loses control over a multifunctional green heart but gains significantly on water storage and both councils gain control over a supported solution.

Thus each actor gains control over the issues that interest them most but other actors still may have more control over these issues. In the equilibrium situation the municipal government has more control over housing (0.21), but the provincial government still has the most control (0.24). This as the provincial government overall has more control than the municipal government, it is a more powerful actor.

The equilibrium result also suggests that a solution is possible where each actor gains on the issues that interest the actor the most. It is therefore unlikely that the equilibrium situation reflects one of the developed strategies. In the equilibrium situation the control over “respect for landscape” increases for the inhabitants and the control over “water storage” increases for the provincial government. The transactional analysis thus suggests that a solution that respects the landscape but also involves water storage is possible. None of the developed strategies both respect the landscape and also include water storage. The strategies do nothing, local peat plan, and techniques have little impact on the appearance of the polder while the strategies heighten, grow along, and lake have a severe impact on the appearance of the polder. One might wonder what this type of strategy would be. A strategy where only part of the polder is flooded to provide for water storage could maybe be an option.

5.6 Q-methodology

5.6.1 Argument selection Q-methodology

It is important to have captured the full breath of the arguments used by the actors in the debate (see Section 4.6.3). For this different types of sources are important. For this research we used texts from national and local media, reports and minutes of meetings of the province. We also used accounts of the meeting of the involved actors: the inhabitants meetings, the core group meetings, and the sounding board group meetings of social organizations. After removal of duplicate arguments 182 arguments were left over. Similar arguments were categorized and representative arguments per category were chosen or created. The remaining sample had 30 arguments (see Appendix 2, Table 2.3) that were related to the problem, the process, and the solutions for the problems in polder Groot Mijdrecht.¹¹

A seven point scale was chosen to arrange the arguments from completely disagree (-3) to completely agree (+3). The distribution of arguments in the columns represents a normal distribution. In this case two arguments were allowed at the extremes (-3 and +3),

¹¹ In the documents water storage was mentioned as a problem and as a solution. Only one argument regarding water storage was taken for the sample. This was an argument stating the lack of water storage as a problem.

followed by four and five arguments in the following columns, and with 8 arguments in the middle columns that represents indifference (see Figure 5.3). This distribution that a single person makes is called a Q-sort and represents the perspective of that person on the research subject.

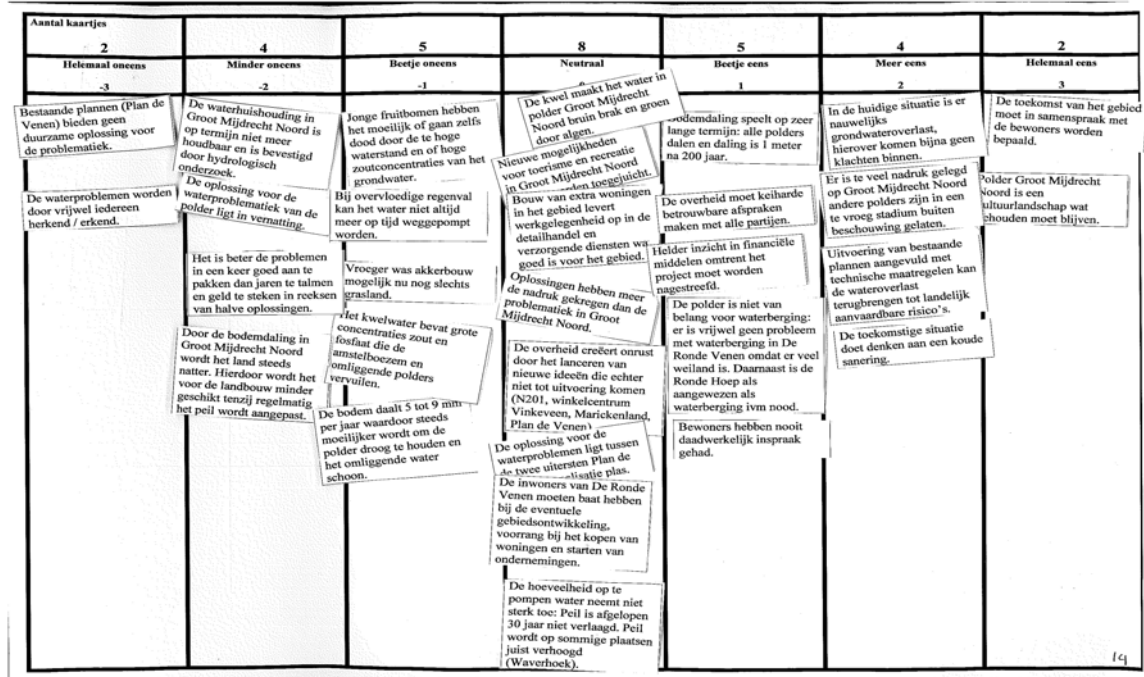


Figure 5.3: An example of a Q-sort.

5.6.2 Respondents Q-methodology

The respondents should be representative of the different positions taken in the debate. Enough respondents are needed to create different perspectives that can then be compared with each other (Brown 1980). Which proportion of the respondents studied falls into a certain perspective is not important for Q-methodology.

To try to capture the diversity of perspectives we tried to interview respondents from five different categories (see table 5.10). The interviews were held between 1 May 2007 and 29 June 2007. In total 19 persons were interviewed and 19 Q-sorts were made. The number of respondents in table 5.10 does not count up to 19 as different persons fall into multiple categories. Of the 19 respondents five do not live in or on the dike of the polder. The category “otherwise involved” consists out of a person whose parents live in the polder and a person whose family owns land in polder Groot Mijdrecht.

Table 5.10: Categories of respondents.

Category	Number of respondents
Inhabitants of the polder Groot Mijdrecht that live on the dike	8
Inhabitants of the northern part of the polder Groot Mijdrecht	6
People working in northern part of the polder Groot Mijdrecht	8 of which 5 depend on their land for income
Members of the core group	6
Otherwise involved	2

5.6.3 Results Q-methodology

The interviews resulted in 19 Q-sorts. These have been analyzed with factor analysis. The factor analysis has resulted in five factors with an eigenvalue larger than one which in total explains 76% of the data. This thus means that there are five different perspectives in the group of respondents.

For these five factors the contributions of each individual Q-sort was calculated (see Appendix 2, Table 2.4). The Q-sorts with a significant contribution were used to construct the shared perspectives and have the same form as an individual Q-sort (see for example Figure 5.3). In Appendix 2, Table 2.3 all five full perspectives are presented. In the following sections the most important parts of these perspectives are discussed.

The different perspectives are discussed by focusing on the extremes of the scale +3 +2 and -2 -3. The 0 category represents indifference and is not discussed. Examples of arguments are shown in tables according to Van Eeten (1999). In these tables the discussed perspective is represented in bold, the scores on the other perspectives are also represented to the reader to for comparison of the perspectives.

Perspective A: There are no water problems that legitimize an intervention in the polder

Perspective A is especially characterized by the negative side of the distribution. The negative extreme of the distribution emphasizes the fact that there is no water problem as water problems are not recognized and the hydrological research not acknowledged.

	A	B	C	D	E
The water problems are acknowledged and recognized by nearly everybody.	-3	-1	3	0	-2
Gradually the water management in the GMN polder is no longer sustainable and this is confirmed by hydrological research.	-2	0	1	-3	-3

In this perspective the arguments that confirm the existence of the water problems are placed on the negative side. The arguments that were placed in the -2 and -1 columns all deny the sketched aspects of the water problems.

	A	B	C	D	E
The ground subsides 5 to 9 mm per year which makes it harder and harder to keep the polder dry and the surrounding waters clean.	-2	0	3	-1	-2
The percolating water makes the water in the GM polder Groot Mijdrecht brown and brackish, and green because of alga.	-2	0	-2	0	0
Young fruit trees have a hard time or even die as a consequence of the high water level and /or high salt concentrations in the ground water.	-2	1	-3	-1	0
On days when it has rained abundantly the water can not be pumped away in time.	-1	-2	2	-1	0
The percolating water contains large concentrations of salt and phosphate that contaminate the Amstel outlet and the surrounding polders.	-1	1	2	0	0
Surface sinking is a process that takes place over a very long time span; all polders sink and the surface lowering is 1 meter in 200 years.	-1	0	0	1	0

In the past arable farming was possible now only grassland is possible. -1 0 0 -1 -1

Because of the surface subsidence in the GMN polder the land gets wetter. Because of this the land becomes less suitable for agriculture unless the water level is lowered on a regular basis. -1 1 0 -2 -2

In this perspective the sinking of the ground, the negative consequences for nature and the flooding are not experienced by the stakeholders. In none of the other perspectives these arguments have all been placed on the negative pole.

Because the stakeholders do not recognize these water problems intervention in the polder is viewed as illegitimate. The argument that states that the polder should remain as it is therefore scores high. This argument also scores high in perspective D but this has another reason. Perspective D is characterized by relative inflexibility regarding any change in the polder whereas in perspective A the water problems are not recognized.

	A	B	C	D	E
The polder Groot Mijdrecht Noord is a cultural landscape that needs to be preserved.	3	0	-1	3	1

Perspective B: Area development offers possibilities

The second perspective is a perspective that is oriented towards potential developments and possibilities of the polder. The stakeholders are convinced of the water problems in the polder but expect that the inhabitants of the polder are allowed to participate in the decision-making.

	A	B	C	D	E
It is better to tackle the problems all in one go than to linger for years putting money in series of insufficient measures.	0	3	1	0	-1

The future of the polder has to be decided in dialogue with the inhabitants of the polder.	1	3	2	2	3
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The development of the polder through the construction of houses and the stimulation of recreation in the polder is seen as positive. It is worth noticing that the development of the polder does not score high in any of the other perspectives. Development of the polder does not mean making the polder wetter nor does it acknowledge the solution space promulgated by the project management. These arguments (23 and 27 in Appendix 2, Table 2.3) score -1 in this perspective. In this perspective stakeholders are in favor of development but probably against the realization of a lake.

	A	B	C	D	E
The construction of extra houses in the area provides employment in retail trade and supporting services which is good for the area.	0	2	-3	0	-1

New possibilities for tourism and recreation in the polder Groot Mijdrecht Noord need to be welcomed	0	2	0	-2	-1
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In this perspective one has faith in the government and people do not give priority to people of their own municipality. It is worth noticing that perspectives A, C, and E have a

more neutral stand towards this issue. Perspective D seems to be in direct opposite of this. In this perspective the stakes of the inhabitants are viewed as important.

Argument	A	B	C	D	E
The government creates unrest through the introduction of new ideas that do not get implemented (<i>e.g.</i> the new road N201, the planned mall in Vinkeveen, the creation of a swamp called Marickenland, and the attempt to connect various parts of nature in the local peat land plan).	0	-3	0	1	0
The inhabitants of the municipality of De Ronde Venen should benefit from possible spatial development, get priority for buying houses and the set-up of businesses.	0	-3	-1	2	0

Perspective C: No construction

This perspective is determined by a single respondent. It assumes that some of the water problems presented by the Province of Utrecht like subsidence, flooding and percolating water are acknowledged by a large number of people.

	A	B	C	D	E
The ground sinks 5 to 9 mm per year which makes it harder and harder to keep the polder dry and the surrounding waters clean.	-2	0	3	-1	-2
The water problems are acknowledged and recognized by nearly everybody.	-3	-1	3	0	-2
On days when it has rained abundantly the water can not be pumped away in time	-1	-2	2	-1	0
The percolating water contains large concentrations of salt and phosphate that contaminate the Amstel outlet and the surrounding polders.	-1	1	2	0	0

However, another part of the water problems characterized by the province are not acknowledged. The arguments that state poor growth of the fruit trees and the blossoming of algae are not recognized at all. These issues are not recognized as the respondent has seen evidence to the contrary.

	A	B	C	D	E
Young fruit trees have a hard time or even die as a consequence of the high water level and /or high salt concentrations in the ground water.	-2	1	-3	-1	0
The percolating water makes the water in the polder Groot Mijdrecht brown and brackish, and green because of alga.	-2	0	-2	0	0

Important for this perspective is that the perspective is against the construction of houses.¹² None of the other perspectives is so against the construction of houses. When

¹² This is not entirely what not agreeing with the argument suggests. Strictly speaking this person could also be in favor of extra houses but could disagree with the expectation that it will result in more employment. During the interview however I got the impression that this person was predominantly against the construction of houses in the area.

change is needed more nature in the form of swamp nature or maybe even a lake could be acceptable but the construction of new houses would not be. In this perspective one wants to live peacefully in a relatively sparsely populated area.

	A	B	C	D	E
The Construction of extra houses in the area provides employment in retail trade and supporting services which is good for the area.	0	2	-3	0	-1

Perspective D: The inhabitants have been harmed and the polder should stay as it is

The emphasis of this perspective is twofold. On the one hand one does not agree how the inhabitants have been treated. The table below shows that the argument that inhabitants have never had a chance to participate scores very highly also when compared to the other perspectives. The trust in the government seems to be low because this perspective endorses the argument that the government creates unrest. There is strong sense of ownership of the polder as inhabitants should be able to participate in decisions for possible changes and that the inhabitants should benefit from these changes.

	A	B	C	D	E
The inhabitants of the polder never actually could participate in the process.	1	-2	-2	3	1
The government creates unrest through the introduction of new ideas that do not get implemented (<i>e.g.</i> the new road N201, the planned mall in Vinkeveen, the creation of a swamp called Marickenland, and the attempt to connect various parts of nature in the local peat land plan).	0	-3	0	1	0
The future of the polder has to be decided in dialogue with the inhabitants of the polder.	1	3	2	2	3
The inhabitants of the municipality of De Ronde Venen should benefit from possible spatial development, get priority for buying houses and the set-up of businesses.	0	-3	-1	2	0

Part of this perspective is that one does not see any problems with the water management of the polder. Generally one is against change and for the preservation of the polder. One does not see anything in wetting the polder and new plans for tourism and recreation. The existing plans are sufficient for the polder. Compared to the other perspectives one is very much against any change in the polder.

	A	B	C	D	E
Gradually the water management in polder Groot Mijdrecht Noord is no longer sustainable and this is confirmed by hydrological research.	-2	0	1	-3	-3
The solution for the water problems lies in making the area wetter.	-3	-1	1	-3	-3
The GM polder is a cultural landscape that needs to be preserved.	3	0	-1	3	1
New possibilities for tourism and recreation in the polder Groot Mijdrecht Noord need to be welcomed.	0	2	0	-2	-1
Existing plans (local peat land plan) provide no sustainable solution for the problems in the polder.	1	1	0	-2	2

Perspective E: The approach of the process has been unjust

In this perspective one is predominantly against the way the process has been organized and the consequences that the inhabitants experience as a result of the process. One feels that there has been too much emphasis on the northern part of the polder, and that solutions have been emphasized more than the problem. Because of the plans the future situation reminds of a “cold reorganization,” a situation where prices drop due to government plans making the assets the government needs to buy from the inhabitants cheaper. In none of the other perspectives these arguments have scored so high.

	A	B	C	D	E
Too much emphasis has been put on the Northern part of the polder and other polders have been left out at a too early stage.	1	-2	2	0	3
Solutions have gotten more emphasis than the problems in the polder.	2	1	-2	0	2
The future situation reminds a cold reorganization.	0	-2	1	1	2

The fact that there is resistance against the process does not mean that this perspective is against change. This perspective acknowledges that the existing plans are not a sustainable solution for the problems and that existing plans supplemented with technical measures might also not be sufficient.

	A	B	C	D	E
Existing plans (local peat land plan) provide no sustainable solution for the problems in the polder.	1	1	0	-2	2
The execution of existing plans supplemented with technical measures can reduce the flooding to nationally acceptable risks.	0	0	0	-1	-1

Yet regarding the solutions one is probably conservative and against radical changes in the area. This perspective is for example against making the area more wet, against the strategies of the project management, and slightly is favor of the conservation of the area. Also the other perspectives, except perspective C, are also against wetting the polder. What is worth noticing is that none of the perspectives agrees that the solution for the area lies between the presented extremes of the project management.

	A	B	C	D	E
The solution for the water problems lies in making the area wetter.	-3	-1	1	-3	-3
The solution for the water problems lies between the two extremes: the local peat land plan and a lake	0	-1	-1	-2	-2
The polder Groot Mijdrecht Noord is a cultural landscape that needs to be preserved.	3	0	-1	3	1

5.6.4 Validity Q-sample

It is important for the validity of the perspectives that all relevant arguments from the debate have been presented. For this reason each respondent was asked after completing their Q-sort if there were arguments missing. Nine respondents told that they missed no

arguments. Some even said that they were reminded by the arguments of arguments that were used in the debate. One of the respondents could relate a missing argument to an argument already presented in the Q-sort but on a higher level of aggregation. Nine respondents said they missed arguments from the debate. Below we will deal with these arguments.

- “The influence of consultants and advisory bureaus is missing [respondent 17].”
- “People are wasting their time and keeping themselves employed [respondent 16].”

These remarks provide criticism on the general way of working of the government. In the researched documents these comments can not be found. In relation to the way of working of the government the arguments 2, 5, and 8 (see Appendix 2, Table 2.3) are relevant. These focus on the way of working of the government with regards to the area.

- “It, for example, does not say: has the government approached the inhabitants wisely? It does not say who is responsible for the process. Who is the initiator? Unknown makes unloved [respondent 6].”
- “I miss that they have to listen to the inhabitants. Why keep pushing? We do not see any problems [respondent 12].”
- “The way the inhabitants have been treated. Participation needs to be transparent. What do you mean with participation? Do not operate with hidden agenda’s because they will surface and cause institutionalized distrust [respondent 13].”

These remarks show that the inhabitants have not been treated fairly and that one should listen to the inhabitants. The arguments 4, 5, and 6 (see Appendix 2, Table 2.3) cover the meaning of these remarks. These remarks emphasize honest agreements, participation of the inhabitants, and the way inhabitants should be treated.

- “Where do I have to go to? It does not say anything about the consequences for the inhabitants [respondent 7].”
- “I miss that we still do not know what will really happen [respondent 18].”

These remarks show that one does not know what will happen. Because this truly is not known these kinds of arguments are not in the selection.

- “I miss that the urban area is the cause of the problems, that so much of the land is paved [respondent 8].”
- “There are arguments missing of the experts that the provincial council have consulted [respondent 11].”

These statements address the fact that factual information is missing from the set. The studied literature does not contain this information. The first statement could have been found in the municipal water plan (AGV and Gemeente De Ronde Venen 2006). As the document is not related to the GM polder project this document fell outside the scope of consulted literature.

The statements of the experts that the provincial council consulted do fall within the scope of literature for the analysis. It seems however that these documents came available after the data collection period had ended. The data collection was stopped after the decision of PS on 6 February 2006. Documents that have been published after this date have not been consulted. The expert reviews are appendices to a letter published on the site of the Province of Utrecht. The letter has no date but it must have been sent after 6 February 2007 as the decision of the provincial council of the 6th is also an appendix to the letter, next to the expert reviews.

To conclude the chosen sample of arguments seems applicable in representing the debate as a large amount of information that participants miss can be interpreted with the current sample of statements. Two stakeholders miss information that is unavailable in the literature and could not have been part of the sample. Finally, two stakeholders miss information that was available, although not part the selected literature or not available in time.

5.7 Case conclusions

5.7.1 Case study results

Conflict analysis: more research on water problems

The conflict analysis predicts that a new process with an open problem formulation, something that the inhabitants would like to see, is not feasible. Thus the province will always pursue the option of a lake in the polder as it is dependent on considerable funds from the national government that are granted for innovative projects that stimulate the local economy and enhance the environment. However, the analysis also shows that it is unlikely that the provincial government can unilaterally pursue the option of a lake; it has to consider the stakes of the local inhabitants in order to get the plans through the provincial council. It is therefore most likely that the provincial government will allow for additional research on the water management problems in the polder. More research on the water problems is best the inhabitants can opt for, as a new process is out of the question.

Transactional analysis: an intermediate strategy is possible

The transactional analysis shows how control and interest of the actors are spread over the different issues. The interest matrix (Table 5.7) showed that the issues “a supported solution” and “prestige” are the issues the actors are most interested in. The total amount of interest is the highest for these two issues. It thus seems that these issues are very important for the actors involved. These issues get more interest than the issues “water management” and “water storage” that represent the problem according to the province.

The equilibrium matrix (Table 5.9) shows that all actors can gain more control over the issues that interest them most. The provincial government, for example, gains more control over “water storage” and the inhabitants over “security and continuity,” “process objectivity,” “process transparency,” and “respect for landscape”. The equilibrium matrix suggests that a solution to the deadlock problem can be found where all actors are better off. This solution most likely is not one of the developed strategies. None of the strategies represent a situation where all actors are better off. This can be illustrated with the issues “respect for landscape” and “water storage.” The developed strategies either have a strong influence on the appearance of the polder or not (see Figure 5.1). A strong influence on the appearance of the polder is reflected by the realization of water storage in the strategies or low respect for the existing landscape. A low effect on the appearance of the polder is reflected by no realization of water storage and respect for the existing landscape. There is no strategy in which water storage is realized in combination with respect for landscape.

Q-methodology: flawed problem formulation and process

Q-methodology has resulted in five different perspectives:

- A: There are no water problems that legitimize an intervention in the polder.
- B: Area development offers possibilities.
- C: No construction.
- D: The inhabitants have been harmed and the polder should stay as it is.
- E: The approach of the process has been unjust.

Perspective A does not acknowledge the problem formulation and is the perspective to which most of the respondents contribute closely followed by perspective E. The perspectives show why certain inhabitants oppose to the idea of a lake. But this does not mean that change in the GMN polder is not possible.

From the perspective of the inhabitants there is room to progress. In order to move forward a well-defined problem must be made available. Also the analysis shows that if there could be made changes in the water management of the polder these changes are

most likely small changes. A strategy based on small scale interventions however was not researched by the project authorities.

5.7.2 How real world events evolved

In December 2007 the committee published its findings (Onderzoekscommissie Water en Bodemdaling Groot-Mijdrecht Noord 2007). In the foreword the committee wrote that it had trouble with the focus on the northern part of the polder and with understanding the problem. The polder is a unity and from a hydrological perspective there is no difference between the northern and the southern part of the polder. With regard to the problem the committee wondered what the main problem was in the polder. What water management issue weighs most? After discussions with the water board the (in)stability of the ground was pointed out as the main problem followed by the with salt polluted water that in dry periods is pumped out of the polder. The committee agreed that if more space is needed for the storage of excess water a vulnerable area like the GM polder is a first choice to look for this option (Onderzoekscommissie Water en Bodemdaling Groot-Mijdrecht Noord 2007).

The main points of critique of the committee regarded the research on the water system, the developed strategies, and the focus on the northern part of the polder by the provincial government. First, the quality of the hydrological models used in the research reports was found insufficient and inconsistent. Old hydrological models were used but not well adapted for the situation in the GM polder. Therefore the models used in the research reports did not adequately represent the ground water situation in the polder. Also the chance that the ground will “break open” in future was heavily accentuated but poorly underpinned. These estimates were based on the norms for excavation sites but flooding of excavation sites has never taken place in the GM polder. This should have been a sign that the excavation norms were insufficient. Second, the committee judged that the proposed strategies adequately represent the solution space. However, more attention should be paid to two strategies. In the strategy techniques it may be possible to produce drinking water that will lower the costs of the strategy techniques. For the strategy lake research on the consequences of the realization of a lake is poorly described (Onderzoekscommissie Water en Bodemdaling Groot-Mijdrecht Noord 2007). Even when a lake is created a large number of problems will continue to exist, especially in the southern part of the polder. The consequences of the realization of a lake regarding the southern part of the polder are still unclear. Third, the committee concluded that the focus on the northern part of the polder was probably made on economic terms as it is a sparsely populated area. But this choice was not made clear in advance.

In 2008 the provincial government decided to take up the findings of the committee and issued more research on: an improved ground water model to have better insight on the effects of the developed strategies, the subsidence in the polder on the long term till 2050, and the possibilities for drink water extraction from the polder (Provincie Utrecht 2008a). These results show that drinking water companies are not interested in making drinking water from the water from the polder. It showed that the chance of percolating water due to subsidence is much smaller than was suggested especially in the western part of the polder and that agriculture in the current situation is also possible in 2050 (Provincie Utrecht 2008b). Furthermore in September 2008 the Ministry of Housing, Spatial Planning and the Environment made it clear to the Provincial Government that it will not allow for the building of more houses in the polder as it would negatively affect the spatial appearance and quietness of the polder (College van Gedeputeerde Staten 2008). This decision affects three of the six develop strategies, lake, grow along, and heighten, that all included the building of more houses making these strategies now too expensive to pursue. Following this prohibition and the research results the provincial

government decided to develop an additional seventh strategy that would solve the water management issues and also be affordable (Provinciale Staten 2008).

5.7.2 Performance of the methods

Short term: December 2007 the committee findings

The findings of the committee focus on how the water management issues were represented and modeled and how choices that had been made in the process were unclear and not communicated to the involved people. Of the applied methods Q-methodology was able to show that the dominant perspective under the inhabitants was dissatisfaction with the problem formulation and the policy process. This is shown by perspective A that states that there are no water problems that legitimize an intervention in the polder and E that states that the approach of the process has not been right.

