

Multilevel governance patterns and the protection of groundwater and drinking water in Florida and the Netherlands

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Abstract

This paper develops a model of 'governance' as an aid for comparing such governance structures and applies these to a particular policy arena: policies on the protection of groundwater and on drinking water quality in the Netherlands and Florida.

The research questions examined by this paper are:

1. Which elements make up a governance structure?
2. In what ways do these elements influence each other?
3. What are the differences between the multilevel structure of protection for aquifers in Florida and the Netherlands, and how do these differences relate to other differences in the governance structure?

The analysis in this paper has shown that 'governance' involves more elements than policy objectives and the means to implement policy. These elements are not simply the sum of individual aspects but are closely interlinked. We have tried to illustrate how these interrelations work. The case study we used for this was the comparison between the Netherlands and Florida regarding the protection of the quality of groundwater and drinking water. The high degree of similarity between both states highlights the differences, which exist as well. The interrelations between these differences can be understood by using our hypotheses of the mechanisms by which they work.

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1 Introduction

This paper develops a model of 'governance' as an aid for comparing such governance structures and applies these to a particular policy arena: policies on the protection of groundwater and on drinking water quality in the Netherlands and Florida.

Various current approaches in policy science focus on changes in government policy when making comparisons (Sabatier & Jenkins-Smith 1993, 1999; Baumgartner & Jones 1993). This paper does not so much focus on (long-term) changes in policy (diachronic study) but compares policies in a certain sector in different areas (synchronic study). As far as developments in time are described, this is primarily intended to provide indications of the relations between the various elements of the governance structure. In this paper we restrict ourselves to a comparison between the Netherlands and Florida. The study is concerned less about interaction processes (activities and interactions between actors) than the more structural elements of governance, which form both the inputs and outputs of such policy processes. In comparing the Netherlands with Florida, we concentrate on the differences between both these areas with respect to the distribution of governance between the various levels.

The research questions examined by this paper are:

1. Which elements make up a governance structure?
2. In what ways do these elements influence each other?
3. What are the differences between the multilevel structure of protection for aquifers in Florida and the Netherlands, and how do these differences relate to other differences in the governance structure?

These three questions are addressed in the next three parts of the paper. The rest of this introduction discusses the reasons for making a comparison between the Netherlands and Florida. In part 2 we develop a model of governance based on various approaches taken in studies of public administration. Part 3 is also theoretical and presents a vision of the mutual influences between elements of governance. Part 4 is empirically oriented and examines to what extent the differences between the relevant policies in the Netherlands and Florida appear to reflect the expected patterns of mutual influences or not.

The reason for comparing the governance structure of groundwater and drinking water protection policies in Florida and the Netherlands is that the problems underlying the policies in both states display a number of remarkable similarities. Do different states that have similar problems develop similar types of policies? Or are there conspicuous differences? And if there are differences, how can these be explained in terms of administrative practices?

Both Florida and in the Netherlands make significant use of groundwater for their supplies of drinking water. In Florida groundwater provides about 90% of all the drinking water; in the Netherlands the proportion is about 66%, but in the north, east and south of the country almost 90% of drinking water comes from groundwater. The groundwater systems which are used are vulnerable on a large scale, particularly the shallow groundwater. In Florida this is because the aquifers are covered by a layer of porous limestone or limestone with faults, fractures, voids and stream sinks, etc. (karst) or because the surface strata consist mainly of sandy soils (the Central Ridge, which stretches lengthwise through the middle of Florida). In the Netherlands the groundwater systems in the east and south of the country are most vulnerable. Here the upper layers of groundwater lie under porous sandy soils. Both in Florida and the Netherlands the deeper aquifers are better protected.

A third similarity between the two states is that the supply of drinking water not only depends on highly vulnerable groundwater systems but that these groundwater systems are threatened to a high degree by diffuse sources of contamination from intensive agricultural systems, in particular the application of nitrates and pesticides used in crop protection. In Florida the nitrates are applied in the form of artificial fertilizers; in the Netherlands the nitrates are applied in the form of animal manure spread on the fields. This manure is mainly a by-product of the intensive livestock farms in these areas, which usually have little arable land. This results in the tendency to spread excessive amounts of manure on the land. The arable crops that are grown are mostly fodder crops for the animals (such as maize). In Florida the groundwater systems are threatened not by intensive livestock farming but by the intensive fertilization and use of pesticides on citrus fruits, fruit and vegetable crops, and tree and fern nurseries. These three forms of arable farming are big business in Florida, just as the intensive livestock farms are in the Netherlands.

There are more striking similarities between Florida and the Netherlands, too. Although they differ considerably in size (Florida is more than four times bigger than the Netherlands) the number of inhabitants in each state is roughly the same (about 15 million). Although the average population density in Florida is about 100 per km² (in the Netherlands this is more than 400 per km²) the Floridian population is concentrated mainly in the urban coastal areas, where 70% of the people live. This part of the population is highly environmentally aware, which makes Florida very different in this respect from the rest of the USA. A state comparison made in 1987 placed Florida seventh in 'commitment to environmental protection', and the state came eighth in the following survey held in 1988 (Ridley 1987; Sapowith & Ridley 1988). In both years the environmental performance of American states was assessed according to a figure allotted on the basis of the environmental programmes they had developed. In this test Florida scored particularly well in the area of groundwater programmes (scoring 9 out of 10) but only just scraped a pass for 'reducing pesticides contamination' (6 out of 10). If we compare this with the Netherlands, what is striking is that the Netherlands also has a reputation for a high level of environmental awareness among the population and for having well developed environmental programmes. The Dutch National

Environmental Policy Plan (NEPP) of 1988 was the first example in the world of an integrated national environmental plan. In both states a powerful agricultural policy community, as well as a certain level of environmental awareness among citizens, seem to be influential political factors. Furthermore, both states have a special relationship with water issues and groundwater plays a crucial role in the functioning of their ecosystems. The growth of public awareness of groundwater as an issue and the placing of this issue on the political agenda took place in both the Netherlands and Florida from the beginning of the 1980s, and led within a period of 10 years (1985–1995) to the development of detailed policy programmes and legislation. At the regional level, water management has been institutionalized and democratized in a similar way in both states (water management districts in Florida and water boards in the Netherlands) under a form of management (functional democracy) that can be considered quite unique internationally. Historically, water management in both states has enjoyed a prominent position in public life and is an important area of policy.

We are interested how two states that are geographically far apart and both part of different wider administrative associations (Florida as a state within a federal nation and the Netherlands as a member state of the European Union) and which are confronted by a similar policy problem – and that also display a number of other striking similarities that are relevant to the problem – deal with this problem. To explain similarities and differences in policy approach we expect to be able to make use of an explanatory model that offers insight into the governance structure of the policy sector that will be the subject of the comparison. In the next two sections we will construct such a model, drawing on a number of developments in the policy sciences.

