4 Actor Analysis

An actor is a social entity, a person or an organization, able to act on or exert influence on a decision. This book places policy analysis in a multi-actor environment. From this perspective policy problems and policy processes involve multiple actors ('parties') because we presume that no individual single actor will be able to unilaterally impose their desired solution onto the others. Rather some form of cooperation between parties is required; the actors are interdependent. In such circumstances knowing who the 'others' are and understanding their objectives and motivation for participating or not is crucial for successful problem solving. This chapter presents some tools for analyzing actors and actor configuration in a policy issue.

4.1 Introduction: Why Actor Analysis?

The system diagram presented in Chapter 3 presumes that policy analysis revolves around the perspective, interests and the policy instruments or means of one problem owner. This approach suffices when the problem owner himself has sufficient means to solve a policy problem. In practice, however, such situations are rare. Therefore, the problem owner has to be aware of the interests and objectives of the other actors who are in some way involved with the policy problem, will be affected by the solutions, or have means that are essential for solving the problem.

Thus it is of great importance that a problem analysis provides insight into the range of actors involved as well as their networks. This insight can support policy analysis in various ways. If we take the different styles of policy analysis from the hexagon model discussed in Chapter 1 as a starting point (Mayer et al., 2004), actor analysis can help to support various policy analysis activities (see Table 4.1).

Actor analysis as discussed here is rooted in a method more commonly known as stakeholder analysis. This method has been used mainly to support project management and design activities as well as strategic advice in the corporate sector (see e.g. Mitroff, 1983; Freeman, 1984; MacArthur, 1997; Scholes, 1998). In line with these historic roots, in this chapter we will focus on its use to support problem formulation, which bears most resemblance to policy analysis activities 'advise strategically', 'design and recommend' and 'clarify values and arguments'.

Table 4.1 Possible contributions of actor analysis to policy analysis activities

Policy analysis activity	Actor analysis can help to ...
Research and analyze	Mobilize knowledge and information from a broad actor base, which is likely to improve the quality of the problem analysis
Design and recommend	Create ideas for alternative strategies and tactics by mapping options and interests of different actors. This helps to identify common ground and shared fundamental values, to identify ways in which different actors can contribute to these shared values, and to identify needs and possibilities for compensation or mitigating measures to satisfy particular actors
Advise strategically	Assess the feasibility and potential to implement policy options, by mapping the positions, interests, resources, and relations of actors, providing insight into the opportunities and threats that actors pose for problem solving
Mediate	Map conflicts, identify potential coalitions of actors, and propose a road map for a negotiation process, including agenda items and participants in various stages of discussion
Democratize	Ensure that all the important actors are included in the policy process, and/or that their views and concerns are incorporated in the problem analysis. From a normative point of view, this supports a more legitimate problem analysis
Clarify values and arguments	Include the full range of values and arguments in a problem analysis, which aids a problem analysis that is recognized and accepted by different parties, offering a better basis for agreement and cooperation concerning policy options

4.2 Conceptual Framework for Actor Analysis

Before sketching the main steps involved in actor analysis, it is useful to reflect on the object of analysis: what is an actor and what are the main concepts that are needed to describe their behavior in policy networks? This helps to identify the main concepts and dimensions that one should cover in a first comprehensive scan of the multi-actor context of a policy problem.

In this chapter, we define an actor as a social entity, person or organization, able to act on or exert influence on a decision. In other words: actors are those parties that have a certain interest in the system and/or that have some ability to influence that system, either directly or indirectly. Note that we use the term 'actor', and not 'stakeholder'. In practice, the terms are often interchanged. However, sometimes the term stakeholder is used to refer to those groups that have an interest, or stake, in decision-making processes, but that have relatively few means to influence decision-making or the system. Such stakeholders typically include interest groups or pressure groups and, in some cases, the public at large or a specific part of the public such as poor households, people of a certain age-group or the beneficiaries of a certain welfare scheme. In this chapter, the capacity to influence the decision-making of actors is as important as their interest or 'stake'.

Beyond a direct description of the term 'actor', further insight into what an actor is can be gained by discussing the key attributes of actors in relation to policy

making and policy analysis. What characterizes an actor? For this, we turn to theories of the policy process, many of which have been presented in Chapter 2.

Several authors emphasize that public policies are generally generated within networks in which multiple actors are interrelated in a more or less systematic way (Rhodes & Marsh, 1992; Klijn, 1997; De Bruijn & Ten Heuvelhof, 1999). Looking only at policy networks, however, has a limited potential to explain policy changes if it is not complemented by an analysis at a lower level in terms of actor properties (Rhodes & Marsh, 1992: 196). At this actor level, most theories converge around three basic dimensions that help explain actor behavior: perceptions, values, and resources (Mitroff, 1983; Sabatier, 1988; Jobert, 1989; Scharpf, 1997).

If, in a somewhat crude simplification, one takes the network level to be a fourth conceptual dimension, the behavior of actors in policy processes can be described using the following conceptual dimensions:

1. Networks: 'More or less stable patterns of social relations between interdependent actors, which take shape around policy problems and/or policy programs' (Klijn, 1997: 30). In these networks, the institutional context and rules limit and structure the possible range of activities (Ostrom et al., 1994).
2. Perceptions: The image that actors have of the world around them, both of the other actors and networks, and of the substantive characteristics of a policy problem (Bots et al., 2000; Scharpf, 1997). Perceptions may also be labeled causal beliefs, cognitions or frames of reference. Perceptions here refer only to 'neutral' theories of how the world operates, and not to normative beliefs about what is good and desirable. The latter are discussed under the dimension of 'values'.
3. Values: These provide the directions in which actors would like to move; they describe the internal motivations of actors. Related concepts such as 'norms', 'interests' and 'purposes' function on a more abstract level, whereas 'objectives', 'goals' and 'targets' express values in more specific terms. 'Preferences' and 'positions' translate values into a preference ordering over specific solutions or policy outcomes. Variables on this dimension are closely linked to actors' perceptions (see also Sabatier, 1988: 131-133).
4. Resources: The practical means that actors have to realize their objectives. Resources are the 'things over which they have control and in which they have some interest' (Coleman, 1990: 28). Resources enable actors to influence the world around them, including other actors, relations and rules in a network. As such, resources are closely related to power and influence.