This large disagreement over the problem formulation was not found by the application of conflict analysis and transactional analysis. For conflict analysis disagreement over the problem formulation was mentioned as a reason to want to have a new process with an open problem formulation. However the analysis showed that a new process with an open problem formulation was unfeasible as none of the feasible scenario's included the option to restart the process. The conflict analysis did predict that more research would be done on the water problems and this did happen.

For the transactional analysis "water management" was modeled as an issue to represent the water management issues percolating water, polluted water, subsidence, and flooding. These issues according to the Province of Utrecht constitute the problem with the water management of the polder. The model reflected low interest in the issue on the part of the inhabitants but it did not reflect the large dissatisfaction of the inhabitants regarding this issue. The inhabitants simply did not acknowledge the issue while the other actors did. In the way we have applied transactional analysis it is important that the issues represent the same meaning for all the actors. Because this is not the case for the studied problem the results of the transactional analysis are influenced. It might have been possible to formulate the issues differently to circumvent this. On the other hand, this might be a limitation of the method itself. It seems very unlikely that all issues in a transactional analysis will always have the same meaning for all the actors.

The transactional analysis did include the issues "process objectivity" and "transparency." These issues reflect the dissatisfaction with the policy process. Although the dissatisfaction with the policy problem was not a result of the transactional analysis the transactional analysis did show that the inhabitants were unsatisfied with the policy process. The issues "process objectivity" and "transparency" received high interest from the inhabitants reflecting their preference for more control over this issue. This result does corresponded to real world events as the committee did critique the poor state of the reports and the unclear process (Onderzoekscommissie Water en Bodemdaling Groot-Mijdrecht Noord 2007; Keijts 2008).

All methods captured parts of reality and predicted parts of reality. On the short term, however, Q-methodology showed dissatisfaction with the problem and the process, something that the committee themselves had a hard time to uncover. The committee noted that based on the two main documents the problem formulation remained unclear. As an example they note that the main documents (Provincie Utrecht and AGV 2005, 2006) list a lot of problems but in a different sequence and without making clear what the main problem is (Onderzoekscommissie Water en Bodemdaling Groot-Mijdrecht Noord 2007, p.5). After speaking to the water board, the instability of the land was labeled as the most important problem and the committee focused on this issue. As described above the findings of the committee show that serious knowledge gaps regarding the stability of the land exist and further research has shown that the chance of percolating water due to

subsidence is much smaller than was suggested especially in the western part of the northern polder. These findings support the perspective of the inhabitants that have disagreed with the problem definition.

Longer term: December 2008 a new strategy

In December 2008 it was decided to develop a new strategy, a strategy that would solve the water management issues but also be affordable. Strategies like Heighten, Grow along, and Lake now have become too expensive to pursue. Also the additional research that was done showed that some of the water management issues had been exaggerated. It for example showed that the subsidence in the polder had been estimated too high for parts of the polder. The new strategy the province wants to develop has to be affordable and has to solve more of the water management problems than the strategies that have a low impact on the appearance of the polder. It also has to allow for agriculture for the coming decades in part of the polder (College van Gedeputeerde Staten 2008).

Both Q-methodology and transactional analysis show that a strategy for the polder that is based on smaller changes than flooding the whole polder or heightening the whole polder is possible. Transactional analysis shows this solution is possible for all actors while Q-methodology shows that this is a solution that the inhabitants prefer. The transactional analysis showed that a solution where everybody is better off is possible. It now seems that this solution is being sought by researching a seventh strategy. The impact of this strategy on the appearance of the polder is less than the Heighten, Grow along, and Lake as part of the landscape respected needs to be respected. This also means that the polder can not be flooded to serve as water storage in its entirety. It seems that this strategy might be able to combine the issues “water storage” and “respect for landscape” as proposed by the transactional analysis. Conflict analysis did not predict an intermediate solution. This is because the options that were used in the conflict analysis did not allow for this type of solution. That is, there was no option that suggested developing a new strategy. This type of option is not included as at the time of analysis this was not an option considered by the involved authorities. At the time of analysis this option did not exist. An intermediate option could have been added by the researcher. However, the goal of the research was not to think about hypothetical solutions to the problem but to model the deadlock itself. On the longer term it thus seems that transactional analysis resembles real world events more than conflict analysis and Q-methodology. Time will have to tell, however, what will be decided on the polder.

No complete hindsight

Interpreting the performance of the methods in light of real world events is difficult as no decision regarding the final policy solution for the polder has been made. As there is no complete hindsight we can not declare a ‘winner’. What we do see though is that over time parts of reality are captured by all three methods. On the short term Q-methodology was able to show that the inhabitants did not agree on the problem definition and the process. On the longer term transactional analysis resembles real world events the most.

Regarding our first premise that different methods yield different results, it is important to underscore that the methods did yield different results and that a selection of methods therefore is far from arbitrary. This conclusion that different methods yield different results is independent of what method in the end performed best. If in future we will have the final outcome of the case, we can then evaluate which of the methods had the highest predictive value and thus was most suitable.

Chapter 6

The network unbundling case¹³

6.1 Introduction

This case study is an analysis of the network ownership unbundling controversy in the Netherlands. The case of network ownership unbundling was chosen because it represents a conflict situation. In 2004 the Dutch government was convinced that the current organization of the Dutch energy companies was not adequate and was considering unbundling the integrated Dutch power companies. The power companies, of course, opposed.

The goal of the case is to compare the performance of the actor analysis methods conflict analysis and transactional analysis for a conflict situation. (For a short description on conflict analysis and transactional analysis see Chapter 2.) In Chapter 3 it was shown that transactional analysis has not been applied to a conflict situation while conflict analysis has.

We assumed that the fact that a method has not been applied to a specific type of problem does represent a limitation to the suitability of that method for that given type of problem. This second case study addresses this premise that a method that has not been used for a certain type of problem is less suitable than a method that has been applied for that type of problem. That is, the performance of the not yet applied method will be lower than the one that has already been applied.

In Section 6.2 we describe the background of the conflict and describe the composition of the Dutch energy industry. Section 6.3 and 6.4 discuss the application of transactional analysis and conflict analysis. Section 6.5 presents the case conclusions regarding the suitability of conflict analysis and transactional analysis for the conflict situation.

6.2 Case background and current status of the Dutch energy industry

In the nineties the belief was that publicly owned companies were not as efficient as private companies. These companies would perform better if they were liberalized – made private. The liberalization in Europe started on the initiative of the UK and Norway. In 1996 the European Commission issued Directive 96/92/EC, which formed the basis of the liberalization of the electricity markets in the European Union. The main goal was to form a single European market that would increase the competitiveness of the European economy (De Vries 2004, p.7). The reasons for the creation of an electricity market were an expected increase in efficiency of the energy companies with subsequent lower prices.

In 1995 the Dutch government published the third energy bill that set out to introduce

¹³ Major portions of this chapter appeared as Van der Lei (2005a and b)

competition in the electricity and gas industry. The electricity law of 1998 marked the start of the creation of an electricity and gas market in the Netherlands. Competition has been introduced by creating an electricity market where the vertically integrated electricity companies have been unbundled and partially privatized. Unbundling in the Netherlands has taken shape through the separation of supply, transmission, distribution, and generation of electricity in the value chain (see Figure 6.1).

Thirty eight percent of Dutch generation capacity is owned by large Dutch integrated power companies (ECN 2003). Transmission is the responsibility of the national Transmissions System Operator (TSO) that owns the 380 kV and the 220 kV grids. The Dutch TSO, called Tennet, is owned by the national government. The 150 kV to 230V distribution grids are operated by the network companies. Supply companies buy the electricity from generation companies on the wholesale market and sell the electricity to consumers. The total amount of consumed electricity was about 120 TWh in 2003 of which 20 TWh was imported. The liberalized Dutch electricity market opened on 1 July 2004. All consumers are now allowed to choose their electricity *suppliers*.



Figure 6.1: Representation of the unbundled value chain for the Dutch electricity industry.

Electricity companies in The Netherlands are allowed to be any combination of generation, distribution or supply. However, the different parts have to form legally separate companies within the larger holding. Generation companies and supply companies may be privately owned companies; network companies are responsible for the distribution of the electricity and are publicly owned. The dominant combination in the Dutch industry is distribution combined with supply. Three large integrated power companies Nuon, Essent, and Eneco own 40% of generation, 90% of the distribution lines, and supply 90% of the household consumers (Centraal Planbureau 2005).

6.2.1 Ownership unbundling of the network companies

The underlying reasons for the liberalization of the electricity markets were predominantly economic and focused on efficient market arrangement. Recent blackouts that came as a consequence of the new market organization contribute to the awareness of public values related to the electricity industry. The energy crisis in California between the summers of 2000 and 2001, for example, was caused by a lack of investment in generation capacity (De Vries 2004, p.54). The major US Canada blackout on August 14 2003, for example, was caused by inadequate network operation (U.S. - Canada Power System Outage Task Force, April 2004, p. 18-19).

Before, environmental issues and reliability of service played a secondary role. Reliability of service, however, has become more important after some major blackouts occurred in the electricity systems around the world. EU Directive 2003/54/EC, therefore, pays more attention to the reliability of service (De Vries 2004, p.8). More recently the white paper on services of general interest published on 12 May 2004 underlines the importance of the reliability of services and other public values associated with infrastructures (European Commission 2004). In an attempt to safeguard public values related to the power lines the Dutch government has set on a course of network ownership unbundling.

Network companies are responsible for the distribution of electricity (see Figure 2). At this point in time, nearly all Dutch network companies are not individual companies but are part of three larger integrated power companies that generate, distribute and supply electricity. It is the intention of the Dutch government to protect the reliability of network operation and ensure effective market arrangement by splitting off the network companies economically from the large integrated power companies. This split goes further than is required by EU law since the law only requires a legal split of the network companies.

The reasons of the government for pursuing unbundling are twofold. First, the government claims that the dominant activity of the large integrated power companies in the different parts of the value chain undermines the level playing field for new entrants. In addition to this there is a growing awareness that only the large players on the European electricity market will survive. In the past merger negotiations between the four large Dutch generation companies failed, resulting in the takeover of three of the four large power producers in the Netherlands by foreign companies (ECN 2003). The same could be expected for the network companies resulting in the distribution lines being owned by foreign companies. This foreign ownership could introduce new uncertainties regarding the maintenance and investments of the networks (*e.g.* Baarsma 2004; Brinkhorst 2004b).

6.2.2 Possible manners of ownership unbundling

There are several policies possible in this case. The Dutch Energy Council has identified possible policy options for splitting off the network companies (Algemene Energieraad 2004). These options range from 100% public control of the network companies to a 100% privatization. In a 100% public control scenario the network companies responsible for distribution are publicly owned. In this case only generation and supply may be privately owned. The supply companies and generation companies compete in the market. Transmission and distribution are publicly controlled thereby leaving all power lines in public hands. In a 100% privatization scenario distribution may be privately owned, and transmission remains publicly owned. These two policy options make up the boundaries of the design space for the government (see Figure 6.2). In this chapter we examine this design space for this conflict for the most important stakeholders involved.

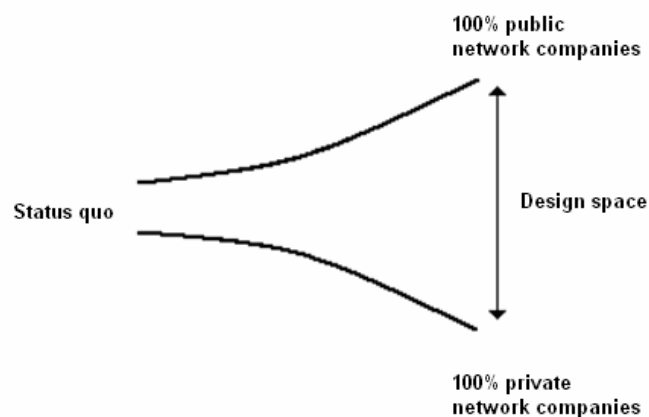


Figure 6.2: Representation of the possible futures that can be reached from the status quo.

6.3 Approach conflict analysis and transactional analysis

The chosen approach of the actor analysis methods is that of desk research. For both methods the key stakeholders, or critical stakeholders, need to be identified. In general, the published applications of conflict analysis do not focus on the way the core stakeholders were selected. Among the applications of transactional analysis this is lacking although a positive exception is Timmermans (2004b).

We performed a stakeholder identification exercise (Koppenjan and Klijn 2004) to arrive at the three key stakeholders in this case. The key stakeholders for the case are the Dutch “national government,” the “provincial and local governments,” and the board of the “integrated power companies.” Examples of stakeholders that were left out are the Dutch Transmissions System Operator (TSO), the Dutch consumer organization, and foreign energy companies. These stakeholders all have a stake in the conflict situation but these stakeholders were not judged to be critical regarding the possible unbundling of the network companies.

The data needs about the stakeholders for the transactional analysis are the *issues*, and judgments about *control* and *interests* over the issues (see Chapter 4 for a more detailed explanation of the method). For transactional analysis the issues of the stakeholders are gathered from arguments of the actors published in the media. The interest and control over the issues are quantified by the analyst who refers to the statements made in media by the actors.

The data that is needed on the stakeholders for the conflict analysis are the *options* of the stakeholders and the *preferences* of the stakeholders over the scenarios the method develops (see Chapter 4 for a more detailed explanation of the method). For conflict analysis the options of the stakeholders were gathered from literature. They are a combination of the report by the Algemene Energieraad (2004) and a letter from the Minister to the parliament (Brinkhorst 2004a). The preferences over the scenarios are argued by referring to literature and popular media.

Stakeholder analyses are snapshots and represent a fixed moment in time. This also holds for the preferences modeled by the analyst. It is therefore necessary to mention that this case study work was done at the end of 2004 and the beginning of 2005.

6.4 Transactional analysis applied

6.4.1 Issues for transactional analysis

Table 6.1 presents the issues of the actors for the transactional analysis. These issues were gathered from literature. Although every actor has a degree of control and interest over all issues, the issues are best explained from the viewpoint of the actors that are most interested in these issues.

Table 6.1: Stakeholders and issues represented for the case of network ownership in the Netherlands.

Stakeholder	Issues
National government	Reliability of network operation Market efficiency
Provincial and local governments	Value of shares
Integrated power companies	Continuity of company

Issues for the national government

The first issue is the “reliability of network operation.” This issue has a national and an international component. On a national level, the government is concerned with the quality of the network. That is, enough investments in the maintenance and development of the network. At this point in time the network company’s profits provide a stable cash flow for the large integrated power companies. The flow is stable because the network companies are natural monopolists: the number of serviced connections of network companies remains the same since consumers can not choose network companies.¹⁴ However, the profits of the network companies can be used for the commercial activities of the larger holding, thereby reducing the amount of money left for maintenance and development of the networks. Therefore the quality of the network companies is, from the perspective of the government, likely to decline as a consequence of this situation.

In addition, the physical network is a valuable asset, the book value of the networks may be 70-80 percent of the total balance sheet value (SEO and Norton Rose 2004). Also the integrated power companies use the networks as a security to obtain funds. The distribution networks are part of so called cross-border leases in which the distribution networks are sold to U.S. companies and leased back. The tax benefit that this generates is split between the companies.

The international component is related to the growing awareness that only the large players on the European electricity market will survive. It is feared that the reliability of network operation could decline because of lack of investments when the distribution networks are owned by foreign companies (Brinkhorst 2004a).

The second issue for the government is “market efficiency.” One of the conditions for an efficient market is free entry and exit (Waldman and Jensen 2001). Some strategic behavior has occurred that limits the market entry of new supply companies. Supply companies pay the generation companies for the electricity they buy which they then sell to consumers. Next to this, the supply companies pay upfront for the distribution costs when separate billing of the network company and the supply company does not take place. To make sure that new supply companies can pay the distribution costs the network companies demand the severest form of financial guarantee, a bank guarantee for the distribution costs of two months (KPMG 2004). This requirement was imposed after energy supply EnergyXS went bankrupt, despite having customers who had paid for the distribution of the electricity. Nonetheless the payments had not all been made to the network companies. The network companies were confronted with losses up to six months worth of distribution costs. This guarantee comes in addition to a cash deposit that already is installed. More importantly, the amount of money that needs to be guaranteed is higher than when the distribution company and supply company are part of the same holding. These factors undermine the level playing field for new entrants.

Issue for the Provincial and local governments

The provincial and local governments in The Netherlands are the shareholders of the large integrated power companies. This as, in the past, these companies were owned and managed by provincial and local governments. The most important issue for them is the money “value of the shares” they hold in the large integrated power companies. Numerous provinces and municipalities have indicated that they would like to sell their shares (Brinkhorst 2004a). It is generally felt amongst the provincial and local governments that owning large companies that operate on the market is not in line with their public task and want to sell their shares (*e.g.* Brinkhorst 2004a). In addition, and probably more important, selling the shares would provide the shareholders with a large

¹⁴ The network company only changes for a consumer when it moves to another network area. The network companies themselves get more ‘clients’ when for example new houses are build.

amount of money. In the current situation, the *status quo*, it is not allowed for a private party to hold shares in network companies and the provincial and local governments can not sell their shares to private parties as part of the value of the shares of the integrated power companies reflects the value of the network companies. They may, in theory, sell their shares to other public parties, maybe as a result of a merger, but private parties most likely would pay considerably more money for the shares. Also one might wonder what public party would have the funds to buy the shares and how it would benefit this public party. Except for the dividend that is returned to the shareholders the money that the shares represent is sunk in the companies.

Issue for the integrated power companies

The “continuity of the company” is the most important issue for the large integrated power companies. The turnover of the three large integrated power companies is about 15 billion Euros a year. The three large integrated power companies in the Netherlands own 90% of distribution capacity (Baarsma *et al.* 2004). These companies own some generation capacity; this amount is however limited to about 40% of national generation. Removing the network companies from the larger holding has a negative effect on the value of the larger holding as the networks represent a large part of the value of the company. Typical arguments of the large integrated companies have been that the unbundling of the network companies will make the remaining holding more vulnerable for hostile takeovers and that it will lead to job loss in the Netherlands (Nieuwsbank 2004).

6.4.2 Interest and control over issues

Tables 6.2 and 6.3 represent interest and control of actors over the issues represented in Table 6.1. The issues of interest and control were obtained by the analyst, who assessed the importance of the issues for the actors on a four point scale: most important, important, unimportant, most unimportant (see Tables 3.1 and 3.2 in Appendix 3). The preferences were translated into numbers according to Timmermans (2004 a, p.91) and the matrices were normalized – horizontally for the issues in the table of interest and vertically for actors in the table of control. The numbers in Tables 6.2 and 6.3 describe the status quo at the end of 2004 and only have meaning relative to one and other.

The concern of the government regarding the reliability of network operation and efficient market arrangement is reflected in the table of interest; it shows that the government has more interest in these issues than the provincial and local governments and the integrated power companies do. The large integrated power companies value the value of the shares and the continuity of the company the most. Provincial and local government score about the same for all issues, the interest in possibly selling the shares is reflected in a higher score for the value of the shares and the continuity of the company that both influence this.

Table 6.2: Table of interest for the status quo.

	Reliability of network operation	Market efficiency	Value of shares	Continuity of company	Total
Government	0.32	0.32	0.18	0.18	1.00
Provincial and local governments	0.24	0.22	0.27	0.27	1.00
Integrated power companies	0.18	0.18	0.32	0.32	1.00
Total	0.74	0.72	0.77	0.77	3.00

Table 6.3 shows that the power of the government regarding the unbundling of the network companies is reflected in the *status quo* as the government has more control over the value of the shares and the continuity of the company than the integrated power companies do. The integrated power companies have the most control over reliability of network operation and efficient market arrangement as the power companies own the networks and have, as incumbents, strong positions in the market.

Table 6.3: Table of control status quo.

	Reliability of network operation	Market efficiency	Value of shares	Continuity of company	Total
Government	0.24	0.27	0.40	0.40	1.31
Provincial and local governments	0.29	0.33	0.40	0.40	1.42
Integrated power companies	0.47	0.39	0.20	0.20	1.26
Total	1.00	1.00	1.00	1.00	4.00

6.4.3 Results transactional analysis

The situation of equilibrium control resembles the optimal agreement the stakeholders can make given the control and interest they have for the issues, the Pareto optimum. This optimal agreement may not be optimal for a single stakeholder but is always an improvement for the group of stakeholders as a whole versus the *status quo*. Table 6.4 illustrates the table of equilibrium control and is the result of the transformation of the *status quo* distribution of control and interest over the issues (Tables 6.2 and 6.3).

In Table 6.4 we see that the government has gained control over reliability and competition, compared to Table 6.3, whereas the power companies have gained control over the value of shares and the continuity of the company. The table of equilibrium control also suggests that the provincial and local governments loose some control over the value of shares and the continuity of the company in return for a greater guarantee of reliability.

Table 6.4: Table of equilibrium control.

C* equilibrium control	Reliability of network operation	Market efficiency	Value of shares	Continuity of company	Total
Government	0.43	0.44	0.23	0.23	1.33
Provincial and local governments	0.35	0.33	0.37	0.38	1.43
Power companies	0.23	0.23	0.39	0.39	1.24
Total	1.00	1.00	1.00	1.00	4.00

What do these numbers mean in reality? When we compare the outcome to the possible design space we can draw more conclusions. As shown in Section 6.5.2 the design space lies between 100% public control and 100% private control over the network companies. An outcome of 100% public control is characterized by the shares of the network companies being in public possession. This may be any public authority but in this case it is most likely that in a 100% public control situation the national government will buy the shares of the provincial and local governments (Baarsma 2004). An outcome of 100%

private control is a situation where the network companies have been privatized and only the high voltage lines remain public.

Given the results, a 100% private control is unlikely, as in this case control over reliability of network operation and efficient market arrangement should lie predominantly with the integrated power companies. The equilibrium table of control shows that the government has most control over these issues. Also, a 100% public control outcome is unlikely as this would leave very little to no control over the issues reliability of network operation and efficient market arrangement for the large integrated power companies and the equilibrium table of control shows that still 20 percent of total control remains with these companies. As the government has more control over reliability of network operation and efficient market arrangement in the equilibrium situation than in the status quo, one can say that the equilibrium reflects a solution where the public influence in the network companies is higher than in the existing situation. The solution thus reflects a situation where public control over the network companies increases.

6.5 Conflict analysis applied

6.5.1 Options for the actors

Options for the national government

The government has three options (Brinkhorst 2004b, Algemene Energieraad 2004). First, the government may prohibit parties from owning shares in both network companies and the rest of the holding: supply companies and possibly generation companies. This measure would separate the network companies from the large integrated power companies and would prevent that the profits of the network companies are used for other activities than the maintenance or extension of the distribution networks. But the type of ownership of the network companies, public or private, is not restricted.

Second, the government can place the network companies under public control by prohibiting private parties to own shares of the network companies. This measure had the same advantage as the first measure in addition it could provide a better insurance that enough investments are made in the networks as the companies would not need to compete on the market. The first two options require anew organization of the shares as the current shares represent the integrated companies.

Third, the government could privatize the network companies. In the status quo a share in the large integrated power companies represents the network companies as well as the supply company. Privatization of the network companies would mean that the current shareholders would be allowed to sell their shares of the large integrated power companies as the other parts of the holding may be privately owned. In this case there is no need to split of the shares that represent the network companies.

Finally, the government may also do nothing and not apply options one, two and three (the current status quo for the national government).

Option for the provincial and local governments

The provincial and local governments have a single option represented by the option “sell shares.” The shares of the provincial and local governments represent the network companies as well as the other parts of the integrated power companies. The provincial and local governments would like to sell all their shares but current legislation prohibits them.

The shareholder have no other options, like influencing the decision of the board, as the Dutch energy companies are so-called “structuur NVs;” in these companies the power

of the shareholders is limited and shareholders have very little influence on the decisions made (Brinkhorst 2004 a; Appendix 2).

Options for the integrated power companies

The three large integrated power companies have two options “lobby the government” and “lobby the share holders” that they can play. Lobbying the provincial and local governments the integrated companies argue that unbundling of the network companies will reduce the total economic value of the shares. “The whole is worth more than the sum of its parts.” The province of Gelderland for example has estimated a 500,000 to 700,000 Euro loss of the value of the shares (Provincie Gelderland 2005) if the network companies are unbundled from the large integrated power companies. Lobbying the government the integrated companies argue that unbundling of the network companies will make the remaining holding, when privatized, more vulnerable for hostile takeovers (Nieuwsbank 2004).

Table 6.5 represents the summary of the options for the actors involved. As explained options may be played or not played. For example, if the provincial and local governments do not play option 4 they hold on to their shares.

Table 6.5: Stakeholders and options represented for the case of network ownership in the Netherlands.

Stakeholder	Options
National government	<ol style="list-style-type: none"> 1. Prohibition of possession of shares in both types of companies 2. Prohibition of possession of shares of the network company by private parties 3. Allow for the privatization of the network companies
Provincial and local governments	<ol style="list-style-type: none"> 4. Sell shares
Integrated power companies	<ol style="list-style-type: none"> 5. Lobby the provincial and local governments 6. Lobby the government

6.5.2 Feasible scenarios and preferences over scenarios

Every possible combination of options is a potential scenario. Since there are six options held by the actors there are $2^6 = 64$ scenarios possible in total. A large part of these scenarios are infeasible as the combination of options is not possible in reality. Therefore the infeasible scenarios are removed. In Appendix 3.2.1 the rationale behind the removal of the infeasible scenarios is illustrated. After removing the infeasible scenarios 21 feasible scenarios are left

Table 6.6 shows the scenarios after the infeasible scenarios are deleted. A ‘1’ means the option is played and a ‘0’ means an option is not played. For convenience the scenarios are translated into decimals and the preferences order of the different actors for the scenarios is represented in Table 6.7.