2 Visions and Synthesis

2.1 Introduction

In recent decades there have been many developments in the way we think of the concept of government policy. One reason for these changes in the way we view government policy in recent years is that more attention has been given to the fact that developments in different sectors of society are guided not only by government but are a result of an interplay between many actors. Within such networks of actors, government may have a more or less central and dominant position, or it may not. This means that attention is shifting from government policy – or ‘government’ – to ‘governance’. In addition, there is also greater recognition of the fact that sectors of society are not managed at one level, or at different levels separately, but by an interplay between these different levels. These levels are often linked to different tiers of government, but this does not need to be the case if there are powerful non-governmental actors that provide direction at a specific level without there being a government body active at that level. This process is known as ‘multilevel governance’.

In this part of the paper we will try to develop as complete a model as possible of the elements of a ‘governance regime’. Later, using this model, we can compare the governance regimes and the changes they undergo in different sectors and/or different places. In this case we compare the protection of groundwater and drinking water supply in the Netherlands and Florida. We develop this model through a synthesis of policy science approaches, and the different emphases in various approaches each have a place in the model. When developing the model we start from the concept of ‘policy’, which we build up using the various elements until we arrive at a ‘governance regime’.

In the synthesis that is made here we do not start with the policy process but with the context and content of government policy. But what is context and what is content is not so easy to establish. The perception of the problem, for example, may be considered to be a part of the policy or a part of the context; it all depends on how narrow or broad one’s conception of policy is. We choose to view policy in the broadest sense. The consequence of this is that, on the one hand, all elements of the governance structure can be accommodated in the scheme (but not the activities and interactions that are part of the process of governance itself), while on the other hand we can assume that there are relations between all these elements (and not just between elements of the context and elements of the content of policy). All the identified elements are part of the content of policy and all are a part of the context of each other. In the following section we examine the relations between the various elements identified below.

A definition of government policy much used in the Netherlands, and which we use as a starting point, is that of Hoogerwerf (1998: 23). He describes

policy (as a synonym for the content of policy) as: 'attempting to achieve a particular objective using particular means at particular times'. Thinking in terms of objectives and means is considered by him to be the basic structure of every policy. The term 'means' is considered to be a synonym for instruments.

This premise will be further developed using various policy science approaches. Of course, many of these approaches have other purposes than identifying elements of the content of policy and governance. For example, they may be used to explain long-term policy changes, or the effectiveness of policy instruments. It is not the intention of our discussion to do justice to the approaches in their own right; what we want to do here is use these approaches as sources of inspiration for our goal of building as complete a model as possible of governance structures

Moreover, an 'injustice' will be done to most approaches in the sense that they will not be left intact, but only the most specific features highlighted. Aspects that are also to be found in other approaches and that generally tend to soften the bias in these specific features in a certain approach are not treated. The intention is not to judge these approaches but to enrich our approach to 'governance' in the light of the wealth of aspects brought to light by the policy science approaches examined.

2.2 *The stage model of the policy cycle*

In the stage model of the policy cycle the policy process is divided into a number of subprocesses, such as political agenda-setting, policy preparation, policy determination, policy implementation and policy evaluation and feedback. This could provide a useful basis for analyzing the content of policy as, in principle, each stage produces an 'intermediate product' (in turn: points of particular interest, proposals, decisions, applications, results and lessons), which will eventually lead to the complete policy content. Nevertheless, we will not use these assumed intermediate products as elements.

The classical stage model of the policy cycle raises the question of the extent to which such subprocesses are only analytical constructions or whether they can also be identified in real life. Setting political agendas can be considered to be an aspect that is present in all policy processes. The same can be said for evaluation. Feedback consists of shorter and longer loops that lead to repetition in an altered form of other subprocesses, and so this is also not a subprocess in its own right. In short: if we are to use 'real life' processes, then setting agendas, evaluation and feedback are possibly *not* separate subprocesses of the policy cycle. Policy preparation and policy determination are in day-to-day empirical practice often also so closely related that it is usually not worth while analyzing these as separate processes.

This leaves just two policy processes from the traditional policy cycle: policy development and policy implementation. But where does this leave the succession of many administrative levels? (In climate policy, for example, these are the global, EU and national levels, and sometimes the provincial and local levels.) What is policy implementation for one level, is policy development for the next level. In principle, it is possible to make an analytical distinction between policy development processes and policy implementation

processes that can be useful for analyzing these processes. In doing this, policy development processes are processes that involve turning diffuse inputs into a more focused output, and policy implementation processes are processes that involve turning a more or less focused input (the 'policy') into a number of diffuse outputs. When looked at this way, though, making a distinction between policy development and policy implementation means that the analyst must first himself specify what this focused output–input is.

Whether policy development and policy implementation are different processes depends on the question of whether there is a separate arena (playing field), an own game that can reasonably be distinguished from others and a largely non-overlapping group of actors involved. In other words, this is an empirical question. The answer will sometimes give cause to draw a distinction between processes and sometimes not, depending on the goal of the research (cf. DeLeon 1999).

The above is not much help for our purposes, though. It would seem to be sensible not to view the division of the policy process into subprocesses as a matter of fact but as an empirical question. In many cases only a distinction between the process of developing and implementing the content of a policy as specified by the analyst will hold water. A listing of possible intermediate products is unsuitable as a basis for a model of the content of policy and governance.

2.3 *Interaction processes and instrument theory*

An elaboration of thinking in terms of policy processes is to emphasize the character of these processes as social interaction processes, as has been the case in the Twente policy sciences approach. Here, attention has shifted from viewing policy as a sort of production process with semifinished products and an end product to a vision in which the actors participating in the process are the central concern. In this vision the course and outcomes of the processes depend not only on the inputs to the process but mainly on the characteristics of the actors involved, particularly their objectives, information and power. All other factors that influence the process do so because, and in so far as, they influence the characteristics of the actors involved. This also applies to the influence of policy instruments. Not all characteristics of actors, however, are determined by policy, and so it is not possible to describe a policy without paying attention to the actors involved in that policy. These actors are, therefore, allocated a place in a graphic model of the policy (Bressers, 1983).

Moreover, the processes in this vision are not only linked in one series or cycle, but are part of a large number of societal processes in which government authorities sometimes participate and sometimes do not. All these processes are connected to other processes in a complicated web via their inputs and outputs, and possibly indirectly linked to *all* other processes. Each definition of a sector of society draws a more or less arbitrary boundary round a cluster of processes in this web. In practice, the boundaries that are drawn between policy development and policy implementation are the same as those between a higher and lower tiers of government (Bressers 1983; Honigh 1985; Bressers & Honigh 1986).