4.3 Methods for Actor Analysis

There are several methods available to support actor analysis. In practice, most use is made of approaches for stakeholder analysis, which are rooted in strategic management literature (see e.g. Mitroff, 1983; Freeman, 1984; Grimble & Chan, 1995; Bryson, 2004). The popularity of stakeholder analysis methods is explained by the fact that they are relatively easy to use and can be applied in a wide range of situations. Furthermore, these methods are flexible enough to cover a wide

range of conceptual dimensions. These qualities also make stakeholder analysis methods very useful for an initial problem exploration. Hence, they provide the basis for the actor analysis approach described in this chapter.[1]

Table 4.2 Overview of methods for actor analysis

METHOD	FOCUS	REFERENCES
Network analysis	**Networks**	
Social network analysis	Structural characteristics of actor networks	Kenis & Schneider, 1991; Scott, 1991
Stakeholder analysis	**Resources and interdependencies**	
Stakeholder analysis	Stakeholder environment to maximize cooperative potential and minimize threat of obstruction	Freeman, 1984; Bryson, 2004
Game theoretic models	**Resources and interdependencies**	
Metagame analysis	Structure of policy 'game' to help identify stable outcomes and advise on strategies for negotiation and coalition building	Howard, 1971, 1989; Fraser & Hipel, 1984
Hypergame analysis	Structure of policy 'game' and role of (mis) information and strategic surprise	Bennett et al., 1989
Transactional analysis	**Resources and interdependencies**	
Transactional process models	Potential for exchange of control between different actors, to facilitate policy process	Coleman, 1990; Timmermans, 2004
Vote-exchange models	Predicted shifts in actors' positions and outcomes of collective decision-making	Stokman, 1994; Thomson et al., 2003
Discourse analysis	**Perceptions of groups of actors**	
Argumentative analysis	Different chains of reasoning used in policy debate and underlying values and assumptions	Toulmin, 1958; Mitroff, 1983
Narrative policy analysis	Opposing views of controversial problems and possible meta-narratives to reformulate those problems	Roe, 1994; Van Eeten, 2006
Q-methodology	Groups of actors with shared perspectives and their underlying basis	McKeown & Thomas, 1988
Cognitive mapping	**Perceptions of individual actors**	Axelrod, 1976
Self-Q interviews	Possibilities to address policy problems through actors' rationale	Bougon et al., 1990
Dynamic Actor Network Analysis (DANA)	Perceptions of actors to enable comparative analysis of agreement, conflict, etc.	Bots et al., 2000
Preference elicitation	**Values of actors**	
Analytic Hierarchy Process (AHP), multi-attribute assessment	Structure and hierarchy in various attributes and alternatives	Saaty, 1990; McDaniels & Thomas, 1999; etc.

Source: Hermans & Thissen, 2009

1 Note that we use the term 'actor', and not 'stakeholder', as discussed in the next section on 'terminology'.

However, it should be kept in mind that in many cases it may be worthwhile to carry out an actor analysis that goes beyond an initial scan or exploration. In such cases, a more focused and detailed actor analysis method is required. In these cases, several methods are available depending on the concepts that are of most interest. These include for instance methods that focus specifically on the structure of social networks (Scott, 1991), methods that map actor perceptions (Bots et al., 2000) and methods that analyze conflicts between actors. An overview of different actor analysis methods for policy analysts is provided in Table 4.2. More background information on the methods in this overview and their use can be found in Hermans and Thissen (2009) and Hermans (2005).

4.4 Steps in Actor Analyses

The following sections of this chapter discuss and clarify the steps that need to be followed in general actor analyses. The core of the method described here is taken from the guidelines for stakeholder analysis that are available in various documents. However, whereas stakeholder analysis methods typically focus on the dimensions of power and interests of actors, our initial scan of the actor network will also cover the network structure and perceptions of actors. This results in a basic procedure for actor analysis that covers six steps:

1. formulation of a problem as a point of departure;
2. inventory of the actors involved;
3. exhibiting the formal chart: the formal tasks, authorities, and relations of actors and the current legislation;
4. determining the interests, objectives and problem perceptions of actors;
5. mapping out the interdependencies between actors by making inventories of resources and the subjective involvement of actors with the problem;
6. determining the consequences of these findings with regard to the problem formulation.

4.4.1 Step 1: Use Problem Formulation as Point of Departure

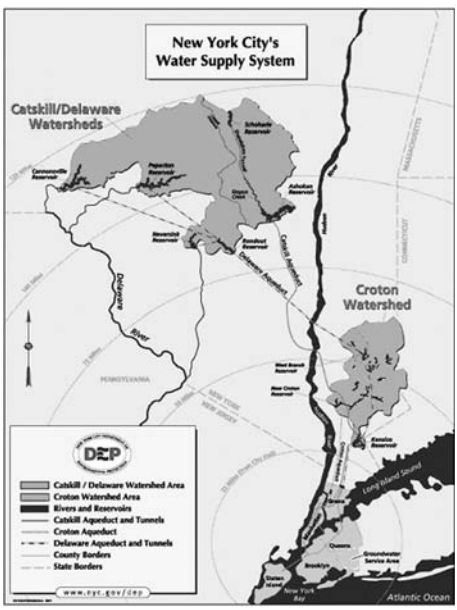
There needs to be an initial problem formulation that can serve as a point of departure for the actor analysis. There are two possible alternatives:

1. the problem formulation as viewed by the problem owner, which is mapped out by the analyst as a first research activity;
2. the problem formulation as formulated by the analyst himself, based on a first substantial problem exploration.

For requirements and examples of good problem formulations, refer to Chapter 2. However, remember that a problem formulation is likely to change because of the actor network analysis. It is the expectation that an actor analysis yields new insights that help the analyst to further complement or sharpen the initial problem formulation.

Text box 4.1 Problem formulation for the case of New York City drinking water supply
Throughout this chapter, we will use one example as a means of illustration. The example concerns the drinking water supply for New York City and the associated New York City Watershed Agreement. More details on this example can be found for instance in Hermans et al. (2003) and NRC (2000). A short introduction to the problem will help to understand case.

The inhabitants of New York City depend on upstream rural watersheds for their drinking water supply. Water is collected in several surface water reservoirs located in New York State. It is not filtered before distribution to the users and New York City wants to maintain this situation because filtration is very costly. Avoiding filtration is only possible if the water in the reservoirs meets certain quality standards that ensure that public health is not endangered. The quality of the water in one particular watershed, located in Delaware County, does not meet the required standards. Based on the prevalent watershed rules, this watershed has a 'restricted status'.



Location map of the New York City Watersheds
(map source: www.nyc.gov/html/dep/html/drinking_water/wsmaps_wide.shtml)

The problem owner in this case is the local government of Delaware County. The 'restricted status' of the watershed prohibits the addition of polluting substances to water streams in the area, which in turn severely restricts economic growth. The problem that Delaware County faces is essentially the problem of how to reduce the pollution loads in the watershed in order to create room for further economic growth Pollution reduction could be achieved for instance by reducing pollution from farms and other businesses, from the rural households that are not yet connected to the sewerage grid, or by upgrading the existing wastewater treatment plants. Whatever the solution, it is likely to put local economic development at risk and it is likely to be costly, stretching the resources of an already underdeveloped rural community.

4.4.2 Step 2: Make an Inventory of the Actors Involved

The second step of the analysis starts with finding the answer to the question of actors are involved (Koppenjan et al., 1993; De Bruijn et al., 2002).

Distinguishing actors that are possibly involved with the problem and its solution is an iterative process. By acknowledging the existence of other actors with different problem definitions, shifts can occur in the problem definition and configuration of actors, specifically in the exploration phase, which makes it possible that other actors become relevant for the solution of the problem. Also later, in the actual policy process, unforeseen shifts can take place in the problem definition and configuration of actors, for example when new solutions are thought of, new parties appear on the scene, or new techniques become available.

Actor Identification Techniques

There are different methods that complement each other and that help analysts to make a first selection of actors that are may be involved. However, the different actor identification approaches discussed by Mitroff offer a useful starting point (Mitroff, 1983) and can be complemented by identification techniques discussed elsewhere. The resulting techniques are complementary, if partly overlapping, and their joint use is likely to result in a list that has less risk of omitting important actors. They can be used by the analyst, preferably in dialogue with the problem owner, and one or more key informants, persons knowledgeable about the policy field.