Table 6.6: Overview of the feasible scenarios.

Actors	Options	Scenarios																				
National government	1	0	1	0	1	1	0	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1
	2	0	0	1	1	0	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	0
	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Provincial and local governments	4	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1
Integrated power companies	5	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1
	6	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
Decimal		0	1	2	3	9	12	16	17	18	19	25	32	33	34	35	41	48	49	50	51	57

Table 6.7: Preferences over scenarios.

Actor	Preference order
National government	3, 19, 35, 51, 2, 18, 34, 50, 10, 1, 9, 17, 25, 33, 41, 49, 57, 0, 16, 32, 48, 12
Provincial and local governments	12, 9, 25, 41, 57, 10, 3, 19, 35, 51, 2, 18, 34, 50, 1, 17, 33, 49, 0, 16, 32, 48
Integrated power companies	0, 16, 32, 48, 12, 1, 17, 33, 49, 9, 25, 41, 57, 2, 3, 18, 34, 50, 10, 19, 35, 51

The preference order shows that the government is most interested in scenarios with a lot of public control over the network companies. The shareholders are interested in scenarios where they expect that the value of the shares will be the highest, thus favoring full liberalization of the large integrated power companies. Finally, the integrated power companies are interested in scenarios where the continuity of the company is the highest which is the current situation next to that they prefer the scenarios where the companies are not unbundled. This because in the current situation the board of directors of the large integrated power companies have a lot of power, while the shareholders have limited decision-making power and are stuck in a situation where they can not sell their shares. This situation leaves a lot of decision-making room for the board of directors of the integrated power companies. One would expect the large integrated power companies to be in favor of privatization, however, privatization is estimated to be risky for the continuity of the company as it would increase the power of the shareholders and could make the company vulnerable for foreign takeovers. This could limit the power of the board. Therefore the *status quo* is the most preferred situation for the integrated power companies and we assume the large integrated power companies would like to keep it this way.

6.5.3 Results of conflict analysis

There are a number of different equilibrium solutions possible for a conflict analysis depending on the chosen solution concept (Fraser and Hipel 1984). Here a scenario is considered an equilibrium solution when no actor except the one's perspective that is taken can play an option in such a way that the outcome would be different. In this way the conflict analysis may provide insight into strategic behavior since an actor may not play an option if it enables another actor to alter the outcome.

The conflict analysis results in five equilibria. The equilibria range between 100% public control and 100% private control and are represented in Table 6.8. The "*status quo*" scenario is the situation of the end of 2004 and is characterized by the integrated power companies lobbying the government and the provincial and local governments. In all other scenarios the large integrated power companies are unbundled in some way and

the lobby option is not played any longer. This reflects the aversion to any change in the current ownership construction of the large integrated power companies. Of course a decision by the government may cause these actors to change the nature of their lobby; what this new lobby would be is unknown and not part of the current problem and therefore no part of the analysis.

The “100% public” scenario is characterized by the national government playing options one and two. In this case the network companies may only be owned by public authorities and the shares in the other parts of the integrated company, like the supply company, need to be sold. We have, however, assumed that the government would exempt the current shareholders from selling their shares of the non-network part of the companies. Currently the view is that the companies are worth more together than separately. However, should the government pursue the 100% public scenario (or the public network companies scenario) then most likely the provincial and local governments would start thinking about selling the non-network company shares, if and how they could do this is a consequence of the decision made by the government and not part of the analysis

The "public network companies" scenario is characterized by public network companies; but the provincial and local governments are allowed to keep the shares of the other parts of the company if they wish to do so.

The “split shareholders” scenario splits the network companies from the large integrated power companies and requires that shareholders may not own shares in a network company and a supply or generation company. Both types of companies may be privately owned. In this scenario the money that is made in the network company can not be used for activities that the generation companies or supply companies want to pursue. A consequence of this action from the government is that the provincial and local governments are most likely to sell their shares. Also in the “100% private” scenario the provincial and local governments are most likely to sell their shares.

Table 6.8: Representation of the five equilibria.

Stakeholder	Option	Scenario				
		Status quo	100 % Public	Public network companies	Split share holders	100% Private
National government	Prohibition of possession of shares in both types of companies	0	1	0	1	0
National government	Prohibition of possession of shares of the network company by private parties	0	1	1	0	0
National government	Allow for the privatization of the network companies (allow shareholders to sell shares)	0	0	0	0	1
Provincial and local government	Sell shares	0	0	0	1	1
Integrated power companies	Lobby the shareholders	1	0	0	0	0
Integrated power companies	Lobby the government	1	0	0	0	0

The results of the analysis also show that the government is the only actor that can freely move between the equilibriums. Figure 6.3 shows the allowed moves for the government and shows that from the 100% public scenario all other scenarios can still be reached. This in contrast to the split shareholder, public network company, and 100% private scenario. The other actors, the provincial and local governments and integrated power companies, can not alter the outcomes of the conflict with the options they have. This means that the government is free to choose the scenario it prefers most which, given the preference order in Table 6.7, would be the 100% public scenario.

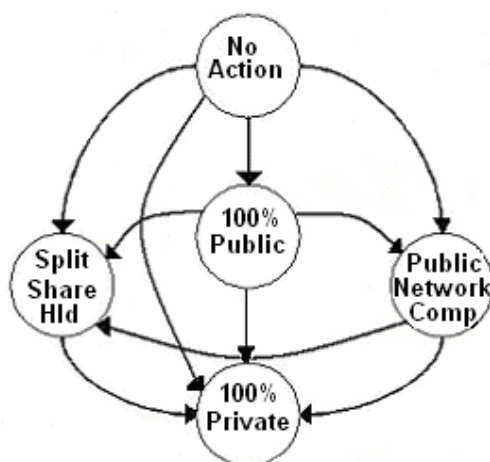


Figure 6.3: Different transitions between possible scenarios represented for the Dutch government.

This analysis shows that a 100% public control scenario is the most likely scenario. This, however, is a simplified representation of reality. Here we have assumed that lobbying the government has no success. Part of the lobby of the integrated power companies has been to threaten to go to court in order to claim anticipated losses, or this could even have been a separate option. It is hard to judge the weight of this option but it seems reasonable to assume that threatening to go to court has little success as the government is legally allowed to pursue a policy of 100% public control of the network companies when it can prove that public interest is otherwise harmed (SEO and Norton Rose 2004).

6.6 Case conclusions

The suitability of different actor analysis techniques may differ for different problem situations - an issue that has not been addressed much in policy analysis literature so far. As a first step in bridging this gap we have performed a conflict analysis and a transactional analysis for a conflict situation. Conflict analysis has been applied to conflict situations before whereas transactional analysis has not been applied to conflict situations.

6.6.1 Case study results

We applied the two actor analyses methods to the possible unbundling of the distribution companies from the large integrated power companies in the Netherlands. The transactional analysis showed that an outcome with more control over the issues of interest for the government – network reliability and market arrangement - is possible (see Figure 5) but that this situation is not a situation of a 100% public control over the network companies. The conflict analysis shows that the government has the power to

choose the scenario it prefers most as the other actors have no options that can help prevent the preferred outcome of the government. This holds true only if there is no credible threat of the other actors of going to court. The recommendation to the government based on the conflict analysis would be to aim for a 100% public control as it is the most preferred scenario of the government.

6.6.2 How real world events evolved

What happened in reality? The case study was done end of 2004. In March 2005 the government decided to try and pursue a 100% public control of the network companies. In a law it proposed to unbundle the large integrated power companies and a transfer of part of the distribution network to the Dutch TSO. This law was accepted by the Dutch parliament and was sent to the senate. 15 November 2006 the senate agreed on the law but attached several conditions to the law limiting immediate unbundling (Eerste Kamer 2006b). These conditions regarded potential negative international activities or undesirable market power of the power companies' (Eerste Kamer 2006a).

The senate wished to wait for two reasons. First, it expected that the European Union would develop a directive on the issue. Second, the financial risks regarding the cross boarder leases were found too high to unbundle at that point in time. The unbundling law may directly be implemented whenever foreign activities of the large integrated power companies endanger the public values attributed to the networks.

In June 2007 the new Minister of Economic Affairs decided to unbundle the distribution companies from the large integrated power companies (*e.g.* Nu.nl 2007). Reason for this was the announcement of a power company called Delta to buy a large Belgium waste disposal company, and the announcement of two integrated power companies, Nuon and Essent, that wanted to merge to be able to grow into a large international firm. These two events prompted the Minister to take action.

Overall the events from 2005 to 2007 showed a tendency towards more public control over the distribution networks with ultimately the decision made by the new Minister of Economic Affairs to totally unbundle the distribution companies – thus deciding to go for a 100% public control (see Figure 6.4).

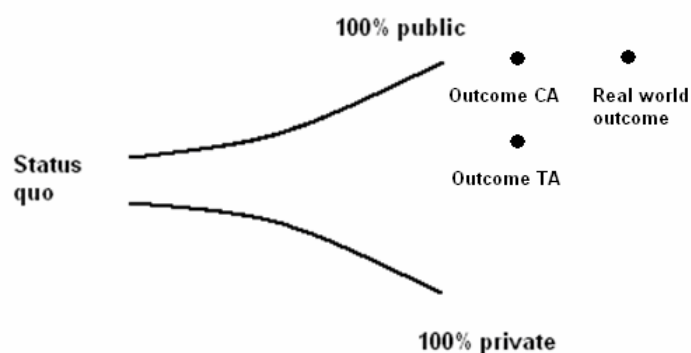


Figure 6.4: Outcomes of conflict analysis (CA) and transactional analysis (TA) and real world outcome represented in the design space.

6.6.2 Performance of the methods

In this case a final decision regarding the ownership of the Dutch network companies was made. It was decided to unbundle the network companies and leave them in public ownership. In this case we thus can use our proxy: the predictive value of the actor analysis method used in relation to our framework.

The transactional analysis suggested an outcome with more control over the issues of interest for the government. This happened: as the network companies will be unbundled from the large integrated power companies. But the transactional analysis also predicted an increase in control over the continuity of the company for the power companies. This did not happen as it was decided that the network companies are now to be unbundled which leaves the remaining part of the company more vulnerable for takeovers. The transactional analysis predicted some loss of control for the provincial and local governments over the value of the shares and the continuity of the companies. The accepted law gave the government the means to unbundle the large integrated power companies; while before, the discussion was whether the government was allowed to do so. Therefore the passing of the law has shifted some control away from the local and provincial governments to the government for this issue.

On the whole the transactional analysis predicted less well than the conflict analysis. The transactional analysis resulted in a division of control between the actors which in practice did not take place. For example an increase in control over the value of shares and the continuity of the company was not realized for the large integrated power companies, not when the law passed and not when the decisions to unbundle was taken. Although the mere structuring of the tables of interest and control for the status quo was beneficial in understanding how control and interest are spread amongst the actors.

Conflict analysis and transactional analysis model the problem in a different way. For transactional analysis the value of shares is an issue, whereas the possibility to sell the shares is an option in the conflict analysis. Conflict analysis directly models the actions that the actors can take whereas transactional analysis models the issues.

The reason why conflict analysis performed better than the transactional analysis may lie in the rationale of the method where each actor trades control over issues for control over issues of interest. It seems that there was no trade made with the other actors as the national government acted on its own. The solutions 100% public or private control lie at the extreme of the design space and can not be reached in the transactional model since the outcome must always be an improvement for the group as a whole. The basic idea of the method, that people trade control over issues, is not the most appropriate one for this conflict situation.

It therefore seems appropriate that in the studied sample of applications of actor analysis methods transactional analysis had not been applied for a conflict situation. Our premise regarding the framework might be correct in this case. One could say that in a situation where the actors' interests are opposed, and when they are not willing to negotiate, a conflict analysis method where the possibilities of each actor are analyzed is a better predictive method than a transactional analysis method that assumes cooperation in the form of trade of control. In this case conflict analysis was thus the more suitable method.

Chapter 7

Developing insight into the performance of methods: From the use of single method case histories to diagnostics

7.1 Introduction

There is a gap in the policy analytic literature regarding actor analysis methods. In literature, little is documented on advantages and disadvantages of different actor analysis methods when applied to a given problem situation. This is peculiar as we, as policy analysts, given a problem make choices regarding the suitability of the different methods in our toolbox and, in fact, like to say that we are specialists at making these choices. Instead, what we do see in the policy analytic literature is that more and more actor analysis methods are developed, but research attention regarding the testing of the performance of different actor analysis methods is lacking. More insight into the performance of actor analysis methods would make method choice easier for both the analyst with an interest in scientific research and the practitioner with a focus on applying methods to problems to analyze concrete settings.

From the observation of this knowledge gap this thesis was born. In this thesis we address three sub research questions and in this concluding chapter we will answer the overall research question: *How and to what extent can we provide a framework that guides the selection of actor analysis methods for multi-actor policy problems?* Before we address the overall research question we will readdress the research sub-questions and reflect on the findings they resulted in (Section 7.2-7.4). Subsequently the main research question of this thesis is answered and possible future research addressed (Section 7.5).

7.2 Research part one: What are actor analysis methods, what do they and how do they differ from single-actor methods and “non-actor methods”

No clear and agreed upon demarcation of the actor analysis field exists although some researchers do provide overviews on what they consider actor analysis methods to be. As we showed in Chapter 2 there are very few overviews of different actor analysis methods that surpass the single field boundary. Hammond (1996) focuses on purposive actor models whereas Hermans (2005) focuses on actor analysis methods that can be linked to theories of multi-actor policy making processes. These overviews, although useful, did not meet our purposes as the methods that were considered to be actor analysis methods were defined differently given our research intention. As our goal is to provide more rigor to the selection of actor analysis methods for problems we needed an overview of the field. That is, we needed clear insight into what we consider an actor analysis method is and what it is not. Only after setting the boundaries around the field it was possible to

make a categorization (see Figure 2.6) of the different types of actor analysis methods in the field.

We conclude that the primary difference between a non-actor analysis method and an actor analysis method is that the method *itself* focuses on the analysis of characteristics of *multiple* actors. A non-actor analysis method therefore does not explicitly model characteristics of actors and can be used to model a problem domain without human actors. Applications of non-actor methods where attributes or characteristics of humans are modeled are possible though. Examples of non-actor analysis methods are: weather forecasting models, and hydrological models, but also system dynamics and queueing models.

In Chapter 2 we choose the following definition of an actor analysis method: a method that allows for the study of some or one characteristic of multiple actors. Characteristics might be: options, relationships, and issues the actors have. Starting from the definition we distinguished two types of actor analysis methods: actor analysis methods that model multi-actor decision-making, and structural actor analysis methods. We conclude that the actor analysis methods that model multi-actor decision-making can be subdivided into two groups: bottom up and top-down methods. The structural actor analysis methods can be subdivided into structural methods that focus on the actors or on the relationships between the actors.

Our categorization focuses on what the actor analysis method models and not what mathematical principle or policy theory it adheres to. That is, we focused on what characteristics of multiple actors are modeled (and simplified) by the methods irrespective of the mechanisms and theory they adhere to. Our perspective is but one possible perspective on many actor analysis methods although, to our knowledge, it is the first perspective that reasons from what the methods model about multiple actors. The merit of the developed categorization is that a wide variety of actor analysis methods can be placed in it. Of course our list of actor analysis methods is not comprehensive as many more actor analysis methods exist. The natural disadvantage of a categorization that fits a wide variety of methods is that the categorization is broad. Overall, we believe our perspective shows the current range of actor analysis methods in the policy analyst's toolbox.

7.3 Research part two: How and for what reasons have actor analysis methods been applied

From the categorization of actor analysis methods we selected 5 actor analysis methods for further study. In Chapter 3 we describe how we analyzed 19 papers with applications of these actor analysis methods in order to understand how and why these methods have been applied. We analyzed the papers on five important elements of the modeling process: the "problem" element represents the nature of the problem situation described, the "method choice" element represents why the particular method was chosen, its justification, the "approach of modeling process" element represents the way of working chosen for the research, the "validation" element represents how the results of the application of the actor analysis method were validated and the "results" element represents the type of results that the application of the actor analysis method delivered.

In order to understand how actor analysis methods have been applied, we look at the elements "approach," "validation," and "results." Although most actor analysis methods have been applied in an intervention setting, the dominant modeling approach for the selected actor analysis methods was desk research. The result of an actor analysis method can be either descriptive or prescriptive and in general the outcomes are regarded as a positive contribution to the goal of the research. Less attention, however, was paid to the validation of these positive results. We conclude that the field of actor analysis methods is

still developing as most authors seem to be either exploring the utility or advocating the methods.

In order to understand why actor analysis methods have been applied we look at the elements “method choice” and “problem.” Relatively little is said about why a specific method was applied for the specific problem situation. In our sample only once an actor analysis method was applied to resolve a specific real-world problem situation. Most authors either contrast the method to the dominant practice in the field, or focus on explaining the method and illustrating its usefulness. This may also be the result of the fact that we studied scientific papers: the author’s research goal is most often not to study the policy problem. As the goal of the methods is to help analysts understand policy problems in which multiple actors are involved the absence of arguments why the problem situation was suitable for the method was unexpected. The problem category shows for what multi-actor problems the studied actor analysis methods are applied. We inferred the developed categorization of multi-actor problems from the authors’ descriptions of the policy problems. We categorized the problem situations described in the studied papers as deadlock, conflict or negotiation.

The analysis resulted in a table (see Table 8.1) that shows for which problem types what actor analysis methods have been used. Drama theory and transactional analysis seem to be used mostly for negotiation situations. Hypergames are only used for conflict situations. Q-methodology has been used for deadlock situations. Metagames / conflict analysis can not be related to a single problem situation and have been applied in all situations. It was upon this table that the case study approach was based.

Table 8.1: Different types of problems and the actor analysis methods that have been applied to the problem situations.

Method	Hypergames	Meta games/ conflict analysis	Q-methodology	Transactional analysis	Drama theory
Problem					
Conflict	X	X			
Deadlock		X	X	X	
Negotiation	X	X		X	X

7.4 Other frameworks and types of problems in literature

We chose to analyze a sample of papers with applications of actor analysis methods in order to find out to what problems the actor analysis methods have been applied. The problem categories were developed on the basis of researchers’ descriptions of problem situations; some interpretation is done on our part. In our study, we used an analysis of existing papers documenting the applications of actor analysis methods as a starting point. To our knowledge, this represents the first attempt at inducing a classification of multi-actor problems based on published studies with the objective to link that classification to different multi-actor methods. In other words, we took the cases documented in literature as starting point. Although the literature on the nature of policy problems related to methods might be labeled as under-developed, a number of authors have made some suggestions based on more theoretical considerations. We found two papers with an intention of relating policy problems to methods.

Peters (2005) describes seven characteristics of policy problems: solubility, complexity, scale, divisibility, monetarization, scope of activity, and interdependency of problems. In Peters’ view (2005) these characteristics can all help the policy design and ultimately help in selecting the appropriate instruments for policy problems. Although Peters starts with the general problem of the lack of insight in what methods are suited for which problems, he limits himself to just a categorization of problems. That is, he does

not pursue the linking of individual methods to the categorization he developed. He acknowledges this limitation, and argues that further research should be directed toward the topic of linking methods to problems.

French and Geldermann (2005), categorize methods in a grid where the vertical axis represents the level of decision support for policy makers and the horizontal axis represents the degree of structure of the problem. In the grid different groups of methods: artificial intelligence and expert systems, operations research models, decision analysis, forecasting, soft modeling, and data mining and statistical analysis are mapped. Multi-actor problems are, in this categorization, relatively unstructured problems. For these unstructured problems, French and Geldermann (2005) identify levels of decision support. It is important to note that these levels of decision support do not reflect types of multi-actor problems, but reflect the activities required for the problem analysis. That is, for each possible problem, all the mentioned levels of decision support apply. Furthermore, not all groups of methods can be considered actor analysis methods. We therefore conclude that, for the domain of relating types of problems to selecting specific multi-actor methods, the classification used by French and Geldermann (2005) will not help. French and Geldermann, however, do underscore that actor analysis methods are suitable for unstructured multi-actor problems.

Analysis of published experience with methods is not the sole mechanisms for creating classifications of problems. One could, in principle, also develop a framework based on, for example, problems listed in literature. In such an approach, not the actual use of the methods would be the guiding principle, but theoretical properties of the problems. However, while a lot of policy analytic literature exists that describes general characteristics of multi-actor problems (see Introduction 1.2), less attention is paid to categorizing relevant types of multi-actor problems. Lists of types of multi-actor problems are therefore scarce. We found two categorizations of multi-actor problems.

Rommetvedt (2006) argues that there are eight different decision situations that give rise to eight different public decision-making processes: war, strategic bargaining, deliberative negotiation, deliberation, voting, trial, investigation, and subsumption. These decision-making processes can be interpreted as problems. The first five decision-making processes are somewhat similar to the conflict and negotiation categories developed in this thesis, although they are more detailed regarding the preferences of the actors. The last three of the decision situations described by Rommetvedt belong to a certain institutional settings, like courts, or are too specific to be related to the developed problem category.

The work by Rommetvedt shows that the preference types of the actors can be described with more nuance, thereby generating more types of analyzable problems. He has more ways in which the preferences of the actors differ. Actors in the first five problems have: incompatible preferences and no fellowship, similar preferences, unclarified and/or different but compatible preferences, unclarified preferences, incompatible preferences where fellowship exists. He thus stresses the importance of the culture or fellowship amongst the actors in a more detailed way than the categorization we developed in Chapter 3.

Game theory is a field where attention has been paid to characterize core types of problems that multiple actors face. Game theory has characteristic 2 by 2 games (Rapoport and Guyer 1966) of which four 'core' games are also called social dilemmas (Poundstone 1992). These are "deadlock," "chicken," "stag hunt," and "prisoner's dilemma." Three of these dilemma's: deadlock, stag hunt, and prisoner's dilemma can on a very generic level be compared to the developed categorization in this thesis. The prisoner's dilemma is characterized by two actors involved in a crime that can either cooperate by keeping silent or defect by betraying the other actor. Although mutual cooperation would be the best for both actors, none of the actors wants to run the risk of

cooperating while the other defects so the outcome of the game is that they both defect. One could compare this game to a conflict situation as the actors in the prisoner's dilemma do what is best for themselves – they cheat. In a conflict situation the actors are opposed to each other and want to “win the fight” instead of coming to a shared solution. Stag hunt is characterized by two actors that go hunting. If they cooperate they can catch a stag which can not be caught individually but are worth more than hares. For the stag hunt situation mutual cooperation is the best outcome. It has some similarities with the negotiation setting. A negotiation setting is characterized by actors willing to negotiate or cooperate to reach some kind of resolution. Like in the stag hunt cooperation is preferred to defection in a negotiation setting which may happen for lack of trust amongst the actors. Deadlock is characterized by two actors that can cooperate or defect. The game is characterized by non-cooperating actors and shows a situation where non-cooperation is most beneficial. Deadlock happens when two actors fail to cooperate but do want the other actor to cooperate. The deadlock dilemma is similar to the deadlock situation. We described a deadlock situation as a situation actors find themselves locked in a situation that is not progressing any longer. In such a situation actors are defecting, like in the deadlock dilemma. The deadlock game represents all possible outcomes, in real life however not always all information is known. In real life the uncovering of new information may help to move the process forward. This new information changes the game; it may even change to a negotiation setting, which may help to move away from the deadlock.

The text by Rommetvedt and the dilemmas in game theory provide some leads to extend or refine our problem types from a theoretical perspective. We on the other hand, could not have developed our problems types based on these existing lists of problems. Overall our developed problem categories resemble the game theoretic social dilemmas more than the different types decision situations proposed by Rommetvedt. This is maybe due to the fact that some of the analyzed actor analysis methods like conflict analysis and drama theory have their roots in game theory. Transactional analysis is rooted in economics, also a field which has adopted the idea of the rational actor paradigm.

In conclusion, we must emphasize that our classification is based on documented use of a limited number of multiple-actor methods. Our objective was to relate methods and problems based on case-reports in literature. It is quite possible that if the scope of the cases studied would increase by including more methods, more distinctions can be drawn which would, consequently, expand our classification of problems. In the process of expanding the classification, it is possible that additional distinctions will resemble those suggested by game theory or by authors like Rommetvedt.

7.5 Research part three: Given a policy problem how do different actor analysis methods perform

In order to get more insight into the performance of different actor analysis methods, two *ex ante* case studies were done in which multiple actor analysis methods were applied for the same policy problem. The performance of the actor analysis methods was assessed by looking at how well the different actor analysis methods predicted real world events. This predictive capability of the actor analysis methods was used as a proxy for performance. The closer the applied actor analysis method would come to predicting real world events the better the performance of that method would be. The chosen proxy made it possible to compare the very different outcomes of the methods.

The first case was studied with conflict analysis, transactional analysis, and Q-methodology. This case represented a deadlock situation. All three of the methods had been applied to a deadlock problem before, and we were interested to study whether the application of the different methods would yield different results.

Q-methodology showed two dominant perspectives for the inhabitants: (1) the inhabitants did not acknowledge the water household problems as presented by the provincial government and (2) they were unsatisfied with the policy process. After the analysis we present in this thesis had been completed, a committee under the leadership of a former minister was established to study the case. The findings of this committee correspond with the main findings of our analysis. On the short term Q-methodology was able to show that the inhabitants did not agree on the problem definition and the process.