The 'instrument theory' which stems from this perspective focuses on the application and effects of instruments on the target groups of policy (Bressers & Klok 1987; Bressers, Klok, Kuks & Lulofs 1988; Klok 1991). It also takes account of the fact that instruments do not influence the characteristics of the actors involved separately but rather as a package or as an 'instrument strategy'. Instruments and strategies have various properties, for example a certain proportionality between target group behavior and government reaction to this behavior, or giving resources to the target group or taking these resources away from the target group. Such properties of instrument strategies affect their applicability in practice. Klok emphasizes that some of the instruments are designed to give those implementing the policy the power to apply other instruments (Klok 1991: 176-194) and also that the implementing organizations depend on being equipped with sufficient capacity and expertise (idem: 163-164; see also Bressers 1983: 218-237 and 256-274). In his thesis, Arentsen (1991) exhaustively discusses the relation between the policy organization and policy implementation.

Later publications on this approach (Bressers & Kuks 1992; Bressers 1993; Bressers, O'Toole & Richardson 1994; Bressers, Huitema & Kuks 1994) have paid more attention to the interrelations between the actors, including actors that do not directly participate in the processes under examination. Klok (1995) gives primary importance to the allocation and removal of resources in such relations and in the classification of policy instruments. The mutual relations between actors within such policy networks are seen as an important factor in the development of the content of policy (Ligteringen 1999). In addition, the relation between policy processes at the various administrative levels is explicitly dealt with (Bressers, Kuks & Ligteringen 1998). During this theoretical development, the approach to policy as an interactive process and the instrument theory based on this gradually grew into an integrative policy science approach, uniting elements from a variety of other approaches.

This discussion brings us to the following provisional elements of governance:

1. Administrative levels
2. Actors in the policy network
3. Objectives
4. Strategies and instruments
5. Organization of implementation.

We now examine what modifications are made if we bring a few other integrative policy science approaches into consideration: Ostrom's institutional approach and Sabatier's 'advocacy coalition framework'.

2.4 *The 'institutional rational choice approach'*

Ostrom's institutional model is in essence a 'rule-based' approach. Although in later work (for example Ostrom 1999) attention is also paid to the characteristics of the actors themselves and the physical conditions as the context of the processes, the distinguishing feature of the approach is that collections of rules are used to describe the 'action arena' in which such processes take place.

Ostrom (1999: 52-53) distinguishes seven different types of rules which together define the arena: 'entry and exit' rules that determine who may take up a position between the actors and who may not; 'position' rules that determine which position these actors have in the network; 'scope' rules that state the field to which this position relates; 'authority' rules that indicate the competences of the actors as experienced by themselves; 'aggregation' rules that state for certain actions, in the experience of the actors, whether permission from others is required or not; 'information' rules that state what is known and to whom and how this information is disseminated – for example whether information must remain secret or whether it should be made public; and 'payoff' rules that state what the benefits or sanctions are for the various actors and how these are arrived at (for example, regarding compliance with or infringement of rules, who checks compliance and imposes sanctions, and how). These categories appear to partly overlap (Heilman 1992: 81). Nevertheless, they can enrich the elements of governance we have identified.

This applies in particular to the element 'networks and actors'. In the instrument theory the composition and position of the actors involved in the network is assumed to be a given fact. The first two types of rules require that attention is given to the fact that these are crucial variables. A similar situation applies to the 'scope' rules that determine the extent of certain positions, competences and other sources of power. For that matter, when applying the model many of these rules are related to the allocation of ownership and use rights between those involved (Ostrom 1990).

An interesting fact is that a few times it is explicitly stated that it is not the 'objective' rules that describe the actual arena but the way in which these are experienced in the eyes of those involved. Something similar is emphasized by listing the 'information' rules as separate entities, which also require that particular attention be paid to the limitations of the available information. Incidentally, a parallel can be drawn between the last four types of rules and the three characteristics of power (2x), information and objectives from the instrument theory. The difference always lies in the fact that these are not described as characteristics of the actors involved but of the rules of the game for each situation. Besides institutional arrangements, Ostrom also recognizes 'characteristics of the community' and 'events and the nature of the goods (for example groundwater and the physical features of the aquifers) as influencing the choice situation (Kiser & Ostrom 1982; Sabatier 1991).

Another aspect of Ostrom's approach is that she makes a distinction between the different levels of analysis. Rules that influence 'operational' situations such as production and consumption are made at a higher or deeper level of 'collective choice situations'. Making these rules is, in turn, subject to 'constitutional' rules, etc. This layered structure of the rule context is not the same as a classification of administrative layers. After all, constitutional rules apply to all administrative layers and collective choice situations arise at each administrative level. This structure developed by Ostrom accentuates the fact that action arenas are 'nestled' in the rules that are set by other arenas, independently of the question of whether this takes place in another administrative layer. On the other hand, such administrative layers are usually established to create just such a context for policy processes at 'lower' levels. Moreover, the analytical separation between the various types of rules appears in practice difficult to operationalize into

observable differences. Thus, it is not clear to what extent the application of policy instruments is a part of the operational level or a part of the collective level.

A compromise between both interpretations of the term ‘level’ could be – as in the introduction to this section – to speak about levels within a concept of ‘multilevel governance’, in which the other level often, but not always, and not by definition, also has its own characteristic administrative level.

2.5 *The ‘advocacy coalition framework’*

The ‘advocacy coalition framework’ developed by Sabatier and others was developed as an answer to the stage model of the policy cycle and to better understand the relation between ‘technical information’ (expert knowledge) and the policy process (Sabatier & Jenkins-Smith 1999: 117). An ‘advocacy coalition’ is a collection of actors from both within and outside government who hold common beliefs and who coordinate their activities to a considerable degree (Sabatier 1988, 1991). Within a sector of policy – the ‘political subsystem’ – there is usually more than one advocacy coalition active. In addition, there are actors who are more likely to have objectives that relate to policy processes than to the content of policy, and these actors are referred to by Sabatier as political brokers. The characteristic features of coalitions are their political convictions or ‘policy beliefs’ and the resources they have, which lead to the proposed strategy and instruments of the coalition. The decisions that result from the policy process provide implementing organizations with both policy lines and resources. The actors in the subsystem are influenced by resources and restrictions from without the subsystem, which in turn arise out of more or less stable conditions and events elsewhere in the system.

In the development of the model much more attention has generally been paid to the aspect of policy beliefs than to the aspect of resources. Only recently have Fenger & Klok (1998) developed a connection between the model and resource dependence, which has been enthusiastically received by Sabatier (Sabatier & Jenkins-Smith 1999: 141). For our purposes it is important that the allocation of resources to the implementing organizations is explicitly recognized to be part of the policy decisions. Besides that, what is of particular importance is the idea that there are coalitions of actors in the policy network that do not just simply represent the division between government and other actors, but contain actors from both of these groups and are based on common beliefs.

Regarding the beliefs of actors, we can identify various layers. In the ‘deep core’ are issues relating to fundamental values. The ‘policy core’ contains positions relating to the perception of problems, the division of the costs of policy implementation, the desirability of contributions from experts, politicians and the general public and other relevant values and preferences. The ‘derived aspects’ contain elaborations for each given situation. Besides this layered structure what is also important to us is the importance that is attached to the perception of the problem.