- The *imperative* approach identifies actors who feel strongly enough about a certain policy problem or issue to act on their feelings. More generally, one could ask 'Who has an interest in or feel the consequences of the issues around which the problem revolves, or the solutions that are being considered?'
- The *positional* approach reviews the existing policy making structures to identify actors with a formal position in policy making. Studying the formal legislation, procedures, policy pieces, and so on, provides a first indication of the parties that are possibly involved.
- The *reputational* approach uses key informants related to the policy problem and asks them to identify important actors. The resulting list of actors may be further expanded by asking each of the actors on the list to nominate additional actors. The latter technique is known as 'snowballing' (Wasserman & Faust, 1994). A variation to this technique is for the analyst to ask for any of the seemingly important actors who have important relationships with that actor.
- The *social participation* approach identifies actors to the extent that they participate in activities related to a policy issue. For instance as part of committees, by attending meetings, or as part of platforms.
- The *opinion leadership* method identifies actors who tend to shape the opinions of other actors. For instance, the opinions of certain universities or research groups, certain international organizations or certain individuals may be highly influential.
- The *demographic* approach identifies actors by such characteristics as age, sex, occupation, religion, level of education, residence etc. This is relevant

when policy problems and policy options have a different impact on different demographic groups.
- Finally, the problem diagram and the causal map offer important leads. Relevant actors can be identified by asking the question: 'Who influences, directly or indirectly, relevant system *factors*?' Attention needs to be given here to the actors and factors *inside* the system, as well as in the *environment* of the system.

Some Specific Points for Attention

Dealing with Composed Actors
A problem occurs when we have to deal with a *composed* actor. An organization can be involved in the problem situation with more than one of its parts. For instance, a government ministry typically consists of different directorates, departments and sections, each with its own mandate and mission. The question is then which organization level we have to appoint as an actor: the ministry as a whole, or one of more specific units within the ministry.

When different units of an organization are involved with a problem based on their own, distinctive objectives and responsibilities, it is wise to include all these units as separate actors.

When there is only one unit of an organization involved, then the question remains: is that specific unit or the whole organization the actor? The rule here is: choose an organization level as high as possible, without losing information in the process or involving objectives that are irrelevant to the problem situation. However, *avoid the inclusion of actors on the level of 'government' or the 'trade and industry'*. Such a high level of aggregation may limit the usefulness of the analysis.

Text box 4.2 Composed actors in the New York City drinking water problem
In our example of Delaware County's problem with New York City's drinking water supply, several composed actors play a role. For instance, the government of New York City is organized in several bureaus and departments. However, only one department is responsible for the City's water supply: the Department of Environmental Protection. Therefore, this department can be identified as the actor representing New York City's interests. For Delaware County, two distinct organizational units should be included as they have clearly different interests and roles in the problem: the Department of Soil and Water Conservation, which is concerned with environmental protection, and the Department of Planning and Economic Development.

Setting Network Boundaries
Depending on the problem, it may difficult to identify the boundaries of the actor network. Where to draw the line between actors that are important and those that are not? The first general advice is not to be too restrictive in the identification of

actors to prevent premature focusing on a limited number of actors (Brugha & Varvasovszky, 2000: 341). Although this is good advice for drawing up an initial long list of actors, keeping the remainder of the analysis feasible means that one subsequently needs to limit the number of actors to keep the time and resources required for the analysis within reasonable limits (cf. Grimble & Chan, 1995: 119).

Suggestions for how to do this streamlining of the initial long list of actors are not easy to find. However, three general guidelines may help:

- *Ensure that the actor network is in line with the chosen level of problem analysis*. For instance, if the problem is on the regional or local level, there is often less need to involve national level actors who often set relevant boundary conditions without active involvement in local policy making. Often, not always. If the problem analysis focuses on national level, there is less need for actors that are predominantly active on the regional or local level. For instance, one could include the National Association of Municipalities, but there will be little need to include individual municipalities.
- *Ensure that the list of actors covers a balanced set of interests and roles*. Ideally, all the important interests and roles within a policy-making situation should be represented in the initial actor selection. If possible, at least *two or three* actors with different roles should be identified for each interest. For instance, if agriculture is an important interest, one could identify the Ministry of Agriculture, the national association of farmers' cooperatives and an agri-business branch association as important actors. In this regard, the categorization of actors using two or three different classification schemes, as illustrated in Table 4.2, offers a useful tool.
- Finally, a simple rule of thumb: experience indicates that a useful actor analysis often includes anywhere *between ten and twenty different actors*. Taking less than ten actors into account will increase the risk that important actors are being overlooked. Taking more than twenty actors into account increases the risk that the analysis is insufficiently focused to be useful. This may be the case when the network boundaries are too broad or when an unnecessary level of detail is employed.

Changing Roles of Actors

In determining network boundaries and identifying actors, one has to keep in mind that the inventory of actors who are actively involved at the moment of the analysis does not have a predictable value for the future: new actors may participate and parties that play an important role now may 'exit the stage' later on. For instance, climate change has the interest of many more actors since 2006-2007 than it did previously. This means that the list of actors involved in policy problems that involve climate change will have changed dramatically in the past year or so.

Furthermore, from the above descriptions it will be clear that, throughout the actor analysis, one needs to check at regular intervals whether or not the initial list of actors is still appropriate, or if new insights require new actors to be added, or existing actors to be removed from the list.

Problem-Owner as an Actor in Actor Analysis
A common omission is to leave out the problem owner from the list of actors and the subsequent steps in actor analysis. This is understandable as the purpose of an actor analysis is to gain insight into the roles and positions of other actors, but, in order to produce a complete overview of an actor network, it is important to include the problem owner explicitly in the analysis – at least in those steps where comparisons and overviews are made of the characteristics of various actors.

Structuring the List of Actors
The clarity of the list of actors can benefit from dividing it into categories. This can be done in various ways. A first classification can be based on the role and position in a governance system: government authorities on various levels; companies (utilities and enterprises, both private and semi-public); non-governmental organizations (NGOs); local interest groups (e.g. local community organizations); non-organized interests or individuals.

Another complementary classification of actors can be made by looking at their interests in the problem or their position in a production chain. For instance, in relation to a policy problem in the field of energy, such interest categories could include: energy provision, energy consumption, environmental conservation, economic development, and so forth. Use of this second classification logic will be helped by a specific assessment of each actor's individual interests. This is done in Step 4 of the actor analysis, so it will be worthwhile to revisit and reconsider the initial categorization in a later stage of the analysis – as part of an iterative process.

Text box 4.3 Actors involved in the New York City drinking water problem
The table below contains the actors identified for the New York City drinking water problem, using two different classifications. The first column uses a classification based on their role in governance, the second column contains the same actors, but grouped based on their main interests.