Although Q-methodology identified the large disagreement about the problem as seen by the inhabitants versus the provincial government, both conflict analysis and transactional analysis failed to uncover this issue. The main result of the conflict analysis was the conclusion that a new process with an open problem formulation, as requested by the inhabitants, was infeasible. Conflict analysis also suggested that the likely outcome would be additional research. This conclusion is vindicated by the committee under the leadership of the former minister and had been accepted by the provincial government.

On the longer term transactional analysis resembles real world events the most. Transactional analysis suggests that a possible solution can be found in a new scenario where respect for the landscape is combined with the need to store water. It now seems that this type of solution is being sought by researching a seventh strategy. Time will have to tell, however, what will be decided on the polder.

For the second case we applied conflict analysis and transactional analysis to a conflict situation: the possible unbundling of the distribution companies from the large integrated power companies in the Netherlands. While conflict analysis had been applied to a conflict situation before transactional analysis had not.

The conflict analysis showed that the government had the power to pursue its preferred outcome: the unbundling of the network companies. This corresponds to what happened in reality. Why conflict analysis predicted more accurately than the transactional analysis may lie in the rationale of the method. In a transactional analysis control over issues is traded. It seems that there was no trade made with the other actors as the national government acted unilaterally. As transactional analysis assumes trade, situations of unilateral action can not be modeled successfully. The assumption of the method, that people trade control over issues, may well be not the most appropriate one for conflict situations where unilateral decisions can be made. It therefore seems appropriate that our framework shows that transactional analysis has not been applied for a conflict situation. One could say that in a situation where actor interests are opposed, and when they are not willing to negotiate, a conflict analysis method works better as a predictor than a transactional analysis method, since transactional analysis assumes cooperation in the form of trade of control. We conclude that for this case the conflict analysis was the more suitable method.

The methods as applied in the first case provided different outcomes. In the first case Q-methodology performed better on the short term than both conflict analysis and transactional analysis. On the longer term transactional analysis came closest to real world events. The second case illustrated that transactional analysis may not be a suitable method for a conflict situation. We conclude that in hindsight this may be explained by the nature of the two different methods but *ex ante* little was known about the suitability of the two different methods.

Using the predictive ability of methods to judge performance is a very narrow definition of the performance of a method. Other parameters that could be used to judge performance might include ability to establish new perspectives, provide overviews, find supporting data for particular viewpoints, and so on. Final judgment on whether a method is successful will thus depend on the goal of the analysis and the required results.

7.6: Reflection on the role of the analyst regarding the cases

With the study of real world problems the degree the analyst him- or herself becomes an integral part of the problem may pose a threat to validity. In essence, we need to assess to what degree the results of an analysis are influenced by the analyst him/herself. When reflecting on this issue for this thesis, a number of questions can be asked. First, did the presence of the analyst and activities change the course of events? Second, to what degree are the data collected by the analyst dependent on that particular analyst. That is, would another analyst faced with the same case get the same data (in essence, the issue of inter-observer variation).

Before discussing these aspects for our two cases, we want to point out that these aspects of policy analysis are only rarely addressed in the studies we analyzed for this thesis. Of the 19 papers we analyzed in Chapter 3, the ones that involved real world actors most totally ignored the question whether or not the analyst influenced the course of events. Neither was the issue of inter-observer variation raised. It seems that validity is taken for granted. The reader himself must try to establish some opinion on these issues by carefully reading the methods sections of the paper in which the analyst documents the procedures used.

In the following sections, we will reflect on the degree to which the person of the analyst influenced the course of events. In addition, we will reflect on the reliability by which the data that formed the basis of the application of the methods was collected. This latter is all the more important because especially changes on the input data for a model (*e.g.* identification of actors involved) are likely to change the outcome of that model.

7.6.1 The case polder Groot Mijdrecht

Influencing the course of events

In the Groot Mijdrecht case, the analyst discussed with a number of parties involved in the problem. When the analysis was conducted, the case was still in progress and is at the time of writing still in progress – no final decision regarding the water management of the polder has been made. The case has attracted national attention, including radio and television programs that covered the case in various degrees of detail. The case, therefore, was a high-profile case when viewed from the perspective of media attention. During the course of conducting the field work, the analyst received the request from the province to stop the investigation. When the researcher declined this request, she was confronted by the decision of the provincial authorities to cancel all communications. Fortunately some of the field work had already been conducted (most notable, discussions with the water board). Interviews with local and provincial authorities were cancelled. At present, it is unclear whether or not the study influenced the course of events.

Verification of input data

Based on available literature and documentation, the researcher identified the various actors and their roles. To verify this input data, the researcher wished to interview all actors involved on their roles. In total 19 people were interviewed. From each interview, the researcher prepared a detailed document describing that interview. The reports of each interview were sent back to the interviewed person with the request to verify its content. Of the 19 reports, 18 were returned. No major changes were required by the individuals who were interviewed.

The responses of the interviewed people were compared to the actors, issues and preferences identified by the researcher. The content of the interviews was in line with the input data prepared for the methods used that was based on the available literature. Although the whole process of conducting interviews to verify the input data did

constitute a significant amount of work, the fact that input data did not have to be changed increased the belief that these input data are reliable.

The fact that provincial authorities prohibited representatives of public bodies to continue conversations with the researcher means that for some of the actors involved some data is missing. For the water board, for example, we have preferences; these preferences as expressed during interviews are in line with the preferences described in the available documents. In addition, the preferences of the inhabitants interviewed align with the data used for conflict analysis and transactional analysis and with the perspectives of the Q-methodology. But for provincial and municipal authorities we do not have these preferences – other than already available in published documents.

7.6.2 The network unbundling case

Influencing the course of events

For this case, the actual outcome is available: the network companies have been unbundled from the large integrated power companies. It is highly unlikely that conducting the study influenced the course of events. Parties identified as actors involved in the problem were not aware of the analysis performed by the researcher. The researcher did not contact any actor in the case during the period that the case was still unfolding. It is therefore unlikely that the course of events was influenced.

Verification of input data

After conducting the analysis, the input data for the analysis was compared with the opinion of two experts (one from an academic perspective, and one from the perspective of the energy industry) who were asked two questions regarding the input data: (1) what the most important actors are given the problem and (2) why they are the most important actors. Table 7.1 compares the actors that were chosen for analysis in this thesis with the actors chosen by the experts.

Table 7.1: Critical actors as chosen for the case and as chosen by two experts.

Analyst	Expert 1	Expert 2
<ul style="list-style-type: none"> • National government • Large integrated power companies • Provincial and local governments (the shareholders) 	<ul style="list-style-type: none"> • Ferd Crone, Member of parliament for the labor party • The minister of economic affairs Brinkhorst • Tennet, the Dutch Transmissions System Operator • The board of the large integrated power companies • The Ministry of economic affairs 	<ul style="list-style-type: none"> • Minister of Economic affairs, Brinkhorst • The large integrated energy companies • The shareholder of the large integrated energy companies • Parliament and Senate (what you could call government)

There are similarities between our list of actors and the list of actors of the experts. The large integrated power companies are mentioned by both experts. Also a government actor is mentioned by both experts. The difference is who is seen as representative of the government: the ministers and prime minister, as in our case; the minister of economic affairs or Parliament and Senate.

The largest difference in choice of actors included in the study occurs with expert 1, the industry expert. In his view, the Minister of Economic Affairs is a distinct actor to the Ministry of Economic Affairs. Apparently this expert distinguishes between the appointed minister as a member of the current government and the ministry headed by that minister. In the analysis, these two roles were not separate. A second difference is the

addition of Tennet to the list; the Dutch transmissions system operator. Apart from the unbundling a discussion on the ownership of the high voltage lines took place. This part of the problem had not been modeled.

The fact that the final outcome was known for this case allowed us to also ask whether or not the final outcome came as a surprise. It is worth noting that the final outcome, the unbundling, was predicted by the analysis. Although predicted by the analysis, both experts did not foresee the unbundling and were subsequently surprised when the decision to unbundle was made. The industry expert explained that the large integrated power companies were under the impression that they were in dialog with the Ministry of Economic Affairs, but in the end the Minister decided on unbundling. He believed that, in hindsight, the large integrated power companies were in fact talking to the wrong interlocutor. Both experts had expected a negotiated solution. A negotiated solution might have resembled the outcome of the transactional analysis but did not happen in reality.

7.6.4 The role of the analyst in the cases

Although the methods used in the cases come with their own detailed modeling approach, the analyst does play an important role. The role is especially critical when the input data for the method are collected as the results of the methods are predominantly obtained via mathematical calculations. That is, the methods assume input data, but the translation of the case to these input data does require an active role that includes the judgment of the analyst. In this process of translating the case to the input as required by the method, the analyst therefore plays a potentially critical role regarding the performance of the method.

In literature, little is reported about the impact of the individual analyst on the translation of a case to the input data for the methods. In literature, the typical approach taken in documenting the research conducted is that the investigator describes the process by which the case was investigated. Although such description does allow the reader to gain an understanding of how that translation had been performed, the reader typically will have to use his or her own judgment in deciding whether the translation had been performed adequately.

The role of the analyst could, for example, be studied by having more analysts independently translate a specific case to input data for a given method. Although in this thesis we have addressed the issue of the reliability of our input data, we have not extended our research to include multiple analysts performing the translation of the cases to the input data of the applied actor analysis method.

One of the limitations of this thesis is that the investigator had no prior experience with executing these methods prior to the research described in this thesis. One might argue that in the context of personal experience of the analyst involved, such a translation of the case to input data for the method could vary. That is, if an analyst would have extensive experience with a given method, he or she might be more trained in recognizing the critical factors required by that method. The degree to which the experience of the analyst might influence the transformation of the case in reality to the abstracted input data for the method is not further investigated in this thesis.

The question remains whether a certain method is more susceptible to a possible “mistranslation” of a case to input data for a given method. The methods themselves do not provide a framework that would allow the users of that method to estimate the degree of subjective translation of the case to input data. We want to underscore that although we tried to be as objective as possible we cannot exclude the possibility that if another analyst would have applied the same methods it would have resulted in different conclusions. We, however, have followed some additional precautions aimed at

minimizing the risk of a bias due to the subjective role of the analyst in translating the case to input data for the method.

7.7 An answer to the main research question: How and to what extent can we propose a framework that guides the selection of actor analysis methods applied to multi-actor policy problems?

The fundamental issue addressed in this thesis is the challenge to define a possible framework that would allow a more rational and scientific selection of an actor analysis method when a policy analyst is faced with a multi-actor problem. The underlying belief is that for a scientific field to progress, a clear understanding of the suitability of the available methods and a theory of how different problems are dealt with by those methods is an absolute requirement for progress.

It is sobering to observe that in the current literature in the field of policy analysis little or no attention had been paid to research that aims to compare methods and relate characteristics of those methods to specific problems that are to be addressed. When looking at the literature, single problems are dealt with by applying single methods – little or no attempts are made to generalize the individual case studied beyond the $n=1$ of that particular study. It is, for example, nearly impossible to find a paper in which the same problem is studied using multiple potentially suitable methods. As a result, the policy analyst cannot use past experience documented in literature when having to decide on the most suitable method. We have to conclude, therefore, that when we search in the literature for methods in relationship to types of problems, we find few answers. In this thesis we try to initiate this type of research. In conducting our research and writing this thesis, our overriding objective was to relate methods to a classification of problems.

Given that little previous literature is available, we cannot rely on the work of others who attempted to develop frameworks that aid in matching properties of the problem to specific methods. We therefore had to constrain the research to a specific number of methods. Given the wide range of methods available, a framework that would include all the methods in the policy analyst's toolbox is beyond the scope of this thesis. In this thesis, we focus on a special class of methods: actor analysis methods. Even in this limited domain, dozens of methods have been used to study multi-actor problems. It is important, therefore, that the reader realizes that the failure to compare methods for types of problems is a general problem in the field, but that in this thesis solely a small subset of a specific group of methods is researched in relation to policy problems.

As there is little research that aims to compare methods and relate characteristics of those methods to specific problems available, we are entering new territory. In literature lists of actor analysis methods and lists of multi-actor problems can be found (see Chapters 2 and 7.4), the joining of actor analysis methods to multi-actor problems is lacking. We have made a number of choices and proposed a framework that in subsequent research will have to be further developed and tested. Based on a review of literature, we propose a broad categorization of problems (into the types conflict, negotiation, and deadlock) to which actor analysis methods have been applied. We also propose a subdivision of groups of actor analysis methods and we have studied to which of the problem types various actor analysis methods have been applied. The result of this research is the framework that we propose in Chapter 3. As similar frameworks are lacking we cannot compare our framework to similar attempts. Our framework, therefore, should be viewed as an initial attempt. We are convinced that future research will significantly change the framework and add more detail to the framework.

The subsequent empirical work (Chapters 5 and 6) should be viewed as the first comparative studies that we performed to explore the premises of the framework. We

limited ourselves to a small number of actor analysis methods. It is very likely that other related actor analysis methods, like the graph model for conflict resolution or vote exchange models, could have provided different answers. Our first case study (Chapter 5) studies the premise that different methods that according to our framework can be applied to a specific problem, will yield different results. One might argue that, of course, different methods would yield different results given the diverse theoretical frameworks and assumptions that underpin each individual method. If, however, each method would result in different results, then one would expect that analysts when documenting their work in literature would exhibit a keen understanding of the consequences of their choice for (or against) the selection of a certain method and that this understanding would be included in the discourse that documents their activities. As such a discourse is wanting, one needs to clearly demonstrate that different potentially suitable methods applied to the same problem will indeed yield different results. One needs to counter the notion that the performance of the method is independent of the method applied. If methods can be interchanged without consequences, the analyst can just select his or her favorite method without running the risk of a less suitable result. In this case, all roads would lead to Rome. We want to emphasize that underpinning this thesis is our belief that we cannot take for granted that different potentially suitable methods applied to the same problem yield a different result. In Chapter 5 we wanted to test that premise.

In Chapter 5, we wanted to take a problem and apply all methods that according to our framework have been applied in the past, by other researchers, to that type of problem. We selected a deadlock problem. For deadlock problems, three actor analysis methods have been used in literature: conflict analysis, transactional analysis, and Q methodology. In Chapter 5, we apply all these three methods to the same problem.

Regarding our first premise, we conclude that all three methods do yield different results. That is, not all roads lead to the same Rome. In our case study, we do not yet know the final outcome. The case is still evolving, and what the final outcome will be regarding the polder is not yet certain. As a result, the current outcome of the case cannot be used as a proxy to determine a best performing method. Although we do not have the benefit of complete hindsight, at present certain options do not seem to be as likely as they were when we did our analysis (see 7.5). It is important to underscore that the methods did predict different results and that the selection of methods therefore is far from arbitrary. This conclusion that different methods yield different results is independent of what method performed best. If in future we will have the final outcome of the case, we can then evaluate which of the methods had the highest predictive value and thus was most suitable for the given problem.

Our framework shows that certain actor analysis methods have been applied to certain types of multi-actor problems and that other actor analysis methods have never been applied to certain types of multi-actor problems. For example, we have observed in literature that conflict analysis was used in problems we labeled as conflict situations. We also observed that transactional analysis has never been applied to this type of problem. The strength of our framework is that it identifies these discrepancies. The scientific question it begs is whether or not transactional analysis could also be applied to a conflict situation, and, if done, would it be a better or worse predictor of real world events than conflict analysis.

In Chapter 6, we focused on this aspect of our framework and formulated a second premise regarding the framework: the performance of a not yet applied method will be lower than one that has already been applied for a given problem. One could argue that the finding in our framework that no conflict problems have been addressed using transactional analysis represents a limitation of that method for that type of problem. The explanation for the absence of that type of study could then be, for example, that no sane policy analyst would dream about using that method for that problem. That is, the

knowledge of this limitation of transactional analysis is not explicitly discussed in literature dealing with the comparison to conflict analysis, but implicit in a common understanding among the researchers in the field. Alternatively, one could argue that the fact that transactional analysis has not yet been applied to a conflict situation represents an underutilization of the method. That is, the use of the method could possibly be expanded and serve to enrich the applicability of the method as there are no fundamental properties of the methods that prohibit its use for that type of problem.

When we look at the results of this case study in Chapter 6, we conclude first that although transactional analysis has never been used for conflict problems there are no inherent limitations of the transactional method that prevents it from being used in a conflict situation. Second, we conclude that in this case study the conflict analysis performed better as it predicted the real world outcome more accurately. For the specific case in Chapter 6, we argue that indeed conflict analysis was, with hindsight, the better performing method and thus the more suitable method. It is important, however, to underscore that for many analyses such a “final outcome” is not available as it may require years before it is apparent.

In our thesis, we proposed to use predictive value as the proxy for method performance. We want to underscore that often truth is not known, and the fact that we could compare it to reality is a relative luxury. Second, we want to underscore that interpreting the results regarding general strengths and weaknesses of the methods for the different problem situations must be performed very carefully. Just like our framework is a first attempt at defining structure for method selection, the cases are the first attempt of comparing methods in the light of that structure. For example, in the case study that compared conflict analysis with transactional analysis we conclude that for this case the conflict analysis predicted the real world outcome more accurately and we propose that the notion of transactional analysis that people trade control over issues was not suitable for this case as a final decision was made that did not involve a trade. This finding should not be generalized to all conflict situations. From a scientific viewpoint, the generalization of the results of that single case to general properties of the method regarding the conflict situations cannot be done. Given the fact that it only constitutes a single case, one must refrain from overinterpreting the results. The desire of the individual researcher to generalize the results of his or her case study needs to be countered by the awareness that it is only just a single case. The framework when viewed from its ability to guide selection of methods for given problems must be substantiated by a larger number of cases all pointing to the same strengths and weaknesses of the methods. Only then can generalization in the form of a more detailed discussion of methods and problems be entertained in a scientifically sound fashion.

To illustrate this dilemma, and maybe stimulate the imagination of the reader, we would to draw an analogy – albeit of course a very partial analogy – with how we deal with research in the area of medications and diseases. Let’s compare the problems with diseases, and the methods we have in our toolbox with medications. Given a problem (or disease) we have to select a method (or drug). It is important that both diseases and drugs are clearly classified. That is, we have to have well-defined classes of diseases and well-defined groups of drugs. Just as we cannot generalize the effectiveness of a drug for a given disease based on only one patient, we must make sure that future policy analytic research has a wealth of case studies that will allow a proper generalization. Such a generalization cannot rest on a single case only.

7.7.1 Future research

Any PhD project is characterized by the need to restrict the research in order to manage the effort. In practice, this means that a number of decisions are made that on one hand

constitute the limitations of the work conducted, but at the same time underscore or illustrate future research that could be contemplated.

The objective of this thesis is to initiate work on a framework that relates methods (and properties of those methods) to types of problems. This thesis represents just an initial effort in that process. The major limitation of this thesis is that we can only provide initial, case-based support for our framework. Although the framework is based on an analysis of available literature, literature only documents single applications to single problems. That is, the literature does not document much research in the domain of relating specific characteristics of methods to classes of problems. As a result, future comparative research will have to clarify whether this framework will indeed aid in structuring the choices a policy analyst has to make in selecting actor analysis methods when faced with a multi-actor problem.

A second major limitation of our work is the restriction we posed on the performance of the methods. That is, we chose to compare the predictive value of the different methods. Although we can compare these methods on their predictive value these methods are not solely or even not primarily used for their predictive capabilities. The methods are also used for participatory research and strategic advice and our study does not address these issues in those domains.

In relation to this, a third major limitation is that the outcome assessment is limited. In this thesis we used final outcomes of the policy process. We predicted the global situation rather than intermediate outcomes. Final in our case meant the choice for a particular strategy or solution. One could have expanded the scope of the space of outcomes to include intermediate decisions regarding the problem. Like in the Groot Mijdrecht case the decision to install a committee or the decision to develop a new alternative. Including intermediate decisions might even have changed the degree to which certain methods were suitable to the problem at hand. The polder Groot Mijdrecht illustrates this, in this case study Q-methodology performed well on the short term. As time moved along transactional analysis became the better predictor.

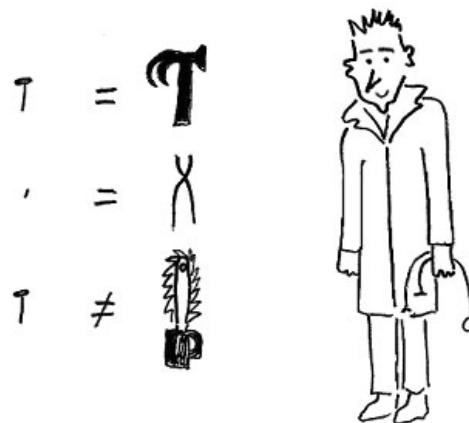


Figure 7.2: A policy analyst that has diagnostic information on the suitability of different tools for different problems.

When contemplating future research, the first issue that needs to be addressed is a further development of our understanding of the relationship between the method selected and the result obtained when dealing with a specific problem. Although we propose an initial framework that related methods to categories of problems, this framework should be further developed and elaborated with a special focus on conducting research that will generate a comparative understanding of the different methods. In this thesis, only two

cases were analyzed using multiple methods. This is far too little to infer generalized conclusions. We believe, however, that as experience with multiple methods applied to the same problem increases, our ability to identify specific characteristics of those methods in relation to the problems will be growing.

The second issue that needs to be addressed in future research involves the use of other performance criteria. As we underscored already earlier, we have limited ourselves to the predictive value of the methods. In many cases predicting the outcome is not even the objective of the analyst. Often, the analysis aims to inform the decision maker, influence actors in the field, or facilitate the progress of the policy process. The measure of success of the methods then does not solely lie in how well it can predict reality, but how well it can inform actors or change the course of action of a group. The framework could be expanded for these different criteria of performance.

The third issue that needs to be addressed in future research is the completeness of the developed problem types. In this study we inferred the problem types from the descriptions of the problem by the authors of predominantly journal papers. The typology could have been very different when more book chapters would have been added or other type of literature used that might have provided a richer picture on the studied policy problem. The focus in the journal papers often lies more on the method and the way it was used than on the solution of the policy problem at hand. Further research that takes up the challenge of more reliably determining the problem types is needed.

One might argue that the type of comparative research needed for insight on the suitability of actor analysis methods for multi-actor problems is too time-consuming or too expensive. We would argue that if a scientific field is to further develop, a well-grounded understanding of the potential and limitations of the methods used is an absolute requirement. In the absence of that understanding, the subjective decision of the individual policy analyst will not be defensible. Also in our experience, most effort of the analyst is directed towards understanding the problem situation and gathering the relevant literature. Relatively less time is spent on the actual application of additional methods as the input of the different methods may overlap significantly. Although others might propose different strategies to study the relative merits of methods in relation to problems addressed, we feel that the issue of comparing methods in relation to similar problems must be further pursued.

As research accumulates, it is quite feasible that the distinctions we draw in our framework will be further refined – or that even new distinctions emerge. Our division of multi-actor problems in just three classes of problems (conflict, deadlock, and negotiation) might well further develop in a much more sophisticated and refined classification.

The ultimate goal of our framework is to enable the relation of special characteristics of methods to the properties of the problems that are studied. Ideally, it would result in diagnostic rules (*e.g.* Figure 7.2) that would guide the policy analyst in selecting methods and, maybe even more importantly, interpreting the results of those methods. The advantage of such a framework could be that a policy analyst can make a methodological choice for the study of policy problem beyond his or her own expertise of a limited number of actor analysis methods as this experience could possibly exclude a more suitable actor analysis method. More importantly in our view knowledge about the suitability of the methods in our toolbox in relation to policy problems is an absolute premise for the policy analytic field to progress. As policy analysts we have to move beyond the casuistry – the use of case histories – that describes single problems and single methods and work on formulating diagnostic rules by comparing the performance of multiple methods to given problems.

Appendix 1: Analysis applications of actor analysis methods

Table 1.1: Analyzed drama theory papers.

Problem	Approach	Results	Reference
Inter organizational collaboration and strategy making for the health services in the UK regarding problems in which organizations have their own agendas regarding decisions.	Collection of dilemmas in the health service sector drawn up by managers. The dilemmas are presented/modeled in tables called vignettes. <i>Method choice:</i> Drama theory is contrasted to case descriptions of inter organizational collaboration as Drama theory 'does not pose a structure to every relationship' (Bryant 2002, p. 611) and offers clear analytical support. <i>Validation:</i> Comments made by participants regarding the benefit of the vignettes are presented (Bryant, p 621).	Benefits of the vignettes mentioned are: insight into potential collaboration, allows for a structure through which dilemmas can be solved, shows important issues, insight into other players and own possibilities (p 621).	(Bryant 2002)
The introduction of a new policy for different healthcare organizations in the UK	The paper describes a role-play workshop on the basis of drama theory for expected conflicts that could arise from policy changes for healthcare organizations. <i>Method choice:</i> No statements on why Drama Theory is chosen, as the goal of the study was to test an application of the method. <i>Validation:</i> Comments made by participants of the role-play approach (p. 664)	Drama theory provided valuable insights on mutual dependencies for attendants. But more important was the way in which the method influenced the information that was gathered.	(Bryant and Darwin 2004)

Table 1.2: Analysis for Hypergames.