2.6 *The position so far*

We have noted that no completely new elements have been added to the model of governance. But it has been possible to improve on the five elements and make them operational. In its shortest form the 'governance model' consists of five questions: Where? Who? What? How? and With what? A characteristic feature of modern 'governance' systems is that they have many aspects. They are: multilevel, multi-actor, multifaceted, multi-instrumental and multi-resource-based.

1. Levels of governance – Where? – multilevel –
[Which levels are related to the sector and to what degree? How are the relations between the levels organized?]
2. Actors in the policy network – Who? – multi-actor –
[Which actors have access to the network? What is their position? Are there actors that take on the role of process broker? What is the position of the general public versus experts versus politicians?]
3. Beliefs and objectives – What? – multifaceted –
[What is seen as a problem and how serious is this thought to be? What are thought to be the causes of the problem? What values and other preferences are considered to be under threat? What are the policy objectives?]
4. Strategies and instruments – How? – multi-instrumental –
[Which instruments belong to the policy strategy? What are the characteristics of these instruments? When are they deployed (timing)? How are the costs and benefits of the policy allocated?]
5. Responsibilities and resources for implementation – With what? – multi-resource-based –
[Which organizations are responsible for implementing the policy? Which resources are made available to these organizations by the policy?]

The next section reviews a few other approaches, which may be seen partly as precursors to the perspectives examined above. The discussion will concentrate on aspects that can be used to improve on the operationalization of the five elements, asking ourselves each time whether the approach can really contribute something extra to the model.

2.7 *Some other approaches*

Synoptic rationality, bounded rationality, incrementalism and mixed scanning (Simon, Lindblom, Etzioni)

It may be strange to begin this treatment of a series of approaches with one that we describe mainly in order to reject it, namely the approach based on fully rational choice. In particular, the premises that the decision maker has unambiguous preferences and complete information are invalid.

It was the Nobel prize winner for economics Herbert A. Simon (1997 (1945)) who provided the most famous criticism of these premises. His view of mankind is not that of an all-knowing 'Homo economicus' with clear and confident preferences, but of a being with a 'bounded rationality'. While the concept of rational decision making only refers to the decision making

process itself, and not the context, 'bounded rationality' takes account of the limitations in the capacity of actors to collect and process information.

Lindblom's 'incrementalism' (Lindblom 1959; Braybrooke & Lindblom 1970 (1963)) also assumes a limited human capacity to process information. In addition, it devotes much attention to the power of continuity (see next section) and for the character of pluralistic processes geared to political negotiations. This approach also pays attention to the interaction between 'values' and 'facts'. These feature again, more prominently, in the cognitive approaches, which are examined at the end of this section.

'Mixed scanning' (Etzioni 1967) is primarily meant to be a description of the process of policy development (either in a normative sense or not). It offers little extra of relevance to the context of governance. Opening up the possibilities of non-incremental policy changes has to do, for example, with 'megapolicy changes' (cf. Dror 1971). This fits in with the previously mentioned cognitive approaches, with their frames, maps of reality, etc.

Bureaucracy and politics (Allison)

In his groundbreaking work Allison (1971) attempts to explain the course of the Cuban missile crisis in three ways. He, too, starts with the model of the rational actor, not only to determine his own position but also to provide an initial explanation of the process. This allows him to present the added value of discussing and using the other two explanatory models with extra clarity.

The 'bureaucracy model' (following Allison's example) specifically addresses the standard approaches and repertoires of organizations, which restrict flexibility in conducting policy. The model has some aspects in common with elements of our governance model: it goes into the role of organizations at various levels; it is also one of the few approaches that explicitly addresses the organization of implementation. In the construction of objectives it addresses the phenomenon of 'solutions in search of a problem' (compare the flow model, examined below), an aversion to risky measures (dealing with uncertainty) and the organizations' own management objectives.

The 'political negotiation' model (à la Allison) looks at the positions, interests and mutual power relations between actors (in so far as these do not relate to the game itself). The reasoning in terms of power in the interaction process approach (see above) are based on this model.

Flows and garbage cans (Kingdon)

Decision making does not always follow an orderly procedure but sometimes seems more like a process of fermentation in a compost heap ('garbage can' model of Cohen and others 1972), in which various issues come together by chance. The flow model of the policy process (Kingdon 1995 (1984)) builds further on this and examines how three relatively autonomous flows come together each time a decision has to be made. Political 'entrepreneurs' promote this by making use of 'windows of opportunity' (or creating them). These three flows consist of problem perceptions, ideas for possible policies and political 'salience' for the voters and those elected, and of the people who emphasize each of these three or parts of them.

It is tempting to link these three flows to our elements 'beliefs and objectives', 'strategies and instruments' and 'actors in the network'. With respect to this it should be noted that that Kingdon considers the three flows

more as notions than as matters of fact (Zahariadis 1999: 74-78) (see also the subjectivist approaches discussed below). We should also note that where we emphasize more or less stable features of policy sectors in the governance model, to allow comparisons to be made between sectors, Kingdon looks instead at the changeability of these features with regard to individual subjects of decision making. Nevertheless, the three elements mentioned allow the issues Kingdon wants to highlight to be accommodated.

Conversely, reasoning from the governance model to the flows model, the following can be added to the requirements that have to be met if a policy is to be amended. The convergence of problem perception, policy opportunities and political salience should not take place at different levels (as, for example, when there is concern about a problem at the national level while solutions are being sought at the European level). Moreover, it is necessary that ideas for solutions include ideas about the management and allocation of tools and resources for implementation. Otherwise, an issue will lead to a policy decision (and thrown out of the 'open window' and so be removed from the political agenda), but that decision will only result in a symbolic policy.

Real games (Scharf)

In his recent overview of policy science approaches, Sabatier (1999) classifies the game theory of Scharf (1997) with the institutional rational choice approach (see above). There is something to be said for this, but still, Scharf and co. highlight a few points left out by Ostrom and co. Scharf calls his approach 'actor centered institutionalism'. Besides links to the Ostrom approach, it is true that much attention is paid to the 'actor constellations'. The goal and structure of the approach appear similar to that of the instrument theory, namely that the course and outcome of the processes are explained, but without being specially concerned with one of the five elements of governance as outcome. The most important difference from the instrument theory is that the outcome to be explained is related to the question of whether those involved can cooperate or not, while the instrument theory mainly tries to explain the relation between the inputs and the outputs of the process. The explanation takes place primarily in terms of the distribution of preferences for alternatives. Much attention is also paid to information, but only to direct information and not so much to frameworks for interpretation (see below). Further, the approach is based primarily on individual rational actors, although other values are also taken into account.

Cognitive maps, 'discourses', 'frames', argumentation and cultures (Axelrod, Dryzek, Fischer, Schön, Thompson & Wildavsky e/o.)