Actors' roles in governance		Actors' issues of interest
Federal government		*Environment*
US Environmental Protection Agency		US Environmental Protection Agency
US Department of Agriculture		NYS Dept. Of Environmental Conservation
New York State (NYS) government		Delaware County Soil & Water Conserv. District
NYS Dept. of Environmental Conservation		Catskill Watershed Corporation
NYS Dept. of Health		*Health: Water supply and sanitation*
NYS Dept. of Agriculture and Markets		NYS Dept. of Health
Local government		New York City Dept. of Environmental Protection
New York City Dept. of Environmental Protection		Health interest groups in NY City
Delaware County Soil & Water Conserv. District		Wastewater treatment plant operators
Delaware County Dept. of Planning & Econ. Dev.		*Agriculture*
Towns and villages in Delaware County		US Department of Agriculture
Non-governmental organizations		NYS Dept. of Agriculture and Markets
Cornell Cooperative Extension Association		Farmers
Catskill Watershed Corporation		Watershed Agricultural Council
Watershed Agricultural Council		Cornell Cooperative Extension Association
Organized local interests		*Local economic development*
Delaware County Chamber of Commerce		Delaware County Dept. of Planning & Econ. Dev.
Companies and non-organized interests		Towns and villages in Delaware County
Farmers		Small and Medium sized Enterprises
Small and Medium sized Enterprises		Delaware County Chamber of Commerce
Wastewater treatment plant operators		
Health interest groups in NY City		

4.4.3 Step 3: Mapping Formal Relations

Characteristics and positions of actors and their mutual relations have a formal and an informal side. Knowledge about both sides is essential in order to understand actors and their environments. The analysis should begin by mapping out the formal positions and relations because these are mostly easy to reconstruct using available documents. Moreover, they form a good basis to subsequently investigate the informal relations. The 'formal chart' can be used as a means of orientation in this. Although formal authorities and formal hierarchical relations do not determine the informal relations between people, it would be wrong to assume that hierarchical relations do not matter. On the contrary, they have a strong shaping influence and they do limit the informal interaction processes. It is clear that legislation and formal procedures strongly shape the interaction and influence the behavior of parties.

Therefore it is good to know which laws and procedures actors have or will have to deal with. Formal task-settings determine to a large extent the identity of public organizations. Their interests can be related back to these task-settings. So it is a

good thing to systematically map out those formal tasks. Formal authorities are also a type of resource, to which we will turn later in the analysis when we map out the interdependencies between parties. Drafting the 'formal chart' produces not only context information for the analysis of the informal relations, but also information about resource dependencies between actors in a network.

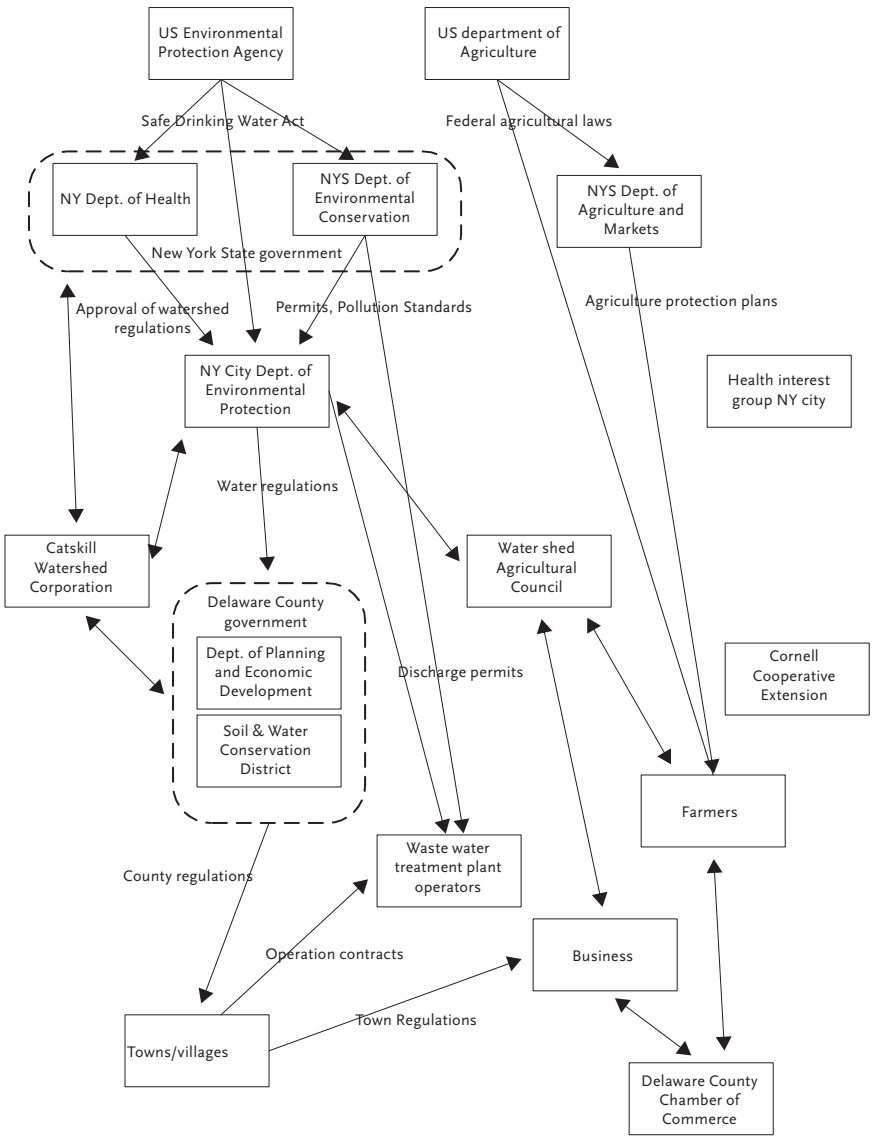
Formal relations can be described as:

- *Describing the formal positions of actors and their tasks and responsibilities*. For government organizations, these positions and responsibilities are likely to be defined in specific laws and regulation. Information about the position and tasks of non-government actors, although often more 'fuzzy' and somewhat less formal, can often be found on website, annual reports etc. Also, their room for maneuver will be limited by the prevailing legislation, see third bullet of this list
- *Specifying formal relations between actors, when possible by exhibiting an organization chart* with clarification. Do certain organizations or departments have a hierarchical relationship? Is there a formal membership of representational arrangement? Who bears final responsibility, or acts as coordinating agency? Who has a formal advisory role in a decision-making process?
- *Describing in short the most important laws, legislation, procedures and authorities* that play a role in the problem situation. This is likely to provide information in support of the previous items, but also may yield additional information that is useful for getting an idea of the position, interests, influence and 'solution space' of actors.

Parts of this information can be presented using a diagram to depict the formal relations between actors. Usually, such diagrams do not depict all the existing formal relations, but those deemed most important for the problem analysis. Note that in fact each arrow in this formal chart represents a resource needed for analyzing dependencies. Text box 4.4 gives an example.

Text box 4.4 Formal chart for the New York City drinking water problem

The diagram below shows the most important formal relations between the actors. It should be noted that the informal influence relations are not included. As a result of this, the non-governmental actors may seem less connected or less influential than they may actually be.



Formal chart for the New York City drinking water problem

Legend: single-sided arrows indicate a hierarchical relationship, two-sided arrows indicate formal representation relationships/membership.