Problem	Approach	Results	Reference
Analysis of the fall of France in 1940 to show how hypergame analysis may help problem formulation. That is, find the appropriate level of analysis.	Hypergame is constructed through the ex post analysis of literature on the fall of France. <i>Method choice:</i> Conflict analysis is usually done with the help of game theory or metagame theory and these methods do not allow for different perspectives. <i>Validation:</i> The study is validated through real life events. That is, the hypergame analysis can explain the Allied defeat from the point of misperceptions.	The defeat of the Allies lied in the fact that their perception of the problem was too simple. The use of hypergames allows for good problem formulation in conflict settings because misperceptions can be modeled.	(Bennett and Dando 1979)
The social phenomenon of soccer hooliganism in the U.K. is studied.	Predictive hypergame models are built based on sociological research of Marsh and Ingham.	The results provide some new insights into the perspectives of the authorities and the hooligans. The overall conclusion is that hypergames allow for the exploration of different hypothesis of actors'	(Bennett <i>et al.</i> 1980)

		behavior.	
	<i>Method choice:</i>	<i>Scientifically interesting because of new subject area for hypergames in which actors have radically different views.</i>	
	<i>Validation:</i>	<i>The data is gathered from sociological research and the results are presented as possible models of behavior and that the success of policies based on hypergame analysis can only be judged in practice.</i>	
Ford's plant siting problem is used to illustrate how different hypergame sets of competitive bidding can be explored.		Different models of bidding are developed: inter-bidder competition (of governments), and how the bidding is influenced by the manipulator (multi-national cooperation).	The case shows that if a large multi-national cooperation wishes to deceive the bidders it must hide its location choice and preferences. (Bennett 1980)
	<i>Method choice:</i>	<i>Game theory is the common framework used to analyze decision situations. Hypergames allow for a larger set of models than game theory for example does.</i>	
	<i>Validation:</i>	<i>Data is taken from publicly available data, and primarily from a single newspaper article.</i>	
Analysis of the Arab-Israeli war. The interest lies in showing how hypergames may illuminate the event.		Ex post analysis of literature and the event is constructed from the point of view of Egypt.	The hypergame models were able to explain the course of events. Hypergames allow decision makers to make a logical choice in a situation where emotions may rule and actors make selective choices. (Said and Hartley 1982)
	<i>Method choice:</i>	<i>Hypergames are put forward as a better tool to model real world conflict than traditional game theory.</i>	
	<i>Validation:</i>	<i>Hypergame analysis was able to explain the events well. That is, from each actor's perspective the decisions were taken rationally.</i>	

Table 1.3: Analyzed metagames/conflict analysis papers.

Problem	Approach	Results	Reference
Dispute over the rights of the revenue of a hydro power plant to be built in the Poplar river that runs from Canada to the U.S..	A metagame analysis of the conflict including 3 actors and 12 options.	The resolution of the conflict depends on the recommendation of the International Joint Commission (one of the actors).	(Fraser and Hipel 1980)
	<i>Method choice:</i>	<i>That the tool has been recommended as a tool for water resources conflicts.</i>	
	<i>Validation:</i>	<i>Published reports on the conflict.</i>	
Trade negotiations on grain between the U.S.S.R. and the U.S..	A metagame model consisting out of eight options and four outcomes made with the help of the software tool CONAN.	Some counter intuitive results were found regarding the influence of other actors. But more importantly outcomes of mutual benefit to the actors can be found.	(Benjamin and Powell 1990)
	<i>Validation:</i>	<i>To test the use of a metagame software program CONAN and to draw conclusions on the strength and weaknesses of the technique in light of problem situations that are characterized by multiple participants and objectives.</i>	
	<i>Method choice:</i>	<i>The actors involved in the grain negotiations were interviewed and the results of the model were compared to real life events.</i>	
Intra-organizational conflict situation in a fundraising company including two parties.	The approach follows the general meta game rationality but introduces the notion of story telling as it is applied to a case where preferences for scenarios were highly uncertain. Because of the lack of information on the preferences the author develops different stories of the conflict.	Author lists 8 insights that he learned by following the metagame approach. The story telling approach is judged as useful in a situation where preferences are uncertain.	(Klein 2000)

<i>Method choice:</i>	<i>Metagame analysis was used to describe the situation which was relatively complex and characterized by two actors. These characteristics made metagame analysis 'an obvious approach' (Klein, p1).</i>		
<i>Validation:</i>	<i>The actual course of events resembled the first scenario.</i>		
Infrastructure planning for water resources management in Egypt.	A metagame analysis served as a basis for a role playing workshop.	The role playing workshop resulted in a compromise between all of the actors.	Hermans and Bots 2002)
<i>Method choice :</i>	<i>Test metagame in participatory setting with project engineers not real stakeholders. The result of the negotiation did not come as a surprise.</i>		
<i>Validation:</i>	<i>The eventual resolution, however, was different from the scenarios in the metagame as it involved actors exerting informal power.</i>		
The study of the salmon farming aquaculture expansion conflict in British Columbia and the inaction of the provincial government.	Conflict analysis of the most important actors and actions with the graph model for conflict resolution. The actions and preferences are largely based on literature and historical behavior.	The analysis showed that a full lift of the ban on salmon fishing was not likely. Only when the actors would change their preferences.	(Noakes et al. 2003)
<i>Method choice:</i>	<i>Strategic interaction amongst actors is usually analyzed with non-cooperative game theory. The conflict approach has less demanding information requirements than games in extensive form and is therefore applicable in situations where the timing of the moves of the actors is less important (Noakes et al. 2003, p. 128-129).</i>		
<i>Validation:</i>	<i>The results of the conflict model are compared to real life events. The model did suggest that the lifting of the Salmon farming moratorium was unlikely and this indeed did not happen.</i>		

Table 1.4: Analyzed Q-methodology papers.

Problem	Approach	Results	Reference
Interested in identifying an area of discourse between members of local employment and trading systems in order to establish patterns across individuals and not patterns across individual traits, like gender and age etc.	36 statements on sustainability were ranked by 25 participants of local employment and trading systems.	The authors suggest that Q-methodology might be a good method for making better environmental policy that reflects the view of the stakeholders. The method allows for understanding and identification of discourses about people. Q-methodology gives an idea of how the public views environmental issues and policies.	(Barry and Proops 1999)
<i>Method choice:</i>	<i>Q-methodology is applied to get more insight into how to implement environmental policies that are in line with the perceptions of the public.</i>		
<i>Validation:</i>	<i>A separate methodology 'concourse matrix' was used to get to the right sampling of statements.</i>		
Interest in the motives of people associated with performing public service.	Q-methodology public service motivation of a mixed group 69 in total. Issues taken from James L. Perry's (1996) research on public service motivation.	Four types of public service motivation are found: Samaritans, communitarians, patriots, and humanitarians.	(Brewer et al. 2000)
<i>Method choice:</i>	<i>Use Q-methodology because previous research is inconclusive.</i>		
<i>Validation:</i>	<i>Issues taken from James L. Perry's (1996) research on public service motivation and a large set of people that participated. Still nothing about the magnitude of the perspectives can be said.</i>		

Interest in analyzing positions really held by actors in the debate around the airport expansion of Schiphol instead of putting policy frame on them.	Statements on the expansion of Schiphol taken from literature then sorting done by 38 individuals.	Q-methodology helps to recast policy issues and frame an agenda.	(Van Eeten 2001)
	<i>Method choice:</i>	<i>Conventional stakeholder analyses reproduce the conventional views of the stakeholders. Q-methodology helps to find the original perspectives of the people involved as they themselves provide the ordering of the issues.</i>	
	<i>Validation:</i>	<i>200 statements were collected from various media and interviews were condensed into 80 issues to be ordered by the respondents. The case study results help on policy analytic issues like the reframing of policy issues and collection of stakeholder views.</i>	
Interest in defining what a good public participation process is.	Actors involved in the Northern Forest Lands Council of New England.	Five different discourses on a good participatory process were found: legitimate process, search for shared values, should adhere to the democratic principles of 'fairness and equity, equal power amongst actors, and promote responsible leadership.' Overall planners should take into account the different perspectives on a public participation process.	(Webler <i>et al.</i> 2001)
	<i>Method choice:</i>	<i>Q-methodology is a good way of figuring out preferences in a group.</i>	
	<i>Validation:</i>	<i>The preferences for public participation were gathered from participants in a well-organized public participation process. Statements were gathered from documents and semi structured interviews. After selection 45 statements were sorted by 27 persons.</i>	

Table 1.5: Analyzed transactional analysis papers.

Problem	Approach	Results	Reference
Interest in how decisions in the German and American labor policy domains are made.	Operationalization of the exchange model developed by James Coleman for the German and American labor policy domains. Literature research on labor laws and decisions from 1983 to 1988 supplemented with interviews. Design allows the comparison the power distribution and value distribution in the two countries.	The authors present a lot of interesting conclusions <i>e.g.</i> the German system is less depended on exchange than the American system and that actors are successful if they concentrate their interests in a specific sub domain.	(Pappi and Knoke 1991)
	<i>Method choice:</i>	<i>The exchange model has benefits over the economic models of perfect competition in a situation of political exchange. A large dataset was gathered from laws and bills in Germany and the United States and from statements of the actors involved. In the conclusions the authors point out that the model of Coleman was implemented with the least strong assumptions about social exchange.</i>	
	<i>Validation:</i>		
Interest in the simulation of the negotiations on early retirement in the dairy industry in the Netherlands to test the explanatory power of two models: the exchange model by Stokman and Van	The two models are both separately made to simulate the labor negotiations in order to test their explanatory power.	The labor negotiations seemed to be cooperative in nature. The exchange model (mean error of 0.43) performed significantly better than the conflict model (mean error of 0.92) for this test.	(Rojer 1999)

Oosten and the Expected Utility Model of Bueno de Mesquita.	<i>Method choice:</i> There is limited insight into how negotiation processes work. Therefore these two models are empirically tested.		
	<i>Validation:</i> The data was collected from 18 experts (the negotiators themselves) on the negotiations. The results of the models were compared to the actual decisions taken.		
Application of transactional analysis to the deadlock situation of the land-use management project of Alphen on the Rhine, The Netherlands.	Transactional analysis in workshop setting. This participative planning session involved fourteen actors of seven planning agencies.	Goal to provide insights into control and interests of the actors over the issues and to test the method. The result of the model was that there was not much potential for exchange and the researcher advised to include more actors in the planning.	(Timmermans and Beroggi 2000)
	<i>Method choice:</i> To provide insight for a Ministry on interest and control of actors in the deadlock situation and to provide evidence on the validity of the technique applied (previously only applied in political science) (p.177)		
	<i>Validation:</i> The participants remarked that the tool provide added value as they gained insight into the other actor's interests and control and possibilities for exchange.		
A pilot project to test if the transactional approach can be implemented into real-world policy making.	The data collection for the transactional analysis is done with the help of interviews and questionnaires.	That it is possible to apply the transactional approach in a real world setting as the results were judged by local experts.	(Timmermans 2004a)
	<i>Method choice:</i> The case was done as a test if the transactional model could be operationalised into a real world policy setting. The data collection method (single interviews) is verified by noting the lack of time of the researcher.		
	<i>Validation:</i> The case was considered a success although limitations on the validity are also mentioned: the system was not closed and the meaning of the issues might not have been the same for each actor.		
A project to test in the transactional approach can be applies in an interactive policy setting and measure its contribution	The preference data of 9 actors was interactively gathered into a computer model through pair wise comparisons.	The municipality of Rhenen was considered the most important actor as most actors were dependent on this actor.	(Timmermans 2004b)
	<i>Method choice:</i> The case was chosen to test if the transactional approach could be applied as an intervention. The case was considered appropriate as the municipality involved wished to focus on integrative approach for tourism.		
	<i>Validation:</i> The workshop was evaluated through participants' comments. The participants could understand the method itself, the concept of value focused thinking, and the way the preferences were to be ranked. The results of the model corresponded with the experiences of the actors in the real world and none of the actors wished to discuss the validity of the model.		

Appendix 2: The case polder Groot Mijdrecht

2.1 Transactional analysis

2.1.1 Scoring of interest in issues

For this case it was hard to judge the preferences and control over the issues for the individual members of the project team. The municipal government and the water board have hardly made any public statements regarding their preferences. The spokesperson of Habiforum on the other hand has made statements in the press that can be translated to preferences over the issues. Thus not a lot of opinions from the individual members of the project group could be found as they “spoke with one voice” and some interpretation was done on our part. The control over issues and interest in issues is therefore predominantly estimated on the basis of the formal roles and qualifications.

Table 2.1: Table of interest in issues.

Actor	Nat Gov r / d	Prov Gov r / d	Mun gov r / d	Prov Council r / d	Mun Cou r / d	Wat bor r / d	Inhab r / d	Habi r / d
Multifunctional green heart	4/1	2/1	1/0	3/0	1/0	2/0	1/-1	2/0
Water storage	3/1	4/1	1/1	3/0	1/0	3/0	1/-1	2/0
Prestige	3/1	4/1	3/0	3/0	1/0	3/1	1/-1	3/1
Security and Continuity	1/0	3/0	3/0	3/0	3/1	2/0	4/1	2/0
Process objectivity	2/0	2/0	2/0	3/1	3/0	2/0	4/1	2/0
Process transparency	2/0	2/0	2/0	3/1	3/0	2/0	4/1	2/0
Respect for landscape	3/0	2/0	3/0	2/0	3/0	1/-1	4/1	1/-1
A supported solution	3/1	3/0	3/0	4/1	4/1	2/0	3/1	2/-1
Water management issues ¹⁵	4/0	3/0	3/0	3/0	3/0	4/1	2/0	2/0
Housing	3/0	3/0	4/1	3/0	3/0	1/-1	1/-1	2/0
Successful learning process	3/0	3/0	3/0	2/0	2/0	3/0	1/-1	4/1

The interest matrix (Table 2.1) is filled according to Timmermans (2004 a, p. 91) again the numbers are reasoned by the analyst. The rank (r in Table 2.1) is based on a four point scale that goes from most unimportant, unimportant, important to most important. The direction (d in Table 2.1) of the interest is based on a three point scale (Timmermans 2004 a, p.91) that is an answer to the question “Does *issue x* have a positive impact for your organization?” The scale is as follows: I do not agree, no opinion, and I agree (-1, 0, 1). Together the rank and direction are translated to a 9 point scale that is then normalized for the actors to 1.

In order to get a single value in the cells of Table 2.1 the values are translated to a nine point scale (not shown here) according to Timmermans (2004 a, p. 91). All the issues that have a direction of 0 receive a 5 on the 9 point scale no matter the rank (1, 2, 3, or 4). The issues that have rank 1, 2, 3, or 4 and a direction of -1 are translated to 1, 2, 3, and 4 on the 9 point scale. The issues that have rank 1,

¹⁵ These are: percolating water, polluted water, subsidence, and flooding.

2, 3, or 4 and a direction of 1 are translated to 6, 7, 8, and 9 on the 9 point scale. Thus the variance in the interest of the actors is somewhat leveled out. Only issues that have directions 1 and -1 are translated to high and low weights; (1, 2, 3, and 4) and (6, 7, 8, and 9) issues with a direction of 0 have a value of 5 on the 9 point scale no matter the rank.

In this case, the issues also reflect some general values that have some importance to all public authorities involved, like housing. Housing is an issue on national, provincial, and municipal level. Therefore a direction of -1 is hardly present for the public actors. The interest of the actors is therefore somewhat high, there are less extreme's, as the values 1-4 on the 9 point scale a hardly given.

National government

The national government is mostly interested in a “multifunctional green heart” as it is one of its policy action points (4 and 1). “Water storage” is also seen as important as the national government has made legislation for this issue and the realization of more water storage is seen as positive (3 and 1). The GM project is mentioned as an ‘icon project’ in the policy documents (VROM 2006). It is presented as an example of a project where water problems are taken seriously. Therefore “prestige” is important for the national government (3/1). For the national government “security and continuity” in the polder is important but is no national level issue (1 and 0). “Process objectivity” and “process transparency” are important but have no consequences for the national government itself as the process is lead by the provincial government (2 and 0). “Respect for the landscape” is important (3) as the Green Heart needs to stay ‘green’. However, it is of little interest for the government for this case as a lake is also seen as nature. The impact therefore is neutral (0). A “supported solution” is probably seen as important (3 and 1) as this will allow for a smoother and therefore less costly process. The “water management issues” are important for the government but not on this local level (4 and 0). The same in fact holds for the issues “successful learning process” and “housing” that are issues of importance but are not important on national level (3 and 0).

Province of Utrecht

There are two issues the provincial government is most interested in. First, the Province of Utrecht is interested in “water storage” as it has to realize water storage for the province. The interest of the province is therefore high (4 and 1). The costs of the project are an estimated 300 million Euro. It is the project in the Green Heart that costs most money (VROM 2006) compared to other projects. Second, getting such a costly project funded is “prestigious” and may be good for the image of the province (4 and 1). Third, a multifunctional green heart is not of direct interest to the province as this issue belongs to national policy (2), however, the direction is 1 as money spent on this issue by the national government benefits the province as well. Fourth, “process objectivity” and “process transparency” seem not that important for the province. Documents are not made public or are made public after decisions have been made, like the expert consultation of the provincial council¹⁶. Another example is a press release that contained inaccurate information. Inhabitants opposed this in a new press release. The province admitted the release was wrong but failed to communicate this in a new press release but altered the old one instead without changing the date (Provincie Utrecht 2007). It seems to be strategic to withhold information or change information to the interest of the provincial government (2 and 0). The rest of the issues are important for the provincial government but for this case do not contribute directly to the interest of the province and are given a 3 or 2 for rank and a direction of 0.

Municipal government

A lot of the issues are important for the municipal government. The municipal government is chosen by the inhabitants of the whole municipality so their well being is the responsibility of the municipal government. For the GM case this also holds but the main issue of interest is probably “housing” (4 and 1). There is no direct evidence for this although there is a publication that says that in the lake strategy 2500 houses have been planned to compensate costs (Provincie Utrecht 2006). No statements have been made by the municipality on the issues: “security and continuity,” “process objectivity,” “process transparency,” “a supported solution,” “the water management issues,” and the “successful learning process.” These issues are important for the municipality but do not have a positive impact for this case, the thus a rank of 2 or 3, and a direction of 0. The issues a “multifunctional green heart” and “water storage” are not interesting for the municipal government receive a 1 for the rank. The water storage issue, however, may be of potential interest to the municipality. When the other authorities

¹⁶ <http://www.provincie-utrecht.nl/prvuutr/internet/bestuursagenda.nsf/all/20070307141236?opendocument> (accessed 3 November 2008) Deskundigenraadpleging Polder Groot Mijdrecht Noord

wish to pursue water storage the municipal government wants to be compensated for the realization of water storage on its grounds as the water board will probably save on water management costs in the polder (Nieuwe Meerbode 2006b). The direction is therefore 1. It is however unclear if such compensation is even possible and will ever be paid.

Provincial council

A supported solution is of high importance for the provincial council (4 and 1). This because the provincial council is the people's representative and thus also represents the inhabitants of the polder; large unrest among the inhabitants can therefore not just be ignored. "Process objectivity" and "process transparency" is important for the provincial council as they have a supervisory role regarding the work of the provincial government (3 and 1). A "multifunctional green heart," "water storage," "prestige," "continuity and security," "respect for landscape," "water management issues," "successful learning process," and "housing," in general, are important for the provincial council (3 or 2) but in this case the provincial council does not want to have more control over these issues (0).

Municipal council

"A supported solution" is of high importance for the municipal council (4 and 1). This because the municipal council represents the inhabitants of the municipality and also the inhabitants of the polder. Therefore large unrest among the inhabitants can therefore not just be ignored. Also during the build-up towards the local elections In March 2006 the local parties made clear that a supported solution is important for them. "Process objectivity" and "process transparency" are important for the municipal council but less than for the provincial government as the decisions regarding the polder are not taken at local level (3 and 0). "Continuity and security" are important as they are related to the well-being of the inhabitants (3 and 1). A "multifunctional green heart," "water storage," and "prestige" are of little interest for the municipal council (1 and 0). "Respect for landscape," "water management issues," "successful learning process," and "housing" are important for the municipal council but do not have a positive effect for the municipal council (3 and 0). That is, the values do not affect the functioning of the council as such and therefore receive a low score on interest.

Water board

The "water management issues" are most important for the water board (4 and 1). The water board is worried about the long term sustainability of the current water management of the GM polder (Provincie Utrecht and AGV 2005 and 2006). "Water storage" is important (3) but the direction is given a 0, this because the polder that lies just above the GM polder is designated as a place for water storage in extreme circumstances (e.g. Palm 2005). This polder also lies in the area the water board manages but is located in another province. The water management is judged to be more important for the water board than water storage. Also for the water board the project is "prestigious" as it the potential flooding of a large area of water. A lake is the option the water board pursues as in this case all water management issues are addressed (Provincie Utrecht and AGV 2006). Given the desire of the water board to flood the polder "respect for landscape" is ranked low with a rank of 1 and a direction of -1. Also *housing* receives these same numbers (1, -1) as the water board is not responsible for this or interested in it. The remaining issues are somewhat or not of interest for the water board (2 or 3 for the rank and 0 for the direction). That is, the water board is not interested in more control over these issues.

Inhabitants

The unusual cooperation in the form of a learning process of the involved public authorities makes it unclear what public authority represents the interests of the inhabitants. The inhabitants have mobilized themselves to defend their own interests. The inhabitants find the issues "security and continuity," "process objectivity," "process transparency," and "respect for landscape" highly important (4 and 1). Security and continuity have been negatively affected by the plans for the polder and the inhabitants are interested in clarity on these issues. Process objectivity and transparency are issues that the inhabitants are interested which they find lacking in the current process (Nieuwe Meerbode 2007). The issues a "multifunctional green heart," "water storage," and "prestige" are not important for the inhabitants (1 and -1). These issues are related to the project and the inhabitants feel that there necessity of the water problems is unclear and that they have not asked for the project (Hoogendoorn 2006b). The water management issues are not important for the inhabitants. The inhabitants may have local water issues but they do not agree on the problems (2/0) (Nieuwe Meerbode 2007). The inhabitants are not interested in a "successful learning process" amongst authorities (1/-1).

Habiforum

A “successful learning process” is the most important issue for Habiforum as a Habiforum expert has been hired to lead the (learning) process of the authorities constituting the project management (Provincie Utrecht 2005b) (4/1). The learning objectives, if there are any, have not been made public. What has been written down is an account of the events of the process (Van Rooy 2007). A successful learning process is different from a successful process that results in a supported solution. Learning, always takes place. Therefore the participation of the inhabitants in the process is not necessary in order to claim learning success. More important is that the project management remains committed to this process. “Prestige” is estimated as an issue of importance for Habiforum (3/1). It can be seen as “prestigious” to lead a process with multiple government institutes involved, an area of 200 ha involved in the planning, and 275 million Euros of government funds needed. Especially as the project is advertised as a new and innovative way of using land. “Process transparency” and “process objectivity” are less important for Habiforum (2/0). The Habiforum expert that was put forward as an objective chairman of the project made remarks in the media that point in the direction of a lake being the best option for the polder (Pronk 2006). A “supported solution” where all actors agree with the chosen solution seems relatively unimportant (2/-1). For a supported solution the inhabitants are needed but the inhabitants quitting the process was not seen as a negative thing (Van Rooy 2007). The issues “multifunctional green heart,” “water storage,” “security and continuity,” “the water management issues,” and “housing” are of little interest to Habiforum as it is a knowledge institute in charge of the process of the project (2/0).

2.2.2 Scoring of control over issues

The control matrix, Table 2.2, is filled for the actors on a nine point scale like in Timmermans (2004a, p. 89-91). In this case however the amount of control is estimated by the analyst and not the actors themselves. Also in Timmermans (2004a) there was still uncertainty about the total number of actors in the studied system. Therefore an actor ‘others’ was considered. In our case a network analysis was performed in advance and this uncertainty did not exist. The numbers in the matrix should not be interpreted as absolute, the proportions between the numbers are more important as the scores will be normalized for each row.

Table 2.2: Table of control over issues

Actor	Nat Gov	Prov Gov	Mun gov	Prov council	Mun council	Water Board	Inhab	Habi
Issue								
Multifunctional green heart	9	5	3	3	1	3	3	1
Water storage	3	5	3	7	2	3	5	1
Prestige	7	3	1	5	3	1	5	1
Security and Continuity	5	7	3	3	2	2	1	2
Process objectivity	1	7	2	3	1	2	1	5
Process transparency	1	7	2	5	1	2	1	2
Respect for landscape	7	7	4	3	2	3	1	2
A supported solution	2	9	3	5	3	3	9	3
Water management	7	5	2	2	1	3	2	1
Housing	8	6	4	4	4	1	1	1
Successful learning process	1	6	6	1	1	6	3	1

Multifunctional green heart

The issue of a multifunctional green heart is mostly controlled by the national government as the national government is likely to contribute a large part of the funding (9). The provincial government also controls the issue as it designed the project in a way that it contributes to the issue in order to get funding and has reserved funds for it (5). The inhabitants and the provincial council have the power to block the plans through the media and in the council and therefore control part of this issue (3). The

water board and the municipal government are also part of the project group and will need to provide funds for the project and therefore have some control over the issue (3) (Provincie Utrecht 2005b).

Water storage

The national government sets the norms for the amount of water storage that needs to be sought by the province and therefore has some control on the issue (3). The realization of the water storage is done by the province (5) that needs the agreement of the provincial council (7) and the cooperation of the local inhabitants (7). Also the municipal government (3) and municipal council (2) have some control as potential water storage is realized on the land of the municipality. The water board is responsible for the water management not for realizing a location for water storage. As the water board is the expert on water it will probably assist in its realization. Therefore the water board has somewhat control over the issue (2/3). Habiforum as process leader has no control over the issue (1).