A large number of current theories in policy sciences can be characterized as cognitive approaches. Characteristic for these theories is that they all emphasize that the behavior of actors rests on their subjective interpretation of reality and furthermore that this subjective interpretation is formed because observations of actors are given a place in frameworks of interpretation that provide meaning to these observations, but also distort them. Such frameworks of interpretation can be partially viewed as a form of dealing with uncertainty. To depart in analysis from an 'objective' context as assessed by the researcher, leads in this vision to false analyses, because not the facts

but the interpretations count in reality. So, in sense as a context of decision-making not the facts, but the interpretations are 'true'. Think of the well known adagio: 'What is believed to be real is real in its consequences'.

In the layered 'policy beliefs' of Sabatier one finds a partial sediment of these theories. That doesn't mean however that he has very much respect for these theories. In his recent work he assesses some of these as still too vague to be regarded as a real theory. For this reason he doesn't deal with them in his book (Sabatier 1999: 11). The differences between the various theories are to be found especially in the way in which the frameworks of interpretation are conceptualized. In this respect one can observe a certain tendency from more individual to more collective frameworks of interpretation.

Axelrod (1976) writes about the 'cognitive maps' of political elites. For him the emphasis of the cognitive map is on those aspects that decision-makers are able to recognize in a certain situation and on the complex web of causal relationships that they think is linking these aspects. Because the various cognitive maps of participants in decision-making processes often do not match it is hard to find a common ground for the exchange of ideas. Unless one is able to make the cognitive maps more explicit that is.

Schön (1983 and Schön & Rein 1994) starts his analysis from the viewpoint of the professional, who whether as an actor or as an analyst creates an image of the situation. According to Schön he does so by building a 'frame' (as framework of interpretation) in which he can 'store' his lessons learnt about the world and his own repertoire of reactions. In this way he is able to react adequately in the numerous situations in which a fundamental and thorough analysis is impossible. Needed for this is that the 'frame' remains flexible, in other words that new lessons can obtain a place in it and not only are kept out, when they threaten to disturb the frame. He calls that 'reflection-in-action'. To make effective communication with others possible sometimes 'cross frame discourse' is needed, in which the participants try to escape the limitations of their own frame and try to learn to understand the frame of the others in order to better understand the interpretations of them. Necessary condition is an open societal debate.

Fischer (1985, 1995 and with Forrester 1993) concentrated initially especially on the various layers of values that play a role in the assessment process in evaluation. In the layer of the policy goals one can seek optimal realization. But it is also possible to criticize the policy goals themselves from the perspective of general norms than one if thinking relevant to the situation. In doing so also the role of government itself can become a topic. These norms can in their turn be judged from the perspective of the central values of society. And even these can be subject to further evaluation in culture or social critique. In his later work emphasis is more on the 'social construction' of reality. In other words: the way in which a society views reality is regarded as a sort of implicit agreement.

Dryzek (1987, 1997) views frameworks of interpretation as 'discourses. Characteristic for a discourse is that it is not only a set of point of attention, assumptions and judgements. The discourse is also linked with specific language expressions. Because different words and metaphors are used it is extra difficult to communicate crossing the borders between discourses. In that way discourses can also become both stabilized and rigid. The frameworks of interpretation are thus not only 'social constructions'. They

are also a sort of 'story that we tell each other about how the world works' (Milbrath 1993).

Thompson & Wildavsky e/o. (Thompson, Ellis & Wildavsky 1990, Schwarz & Thompson 1990) build upon the cultural anthropologic approach of Mary Douglas. Their 'cultural theory' discerns four (sometimes five) cultural positions on the basis of two dimensions that represent the relation between the individual and society: 'grid' and 'group'. A precise explanation of these two concepts would be too demanding for our purpose, but they have among others consequences for the way in which the role of government is judged. The resulting cultural positions are also called 'biases' because they induce an inclination to interpret reality consequently in a certain way. The result is that frameworks of interpretation in this view are not seen as specific for certain actors in relation to a certain topic, but in principle as belonging to a fixed attitude of persons, groups or even complete societies. Admittedly in later work this strong linkage of various frames of interpretation to one common collective cultural bias have been relaxed.

For our model the above theories have the consequence that we will pay attention in the first element to the access to the societal debate and the acceptance of the role of government. With the problem perception there should be attention for the images of reality that act as filters with the interpretation of observations and for the degree to which uncertainties are accepted as one of the indicators for the degree in which one is in need of such images in order to prevent a feeling of uncertainty. With the strategies it is important to view whether the chosen instruments provide incentives to learn, in other words to exceed existing images of reality. Often for that purpose flexible instruments and indirect steering methods are used.

2.8 *A model of governance in five elements*

At the end of this part of the paper we come to the conclusion that the approaches examined have added some specifications to the identified five elements of governance, but that these in themselves remain intact. Based partly on the previous discussion and partly on a slightly more detailed representation of the specifications from the previously examined approaches, we arrive at the following description of the five elements of the governance structure we have identified.

(1) Levels of governance

Where? – multilevel –

Which levels of governance dominate policy and the debate on conducting policy, and in which relations? What is the relation with the administrative levels of government? Who decides or influences such issues? How is the interaction between the various administrative levels arranged?

(2) Actors in the policy network

Who? – multi-actor –

How open is the policy arena in theory and practice, and to whom? Who is actually involved and with what exactly? What is their position? What is the

accepted role for government? Who have relevant ownership and use rights or are stakeholders in some other capacity (including policy implementing organizations)? What is the structural inclination to cooperate among actors in the network? Are there actors among them who operate as process brokers or 'policy entrepreneurs'? What is the position of the general public versus experts versus politicians?

(3) Problem perception and objectives

What – multifaceted –

What are the dominant maps of reality? What is seen as a problem and how serious is this considered to be? What do people see as the causes of this problem? Is the problem considered to be a problem for individuals or a problem for society as a whole? What values and other preferences are considered to be at stake? Which functions are allocated to the sector? Is the problem seen as a relatively new and challenging topic or as a topic in the 'management' phase without much political 'salience'? To what degree is uncertainty accepted? Where are the recognized points of intervention? What relations with other policies fields are recognized as coordination topics? Which policy objectives are accepted? What are levels to which policy makers aspire (ambition) in absolute terms (level of standards) and relative terms (required changes in society)?

(4) Strategy and instruments

How? – multi-instrumental –

Which instruments belong to the policy strategy? What are the characteristics of these instruments? What are the target groups of the policy and what is the timing of its application? How much flexibility do the instruments provide? To what extent are multiple and indirect routes to action used? Are changes in the ownership and use rights within the sector anticipated? To what extent do they provide incentives to 'learn'? What requirements do they place on the availability of resources for implementation?¹ How are the costs and benefits of the policy distributed?

(5) Responsibilities and resources for implementation

With what? – multi-resource-based –

Which organizations (including government organizations) are responsible for implementing the policy? What is the repertoire of standard reactions to challenges known to these organizations? What authority and other resources are made available to these organizations by the policy? With what restrictions?

In the next part of the paper we examine the types of connections that can be expected between the five elements of the governance structure.