The above figure shows that the US Environmental Protection Agency (USEPA) is 'on top' of the hierarchy, according to the Safe Drinking Water Act (SDWA). Based on this Act, USEPA determines whether or not New York City should filter its drinking water. The State agencies have some influence over NY City Department of Environmental Protection (NYCDEP), as their approval or permits are needed for some of NYCDEP's activities. NYCDEP and the NY State Department for Environmental Conservation are jointly responsible for permits and determining acceptable pollution loads. As a water supplier, NYCDEP is authorized to develop and implement rules and regulations to protect the water quality in the City's watershed, including those in Delaware County, providing that NY State Department of Health approves of these rules. This gives NYCDEP a strong position vis à vis the Delaware County agencies.

To protect New York City's reservoirs from pollution while maintaining the economic viability of the Catskill and Delaware Watershed region, an agreement was signed between New York City and the watershed communities. Part of this agreement was the establishment of several programs to support pollution reduction. The Catskill Watershed Corporation (CWC) was established to administer and manage some of these programs. The CWC is a non-profit organization and its members consist of twelve representatives of West of Hudson communities (of which six are from Delaware County), two members appointed by the State Governor and one New York City employee. Since agriculture is the main economic activity and the main source of pollution in the New York City watersheds, specific arrangements were made concerning agriculture. This resulted in a Watershed Agricultural Program, which is implemented by the Watershed Agricultural Council (WAC), a farmer-led non-profit organization. Its board consists of farmers, agribusiness representatives and the Commissioner of NYCDEP. The WAC has contracted the local Soil and Water Conservation Districts (SWCD), the Cornell Cooperative Extension Association (CCE) and other parties to assist in implementing its program (note that these contractual relations are not depicted to maintain a certain level of clarity in the diagram).

4.4.4 Step 4: Drafting Problem Formulations of Actors

The initial problem formulation by the problem owner is just one of the possible formulations of the problem that is faced in the initial situation. Problem situations are complex because different problem formulations co-exist.

Problem formulations encompass the gap between the perceived existing situation and the desired situation, and include ideas about causes and possible solutions. In this step of the analysis, the problem formulation of the different actors are systematically drafted by looking at their interests, objectives and their causal beliefs or perceptions. The result will be an overview table of actors, their interests, objectives and problem perceptions.

Specify Interests of Actors

Interests are the issues that matter most to an actor, and usually interests have a clear direction. Interests are not directly linked to a concrete problem situation, as opposed to objectives, and are relatively stable. A company typically has an

interest in making an economic profit, whereas the direction will be to increase profits. Another typical company interest will be continuity of business. For the Directory General for the Environment of the Netherlands Ministry of Housing, Spatial Planning and the Environment, the main issue of interest will be the environment, which needs to be conserved or protected. For a politician the main interest may be re-election. An identification of the interests of an actor helps to estimate to what extent certain objectives or solutions will be acceptable for the actor involved. Interests can be found out by asking questions such as: *Why is the problem situation of importance to an actor? How are actors affected by the problem and why do they care?*

Specify Objectives of Actors
Objectives indicate what actors wish to achieve in a certain situation, which changes they would like to realize (or what they would like to maintain). All actors that are involved in a problem have their own more or less clearly formulated objectives. They use these objectives as a measure to judge the existing situation. The gap between the objectives or the desired situation and the perceived existing or expected situation determines the nature and seriousness of the problem. Objectives are the translation of an actor's interests into specific, measurable terms.

An actor usually has multiple objectives, some of which may have nothing to do with the problem. Clearly, in our problem analysis we are first and foremost interested in the objectives that are directly related to the problem situation. These objectives can be found by asking the questions: *What does the actor want to achieve when it comes to the problem situation? When does the actor want to achieve this?* And: *Which specific costs and benefits are associated with the problem situation or the proposed solutions for a certain actor?*

Specify Perceptions
Most actors have their own, unique perceptions of a problem situation and these perceptions can differ significantly. When dealing with complex policy problems, it is neither easy nor useful to determine 'who is right' (see Chapter 2). Thus, instead of looking for who is right, we try to map out the similarities and differences between problem perceptions in the actor analysis. After all, even if 'wrong' problem perceptions arise, they exist, they are a part of the problem situation and they will influence the behavior of the actors who hold them! Therefore, all perceptions should be mapped in a problem analysis, staying as close as possible to the way the actor sees the system – whether we as analysts believe they are right or wrong.

The specific problem perceptions of actors can be specified in causal maps for individual actors, as is done for instance in Dynamic Actor Network Analysis (Bots et al., 2000). Actors may distinguish different factors and may have different assumptions of the main causal relations between those factors: Is there a causal relation? What is the direction and intensity of the relation? Is there a direct relation between factors A and B, or is factor A mainly influenced by factor B via

factor C? However, for our purposes we need not map these detailed diagrams, but we can get a useful impression by addressing the following questions:

- What is the actor's perception of the problem? What is the core of the problem: which factors are central in the system and what are the causal relations between factors?
- What are the main causes of the problem according to an actor? (Rule in this course: limit to a maximum of 3)
- What possible solutions do they distinguish with regard to the problem situation and its causes? (Rule in this course: limit to a maximum of 3)

Make a Systematic Comparison

With the help of the previous steps, a table can be completed that summarizes the problem formulation for each actor. The result will be an overview table as depicted below. Note that the complete overview table may be quite large.

Table 4.3 Overview table of actors' problem formulations

Actors	Interests	Desired situation/ objectives	Existing or expected situation and gap	Causes	Possible solutions
Problem owner					
Actor 1					
Actor 2					
....					
Actor N					

The summary table supports a systematic comparison of the problem formulation of the problem owner and the other actors. This helps to identify the similarities and differences, as well as common objectives and shared interests, or potential conflicts. These insights can be used to complement the initial problem formulation and problem analysis. Also, they can help to formulate recommendations for the problem owner related to the interaction with other actors, and on how to influence other actors.

Text box 4.5 Problem formulations of actors in the New York City drinking water case

Actors	Interests	Desired situation/objectives	Existing or expected situation	Causes	Possible solutions
Delaware County Dept. of Planning and Econ Development	Regional economic development, welfare of citizens Delaware County	Healthy businesses, sustained economic growth, good employment opportunities	Income levels among lowest in the country, decline in local businesses, high levels of unemployment	Rural economies have difficulties nationwide, environmental rules impose further restrictions	**Divers economy (tourism, IT-services), soften environmental regulations**
Delaware County Soil & Water Conservation District	Protection of human and ecosystem health	Good score on various soil and water quality parameters (for instance phosphorus, giardia and cryptosporidium)	Current levels may be high for drinking water purposes, but do not pose a direct health problem for Delaware County inhabitants	Farmers, especially dairy farmers, emit polluting substances, as do wastewater treatment plants, storm water events and old septic tanks of households not connected to the sewerage	**Among others: improve on-farm management through implementation of the Watershed Agricultural Program**
NY City Dept. of Environmental Protection	Protection of human and ecosystem health, provision of safe drinking water to NYC inhabitants at an affordable price	Good water quality in the upstream watersheds that feed the NYC reservoirs (in this case: low levels of phosphorus, giardia and cryptosporidium)	Levels are too high, endangering current water supply arrangements, threatening need of costly investments in filtration techniques	Communities in the upstream watersheds emit too high level of polluting substances, especially phosphorus, giardia and cryptosporidium	**Impose strict environmental regulations on watershed communities, purchase the lands around the reservoirs to stop polluting activities there**
US EPA	Environmental protection	Good water quality and safe drinking water supply sources for New York City	Currently, the NYC drinking water supply system does not meet the national standards	Emission levels in watersheds are too high in relation to the existing supply system that does not include filtration	**Ensure sustainable lowering of emission levels in watersheds or invest in filtration**
Farmers Delaware County	Agriculture	Good income from farming and good future prospects for farming business	Income from farming is low and prospects are bleak – and worsened by restrictive environmental regulations	Structure of agricultural markets, combined with unreasonable demands from New York City for pristine watersheds	**Improve on-farm management with help of Watershed Agricultural Council**
Health interest groups NYC citizens	Public health and costs of living	Safe drinking water supply at an affordable cost	Current arrangements are costly and still leave too much uncertainties regarding public health risks now and in the future	Pollution loads in watersheds are too high and current measures taken to reduce them are not sufficient	**Impose strict environmental regulations on watershed communities, purchase the lands around the reservoirs and restrict access to these lands**
Etc.					