Prestige

Prestige is controlled by the government who is asked to pay a large part of the costs (7). The provincial council (5) and municipal council (3) may amend the solution put forward by the provincial government. The inhabitants may influence the final project proposal by lobbying the council and getting media attention that influences popular beliefs (5). The provincial government has somewhat control over prestige by putting forward the project and by paying a small part of the costs (3). The municipal government (1), water board (1), and Habiforum (1) have little control over the issues.

Security and Continuity

The inhabitants have the least control (1) over security and continuity. The plans for the polder have influence on the feeling of security of the inhabitants as they do not know what the future will bring, what policy will be chosen (Nieuwe Meerbode 2007). The plans also influence continuity as houses become unsalable and companies can not get loans for investments (Nieuwe Meerbode 2007). Security and continuity is thus predominantly controlled by the provincial government that is responsible for the plans for the area (7/8) and to a lesser degree by the municipal government (3). The national government has some control over these issues (5) because the decision to provide money or not influences these issues. The provincial and municipal councils have less influence (3 and 2) on these issues than the national government as they have a supervisory role. Also when the money of the government would become available the provincial council would probably be more willing to agree with the proposals of the government as it has requested more insight into how the project will be financed and how inhabitants will be compensated (Provinciale Staten 2007). Also the responsible persons in the provincial government – the people's representatives, are members of the parties that have formed a coalition to rule the province and have delivered the people making the decisions for the provincial government. The water board and Habiforum have somewhat control (2) over the issue as they have no direct political power but may influence the other authorities in the project team.

Process objectivity and transparency

Process objectivity and transparency is largely controlled by the provincial government who is in control of the process and what information is released (7). The provincial council has a supervision function and therefore has somewhat control over the issues objectivity and transparency. Transparency (5) is controlled more than objectivity as the provincial council may ask for new information or consult experts [ref] thereby having an influence on the information that is gathered and released. Process objectivity is controlled less by the provincial council (3) as they do not appoint the people to that work on the project. The municipal government and the water board have somewhat control as members of the project team (2). The municipal council and the national government have the least amount of control (1) as they are no part of the process in the sense that they have no decision-making power in the official policy process. Also the inhabitants have very little control (1) as they have no official power in the decision-making process, they may however influence these issues by getting media attention and lobbying the provincial council. The effect of this is hard to judge and we focused on the formal relationships and therefore have estimated the control of the inhabitants as small. Of course the inhabitants have a large interest in these issues as in their view the process is not transparent and not objective.

Respect for landscape

Respect for landscape is important for the inhabitants but is predominantly controlled by the national government and the provincial government (7 and 7). The amount of money that the national government will pay has a large influence on the solution that is possible and it is the province that is

responsible for a decision on a solution for the polder. Because of its supervisory role the provincial council also has some control (3). The inhabitants have no decision-making power and therefore very little control over this issue (1) although of course they are interested in more control over this issue as they do not agree with the current plans. The municipal government is in charge of local spatial planning and therefore has somewhat control (4). The municipal council has also has somewhat control because of its supervisory role of the municipal government (2). As a member of the project team the water board has somewhat control over the issue (2).

Water management: Percolating water, Polluted water, Subsidence, and Flooding

These are the issues related to the water management. They are grouped together as they would score the same on control and interest for all actors. Furthermore, the issues are depended on each other and can hardly been seen as separate issues as they influence each other although they have been presented by the project management as such. Also the more issues, the more the smaller the effect will be in the equilibrium control of the actors; this makes interpreting the results more difficult.

The water management issues are most controlled by the national government by the money it will grant for the project (7). The provincial government follows as it is responsible for the water management on provincial level (5). The water board has less control (3). This may seem contradictory. First of all the water board only does the water management for drastic changes in the water management issues, like the one proposed for this case, it has no authority. Also in practice the province only approves the plans of the water board for the water management of the polder. This would suggest more control for the water board as the management of the polders is left to the water board. However, in this case the province has taken unusual steps by wanting to decide on the water level (a water management issue) before the water plan by the water board was made (Provinciale Staten 2007). The inhabitants live and work in the polder and they have somewhat control (2) over these issues, as local farmers build small dams or pump groundwater for their crops. The municipal government has somewhat control (2) as it is responsible for the polder and a member of the project team. The provincial council has somewhat control (2) as it can amend suggestions made by project team regarding the water management. The municipal council and Habiforum are ranked with almost no control (1) both do not have real decision-making power. The representative of Habiforum, however, has said in the media that drastic changes are needed in the polder and in this way has been influencing people's perspectives as a drastic change implies the realization of a lake. In a sense this could be described as control over the water management issues. We have decided to view this under process objectivity, that is, the representative of Habiforum, the process chair, has made some comments indicating its preferences for the polder; comments that do not directly fit with the nature of the job of chair.

Successful learning process

Habiforum is in charge of leading the operational part of the process (the meetings) the successful learning process is therefore controlled by the other actors that are involved in the process although not all actors have the same amount of control. The other members of the project management, the provincial and municipal governments and the water board, have most control (6). The inhabitants are given some control (3) as they have been involved in the project, but eventually stepped out. The other actors are involved but are not involved in the participatory process and have the least control (1).

Housing

Housing is restricted in the area by national legislation. Therefore the government has most control on housing. The province is responsible to check if housing plans of municipalities obey national legislation. Therefore province has second amount of control (6). The municipality also has some control in the sense that it may decide where to built and when but may only built within the national margins (4). Both councils have control over the issue as they have to approve plans regarding housing (4). The water board, inhabitants and Habiforum have limited to no power over housing (1).

A supported solution

A supported solution means a solution that is supported by all actors which means in this case that especially the provincial government and the inhabitants need to come to some sort of an agreement (9) given the conditions provided by the provincial council (Provinciale Staten 2007). The provincial council at this point in time has less control than the inhabitant and the province (5/6) but it still has significant control as it can amend unsupported solutions as it did February 5 2007 (Provinciale Staten 2007). All other actors involved in the process have less control (3) especially the national government

is not needed for a supported solution although insight in the amount money the government will provide may influence the policy outcome (2).

2.2 Conflict analysis

2.2.1 Infeasible scenarios

The logically infeasible scenarios are deleted from the set:

- It is not possible for the provincial government to play options three, to pursue a lake in the GMN polder, and four, the restart of the process with an open problem formulation. As the lake is seen by the province of Utrecht as a solution to the water problems allowing for a different problem formulation would mean confessing that the lake is not best option. The removal of these options deletes 62 scenarios.
- The provincial government needs additional funds from the national government to pay for the project in the GM polder. In order to lobby the government the provincial government needs to pursue a solution. Hence option two can not be played without option three. This deletes another 96 scenarios.
- The national government will only provide the money to the provincial government if it knows the money is needed. Therefore option one can not be played without option two being played. This deletes another 32 scenarios.
- The national government will not provide money once the process is restarted with an open problem formulation. The national government needs a plan for a solution with probable costs attached to it in order to be able to provide the money but if the process is restarted potential solutions remain uncertain. This deletes 0 scenarios as these situations are in the group of the already deleted scenarios.
- When the provincial government does not play any of the options it effectively does nothing. All scenarios where the provincial council approves of the plans but where the provincial government does not play any options are therefore infeasible. Another four scenarios are deleted.
- The inhabitants will not play the ‘court option’ when the province would restart the process. This deletes an additional eight scenarios.
- Also the government will not fund the project if the provincial government does nothing. This deletes 0 scenarios as these situations are in the group of the already deleted scenarios.
- The provincial government will not pursue options four or five if the core group of inhabitants does not lobby. This deletes another 20 scenarios.
- The inhabitants are unable to go to court when the provincial government does nothing as in this case nothing has been decided yet to oppose. This deletes a further two scenarios.
- The provincial government will always play the “lobby the national government” option as a large amount of money is needed for the project and the cooperation of the national government is essential. A further 14 scenarios are deleted.
- When the inhabitants do not lobby, then the provincial council is most likely willing to approve of the plans of the provincial government and will not amend the plan. Thus all scenarios where the inhabitants do not lobby and the provincial council amends are infeasible. This deletes four scenarios.
- When the provincial council approves of the plans of the provincial government the inhabitants will always lobby. That is, any plans the provincial government approves that bring the lake option closer will get resistance from the inhabitants. This deletes a final four scenarios.

2.2.2 Rationale for Preference ordering

Preferences national government

The national government has money reserved for innovative projects in the green heart. The possible realization of a lake is seen as an innovative project (VROM 2006). Thus the national government favors scenarios where the national government provides money and a lake is pursued (226, 227, 234, 229, 230, 231, and 238). When the national government chooses not to invest the scenarios are of little interest to the national government. The scenarios where the inhabitants go to court have been put last.

Preferences provincial government

The provincial government has a preference for a lake in combination with funding from the government. Of these scenarios the provincial government prefers the options where the provincial council approves of the plans of the provincial government. These are all scenarios where options 1, 2, 3, and 8 are played (scenarios, 227, 235, 231, and 239). Of these scenarios allowing for more research (235) is preferred to the scenarios where the inhabitants go to court (229 and 231) as this may slow the process and puts ‘decision-making power’ into other peoples hands. Next, the provincial government prefers the scenarios where provincial council amends the plans of provincial government and the government provides the money for the project (226, 234, 230, and 238). The scenarios where the national government does not provide money are ranked lowest. The national government needs to pay most in order to realize the lake and without the money it is unknown if a lake can be realized. Of these scenarios again the ones are preferred where the provincial council does not amend (99, 107, 103, and 111) followed by the ones where the provincial council amends (98, 106, 102, and 110).

Inhabitants

The inhabitants prefer that the polder is left alone. However, the scenarios where the provincial government does nothing are all infeasible. There is also no scenario where the process is restarted with an open problem formulation. The best the inhabitants can opt for, from the feasible scenarios, is no grant from the national government and more research on the severity of the water problems in the polder (107, 111, 106, 110 with more research on the problem and no money from the national government, and then 98, 102, 99, 103, without money from the national government). The inhabitants prefer that the provincial council does not approve of the plans of the provincial government. Therefore scenarios 107 and 111 are ranked higher than 106 and 110; this also holds for 98 and 102 that are preferred over 99 and 103. Of the scenarios where the national government provides money for the project, the scenarios the provincial council does not approve of the plans of the government are ranked highest, with the scenarios where more research is done on the water problems being preferred most (234, 238, 226, and 230). After this the scenarios where more research is done on the water problems are preferred over the others (235 and 239 over 231 and 227).

Provincial council

The provincial council is in somewhat of a sandwich position. On the one hand it prefers that the water problems are taken care of once and for all, and sees the lake as a good option (Provinciale Staten 2007). On the other hand, it can not neglect the opposition from the inhabitants. The inhabitants have a strong lobby. It does not happen often that the meetings of the council are flooded with people from the province (Nieuwe Meerbode 2007; Rost 2007). The provincial council thus prefers the scenarios where the lake is pursued with money from the government and, to accommodate the inhabitants, scenarios where more research regarding the water problems is done (234, 238, 235, and 239). Of these scenarios the scenarios where the province is pressured to amend the decisions of the provincial government are preferred least (235 and 239). Of the remaining scenarios where the national government provides money for the project, the ones where the provincial council approves of the plans of the provincial government are preferred to the ones where the provincial council does not approve of the plans 9227, 231, 226, 230). The scenarios where the national government does not provide money for the project have a similar preference structure (107, 111, 99, 103, 106, 110, 98, and 102).

2.3 Q-methodology

Table 2.3: The shared perspectives, factors, found with Q-methodology for the GM polder.

Process Arguments	Factor A	Factor B	Factor C	Factor D	Factor E
1. It is better to tackle the problems all in one go than to linger for years putting money in series of insufficient measures.	0	3	1	0	-1
2. The government creates unrest through the introduction of new ideas that do not get implemented (e.g. the new road N201, the planned mall in Vinkeveen, the creation of a swamp called Marickenland, and the attempt to connect various parts of nature in the	0	-3	0	1	0

local peat plan).					
3. Clear insight into the financial means of the project should be strived for.	2	2	1	2	1
4. The inhabitants of the polder never actually could participate in the process.	1	-2	-2	3	1
5. The government has to make solid and clear agreements with all involved parties.	3	2	-1	2	2
6. The future of the polder has to be decided in dialogue with the inhabitants of the polder.	1	3	2	2	3
7. Solutions have gotten more emphasis than the problems in the polder.	2	1	-2	0	2
8. Too much emphasis has been put on the Northern part of the polder and other polders have been left out at a too early stage.	1	-2	2	0	3
Problem Arguments					
9. On days when it has rained abundantly the water can not be pumped away in time.	-1	-2	2	-1	0
10. The ground subsides 5 to 9 mm per year which makes it harder and harder to keep the polder dry and the surrounding waters clean.	-2	0	3	-1	-2
11. The percolating water makes the water in the polder Groot Mijdrecht brown and brackish, and green because of alga.	-2	0	-2	0	0
12. Gradually the water management in polder Groot Mijdrecht Noord is no longer sustainable and this is confirmed by hydrological research.	-2	0	1	-3	-3
13. The percolating water contains large concentrations of salt and phosphate that contaminate the Amstel outlet and the surrounding polders.	-1	1	2	0	0
14. In the current situation there are hardly any ground water problems; there are hardly any complaints about ground water.	2	0	-2	1	1
15. The amount of water that needs to be pumped away is not increasing drastically; the water level has not been lowered the past 30 years on the contrary, in some places the water level is being lifted (e.g. Waverhoek).	1	-1	0	1	1
16. The polder is of no relevance for water storage: there is hardly any problem with	2	-1	-1	0	0

water storage in the municipality De Ronde Venen because there are a lot of pastures. Besides this the Ronde Hoep polder has been marked as an area for water storage in times of need.					
17. Surface sinking is a process that takes place over a very long time span; all polders sink and the surface lowering is 1 meter in 200 years.	-1	0	0	1	0
18. The water problems are acknowledged and recognized by nearly everybody.	-3	-1	3	0	-2
19. In the past arable farming was possible now only grassland is possible.	-1	0	0	-1	-1
20. Young fruit trees have a hard time or even die as a consequence of the high water level and /or high salt concentrations in the ground water.	-2	1	-3	-1	0
Solution Arguments					
21. The inhabitants of the municipality of De Ronde Venen should benefit from possible spatial development, get priority for buying houses and the set-up of businesses.	0	-3	-1	2	0
22. The Construction of extra houses in the area provides employment in retail trade and supporting services which is good for the area.	0	2	-3	0	-1
23. The solution for the water problems lies in making the area wetter.	-3	-1	1	-3	-3
24. Because of the surface sinking in the polder Groot Mijdrecht Noord the land gets wetter. Because of this the land becomes less suitable for agriculture unless the water level is lowered on a regular basis.	-1	1	0	-2	-2
25. Existing plans (plan De Venen) provide no sustainable solution for the problems in the polder.	1	1	0	-2	2
26. The execution of existing plans supplemented with technical measures can reduce the flooding to nationally acceptable risks.	0	0	0	-1	-1
27. The solution for the water problems lies between the two extremes: the local peat plan and a lake	0	-1	-1	-2	-2
28. The polder Groot Mijdrecht Noord is a cultural landscape that needs to be preserved.	3	0	-1	3	1

29. The future situation reminds a cold reorganization.	0	-2	1	1	2
30. New possibilities for tourism and recreation in the polder Groot Mijdrecht Noord need to be welcomed.	0	2	0	-2	-1

Table 2.4: The significant contribution of respondents, marked with an X, to the factors determined for the GM polder case.

respondent	Factor A	Factor B	Factor C	Factor D	Factor E
1	-0.17	-0.04	0.91X	-0.04	-0.05
2	0.12	-0.06	0.11	0.71X	0.15
3	0.68X	0.04	0.05	0.41	0.15
4	0.81X	-0.08	-0.22	0.13	0.35
5	0.07	0.88X	0.07	-0.19	0.19
6	0.53	0.07	-0.22	0.39	0.59
7	0.69X	-0.07	-0.24	0.35	0.39
8	0.36	-0.02	-0.017	-0.07	0.77X
9	0.13	0.14	-0.18	0.33	0.79X
10	0.56X	0.02	-0.00	0.27	0.45
11	0.59X	-0.21	0.06	0.08	0.46
12	0.23	-0.15	-0.13	0.60X	0.42
13	0.40	0.23	-0.06	0.73X	0.11
14	0.41	0.02	-0.06	0.41	0.66X
15	0.25	-0.03	0.35	0.33	0.71X
16	0.59	-0.13	-0.23	0.56	0.37
17	0.78X	0.19	-0.13	0.22	0.27
18	0.68X	0.32	0.48	0.12	0.03
19	-0.02	0.87X	-0.06	0.13	-0.14

Appendix 3: The network unbundling case

3.1 Transactional analysis

3.1.1 Scoring of control over issues

Table 3.1: Control over issues.

Issue	Government	Provincial and local governments	Integrated power companies
Reliability of network operation	4	5	8
Efficient market arrangement	4	5	6
Value of shares	8	8	4
Continuity of company	8	8	4

The control matrix, Table 3.1, is estimated for the three main actors on a nine point scale like in Timmermans (2004a, p. 89-91). In this case however the amount of control is estimated by the analyst and not the actors themselves. Also in Timmermans (2004a) there was still uncertainty about the total number of actors in the studied system. Therefore an actor ‘others’ was considered. In our case a network analysis was performed in advance and this uncertainty did not exist. The numbers in the matrix should not be interpreted as absolute, the proportions between the numbers are more important as the scores will be normalized for each row.

Reliability of network operation and efficient market arrangement

Table 3.1 shows that the government has little control over the issues reliability of network operation and efficient market arrangement. This is ranked with a 4 and not a 1 or 2 since the government has legislative powers regarding these issues. In this case however it is the view of the government that they do not have enough control.

The provincial and local governments are indifferent (5) about the control they have on the reliability of network operation and the efficient market arrangement. This is because of the structure of the company it being a “structuur NV” which means that they have very little decision-making power (Crone 2005).

The integrated power companies receive high amount of control for the reliability of network operation (8). This because the integrated power companies own the network companies. Given the fact that the government has put restrictions on the network tariffs the large integrated power companies are not given a 9. The large integrated power companies have the most control over efficient market arrangement (6). The companies do have more market power than new entrants but other stakeholders like the Dte (market watch dog) and the national government pose restrictions regarding, for example, distribution tariffs.

Value of shares and continuity of company

The value of shares and the continuity of the companies are ranked with a high amount of control for the government. This because the government still has to pass legislation to finalize the process of liberalization. The government is not given a 9 because the process of liberalization has been started and this process provides boundaries to what the government can do. Making the large integrated power companies totally government owned for example is hardly possible as the supply companies are allowed to be private companies.

For the provincial and local governments the values of shares and continuity of the company are ranked with a relatively high amount of control. This, because the provincial and local governments own the shares and therefore control them and by selling (part of) their can have a large impact on the continuity of the companies.

The integrated power companies have little control over the value of the shares and the continuity of the companies. This, because the future is unclear for these companies as the process of liberalization has not been finished and further legislation will be made regarding the companies.

3.1.2 Scoring of interest in issues

Table 3.2: Interest in issues.

Issue	Government Rank/direction	Provincial and local governments Rank/ direction	Integrated power companies Rank/direction
Reliability of network operation	4 /1	3/1	3/0
Efficient market arrangement	4/1	2/1	3/0
Value of shares	3/0	4/1	4/1
Continuity of company	3/0	4/1	4/1

The interest matrix is filled according to Timmermans (2004 a, p. 91) again the numbers are estimated by the analyst. The rank is based on a four point scale that goes from most unimportant, unimportant, important to most important. The direction of the interest “I want more control” or “I don’t mind having less control” is based on a three point scale (Timmermans 2004 a, p.91) that is an answer on the question “Does *issue x* have a positive impact for your organization?” The scale is as follows: I do not agree, no opinion, and I agree (-1, 0, 1).

In order to get a single value the values for rank and direction in Table 3.2 are translated to a nine point scale according to Timmermans (2004 a, p. 91). All the issues that have a direction of 0 receive a 5 on the 9 point scale no matter the rank (1, 2, 3, or 4). The issues that have rank 1, 2, 3 or 4 and a direction of -1 are translated to 1, 2, 3, and 4 on the 9 point scale. The issues that have rank 1, 2, 3, or 4 and a direction of 1 are translated to 6, 7, 8, and 9 on the 9 point scale. Thus the variance in the interest of the actors is somewhat leveled out. Only issues that have directions 1 and -1 are translated to high and low weights; (1, 2, 3, and 4) and (6, 7, 8, and 9) issues with a direction of 0 have a value of 5 on the 9 point scale no matter the rank.

Government

The issues of reliability of network operation and efficient market arrangement are ranked as most important by the government. This because the government believes that currently these issues are public values that should be safeguarded by the government (Brinkhorst 2004a). Naturally the direction therefore is a 1. Table 3.2 shows that the government does think that the values of shares and continuity of the companies are important. This can be related to the public function of the government. The direction of the issue is ranked with a 0. Indicating that the government is neutral regarding more control over the issues - the issue does not have a positive or negative impact for the government.

Provincial and local governments

Logically, the provincial and local governments rank the value of the shares and the continuity of the company as being most important (4) since it has a direct influence on either the amount of dividend they receive or the value of their shares. The direction 1 is provided because currently the shareholders have little influence on the decisions being made and have expressed this as being a bad situation (Crone 2005). Efficient market arrangement is ranked unimportant (2), as this is a national issue, but reliability of network operation is ranked more important (3) as the integrated power companies deliver energy to the ‘clients’ of the shareholders – the inhabitants of the provinces and municipalities.

Integrated power companies

The integrated power companies see the reliability of network operation and efficient market arrangement as important for them (3). This is naturally the case since the large integrated power companies own the network companies and have to compete with other companies in the market. The rank is not 4 since these issues are less important than the value of the shares and the continuity of the company. The direction is 0 as the companies have little incentive to pursue more reliability or more efficient market arrangement than there is at the moment. The status quo provides them with power on these issues (see Table 9). The value of the shares and the continuity of the company are ranked as most important since these issues reflect the functioning of the company. The direction is ranked as one since more control over these issues is, logically, seen as important.

3.2 Conflict analysis

3.2.1 Infeasible Scenarios

The rationale used to delete infeasible scenarios from the developed set of scenarios.

- It is logically not possible that the government allows for the privatization of the network companies while playing options one and/or two. This is because the playing of the first two options requires a new structure of the shares while in the third option the current shares are kept. This deletes 24 of the possible 64 scenarios.
- The power companies have lobbied against the split off. We assume that when the government decides for liberalization the power companies will stop lobbying against the split off (not play options five and six). Also in a situation when the government decides to liberalize, the provincial and local governments will sell their shares¹⁷ (play option four). Thus all other scenarios where the government decides to liberalize and options five or six are played or option four is not played are infeasible. This deletes another seven scenarios.
- Currently it is not possible for the shareholders to sell their shares (to private parties). This as the supply and distribution companies are all represented in these ‘integrated’ shares. As the government has to play any option before the shareholders can sell their shares scenarios where the option “sell shares” is played and the government does nothing are infeasible. This deletes another four scenarios.
- All scenarios where the government plays options one or three the provincial and local governments can sell their shares. In all scenarios where the government plays option two they will not sell their shares. They could in fact sell the not network part but we assume they will not do so as the shareholders think they whole company is worth more than the sum of its parts (*e.g.* Provincie Gelderland 2005). In the scenarios where option two is played in combination with option 1 the shareholders would have to sell their shares of the non-network part of the companies. We assume that the government will not force the current shareholders to sell their shares. This deletes another eight possible scenarios.

3.2.2 Rationale for Preference ordering

Preference ordering of the national government

The preference ranking of the government is ordered in a way that the government prefers the most stringent options for network split of (3, 19, 35, 51). After that the government prefers the scenarios where option two is played (2, 18, 34, 50, 10), prohibiting the network companies to be owned by private parties. Within these scenarios the government prefers the scenario where the provincial and local governments keep their shares (2, 18, 34, and 50) the most. After these scenarios the government prefers the scenarios where option one is played and where the shares of the network companies and the generation/supply companies are not allowed to be owned by the same parties. The statues quo and scenarios where the government does not take any action are then preferred over scenario 12 where the large integrated power companies are privatized.

Preference ordering of the provincial and local governments

The provincial and local governments prefer the privatization scenario (12) the most since they expect the value of the shares to be the most in this scenario. Scenarios where the provincial and local governments sell their shares and the government plays option one are preferred next (9, 25, 41, and 57). The scenario where the provincial and local governments sell their shares and the government plays option two (10) is preferred after that. Scenarios where the provincial and local governments are not allowed to sell their shares are preferred least (3..48).

Preference ordering of the integrated power companies

The integrated power companies prefer the scenario where the national government does not play an option the most (0, 16, 32, 48); this because the large integrated power companies remain a single company in these scenarios. Currently the power of the board of directors of the large integrated power companies is relatively high in the large integrated power companies which makes decision-making relatively easier as the shareholder influence on the operational decisions is limited. Next, scenario 12 is preferred most since the companies are not split into separate companies in the case of privatization. Scenarios 1, 2, 3, 17, 18, 19, 33, 34, 35, 49, 50, and 51 where the large integrated companies are split

¹⁷ See the following link for a overview of how the Province of Friesland has tried to sell its shares <http://www.fryslan.nl/sjablonen/1/infotype/dossier/dossier.asp?objectID=15120&dossierID=69> (last visited 7 February 2006)

and the provincial and local governments keep their shares are then preferred over scenarios 9, 25, 41 and 57, where the large integrated power companies are split and the shares are sold.