¹ For example, some systems of emission charges or tradable licences may require so much information that it makes them almost impossible to apply. The fine tuning of the instrument is very important in this respect, and can make the difference between an effective intervention and a dead end.

3 Patterns and dynamics

3.1 Introduction

In this section we describe the relations between the five elements of governance. The assumed relations between the five elements described in this paper are based on the basic principle that the elements of policy each form the context of the other elements and that they will tend to adjust to each other if not affected by outside influences.

By choosing mutual adjustment as a basic principle, emphasis is placed on stability rather than change. Nevertheless, such a model also offers a framework for explaining change. Changes in the external context of factors that are not considered to be part of the governance model can influence one or more of the elements. Through the same mechanisms of mutual interaction this can in turn lead to changes in all the elements of the governance model.

The idea of mutual adjustment also offers the possibility of explaining differences between the situations in two or more countries, in this case differences in governance in the field of groundwater protection and drinking water policy in Florida and the Netherlands. Differences in external factors, for example in geological and hydrological features, or in solidly grounded aspects of governance, for example the constitutional allocation of competences to government authorities, will, according to this idea, indirectly bring about a series of differences in (other) elements of governance.

There is a certain 'logical' relation between the five elements of governance. This, however, means no more than that it is easy to see why each previous element imposes harder or softer limitations on aspects of the following element. In this sense, these influences create a situation in which the elements are adjusted to suit each other. In our opinion, however, there is no a priori reason for thinking that the mutual influences between the elements is restricted to this alone. In principle, the idea of mutual adjustment means that there is every reason to believe that all 25 mutual influences are possible. All elements form the context for the others and can therefore be both independent and dependent variables. This means that we can distinguish 25 hypotheses.

3.2 Premises

The premises and mechanisms that lie at the heart of these hypotheses are as follows.

(1) The best predictor of the status of an element at t2 is its status at t1. Each change takes up energy and will not take place if the governance system is in balance. Only changes in other situations (within and outside the 'governance system' and via the efforts of the actors) can bring about changes. This idea forms the basis for the five 'continuation' hypotheses, in which an element influences itself.

(2) The elements in the model mentioned earlier form a more or less limiting or determining context for later elements. The division of the conduct of policy between administrative levels activates networks that are active primarily at these levels. Those participating in these policy networks are, of course, those who give shape to the perception of the problem and the ambitions in the public debate and subsequently in the policy itself. These in turn are the focus of the discussion about policy strategies, for one reason because certain actors are considered to be a target group while others are not and because certain intervention points in the policy field are utilized while others are not. The selected strategies and the instruments that are part of these in turn require the availability of an implementation structure and resources to make implementation possible (see also footnote 1 by the diagram below). These ideas form the basis for the four 'logical order' hypotheses. The five elements form a sort of cascade of influence.

(3) This 'logical order' of influence, however, is not the only way in which (changes in) elements of the 'governance cascade' can influence each other. In fact, we believe that all the other conceivable 16 relations are possible, including the influence of elements mentioned later on earlier mentioned elements. All 25 relations should be considered, for example to analyze clusters of related differences between Florida and the Netherlands, because it is possible that the influence of the 'network' on the strategy works via the influence of the former on the 'ambition', etc.

(4) The general idea behind all these relations is that they promote the mutual adjustment of elements. According to this idea, dynamics will always have an external sources, which may consist of (a) major social developments, such as demographic, cultural, economic or physical (technological and spatial) developments, and (b) developments in other policy fields (Ligteringen 1998: 214-215 and following).

(5) All these mutual influences do not occur of themselves but need processes of social interaction to bring them about. In the description of the governance system here, however, we do not explore further the process side of the system, but only go into the elements that are (re)produced by these processes (as outputs of processes) and which in turn again form a context for other processes (as inputs to processes). By accepting that the relations actually work through processes of social interaction means that we can best explore the assumed relations between the elements on the basis of what we see as the central factors in such processes (Bressers 1983; Bressers & Klok 1987a, 1987b; Kuks 1987; Klok 1991).

(6) An adjustment may take place along three possible perspectives, referring to: objectives ('desire', ultimate basis: values), information ('knowledge', ultimate basis: cognition) and power ('ability', ultimate basis: resources). The mechanism of mutual adjustment, distributed over the five elements of the governance system, will tend to make values consistent, to make cognitions fit better into a common framework for interpretation and to make resources act to mutually facilitate the elements. But take note: just as in mechanism 1 and 2, these are not compulsory determinants but probabilistic influences,

taken for the moment to be preliminary working hypotheses. In essence, the influences also play a role in the 'logical order' of the elements in the model.

(7) In principle, of course, every relation can be conceived as working from all three perspectives described above. An attempt will be made to do this later.

Before we discuss each hypothesis separately we examine the three perspectives (desire, knowledge, ability).

3.3 *Values, cognitions and resources*

Why are objectives, information and power (with values, cognition and resources in the background) the useful perspectives when examining the relations between the five elements of the governance model? As we have indicated above this has to do with the fact that the relations between the elements are brought about by processes of social interaction. These three perspectives have proved themselves to be exceptionally useful in explaining the dynamics of such processes. In his thesis Bressers (1983: 1898-197) attempts to indicate why these three in particular are essential. He first looks at what is needed to make a relatively simple object: making a chair requires the carpenter to have an object in mind, and it requires expertise and resources, such as tools and materials. In a multiple-actor process goals also relate to the position relative to other actors as well as information and resources (in the form of power). He also considers the long tradition of thinking in terms of these perspectives (idem: 352-328).

A second way of clarifying the three perspectives is to link them to ideas on policy instruments. Policy instruments are often classified into rules, incentives and communication. This, in our opinion, does not so much reflect different policy instruments but different ways in which they exert their influence. Regulations are not always couched in terms of compulsory rules but may also work by influencing the outcome of balancing the costs and benefits of alternative patterns of behavior (incentives) and ensuring that attention is given to certain alternative forms of behavior (communication). Subsidies are not only incentives, but are also linked to conditions (rules) and information (communication) as well. Communication, certainly two-way communication, often leads to agreements being made, such as covenants or voluntary agreements (rules) and the exchange of concessions, for example acceptance of change in exchange for flexible timing (incentives). In other words, these are aspects of all policy instruments rather than separate groups of instruments. The fact that this classification of instruments still remains so important has more to do with their connections with the perspectives based on societal interaction processes than with their usefulness for this purpose.

A third way of illustrating their rich significance is to relate the three perspectives to social science disciplines. There is a certain connection between these disciplines and the three perspectives mentioned above. This connection is partial, though, and relates to the core principles of these

disciplines rather than any details, making a distinction in principle between individual and social methods of considerations.