Actors

The above table shows that that water quality in the reservoirs downstream of Delaware County does not meet the drinking water standards. This is a problem for New York City and its Department of Environmental Protection because it means they cannot use this water for public drinking water supply without treating it. Restricting the pollution levels in the watersheds is a solution to New York City DEP, but creates a problem for the actors in Delaware County: it would damage the economy in a region that is already lagging behind in terms of economic development. The health interest groups in New York City consider the current efforts of the New York City government and the local watershed actors as a problem. They are altogether skeptical about the effectiveness of pollution reduction by the watershed communities and they claim that New York City should enforce a strict ban on all economic activities in sensitive areas, by buying up lands and restricting access to it. Otherwise they will be forced to build a filtration plant for its drinking water supply in the near future anyway.

4.4.5 Step 5: Analyze Interdependencies

The previous analysis steps covered some of the important characteristics of actors: the formal network structure, the interests, the objectives and the perceptions of actors. However, the resources, power and influence of actors has not been specifically addressed yet, particularly from the point of view of formal and informal power relations. This brings us to the dependency relations between actors and the networks of power.

The first step in mapping out the network aims at determining the dependency-relations between actors. In Step 5 we investigate the dependency of the problem owner on the actors in his environment. This relationship is determined by three things: the importance to the problem owner of resources of other actors, the extent to which those resources are replaceable, and the degree to which the interests and objectives of other actors are similar (Hanf & Scharpf, 1978). Furthermore, it is important to know how important and urgent the problem is to other actors: this will determine whether or not actors are likely to be willing to play an active role in the debate and resolution.

Assess Resource Dependency and Critical Actors

The degree to which a problem owner depends on an actor is related to the resources of that actor. Critical actors are those on whom a problem owner critically depends for solving his problem. Identifying critical actors is an important part of actor analysis, and logically starts with an inventory of the resources of the various actors.

Resources of Actors

The resources of actors are the formal and informal means that are available to the actors to realize their objectives. Formal means are for instance authority (power of decision) and instruments (subsidies). An example of an informal resource is information. The following resources can be distinguished (Kok, 1981):

- information;
- knowledge (and skills);

- manpower;
- money;
- authority/formal power;
- position in the network: support from or access to other actors;
- legitimacy;
- organization (ability to mobilize and use resources effectively and efficiently);
- others, such as ...

In this step we find out which resources are available to various actors. Since every actor has a spectrum of resources, actor analyses often do not benefit from an exhausting overview. Only the resources that are most relevant to the problem situation need to be included.

Text box 4.6 Inventory of resources of actors involved in the New York City watershed problem

Actor	Important resources
US Environmental Protection Agency	Authority in determining whether or not filtration of drinking water is required
NY State Department of Health	Needs to approve the arrangements New York City puts in place in order to ensure provision of safe water supply
NY City Department of Environmental Protection	Authority regarding watershed rules and regulations; significant financial resources to support pollution reduction measures in the watersheds
Delaware County Department of Planning and Economic Development	Relations with local communities and knowledge of the area; appeal to equity argument in relation with NYC
Delaware County Soil & Water Conservation District	Knowledge and expertise regarding environmental protection and pollution reduction
Watershed towns	Use of legal procedures (in fact effectively used in the past)
Actor N	...

Resource Dependency and Critical Actors

The resource dependency of one actor in relation to a second actor depends on the importance of the resources held by the second actor and the degree to which these resources can be replaced by other resources. For instance, most western countries heavily depend on oil imports to sustain their economies. Thus, they are highly dependent on OPEC countries. However, as alternative fuel technologies are being developed, such as bio-fuels, hydrogen, and solar energy, this resource dependency is decreasing. Schematically, the issue of resources dependency can be illustrated as follows:

Table 4.4 Resource dependency

	Limited importance	Great importance
Limited options to replace	Medium dependency	High dependency
Can easily be replaced	Limited dependency	Medium dependency

Source: Hanf & Scharpf, 1978

Using Table 4.4 helps to assess resource dependency but tends to overlook resource dependency related to blocking power. The problem owner not only depends on actors with the resources to support problem solving, or to sustain existing systems, but he also depends on actors with resources to hinder the activities of the problem owner, or to prevent the successful implementation of a solution. Actors that are either important for their 'power of realization' or for their 'blocking power', are the critical actors – the actors that a problem owner cannot ignore (Enserink, 1993).

Table 4.5 Overview-table for determining critical and non-critical actors

Actors	Important resources	Replaceable?	Dependency limited, average, high	Critical actor? Yes/no
Actor 1				
Actor 2				
Actor N				

Assess the Dedication of Actors

The dependency on other parties is not only influenced by the resources these parties have, but also by their interest in the problem and their willingness to use their resources. The importance of a problem to an actor will appear from his problem formulation and the extent to which his core interests are affected by the problem or by possible solutions. In addition, it can help to assess whether an actor will be affected by clear costs or benefits. If he is affected, he will probably be a '*dedicated actor*', or he may become one in time. If an actor does not experience any clear costs or benefits, or if costs and benefits seem to negate each other, this actor will be less likely to try to influence the problem analysis and the choice and implementation of a particular solution. This means that such actors are less likely to pose a threat to the problem owner, but also that it will be more difficult for a problem owner to mobilize their active support. In such cases, we are dealing with a '*non-dedicated*' actor.

Map Actor Interdependencies

The previous step of the actor analysis, in which the interests and objectives of actors have been assessed, enables the analyst to assess if actors have interests that are similar to the interests of the problem owner, or if actors have interests that conflict with the interests of the problem owner. Adding this information to the results of the previous identification of critical and non-critical actors, and of dedicated and non-dedicated actors, enables one to complete an overview of dependencies of the problem owner on the different actors.

Overview Table for Classification of Actor Dependencies

Completing the cells of Table 4.6 provides an overview of the different types of actors on whom the problem owner depends to a larger or lesser degree. This overview table offers the problem owner an impression of the possible reactions of actors in his environment to his problem formulation and the intended solution.