References

- Ackoff, R. L. (1981). The Art and Science of Mess Management. *Interfaces* **11**: 20-26.
- AD Groene Hart (2006). Overheden hebben gefaald. 25 October 2006.
- AD groene Hart (2007). Ronde Venen, Prins bezoekt polder. 20 December 2007.
- Algemene Energieraad. (2004). *Behoedzaam Stroomopwaarts, beleidsopties voor de Nederlandse elektriciteitsmarkt in europees perspectief*. 's-Gravenzande: VanDeventer. Maart 2004.
- Aliksson, S. and T. Oberg (2008). Conjoint Analysis for Environmental Evaluation a Review of Methods and Applications. *Environmental Science and Pollution Research* **15**(3): 244-257.
- Amstel Gooi- en Vecht (AGV) Hoogheemraadschap and Gemeente De Ronde Venen (2006). Stedelijk Waterplan De Ronde Venen, voor de woonwijken Hofland, Veenzijde, Westerheul, Zuiderwaard en Bedrijventerrein Mijdrecht. 14 September 2006.
- Argyris, C. and D. A. Schon (1996). *Organisational learning II; theory, method and practice*. Amsterdam: Addison-Wesley.
- Arrow, K. J. (1963). *Social Choice and Individual Values*. New York: Wiley.
- Axelrod, R. and W. Hamilton (1981). The evolution of Cooperation. *Science* **211**(1390-1396).
- Baarsma B. (2004). Korte inleiding leveringszekerheid elektriciteit. Research memorandum 2004 nr1. 23 March 2004. *Stichting voor Economisch Onderzoek (SEO)*: Amsterdam.
- Barry, J. and Proops J. (1999). Seeking sustainability discourses with Q methodology. *Ecological Economics* **28**: 337-345.
- Beasley, J. E. (No date) OR-notes [Website] Available from <http://people.brunel.ac.uk/~mastjib/jeb/or/softor.html> [accessed 24 February 2009]
- Belton, V. and T. J. Stewart (2002). *Multiple Criteria Decision Analysis: An integrated approach*. Norwell USA, Dordrecht The Netherlands: Kluwer Academic Publishers.
- Benjamin C. M. and Powell C.A. (1990). The Use of Metagame Analysis as a Diagnostic-Technique in Decision Situations - the 1988 United-States-USSR Grain Negotiations. *Information and Decision Technologies* **16** (4): 361-371.
- Bennett P. G. and Dando M.R. (1979). Complex Strategic Analysis: A Hypergame Study of the Fall of France. *Journal of the Operational Research Society* **30** (1): 23-32.
- Bennett P. G, M.R. Dando, and R. G. Sharp (1980). Using Hypergames to Model Difficult Social Issues: An Approach to the Case of Soccer Hooliganism. *Journal of the Operational Research Society* **31**: 621-635.
- Bennett P. G. (1980). Bidders and dispenser: manipulative hypergames in a multinational context. *European Journal of Operational Research* **4** (5): 293-306.
- Bennett P. G. (1998) Confrontation analysis as a diagnostic tool. *European Journal of Operational Research* **109**: 465-482.
- Black, D. (1948). On the rationale of group decision-making. *Journal of Political Economy* **56**: 23-34.
- Bots, P. W. G., M. J. W. Van Twist and J. H. R. Van Duin (1999). *Designing a Power Tool for Policy Analysts: Dynamic Actor Network Analysis*. Proceedings of the 32nd Hawaii International Conference on System Sciences, Los Alamitos: IEEE Press.
- Braybrooke, D. (1974). *Traffic congestion goes through the issue-machine*. London and Boston: Routledge & Kegan Paul.
- Brewer, G. A. and Selden S.C. (2000). Individual Conceptions of Public Service Motivation. *Public Administration Review* **60** (3): 254-264.
- Brewer, G. D. and P. deLeon (1983). *The Foundations of Policy Analysis*. Pacific Grove, California: Brooks/Cole Publishing Company.
- Briggs, R. O., G. J. De Vreede and J. Nunamaker. (2003). Collaboration engineering with ThinkLets to pursue sustained success with group support systems. *Journal of Management Information Systems* **19**(4): 31-64.
- Brinkhorst, (2004a). Letter of the Minister of Economic Affairs, Den Haag, 31 March 2004.
- Brinkhorst (2004b). Aanpak splitsing energiebedrijven. E/EM/4063988. 11 oktober 2004.
- Brodheim, E. and G. Prastacos (1979). The Long Island blood distribution system as a prototype for regional blood management. *Interfaces* **9**(5): 3-20.
- Brown, S. R. (1980). *Political subjectivity: Applications of Q-methodology in political science*. New Haven, CT: Yale University Press.

- Brugha, R, and Varvasovszky Z. (2000). Stakeholder analysis: a review. *Health Policy and Planning* **15** (3): 239-246.
- Bruijn, H. d. and E. t. Heuvelhof (2002). policy analysis and decision making in a network: how to improve the quality of analysis and the impact on decision making. *Impact Assessment and Project Appraisal* **20**(4): 232-242.
- Bryant J. W. (2002). Confrontations in health service management: Insights from drama theory. *European Journal of Operational Research* **142**: 610-624.
- Bryant, J. W. and Darwin J. A. (2004). Exploring inter-organisational relationships in the health service: An immersive drama approach. *European Journal of Operational Research* **152**: 655-666.
- Bryson, J. M. (2004). What to do when Stakeholder Matter, Stakeholder Identification and Analysis Techniques. *Public Management Review* **6**(1): 21-53.
- Buchanan, J. and G. Tullock (1962). *The calculus of consent: logical foundations of constitutional democracy*. Michigan: University of Michigan Press.
- Bueno de Mesquita, B. (2003). Ruminations on challenges to prediction with rational choice models. *Rationality and Society* **15**(1): 136-147.
- Centraal Planbureau (2005). *Vertical separation of the energy-distribution industry; an assessment for several options for unbundling*. Mulder M, V. Shestalova, and M. Lijesen Netherlands Bureau for Economic Policy Analysis. Document 84. The Hague: CPB
- Cohen, M. D., J. G. March, and J. Olsen (1972). A Garbage Can Model of Organizational Choice. *Administrative Science Quarterly*: **1**-25.
- Coleman, J. S. (1990). *Foundations of Social Theory*. Cambridge, Massachusetts, and London: TheBelknap Press of Harvard University Press.
- College van Gedeputeerde Staten (2008). Statenvoorstel Groot Mijldrecht Noord. Registratienummer: 2008INT231563. 28 October 2008.
- Crone, F (2005) Herstel publieke controle belangrijker dan topsalarissen, *NRC*. 19 April 2005.
- De Ronde Vener* (2006a). Statenleden bezoeken polder. 3 May 2006.
- De Ronde Vener* (2006b). Balkenende brengt bezoek aan polder. 6 October 2006.
- De Ronde Vener* (2007). Polder wacht 'natte' toekomst. 7 February 2007.
- De Vries, L.J. 2004. *Securing the public interest in electricity generation markets, The myths of the invisible hand and the copper plate*. Delft University of Technology, Faculty of Technology, Policy and Management.
- Dewar, J. A., C. H. Builder, W.M. Hix, and M.H. Levin (1993). *Assumption-Based Planning, a planning tool for very uncertain times*. Santa Monica: RAND.
- Duke, R. D. and J. L. A. Geurts (2004). *Policy games for strategic management: Pathways into the unknown*. Amsterdam: Dutch University Press.
- Dunn, W. N. (1994). *Public Policy Analysis: an introduction*, Prentice-Hall.
- Eerste Kamer der Staten Generaal (2006a). Motie-Doek (CDA) en Sylvester (PvdA) c.s. inzake inwerkingtreding van het wetsvoorstel Splitsing van energiebedrijven (EK 30.212, H) Ingediend 14 November 2006. Available from: http://www.eerstekamer.nl/motie/motie_doek_cda_en_sylvester_pvda_c
- Eerste Kamer der Staten Generaal (2006b). Eerste Kamer drukt stempel op energiebeleid [website] 16 november 2006. Available from: http://www.eerstekamer.nl/nieuws/20061115/eerste_kamer_drukt_stempel_op [accessed 17 March 2009]
- ECN (2003). *Position of Large Power Producers in Electricity Markets of North Western Europe, report for the Dutch Energy Council on the electricity markets in Belgium, France, Germany and The Netherlands*. Scheepers, M. J. J, A. F. Wals and F. A. M. Rijkers. ECN project 7.7504. Petten: ECN
- Eden, C. (1988). Cognitive mapping. *European Journal of Operational Research* **36**: 1-13.
- Eden, C. (1995). On evaluating the performance of 'wide band' GDSS's. *European Journal of Operational Research* **81**(2): 302-311.
- European Commission (2004). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 12 May 2004 entitled "White Paper on services of general interest" COM(2004) 374 final.
- Fang, L., K. W. Hipel, and D. M. Kilgour (1993). *Interactive Decision Making, the graph model for conflict resolution*. New York: John Wiley & Sons, INC.

- Fraser N. M. and Hipel K.W. (1980). Metagame Analysis of the Poplar River Conflict. *Journal of the Operational Research Society* **31**: 377-385.
- Fraser, N. M. and K. W. Hipel (1984). *Conflict Analysis, models and resolutions*. Amsterdam: Elsevier Science Publishing Co.
- French S. and Geldermann J. (2005). The varied contexts of environmental decision problems and their implications for decision support. *Environmental Science & Policy* **8**: 378-391.
- French, S. (1993). *Decision Theory: An Introduction to the Mathematics of Rationality* Chichester: Ellis Horwood.
- French, S. and J. Geldermann (2005). The varied contexts of environmental decision problems and their implication for decision support. *Environmental Science & Policy* **8**(3): 378-391.
- Fundeborg, D., J. Tirole (1991). *Game Theory*, Massachusetts: MIT Press
- Goeller, B. F. (1984). *Guidelines for Constructing Policy Analysis Models*, P-6975. Santa Monica, California: The Rand Corporation. Cited in Miser and Quade (1985). *Handbook of Systems Analysis, Overview of Uses, Procedures, Applications, and Practice*. Chichester: John Wiley & Sons.
- Green K. C. (2002). Forecasting decisions in conflict situations: a comparison of game theory, role-playing, and unaided judgement. *International Journal of Forecasting* **18**: 321-344.
- Grimble R. and Wellard K. (1997) Stakeholder Methodologies in Natural Resource Management: a Review of Principles, Contexts, Experiences and Opportunities. *Agricultural Systems* **55** (2): 173-193.
- Hair, J. F., B. Black, B. Babin, and R. E. Anderson (2006). *Multivariate Data Analysis*, Link Upper Saddle River: Prentice-Hall, 2006 (1987).
- Hämäläinen R. P. (2004). Reversing the Perspective on the Applications of Decision Analysis (comment on Keefer *et al.* 2004). *Decision Analysis* **1** (1): 26-31.
- Hammond, T. H. (1996). Formal Theory and the Institutions of Governance. *Governance: An International Journal of Policy and Administration* **9**(2): 107-185.
- Hermans L. and Bots P. (2002). Metagames: Exploring Participatory Stakeholder Analysis for Water Management in Egypt. In: Mayer I, Veeneman W. (Eds), *Games in a World of Infrastructures. Simulation-Games for Research, Learning and Intervention*. Delft: Eburon p. 287-300.
- Hermans, L. (2004). Dynamic Actor Network Analysis for Diffuse Pollution for the Province of North-Holland. *Water Science and Technology* **49**(3): 205-212.
- Hermans, L. M. (2005). *Actor analysis for water resources management*. Delft: Eburon.
- Hillier, F. S. and G. J. Lieberman (1995). *Introduction to Operations Research*. New York: McGraw-Hill.
- Hisschemöller, M. (1993). *De democratie van problemen, de relatie tussen de inhoud van beleidsproblemen en methoden van politieke besluitvorming*. Amsterdam: VU Uitgeverij.
- Hodges J. S. (1991). Six (or so) things you can do with a bad model. *Operations Research* **39**(3): 355-365, 1991.
- Hoogendoorn, W. (2006a). Iedereen erkent waterprobleem, bewoners van polder Groot Mijdrecht laten het liefst alles bij het oude. *AD Groene Hart*. P. 2. 25 October 2006.
- Hoogendoorn, W. (2006b). Protest tegen waterberging, 'Dit gebied is mooi, er is ruimte en een grote vitaliteit'. *AD Groene Hart*. 26 October 2006.
- Hoogerwerf, A. (1987). De levensloop van problemen: Definiëring, precisering en oplossing. *Beleidswetenschap* **1**: 159-181.
- Howard N. (1971). *Paradoxes of Rationality: Theory of Metagames and Political Behavior*. Massachusetts: MIT Press.
- Howard, N. (1994a). Drama Theory and Its Relation to Game Theory. Part 1: Dramatic Resolution vs. Rational Solution. *Group Decision and Negotiation* **3**: 187-206.
- Howard, N. (1994b). Drama Theory and Its Relation to Game Theory. Part 2: Formal Model of the Resolution Process. *Group Decision and Negotiation* **3**: 207-235.
- Jackson M.C., P Keys Towards a system of systems methodologies. *Journal of the Operational Research Society* **35**(6):473-486
- Joldersma C. and Roelofs E. (2004). The impact of soft OR-methods on problem structuring. *European Journal of Operational Research* **152**: 696-708.
- Jones, C. O. (1977). *An introduction to the study of public policy*. North Scituate, Mass: The Duxbury Press.

- Juul, J. (2005). *Half-real: video games between real rules and fictional worlds*. Cambridge, MA: The MIT Press.
- Keijts, B. (2008). Discutabele naar leven met water in Groot-Mijdrecht. *Land + Water*. **6/7**: 10-11. June 2008.
- King, C. S., K. M. Feltey, and B. O'Neill Susel (1998). The Question of Participation: Toward Authentic Public Participation in Public Administration. *Public Administration Review* **58**(4): 317-326.
- Kingdon, J. W. (1995) first published in 1984. *Agendas, Alternatives, And Public Policies*. New York: HarperCollins College Publishers.
- Kilgour, D.M., K.W. Hipel (2005) The Graph Model for Conflict Resolution: Past Present, and Future. *Group Decision and Negotiation* **14**(6): 441-460
- Klein J. H. (2000) Telling stories: a metagame description of a conflict. *Omega, International Journal of Management Science* **28**: 1-15.
- Klijn, E.-H. and J. F. M. Koppenjan (2000). Public Management and Policy Networks, Foundations of a network approach to governance. *Public Management* **2**(2): 135-158.
- Kolb, D. (1984). *Experiential learning: Experience as the source of learning and development*. New Jersey: Prentice-Hall, Inc.
- Koppenjan, J. and E.-H. Klijn (2004). *Managing Uncertainties in Networks*. London, New York: Routledge.
- KPMG (2004). *Onderzoek modelovereenkomst netbeheerder en leverancier binnen het leveranciersmodel*. Amstelveen: KPMG. August 2004.
- Kunreuther, H., J. Lathrop, and J. Linnerooth (1982). A Descriptive Model of Choice for Siting Facilities. *Behavioral Science* **27**: 281-297.
- Lieberman, E., C. Hauert, and M. A. Nowak (2005). Evolutionary dynamics on graphs. *Nature* **433**(7023): 312-316.
- Lindblom, C. E. (1973). First published in 1959. *The Science of "Muddling Through"*. A Reader in Planning Theory. A. Faludi. Oxford, Pergamon Press: 151-69.
- Losa F. B. and Belton V (2006). Combining MCDA and conflict analysis: an exploratory application of an integrated approach. *Journal of the Operational Research Society* **57**: 510-525.
- Majone, G. (1985). Systems Analysis: A Genetic Approach. In H. J. Miser and E. S. Quade (eds.) *Handbook of Systems Analysis, Overview of Uses, Procedures, Applications, and Practice*. Chichester: John Wiley & Sons.
- Mayer, I. S., E. v. Daalen, and P.W.G. Bots (2004). Perspectives on Policy Analyses: A Framework for Understanding and Design. *International Journal of Technology Policy and Management* **4**(2): 169-191.
- McKeown, B. and D. Thomas (1988). *Q-methodology*. Newbury Park, CA: Sage Publications.
- Mingers J. and Brocklesby J. (1997). Multimethodology: Towards a Framework for Mixing Methodologies. *Omega, International Journal of Management Science* **25** (5): 489-509.
- Mingers J. (2003). A classification of the philosophical assumptions of management science methods. *Journal of the Operational Research Society* **54**: 559-570.
- Mingers J. and Rosenhead J. (2004) Problem Structuring Methods in Action. *European Journal of Operational Research* **152**: 530-554.
- Miser, H. J. (1980). Operations Research and Systems Analysis. *Science* **209**: 139-147.
- Miser H. J. and Quade E. S. (1988). *Handbook of Systems Analysis, Craft Issues and Procedural Choices*. Chichester, New York, Brisbane, Toronto, Singapore: John Wiley & Sons.
- Monnikhof, R. A. H. (2006). *Policy Analysis for Participatory Policymaking*. Leeuwarden, R.A.H. Monnikhof.
- Munro, I. and J. Mingers (2002). *The use of multimethodology in practice-- results of a survey of practitioners*. *Journal of the Operational Research Society* **53**(4): 369-378.
- Mysiak, J. (2006). Consistency of the results of different MCA methods: a critical review. *Environment and Planning C: Government and Policy* **24**: 257-277.
- Nieuwe Meerbode (2006a). Amendement RVB, CDA en VVD aangenomen: "Als polder Groot Mijdrecht onder water moet, dan iedereen compenseren". 27 September 2006.
- Nieuwe Meerbode (2006b). Even bijpraten met Anco Goldhoorn: Het Waterprobleem van Polder Groot Mijdrecht Noord. 27 september 2006.

- Nieuwe Meerbode* (2007). Veel emoties bij Hooravond Provinciale Staten. "Laat ons boeren, dan blijft het Groene Hart groen!". 5 January 2007.
- Nieuwsbank* (2004). Essent, Nuon, ENECO en Delta sturen minister Brinkhorst brandbrief. 25 October 2004. [accessed 25 November 2008]
<http://www.nieuwsbank.nl/inp/2004/10/25/R182.htm>
- Noakes D. J., L. Fang, K.W. Hipel, and D.M. Kilgour (2003) An examination of the salmon aquaculture conflict in British Columbia using the graph model for conflict resolution. *Fisheries Management and Ecology* **10**: 123-137.
- Nouweland, A. v. d. (2003). "Model of Network Formation in Cooperative Games." *Grand Coalition* 13 (<http://ideas.repec.org/p/gco/abcdef/13.html>).
- Nu.nl* (2007). Energiebedrijven moeten binnen drie jaar splitsen. 7 June 2007. Available from:
<http://www.nu.nl/economie/1105726/energiebedrijven-moeten-binnen-drie-jaar-splitsen.html>
- Onderzoekscommissie Water en Bodemdaling Groot-Mijdrecht Noord (2007). *Water en Bodemdaling in Groot-Mijdrecht, rapport van de Onderzoekscommissie Water en Bodemdaling Groot-Mijdrecht Noord*. J. W. Remkes, K. d'Angremond, M. Donze, R.A. Feddes, P. Vellinga, and P. Huisman. December 2007
- Osborne, M.J. (2002) An Introduction to Game Theory [Website] Available from
<http://www.economics.utoronto.ca/osborne/igt/> [accessed 9 September 2009]
- Palm, P. (2005). Zin en onzin over het onder water zetten van de polder. *Nieuwe Meerbode*. 7 September 2005.
- Pappi F. U. and Knoke D. (1991). Political Exchange in the German and American Labor Policy Domain. In Marin B, Mayntz R. (Eds.), *Policy Networks, Empirical Evidence and Theoretical Considerations*. Campus Verlag: Westview Press.
- Peters, G. B. (2005). The problem of Policy Problems. *Journal of Comparative Policy Analysis* **7**(4): 349-370.
- Phillips, L. D. (1984). A theory of requisite decision models. *Acta Psychologica* **56**: 29-48.
- Postma, N. N. (2007). *Toekomst Noordelijke Helft Polder Groot Mijdrecht, Verkenning ter realisering van het besluit van PS d.d. 5 februari 2007*. 29 May 2007. Hoofddorp: Bureau voor Overheidscommunicatie.
- Poundstone, W. (1992). *Prisoner's dilemma*. New York: Anchor Books.
- Powell, W. W. (1990). Neither Market or Hierarchy: network forms of organization. *Research in Organizational Behavior* **12**: 295-336.
- Pronk, H. (2006). Praatjesmaker. *De Ronde Vener*. 31 October 2006.
- Pronk, J. (2007). Speech for the committee 'Ruimte en groen'. 22 January 2007.
- Provinciale Staten (2007). Amendement A2. 5 February 2007.
- Provinciale Staten (2008.) Groot Mijdrecht Noord, Nummer PS: PS2008RGW28, Registratienummer: 2008INT231563. 8 December 2008.
- Provincie Gelderland (2005). [website] Available from:
<http://www.gelderland.nl/smartsite.shtml?id=6508&menu=4826> [accessed March 2005]
- Provincie Utrecht (2004a). Kaart 4.2A In 'Streekplan Utrecht 2005-2015,' December 2004. Utrecht: Provincie Utrecht.
- Provincie Utrecht (2004b). *Waterhuishoudingsplan 2005-2010*. Utrecht: Provincie utrecht.
- Provincie Utrecht. (2005a). Bewonersbijeenkomst Groot Mijdrecht-Noord, een kort verslag en samenvatting van de bijeenkomst. 13 May 2005.
- Provincie Utrecht (2005b). Plan van aanpak verkenning Groot Mijdrecht-Noord. 15 June 2005
- Provincie Utrecht (2005c). Samenvattend verslag bijeenkomst maatschappelijke organisaties. 23 August 2005.
- Provincie Utrecht (2005d). Samenvattend verslag bijeenkomst kerngroep GMN. 25 August 2005.
- Provincie Utrecht. (2005e). Groot Mijdrecht Noord, nieuwsbrief nummer 1. December 2005
- Provincie Utrecht (2006). Gebiedsontwikkeling Groot Mijdrecht Noord voorlopige samenvatting verkenning. December 2006.
- Provincie Utrecht (2007). PS nemen een eerste besluit over toekomst Groot Mijdrecht Noord. Persbericht 16 februari 2007.
- Provincie Utrecht (2008a). GS wil nadere onderzoeken polder Groot-Mijdrecht Noord. 20 February 2008.
- Provincie Utrecht (2008b). *Verkenning water Groot-Mijdrecht Noord 2de fase*. Utrecht: Provincie Utrecht. August 2008.

- Provincie Utrecht and Hoogheemraadschap Amstel Gooi en Vecht (AGV) (2005). *Voorverkenning wateropgave De Ronde Venen*. June 2005. Utrecht: Provincie Utrecht
- Provincie Utrecht and Hoogheemraadschap Amstel Gooi en Vecht (AGV) (2006). *Verkenning water Groot Mijdrecht Noord*. November 2006. Utrecht: Provincie Utrecht
- Rapoport, A. and M. Guyer (1966). A taxonomy of 2 by 2 games. *General Systems* **11**: 203–214.
- Richardson, G. P. and D. F. Andersen (1995). Teamwork in group model-building. *System Dynamics Review* **11**(2): 113-137.
- Rittel, W. J. and M. M. Webber (1973). Dilemmas in General Theory of Planning. *Policy Science* **4**: 155-169.
- Rojer M. (1999). Collective Decision-Making Models Applied to Labor Negotiations in the Netherlands: a Comparison Between an Exchange Model and a Conflict Model. *Rationality and Society* **11**(2): 207-235.
- Rommetvedt, H. (2006). The multiple logics of decision-making. *European Political Science* **5**: 193-208.
- Rosenhead J. (1989). *Rational Analysis for a Problematic World, Problem Structuring Methods for Complexity, Uncertainty and Conflict*. Chichester: John Wiley & Sons Ltd..
- Rosenhead, J. (1992). Into the Swamp: The Analysis of Social Issues. *Journal of the Operational Research society* **43**(4): 293-305.
- Rosenhead J. and J. Mingers. (2001) *Rational Analysis for a Problematic World Revisited, Problem structuring methods for complexity, uncertainty and conflict*. Chichester: John Wiley & Sons, Ltd.
- Rost, B. (2007). Politiek: meer polderen met bewoners. Actievoeders geven de strijd nog niet op. *AD Groene Hart*.
- Ryan, T. (2000). The Role of Simulation Gaming in Policy-Making. *Systems Research and Behavioral Science* **17**(4): 359-364.
- Said A. K. and Hartley D.A. (1982). A Hypergame Approach to Crisis Decision-Making: The 1973 Middle East War. *Journal of the Operational Research Society* **33**: 937-948.
- Salen, K. and E. Zimmerman (2003). *Rules of play: Game design fundamentals*. Cambridge, MA: The MIT Press.
- Schlange L.E. (1995). Linking Futures Research Methodologies - an Application of Systems Thinking and Metagame Analysis to Nuclear-Energy Policy Issues. *Futures* **27** (8): 823-838.
- Scott, J. (1991). *Social Network Analysis*. London, Newberry, New Delhi: SAGE Publications Ltd.
- SEO, Stichting voor Economisch Onderzoek and Norton Rose Advocaten (2004). Advies aan Gedeputeerde Staten van de Provincie Zeeland, Betreffende: aangekondigde wetgeving splitsing energiebedrijven. B.E. Baarsma, M. de Nooij, W. Koster and C.H.A. van der Weijden. 1 December 2004.
- Shaw, D., M. Westcombe, J. Hodgkin, and G. Montibeller (2004). Problem structuring methods for large group interventions. *Journal of the Operational Research Society* **55**(5): 453-463.
- Shulock, N. (1999). The Paradox of Policy Analysis: If It Is Not Used, Why Do We Produce So Much of It? *Journal of Policy Analysis and Management* **18**(2): 266-244.
- Stephenson W. (1953). *The study of behavior: Q-technique and its methodology*. Chicago: University of Chicago Press.
- Stephenson, W. (1935). Technique of factor analysis. *Nature* **136**: 297.
- Teisman, G. r. (1992). *Complexe besluitvorming, een pluricentrisch perspectief op besluitvorming over ruimtelijke investeringen*. Rotterdam: Erasmus Universiteit Rotterdam.
- Timmermans J.S, (2004a). Individual Application; Multi-Actor Information System for Integrated Coastal Zone Management. In: Timmermans J.S. *Purposive Interaction in Multi-Actor Decision Making, Operationalizing Coleman's Linear System of Action for Policy Decision Support*. Delft: Eburon
- Timmermans J.S, (2004b). Interactive Application; Recreation and Tourism Development in the Utrechtse Heuvelrug National Park. In: Timmermans J.S. *Purposive Interaction in Multi-Actor Decision Making, Operationalizing Coleman's Linear System of Action for Policy Support*. Delft: Eburon
- Timmermans J.S. and Beroggi G.E.G. (2000). Conflict resolution in sustainable infrastructure management. *Safety Science* **35** (I-3): 175-192.
- U.S.-Canada Power System Outage Task Force (2004). Final report on the August 14, 2003 blackout in the United States and Canada: causes and recommendations. 5 April 2004.