The fundamental concept in economics is the scarcity of resources and the decisions and bartering that result from this. In its most classical version, the complexities of all other aspects (the social, cognitive and value aspects) are reduced to assumptions of 'methodological individualism', 'complete information' and 'individual behavior that maximizes benefits'. If 'benefit' cannot simply be equated with money, multiple objectives are formulated, for example 'bureaucrats strive to obtain as large a budget as possible'. This is, in essence, an unethical and pragmatic premise. So, to sum up: 'A: that which gives the greatest benefit will be chosen.'

In political science the social aspect of the distribution of resources, and so the power of one actor over another, are emphasized. Reasoning, then, is about the question of who is going to dominate the field. To sum up: 'B: Whoever has the most power is free to choose.'

Sociology is partly about understanding social problems and psychology is partly about human skill in collecting and processing information. To sum up: 'C: It is not the facts that are important, but how what is observed is interpreted.' (Or: 'What is believed to be real is real in its consequences.')

Social psychology and communication science emphasize the transfer of information in mutual communication processes. Also, the role of information collection and processing is often emphasized in the process of making choices and power relations (and of the development of values). The 'argumentative tendency' in policy sciences (e.g. Hoppe 1999) fits largely into this track. To sum up: 'D: Interpretations of reality are the product of a social construction.'

The value aspect is pivotal in ethics and other areas of philosophy. To sum up: 'E: People should want what is good.'

Regarding normative social aspects, imposing values on others, for example the whole community, we enter the domain of the law. To sum up: 'F: The limits to what is good are set by rules.'

Of course, this characterization of perspectives (and certainly of associated disciplines) is too simple when forced into a simple matrix. Each scientific discipline can borrow elements from the other cells. In doing so, though, it is often clear that they reject some of their own principles and integrate some of the principles of other social sciences into their own set of considerations.

<i>Scientific Perspectives</i>	Individual	Social
Resources (power)	a. Choosing the greatest benefit	b. Those with most power can choose
Cognitions (information)	c. It is not the facts that are important but how what is observed is interpreted	d. Interpretations of reality are the product of social construction
Values (objectives)	e. People should want what is good	f. The limits to what is good are set by rules

All in all, the above shows, in our opinion, the value and significance of following these perspectives when quite a complete picture is required of the relations between social science concepts, such as the elements of the governance system identified by us. After this account of the power and significance of the three perspectives used in this paper, we now formulate the assumptions and hypotheses used in this study.

3.4 Assumptions

Main assumption: The influences that the five elements of governance exert on each other will promote the mutual adjustment of these elements in a governance system.

Subsidiary assumption: Changes within a governance system occur because other factors 'from outside' alter characteristic features of one or more of the five elements to a greater or lesser degree, and the other elements adjust themselves to this.

The main assumption rests on three mechanisms. These can be formulated as secondary assumptions and applied in the formulation of the hypotheses with regard to the relations between elements of governance.

Secondary assumption 1: The influences that the five elements of governance exert on each other arise partly from the tendency towards an increase in the mutual consistency of the values that play a role in these elements if there are no disturbances from outside.

Secondary assumption 2: The influences that the five elements of governance exert on each other arise partly from the tendency of the cognition that plays a role in these elements to fit into a common framework for interpretation if there are no disturbances from outside.

Secondary assumption 3: The influences that the five elements of governance exert on each other arise partly from the dependence in each of these elements on resources from the other elements.

The hypotheses that are based on these assumptions are informative and not tautological because, in the first place, it is conceivable that 'disturbances from outside' are so numerous nowadays that the tendencies listed are not recognizable in the empirical data, even when they are in principle not

incorrect. In the second place, the core ideas can also be questioned, for example from a 'post-modern' perspective in which the autonomous tendency towards fragmentation and coexistence of values and cognition is emphasised.

The hypotheses are testable because the mutual relations between the elements, both in comparisons between cases and comparisons in time, can be mapped and can be compared with what is to be expected according to the hypotheses. To this end it is necessary to specify the expected relations between the elements of governance using all three mechanisms at the same time. This will be done in the next two sections, which are followed by a summary table.

3.5 *'Top-down' influences: relations in the stated order of governance elements*

The 'continuation' and 'logical order' relations will not be further elaborated. In fact, naturally comparable perspectives form the basis these relations rather than the relations discussed below, which we now discuss in turn. The arrows indicate that the first named element in this hypothesis has an influence on the second named element.

Level → Problem and ambition

From the value perspective we can expect that the sort of values that characterize a certain level of administration will work through in the perception of the problem and the policy ambition. Many values are not peculiar to a particular administrative level, but the administrative level provides an indication of the level at which equality or balance is sought. From the cognitive perspective (interpretation frameworks) the problem will be perceived at the level from which it is viewed. The problem of waste, for example, looks different at the national level (eg safe processing) than at the local level (eg impact of waste processing plants).

From the perspective of resources the dominant level, as 'owner' of the problem, will tend to conduct the debate about the problem and policy ambition as it affects that level. If there are other levels that have a strong position this may lead to fragmentation of the perception of the problem and policy ambition. In the end, the composition of aspects that play a role in the perception of the problem and policy ambition will be partly determined by the status of the various levels.

Level → Strategies

From the perspective of values, there are not many values linked to the selection of the administrative level, except the values held at the level at which a balance is desired (equality). The choice of strategy will reflect this. From the cognitive perspective, strategies will be developed primarily for dealing with the problem at the level at which the policy is being developed or at least from which there is a clear view of the problem. If governance is divided between a number of levels, policy strategies will be developed at more than one level.

From the resources/dominance perspective there will be a tendency to select policy strategies that do not threaten the distribution of responsibilities for developing policy at the various levels. In the end, we see here, too, that the characteristics of the chosen strategies will to a certain extent reflect the distribution of responsibilities between the various levels.

Level → Resources

This concerns a big leap over the more stepwise relations between these two elements. This means that there may not be much left for a direct influence of one element over the other.

From the values perspective an attempt will be made to create a certain balance, not only in the way the problem is tackled but also in the allocation of resources between the various subareas of the administrative levels.

From the cognitive perspective the allocation of resources will mainly reflect what the problem is perceived to be, but this is an indirect relation via the problem perception.

From the resources perspective, the resources distributed will mainly be those that are available at the level concerned.

Network → Strategies

Here the 'network-instrumentation model' is relevant (Bressers 1993; Bressers & O'Toole 1999; Ligteringen 1999), which deals with aspects of objectives, information/approachability and power/resources.

From the values perspective strategies will be selected that are appropriate to the degree of consistency between the values held by the actors.

From the cognitive perspective it is important whether the government and target groups (representatives) develop an interpretation framework through a process of negotiation or that there are 'difficult to reach' target groups.

From the resources perspective what is important is the question of the extent to which the party conducting policy is dominant or is strongly dependent on the cooperation of other actors.

Network → Resources

From the values perspective and from the cognitive perspective the influence of the composition of the network will probably be transmitted via the problem perception and policy ambitions.

From the resources perspective the distribution of resources is primarily influenced by the network because people tend to help others in their own or allied organizations. This leads to 'who gets what' games, irrespective of the resources needed for certain strategies.