Table 4.6 Overview table for classification of interdependencies

	Dedicated actors		**Non-dedicated actors**	
	Critical actors	Non-critical actors	Critical actors	Non-critical actors
Similar/ supportive interests and objectives	Actors that will probably participate and are potentially strong allies	Actors that will probably participate and are potentially weak allies	Indispensable potential allies that are hard to activate	Actors that do not have to be involved initially
Conflicting interests and objectives	Potential blockers of certain changes (biting dogs)	Potential critics of certain changes (barking dogs)	Potential blockers that will not act immediately (sleeping dogs)	Actors that need little attention initially (stray dogs)

Text box 4.7 Interdependencies in the New York City drinking water case, from the perspective of Delaware County as problem owner

	Dedicated actors		**Non-dedicated actors**	
	Critical actors	Non-critical actors	Critical actors	Non-critical actors
Similar/ supportive interests and objectives	Watershed towns, farmers, Watershed Agricultural Council, Catskill Watershed Corporation	Delaware County Chamber of Commerce, Cornell Cooperative Extension, other local businesses	US Environmental Protection Agency, NYS Dept. of Env. Conservation, NYS Dept. of Health	US Dept. of Agriculture, NYS Dept. of Agriculture and Markets
Conflicting interests and objectives	NYC DEP	NYC health interest groups		

The above table is based on the premise of the continued collaborative efforts to reduce pollution in the Delaware watersheds as agreed in the Watershed Agreement. If these efforts prove to be insufficient, which is not expected, New York City DEP will have to build a filtration plant before using the water from this area. From this perspective, US EPA is classified as a 'non-dedicated critical actor' because it is obviously critical to approving the existing arrangements under the Watershed Agreement, but although it is interested in meeting the drinking water quality standards, it is not as interested in how these standards are met.

Thus its interests are neither supporting nor conflicting. The same applies to the actors on the level of New York State. This has been indicated by putting these actors in both cells. NYC DEP is positioned as having conflicting interests, although this is not necessarily the case. It does share an interest in making the current Watershed Agreement a success, as does for instance the Catskill Watershed Corporation, but if this fails, it will be in a position opposed to that of the Delaware County actors – as it has been in the past, in the period prior to reaching an agreement. The health interest groups are strongly and clearly opposed to the position of the Delaware County Dept. of Planning and Economic Development, but so far, it has proven non-critical, as it has not yet succeeded in realizing its main objectives.

What this table clearly shows is that Delaware County is currently in a relatively favorable situation, at least as long as it sticks to the Watershed Agreement. This is not likely to solve the problem of slow economic development but it does reduce the obstacles that could otherwise be caused by strict environmental regulations. However, potential complications will arise if the current program does not seem to be working in the future. In this case, the critical actors that are currently not dedicated and not interested will become active and they may not necessarily be on the side of Delaware County. Given the economic and political weight of New York City, they are then more likely to side with the interests of NYC DEP against those of Delaware County. This suggests that Delaware County should show a real commitment to the current Watershed Agreement, showing that it will do whatever it can to control watershed pollution. If this then is not sufficient, the argument the State and federal actors could be that putting in place even more restrictive measures to avoid filtration is unreasonable and ineffective.

Visualizing Interdependencies

The information contained in the overview table for interdependencies (Table 4.6) can also be visualized in 'stakeholder maps' or 'power-interest matrices'. In some cases, such maps may have certain advantages over tables, especially when they provide a quick illustration of important patterns in the actor environment of the problem owner. In stakeholder maps, the power and interests of actors is used to classify different actors, whereas pluses and minuses are used to indicate if an actor supports or opposes the main interests and objectives of the problem owner. Critical actors are those with a high level of power – i.e. important resources – while dedicated actors are those with high level of interest in the problem. Such maps may be used to characterize actors (Bryson, 2004) and to formulate a generic advice regarding the types of relationships a problem owner typically might establish with actors in different quadrants (Johnson et al., 2005).

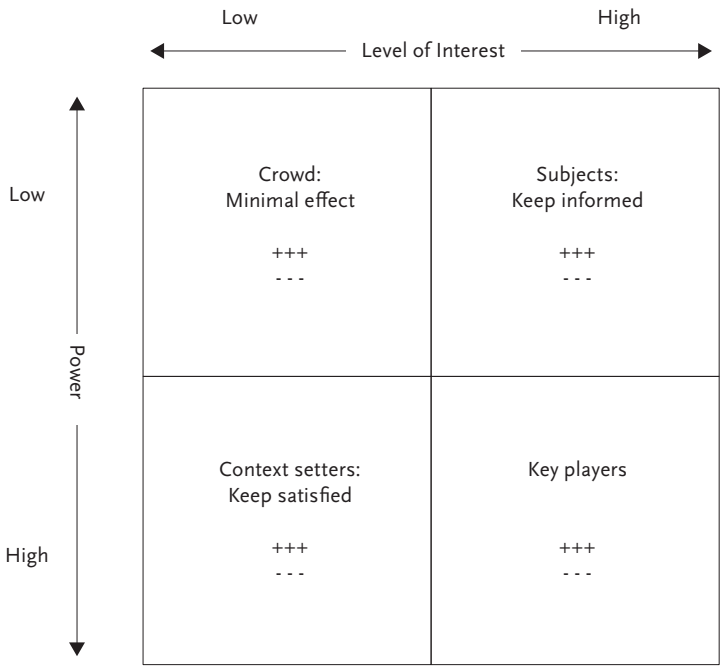


Figure 4.1 Mapping actor dependencies: power/interest matrix (sources: Bryson, 2004; Johnson et al., 2005)

Drawing Conclusions from Overview Tables and Maps

The insights contained in overview tables or dependency maps can be translated into different types of conclusions. For instance, the overview of actor dependencies can be a reason to modify the problem formulation, by identifying key interests in addition to those of the problem owner, that need to be taken into account – i.e. it is wise to at least ensure that the problem formulation recognizes the key interests of critical and dedicated actors. The overview can also be used to identify coalition and alliances that need to be established, encouraged or discouraged, mainly in relation to the dedicated and non-dedicated critical actors (cf. Koppenjan, 1993). Thought needs to be given to the fact that seeking support and coalition building is not necessarily a remedy for the presence of dedicated critical actors that may potentially block certain changes. Their status of critical actor gives them the power of veto to oppose majorities. Therefore the analyst also needs to indicate what opportunities there are to overcome differences and to avoid or defuse conflicts. Finally, the analyst can reflect on possibilities to turn 'biting dogs' into 'sleeping dogs' or 'barking dogs' to prevent 'sleeping dogs' from waking up, or to raise the dedication from critical non-dedicated actors with supportive interests and objectives. The latter is typically done through education and awareness raising activities.

Difficulties, Risks and Limitations in Mapping Actor Dependencies

Whether one uses a table or a matrix, one has to be aware of a number of limitations and risks.