- Van de Riet, O. A. W. T. (2003). *Policy Analysis in Multi-actor Policy Settings*. Eburon: Delft.
- Van der Lei, T.E. (2005a), Public values protected? A comparison of stakeholder analysis methods for the Dutch electricity industry, IAIA conference on Ethics & Quality in Impact Assessment, 31 May - 3 June 2005, Boston, Massachusetts, USA
- Van der Lei, T. E. (2005b). Gaining Insight into Energy Policy Making with Conflict Analysis and Transactional Analysis: a comparison, Paper in proceedings of the 5th BIEE academic conference: European Energy Synergies and Conflicts, 22-23 September 2005, Oxford, UK
- Van der Lei T.E. and S. Cunningham (2007). Coordinating Converging Technologies; A Survey of Models from the Field of Multi-Actor Systems, CD proceedings, Management of Converging Technologies, Portland International Center for Management of Engineering and Technology, August 5-9, 2007, Portland, OR, USA
- Van der Lei, T.E. and W.A.H. Thissen (2008). Quantitative Problem Structuring Methods for Multi-Actor Problems: An analysis of reported applications. *Journal of the Operational Research Society*, p. 1-9, advance online publication, 24 September 2008, doi:10.1057/jors.2008.93
- Van Eeten, M. J. G. (1999). *Dialogues of the Deaf: Defining New Agendas for Environmental Deadlocks*, Delft: Eburon Publishers.
- Van Eeten, M. J. G. (2001). Recasting Intractable Policy Issues: The Wider Implications of The Netherlands Civil Aviation Controversy. *Journal of Policy Analysis and Management* **20** (3): 391-414.
- Van Rooy, P. (2007). *Gebiedsontwikkeling Groot Mijdsrecht Noord, synopsis van verkenning*. Gouda: Habiforum.
- Van Rooy, P., Van Luin A., and Dil E. (2006). *Nederland Boven Water, praktijkboek gebiedsontwikkeling*. Gouda: Habiforum.
- Vennix, J. A. M. (1999). Group model-building: tackling messy problems. *System Dynamics Review* **15**(4): 379-401.
- VROM (2006). Groene Hartbrief, kabinetsbesluiten voor het rijksprogramma groene hart, wonen werken en recreëren in het middelpunt van de Randstad. September 2006.
- Waldman, D. E. and E. J. Jensen (2001). *Industrial organization: theory and practice*, Boston: Addison Wesley Longman, Inc.
- Walker, W.E. (1975). The Development of Emergency Services: A Guide to Selected Methods and Models, R-1867-HUD. Santa Monica, California: The Rand Corporation.
- Walker, W. E. (2000). Policy Analysis: A Systematic Approach to Supporting Policymaking in the Public Sector. *Journal of Multi-criteria Decision Analysis* **9**: 11-27.
- Wasserman, S. and K. Faust (1994). *Social Network Annalysis, Methods and Applications*. New York: Cambridge University Press.
- Webler, T, Tuler S, and Krueger R (2001). What is a good public participation process? Five perspectives from the public. *Environmental Management* **27** (3): 435-450.
- White L.(2006). Evaluating problem-structuring methods: developing an approach to show the value and effectiveness of PSMs. *Journal of the Operational Research Society* **57**: 842-855.
- Witte *Weekblad* (2006). Minister president Balkenende bezoekt de regio. P. 1 and 3. 6 October 2006.
- Wladyslaw, F. and E. S. Quade (1985). The Methodology of Systems Analysis: An Introduction and Overview. In H. J. Miser and E. S. (eds.) Quade *Handbook of Systems Analysis, Overview of Uses, Procedures, Applications, and Practice*. Chichester: John Wiley & Sons.
- Wooldridge, M. (2002). *An introduction to Multi Agent Systems*. Chichester: John Wiley & Sons Ltd.
- Wooldridge, M. and N. R. Jennings (1995). Intelligent agents: theory and practice. *The Knowledge Engineering Review* **10**(2): 115-152.

Nederlandse Samenvatting

Het relateren van methoden voor actorenanalyse aan beleidsproblemen

Voor een beleidsanalist is het beleidsprobleem het beginpunt van een beleidsanalyse. Gedurende dit proces structureert de beleidsanalist het beleidsprobleem en maakt een keuze voor geschikte methoden of technieken om het probleem te analyseren (Goeller 1984). De methoden en technieken die de beleidsanalist gebruikt worden vaak de 'gereedschapskist' van de beleidsanalist genoemd. In deze metafoor bevat de gereedschapskist van de beleidsanalist de verschillende methoden en technieken die toegepast kunnen worden op de diversiteit van problemen waarvoor een beleidsanalyse nodig is.

Vele hedendaagse beleidsproblemen die gerelateerd zijn aan bijvoorbeeld overheidsbeleid, operationeel beleid, of organisatorisch beleid kunnen gekarakteriseerd worden als multi-actor problemen. Deze multi-actor problemen worden gekenmerkt door het feit dat meerdere actoren met hun eigen perspectieven en interesses betreffende het probleem hebben. Voor dit multi-actor perspectief is de gereedschapskist van de beleidsanalist voorzien van methoden voor actorenanalyse. Dat wil zeggen, deze methoden voor actorenanalyse worden door beleidsanalisten toegepast op het brede scala van multi-actor beleidsproblemen. Echter, uit een literatuurstudie blijkt dat tot op heden weinig onderzoek is gedaan naar de toepasbaarheid van specifieke methoden voor multi-actor beleidsproblemen.

De selectie van een specifieke methode voor actorenanalyse voor een gegeven multi-actor probleem wordt verder gecompliceerd door het feit dat de verschillende methoden tot op heden nog niet met elkaar vergeleken zijn. De meeste toepassingen van methoden voor actorenanalyse in de wetenschappelijke literatuur behandelen de toepassing van één methode voor een bepaald probleem. Dientengevolge weten we vaak niet wat de consequenties voor de analyse van een specifiek probleem geweest zouden zijn wanneer de analist een andere methode voor actorenanalyse zou hebben toegepast. Dit onderzoek pakt deze uitdaging aan, en vergelijkt de prestaties van een aantal methoden voor actorenanalyse voor multi-actor problemen. Het richt zich met name op het ontwikkelen van een kader dat de selectie van methoden voor actorenanalyse voor multi-actor problemen bevordert.

Alhoewel methoden voor actorenanalyse aandacht beginnen te krijgen binnen de beleidsanalytische literatuur bestaat er geen heldere definitie voor methoden voor actorenanalyse. Wij vonden het daarom belangrijk om de vraag wat een methode voor actorenanalyse is, en niet is, te beantwoorden. Wij betogen dat het primaire verschil tussen een methode voor actorenanalyse en andere methoden waarmee men actoren kan bestuderen is dat de methode voor actorenanalyse *zelf* focust op de analyse van karakteristieken van meerdere actoren. Na deze scheiding aangebracht te hebben tussen methoden voor actorenanalyse en andere actor methoden delen wij de methoden voor

actorenanalyse in twee groepen: methoden voor actorenanalyse die multi-actor besluitvorming in kaart brengen en structurele methoden voor actorenanalyse. Beide groepen worden vervolgens verder gespecificeerd. De eerste groep wordt verder onderverdeeld in 'bottom up' en 'top down' methoden voor actorenanalyse die multi-actor besluitvorming in kaart brengen. De tweede groep wordt verder onderverdeeld in structurele methoden die focussen op de actoren zelf en structurele methoden die focussen op de relaties tussen de actoren.

Omdat het beleidsprobleem de basis vormt waarop de beleidsanalist zijn of haar methode kiest, ontwikkelen wij in dit proefschrift een kader dat multi-actor beleidsproblemen relateert aan methoden voor actorenanalyse. Omdat er weinig literatuur aangaande dit type kaders is konden wij niet bouwen op het werk van anderen die trachten kaders te ontwikkelen die helpen bij de selectie van methoden voor actorenanalyse voor multi-actor beleidsproblemen.

Om het kader te maken hebben wij reeds gepubliceerde toepassingen van methoden voor actorenanalyse gebruikt. Uit de gemaakte classificatie van methoden voor actorenanalyse hebben wij vijf methoden uitgezocht voor verdere bestudering. Om onze analyse structuur te geven beschouwen wij de toepassing van een methode voor actorenanalyse als een modelleer exercitie en gebruiken wij een conceptueel model van het modelleerproces om de individuele applicaties van methoden voor actorenanalyse te bekijken. De analyse resulteert in drie typen van multi-actor problemen waar de bestudeerde methoden voor zijn gebruikt: conflict, onderhandeling en impasse. Deze resultaten vormen de basis voor ons kader waarin we laten zien welke multi-actor problemen zijn bestudeerd met welke methoden voor actorenanalyse.

De onderverdeling van multi-actor problemen in type multi-actor problemen is afgeleid uit de omschrijvingen van de problemen door de auteurs van de publicaties. Het was nodig deze te onderscheiden omdat de auteurs niet beargumenteren waarom zij een bepaalde methode voor actoren analyse hebben gekozen voor hun multi-actor probleem. Dat wil zeggen, de aangedragen argumenten voor de keuze van de methode hebben meestal geen betrekking op het probleem. De beslissing om een bepaalde methode te kiezen zijn vaak het resultaat van individuele en subjectieve overwegingen van de onderzoeker over de toepasbaarheid van die methode.

Het kader laat zien dat niet alle methoden voor actorenanalyse toegepast zijn op alle typen multi-actor problemen (conflict, onderhandeling, en impasse). Het feit dat een methode voor een bepaald type probleem niet is toegepast is een interessante observatie. Dit omdat er geen fundamentele bezwaren zijn aan de toepasbaarheid van de methoden voor de verschillende multi-actor problemen. Niet alleen specificeert de literatuur deze beperkingen niet, de methoden zelf lijken niet de toepasbaarheid te beperken tot bepaalde typen van problemen.

Een andere vraag is welke methode voor actorenanalyse het meest geschikt zou zijn voor een bepaald probleem. Men zou kunnen aannemen dat de specifieke eigenschappen van methoden bepalen dat een methode meer of minder geschikt is voor een bepaald probleem. De notie van een geschiktere methode veronderstelt dat ervaring is verzameld dat de resultaten contrasteert van de verschillende methoden wanneer deze worden toegepast op een zelfde probleem. Het empirische bewijs wat deze karakteristieken zou kunnen verschaffen mist echter. Daarom hebben wij twee casussen uitgevoerd om dit type empirisch bewijs te verzamelen. Deze casussen representeren twee specifieke beleidsproblemen waarop wij meerdere methoden voor actorenanalyse hebben toegepast. De prestaties van de individuele methoden voor actorenanalyse hebben wij gemeten door te kijken naar de voorspellende waarde van deze methoden, met andere woorden, wij hebben gekeken hoe goed de gekozen methoden voor actorenanalyse de werkelijke ontwikkelingen konden voorspellen.

Onze eerste casus bestudeert de aanname dat verschillende methoden toegepast op hetzelfde probleem verschillende resultaten kunnen opleveren. Men kan het kader zo interpreteren dat alle methoden die toegepast zijn voor een bepaald type probleem allemaal even geschikt zijn voor dit type probleem en daarom allen even goed zouden presteren. We wilden dus alle methoden toepassen die volgens de literatuur toegepast zijn op een bepaald probleem op dit probleem met als doel de uitkomsten te vergelijken. We selecteerden een impasse. Drie methoden voor actorenanalyse zijn volgens de literatuur toegepast op impasses, te weten: conflict analyse, transactionele analyse en Q-methodologie.

De eerste casus betreft de mogelijke ontpoldering van een gedeelte van de polder Groot Mijdrecht. Q-methodologie gaf aan dat er grote onenigheid was over de door de betrokken overheidsinstanties geformuleerde probleemstelling. De belangrijkste conclusie van de conflictanalyse was dat een nieuw beleidsproces zoals gevraagd door de inwoners niet mogelijk leek te zijn. De resultaten uit de transactionele analyse suggereren dat een mogelijke oplossing gevonden kan worden in een nieuw scenario voor de polder waarin respect voor het landschap wordt gecombineerd met de noodzaak om water te bergen. Op het moment van schrijven is er nog geen beslissing genomen aangaande de toekomst van de polder genomen. Als gevolg hiervan kan de uiteindelijke uitkomst niet op basis van de huidige stand van zaken aangaande de polder als proxy genomen worden voor de geschiktheid van de methode.

Hoewel er geen daadwerkelijk besluit aangaande de toekomst van de polder ligt konden we de tussenliggende situatie bekijken. In de huidige situatie lijken bepaalde strategieën voor de polder minder waarschijnlijk dan wanneer wij de analyse startten. Q-methodologie gaf een betere voorspelling op de korte termijn dan conflict analyse en transactionele analyse. Op de langere termijn lijken de resultaten van de transactionele analyse het meest op de huidige ontwikkelingen. Het is echter belangrijk te onderschrijven dat de verschillende methoden verschillende resultaten laten zien en dat de keuze van methode daarom ver van arbitrair is. De conclusie dat verschillende methoden verschillende resultaten opleveren is dan ook onafhankelijk van wat uiteindelijk de meest geschikte methode blijkt te zijn. Wanneer wij in de toekomst weten wat de uiteindelijke beslissing aangaande de toekomst van de polder is kunnen wij evalueren welke methode de hoogste voorspellende waarde had.

In onze tweede casus bestudeerden wij de aanname dat als een methode nog nooit op een bepaald type probleem is toegepast, dat deze methode minder geschikt is voor dit type probleem dan een methode die wel op dit type probleem is toegepast. Enerzijds zou men kunnen beargumenteren dat wanneer een methode nog nooit is toegepast op een bepaald probleem dit een beperking van de methode representeert. Anderzijds hebben we opgemerkt dat de methoden zelf geen fundamentele beperkingen kennen aangaande de probleem typen. In deze casus pasten wij een transactionele analyse en een conflict analyse toe op een conflict situatie. Transactionele analyse was, volgens onze literatuurstudie, nog niet eerder toegepast op een conflictsituatie.

De tweede casus betreft een studie naar de potentiële afsplitsing van de netwerkbedrijven van de grote geïntegreerde energiebedrijven in Nederland. De conflict analyse liet zien dat de overheid de macht had om haar voorkeursuitkomst te kiezen: het afsplitsen van de netwerkbedrijven. Dit kwam overeen wat er in de werkelijkheid gebeurde. Het resultaat van de transactionele analyse was meer genuanceerd. De transactionele analyse suggereerde een tussenliggende oplossing en geen complete afsplitsing. De aanname van de transactionele analyse, dat mensen macht uitruilen over kwesties, was niet de meest geschikte voor de bestudeerde conflict situatie omdat er in deze situatie geen uitruil plaatsvond. We concludeerden dat voor deze casus de conflict analyse inderdaad de meer geschiktere methode was. We concludeerden ook dat alhoewel

transactionele analyse niet eerder was gebruikt om conflicten te analyseren, het probleem de toepassing van de methode wel toe stond.

Het kader wat ontwikkeld is in dit proefschrift is een eerste stap in het formuleren van een structuur die kan helpen bij de selectie van methoden voor actorenanalyse voor multi-actor problemen. De twee casussen zijn een eerste poging in het toepassen van methoden voor actorenanalyse in het licht van de structuur van het kader. Omdat de eerste casus nog geen besluit ten aanzien van de toekomst van de polder kent kan nog niet worden nagegaan welke methode de werkelijkheid het beste benaderde. Als een gevolg hiervan kunnen we nog geen uitspraken doen over de karakteristieken van de methoden in relatie tot de prestaties van de methoden. Voor de tweede casus konden wij dit wel doen. Voor de tweede casus presteerde de conflictanalyse het beste en dit was ook de methode die volgens onze interpretatie van het kader de geschiktere methode was. Echter vanuit wetenschappelijk oogpunt kunnen wij de resultaten van een enkele casus niet generaliseren naar algemene karakteristieken van de methoden ten aanzien van het probleemtype. Wij concluderen daarom dat hoewel het mogelijk is een kader te ontwikkelen met de potentie te helpen bij de keuze van methodes, dat om deze potentie te bereiken dit kader gestaafd dient te worden met een groter aantal casussen die allemaal wijzen naar dezelfde sterke en zwakke punten van de methoden. Alleen dan kan generalisatie in de vorm van een meer gedetailleerde discussie van methoden en problemen plaatsvinden op een wetenschappelijk juiste wijze.

In dit proefschrift hebben we de voorspellende waarde van de methoden gekozen als proxy voor de prestatie van de methoden. De sterke en zwakke punten van de methoden zijn niet beperkt tot de voorspellende waarde van de methoden. Het gebruik van de voorspellende waarde van de methoden om de prestaties van de methoden te vergelijken is een nauwe definitie van de geschiktheid van een methode. De beoordeling van de geschiktheid van een methode voor een bepaald probleem is ook afhankelijk van andere kwesties zoals het doel van de analyse, de benodigde resultaten of praktische overwegingen.

Dit proefschrift representeert daarom een initiële inspanning ten aanzien van een kader dat methoden (en karakteristieken van deze methoden) relateert aan typen problemen. De grootste beperking van dit proefschrift is dat wij alleen initiële casusgerelateerde ondersteuning hebben voor het kader. Als gevolg hiervan zal toekomstig vergelijkend onderzoek uit moeten wijzen of het ontwikkelde kader de beleidsanalist die geconfronteerd wordt met een multi-actor probleem inderdaad helpt in het maken van een keuze voor een methode voor actorenanalyse.

Wanneer we nadenken over toekomstig onderzoek, dan is de eerste kwestie die geadresseerd moet worden een verdere ontwikkeling van ons begrip van de relatie tussen de gekozen methode en het bereikte resultaat ten aanzien van specifieke problemen. Onderzoek wat zich richt op het vergelijken van methoden dient vervolgt te worden om deze karakteristieken van methoden beter te kunnen begrijpen. Wanneer de ervaring van het toepassen van meerdere methoden op een enkel probleem toeneemt, zal ook ons vermogen toenemen om specifieke karakteristieken van deze methoden in relatie tot de problemen te herkennen. Idealiter resulteert dit in diagnostische regels die de beleidsanalist kunnen helpen in het selecteren van methoden en, misschien nog belangrijker, het interpreteren van de resultaten van deze methoden.

Men zou kunnen beargumenteren dat dit type vergelijkend onderzoek te tijdrovend of te duur is. Als tegenargument stellen wij dat indien een wetenschappelijk veld als de beleidsanalyse zich verder wil ontwikkelen, een goed gefundeerde kennis van de potentie en de beperkingen van de gebruikte methoden een absolute noodzaak is. In de afwezigheid van deze kennis blijft de keuze van de methode door de individuele beleidsanalist voor een bepaald probleem een subjectieve keuze – dat wil zeggen een keuze die niet verdedigd kan worden in de wetenschappelijke discours. Hoewel anderen

wellicht andere strategieën zullen aandragen voor het bestuderen van methoden in relatie tot de problemen waarop zij toegepast kunnen worden, vinden wij dat het onderwerp verdere wetenschappelijke aandacht verdiend. Als beleidsanalisten moeten wij de casuïstiek die een probleem in combinatie met een methode omschrijft achter ons laten en werken aan het formuleren van diagnostische regels door het vergelijken van de resultaten van multiple methoden in relatie tot gegeven problemen.

T.E. van der Lei

Short biography

Telli van der Lei was born 25 January 1978 in Helsinki, Finland and grew up in the Netherlands. She attended primary and secondary school in Mijdrecht and graduated in 1997. She obtained her Masters' degree in Science and Policy in 2002 from the University of Utrecht. As part of her degree she studied Economics at the Faculty of Social Sciences of the University of Helsinki in 2000, she also worked as an intern at the Government Institute for Economic Research in Helsinki on which her Masters' thesis "Sustainability in liberalised electricity markets, a comparison of Denmark and Finland" is based. In 2003 she traveled through Asia with her now husband Mark Bakkers. In 2004 she started working as a PhD-student on a project called "Safeguarding Public Values in Infrastructure Design through Actor Analytic Techniques" at the Policy Analysis Section at the Faculty of Technology Policy and Management of Delft University of Technology. This thesis is the end result of the project. Telli van der Lei is mother of Arne and Kai.

Publications

- Van der Lei T.E., B. Enserink, W.A.H. Thissen, and G. Bekebrede (submitted) The systems diagram: a basis for a policy issue paper. How to use a systems diagram for analyzing and structuring complex problems?
- Van der Lei T.E., G. Bekebrede, and I Nikolic (accepted) Critical Infrastructures: a review from a Complex Systems perspective. *International Journal of Critical Infrastructures*.
- Cunningham, S. W. and T. E. Van der Lei (2009) Decision-making for new technology: A multi-actor, multi-objective method. *Technological Forecasting & Social Change* **76**: 26-38
- Van der Lei, T.E. and W.A.H. Thissen (2008) Quantitative Problem Structuring Methods for Multi-Actor Problems: An analysis of reported applications. *Journal of the Operational Research Society*, advance online publication, 24 September 2008, doi:10.1057/jors.2008.93
- Van der Lei T.E. (2007), "Onderzoeksverslag percepties bewoners en direct betrokkenen van het noordelijke deel van polder Groot Mijdrecht" (casus Groot Mijdrecht Noord)
- Van der Lei T.E. and S. W. Cunningham (2007), "Coordinating Converging Technologies; A Survey of Models from the Field of Multi-Actor Systems", CD proceedings, Management of Converging Technologies, Portland International Center for Management of Engineering and Technology, August 5-9, 2007, Portland, OR, USA
- Cunningham, S. W. and T. E. Van der Lei (2007), "Decision-Making for New Technology: A Multi-Actor, Multi-Objective Method", CD proceedings, Management of Converging Technologies, Portland International Center for Management of Engineering and Technology, August 5-9, 2007, Portland, OR, USA
- Van der Lei T.E. and S. W. Cunningham (2006), "Use of the Internet for Future-Oriented Technology Analyses," CD Proceedings, Future Oriented Technology Analysis Seminar, 26-30th Sept 2006, Seville, Spain: Institute for Prospective Technological Studies
- Van der Lei T.E. and J. H. Slinger (2006), "The System Diagram as a Diagnostic Aid for Quantitative Method Choice" in CD Proceedings, ORMMES 2006 Operational Research Models and Methods in the Energy Sector, 06-08 Sept 2006, Editors C. Henggeler Antunes and Alvaro Gomes, Institute of Systems Engineering and Computers of Coimbra and Association of European Operational Research Societies, Coimbra, Portugal
- Van der Lei T.E. (2006), "The Added Value of Problem Structuring Methods," Abstract presented at the Euro XXI 2006 conference, OR for Better Management of Sustainable Development, 02-05 July 2006, Reykjavik, Iceland
- Van der Lei, T.E. (2005), "Public values protected? A comparison of stakeholder analysis methods for the Dutch electricity industry," IAIA conference on Ethics & Quality in Impact Assessment, 31 May - 3 June 2005, Boston, Massachusetts, USA
- Van der Lei T.E. (2005) "Gaining Insight into Energy Policy Making with Conflict Analysis and Transactional Analysis: a comparison," Paper in proceedings of the 5th BIEE academic conference: European Energy – Synergies and Conflicts, 22-23 September 2005, Oxford, UK
- Cunningham, S. W. and T. E. van der Lei (2004), "Fast and frugal algorithms for adaptive policy". IEE SMC (2) 2004: 1315-1320