- Sometimes the actors have not determined their position yet, or they are internally divided. If this is the case, they should not be included in the table. The solution can be to distinguish between different units within composed actors, or to put question marks behind the positions of the actors and to include them, if necessary with question marks in two cells.
- This classification is static, but actors are changing constantly. Allies today can be opponents tomorrow and vice versa. Therefore the problem owner can be thrown off guard by this table. There is a significant risk is that the table will work as a '*self-fulfilling prophecy*': because actors are treated as opponents by the problem owner, they will feel left out and start acting as an opponent.
- Related to the previous bullet is the need to update the contents of the overview table regularly and to indicate uncertainties explicitly.
- The table and dependency maps have a polarizing effect: they divide the field into actors that support or oppose the objectives of the problem owner as if there are no positions in the middle and as if the problem has only two extreme positions (for instance an environmental interest versus an economical interest). In reality there are often several potential positions which make it possible to bridge conflicts that focus on one dimension by focusing attention on other dimensions (Van Eeten, 2006). The table offers no overview on opportunities to overcome differences.
- Scholes (1998) points out that analyzing dependencies, with its focus on resources and power, entails a risk of losing sight of ethical considerations. For instance, dependency analysis may suggest minimal effort is required in relation to non-critical actors. However, these may well be disadvantaged groups in society for whom public policy makers have some responsibility in terms of improving their involvement and taking into account their interests.
- The table and maps were initially developed to be used for stakeholder analysis in relation to project design and implementation. In those cases, it is often easier to assess who is likely to support a specific project, and who is likely to oppose it (or parts of it). However, when the focus is on a policy problem, rather than a specific project, a range of solutions is still possible, and assessing support and opposition is likely to be conditional on the specific types of solutions one has in mind, and is linked to the level at which one looks at interests and objectives. At a higher level, interests may be similar among actors (e.g. in the case of New York, many actors may share an interest in good water quality in the watershed), but at the level of specific objectives, conflicts may arise (e.g. the objective to minimize agricultural activities in a specific part of a watershed). Therefore, when used to analyze policy problems, these tables and maps require a clear explanation of why certain actors are believed to be opposing or supportive.

4.4.6 Step 6: Confront the Initial Problem Formulation with the Findings

The last step of an actors and network analysis consists of the confrontation of the findings with the problem owners' problem formulation. Although any of the previous analysis steps may yield important findings, it is likely to be that the assessment of problem formulation and of actor dependencies in particular that provide useful insights. These analysis steps already combine various elements of the actor analysis in a structured way, thus offering potentially interesting new insights. Therefore it is necessary to list the conclusions and insights from the different analysis steps, translating them into a list of potential threats and opportunities stemming from the characteristics of actors and networks. These conclusions, threats and opportunities may have consequences for:

- the content of the problem analysis;
- the interaction with actors; and
- research activities.

Consequences That Relate to the Content of the Problem Analysis of the Analyst

This actors and network analysis will often be a reason for reformulating the problem. Possibly the core of the problem is differs from the original one, a different demarcation is needed, other factors are noticed and causal relations are different.

Consequences That Relate to the Dealing with Other Actors

The actors and network analysis can be used to inform the problem owner about the consequences of his problem formulation. Will it provoke resistance or support? Regarding which points? With which actors? It can indicate with which actors a fruitful cooperation is possible and from which actors opposition can be expected. The advice can also include involving actors with the further problem analysis or even to set up a future course interactively.

Consequences Regarding Research Activities

Thirdly, knowledge gaps and new research questions may have been discovered that relate to the causal, substantial aspects of the problem situation, as well as to the social dimensions. These need to be specified at the end of the actors and network analysis. They are possible ingredients for the research approach that is presented in the plan of approach at the end of the issue paper.

Text box 4.8 Consequences of the actor analysis for Delaware County
The actor analysis for the New York City drinking water supply problem suggests that the problem owner, Delaware County, indeed faces a dilemma. However, the dilemma is not so much what specific pollution reducing alternatives to implement and how to bear the costs of those. In fact, costs may be less of a problem than effectiveness. Money has been made available by New York City and New York State to support the implementation of measures. The sums available through various funds under the Watershed Agreement are considerable and may even help to improve the local farming system. However, health interest groups in New York City worry about the adequacy of pollution reduction measures to meet the water quality standards – and they may have a point. Nevertheless, given the apparent power and influence of the government coalition of New York State and City actors that favor pollution reduction, it will be difficult for Delaware County to object to the need for pollution reduction as something that is a questionable exercise. The current agricultural activities are not very profitable economically, and are still at risk of being further impaired by the pollution restrictions. This suggests an important knowledge gap. The problem owner should consider widening its problem formulation to look not only for means to reduce pollution, but also to look for clean opportunities for economic development.

4.5 Limitations of Actor Analysis

4.5.1 Trustworthy Sources of Information

Real world actor networks can be characterized as messy, dynamic and ill-defined systems. The task of an analyst is to provide some structure in this mess that allows him to extract some useful lessons for the problem formulation and interaction strategies of the problem owner. In this task, the analyst requires sound and trustworthy information on the characteristics and relations of the actors. Unfortunately, such information sources are not always easy to come by.

Information for an actor analysis can be obtained through *text analysis*: finding out perceptions, resources and objectives from written documents. On a generic level – and for an analysis of formal positions of actors – websites, annual reports and official policy statements may be available. However, when it comes to assessing actor perceptions and their informal relations and means of power, useful written sources of information are generally rare. This means that analysts will have to complement the information from written sources with interviews with the most important actors and with some key informants. This means that data collection often has to be done 'on-site', and is likely to require a substantial amount of time and resources. Furthermore, getting access to actors and ensuring their collaboration poses additional challenges – not everyone is willing to share his ideas with an analyst, or respondents may provide strategically distorted or desirable answers to questions, rather than speaking their minds truthfully.

To counter the risks and limitations inherent in any single source of information about actors' characteristics, the reliability of the information should be improved

by comparing and cross-checking information from different sources, by expanding the number of interviews and questioning actors about each other's positions.

When there is a lack of data, problem perceptions, objectives, interests, and/or dependencies can be *estimated* by the researcher, using logical reasoning based on the information that is available. However, here the researcher needs to be very careful. Estimations may be wrong, and there are many examples where problem owners or analysts hold the wrong assumptions about other actors' objectives or resources. In those cases, a problem owner might be in for a very unpleasant surprise, for instance when an alleged supporter turns out to be a fierce opponent, or when a 'sleeping dog' turns out to be wide awake.

Therefore, it is sometimes better to indicate that information is lacking. This means that there is a knowledge gap, which leads to the formulation of a research question for future research. But in any case, it is very important to indicate the sources of information used for an actor analysis, to indicate which information is based on estimations and to identify key assumptions that underlie the final conclusions and recommendations. When these are not specified, it has a negative impact on the reliability of the whole analysis – and it makes an analyst vulnerable to the justified criticism of a disappointed problem owner once he finds out the recommendations from an actor analysis are counter-productive!

Also remember that parties do not always have crystallized opinions and that these opinions can change. This information is especially interesting because it shows that there are possibilities to influence the realization of problem formulations and courses of solutions.

4.5.2 Actor Analysis Produces a Snapshot Only

The findings of the actor analysis result in a snapshot. Actors' problem perceptions change continually, as do their objectives, strategies and mutual relations. This continual dynamic causes strategic and institutional uncertainty. This uncertainty needs to be taken into account. The possibility to discount this uncertainty in the analysis itself is limited. That's why it is important to be aware of the fact that the validity of the findings from an actor analysis is limited in time. The most important remedy is to re-execute the analysis after a period of time.

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