Problem and ambition → Resources

From the values perspective we can expect – irrespective of the objective resource requirements for the chosen instruments, which is, after all, the line of 'logical order' – that resources will be allocated to those objectives related to the problem that are perceived to be the most serious (a form of symbolic allocation). In the world of politics you often see that 'extra money is provided for solving the problem of waiting lists in the health service' without it being clear what that money can be used for.

From the cognitive perspective we can expect something similar, but this time based on the choice of intervention points within the policy field: changeable causes or symptoms of the problem. Here, too, there is no need of a direct relation with the activities for which the resources are needed.

From the resources perspective we can expect the global effect that the more serious the problem and the higher the level of ambition, the total willingness to acquire the resources will increase.

3.6 *'Bottom-up' influences: influences along the feedback flows*

In this section the arrows in the headings represent a tendency for the second named element to adjust to the first named element. In this case, though, the influences discussed are in the reverse order to the one defined in the 'logical order'. For example, the division of resources influences the (further elaboration of) the strategies instead of the selected strategies influencing the (distribution of) resources.

Resources → Strategies

From the values perspective we can expect that the method of implementing policy strategies will be linked to the question of whether sufficient resources have been made available for the intended implementation. If this is not the case and resources have to be removed from other tasks to compensate, then value conflicts will arise, and these will be resolved by not fully implementing the strategy concerned. In effect, this means changing the strategy.

From a cognitive perspective we can expect that the way the strategy and instruments are interpreted will be influenced by the resources that are made available. If these resources appear to push the implementation in a certain direction or influence the effort put into implementing the policy the conception of what the strategies and instruments are will be adapted to meet these effects. Because 'what is believed to be real is real in its consequences' the strategy will actually be changed.

From a resources (and power) perspective we can expect that the resources made available (and other features of the implementation situation) will be taken by those executing the strategy as the starting point when determining how people deal with the strategies and instruments in practice, in many cases in an attempt to retain as much as possible of the original purpose (bottom-up argument).

Resources → Problem and ambition

From a values perspective we can expect that the policy ambitions will be measured partly against the resources made available. If there is a discrepancy, and, as a result, resources have to be taken away from other problems, value conflicts will arise and these will be resolved by not attempting to fulfil the relevant policy ambitions in their entirety. In effect, the policy ambitions will be changed.

From a cognitive perspective we can expect that the way the perception of the problem and the policy ambition are interpreted by those executing the policy will be influenced by the available resources. If these resources appear to

push the implementation in a certain direction or influence the effort put into implementing the policy, the conception of what the primary issue is and what the actual policy ambitions are will be adjusted. Because 'what is believed to be real is real in its consequences' this will in effect mean a change in the emphasis placed on aspects of the problem and the ambition of the policy. From a resources (and power) perspective we can expect that that the resources made available can also strengthen or weaken the importance of the position held by those executing the policy with respect to the perception of the problem and the selection of policy ambitions, and this may influence later choices. What this all means is that the policy ambitions are extended or pruned back to fit the available resources.

Resources → Network

From a values perspective we can expect that frustration or satisfaction with the distribution of resources will influence the motives of the actors in the network.

From the cognitive perspective we can expect that the actors that have received most resources will be seen to be the most important actors in the network, or may even enter the network because they are provided with resources by other actors for the application of the strategies and instruments.

From a resources (and power) perspective we can expect that the actors in the network, under the influence of the distribution of resources, will seek to form coalitions that match this distribution, and may seek to co-operate with actors that possess resources they do not have and vice versa.

Resources → Level

From a values perspective we can expect the administrative level that receives the most resources to (continue to) feel most responsibility for the problem.

From a cognitive perspective we can expect the administrative level receiving the most resources to strengthen its own interpretation of the problem as one belonging primarily to that administrative level.

From a resources perspective we can expect that the administrative level receiving the most resources will, partly as a result of this, retain the strongest position.

Strategies → Problem and policy ambition

From a values perspective we can expect that those aspects of the problem that come over most clearly as an object of intervention in the selected strategy will be considered most important.

From a cognitive perspective we can expect that the presence of a certain strategy will make those aspects of the problem most noticeable that are the clearest objects of intervention.

From a resources perspective we can expect that the selected strategy will strengthen the position of certain parts of the problem in the debate and strengthen the position of certain policy ambitions. All in all, there are signs here of what is referred to in the literature as 'solutions in search of a problem'.

Strategies → Network

From a values perspective we can expect that the strategies and instruments allocate certain responsibilities to actors, as a result of which these actors will redefine their responsibilities and will then set out to achieve other goals (compare the gradual influence of the allocation of water quality tasks on the environmental awareness of the water authorities).

From a cognitive perspective we can expect the features of the chosen strategies to influence the perception of the way individuals in the network deal with one another and of who belongs in the network and who does not. A tough enforcement strategy based on deterrence may lead to a perception that relations within part of the network are more strained. Consensual management strategies may bring about the opposite.

From a resources (and power) perspective we can expect that the importance of the role that actors play in the implementation also more generally influences their relative importance in the network.

Strategies → Level

From a values perspective we can expect that the division of responsibilities between administrative levels associated with a particular strategy influences what people think about who should have these responsibilities, also concerning administrative level.

From a cognitive perspective we can expect that the strategy raises the level of knowledge of the problem and the possible responses mostly in the administrative level that has most to do.

From a resources perspective we can expect that the position of the administrative levels that have a more important role in the selected strategy will be strengthened relative to other levels. All these phenomena appear to be present in the Netherlands because of the rise of the target group approach, which has strengthened the national level (at which most covenants are agreed) with respect to the provincial and local levels (where most of the licences are issued and which carry out most of the enforcement duties).

Problem and policy ambition → Network

From a values perspective we can expect that a multifaceted problem perception may lead to responsibilities being assigned to, and accepted by, more actors than in the case of a one-dimensional problem perception.

From a cognitive perspective we can expect that a problem perception in which many actors are viewed to be involved in the problem can lead to more actors that have the idea that it concerns them than when the problem is regarded as only the business of a special group.

From a resources perspective we can expect that a problem perception and policy ambition that are found to be a positive or a negative factor by certain actors will also assign a special position in the network to these same actors. All in all we can state that simple problem perceptions can lead to a more closed network than more fragmented, multifaceted problem perceptions. Such influences were ascertained in the concluding analysis of the 'white book', in which shifts in the network were related to the challenges put before the network by the incorporation of the environmental issue and the question of government funding.

Problem and policy ambition → Level

From a values perspective we can expect that the way in which the problem is described has implications for the administrative level that ought to feel most responsible for the problem (see footnote 2 by the diagram below).

From a cognitive perspective we can expect a similar effect to occur regarding the question of what is considered to be the most suitable administrative level in the dominant paradigm, given the scale of the problems.

From a resources perspective we can expect that, for a particular problem, a certain paradigm will strengthen or weaken the relative position of administrative levels in relation to the others.

Network → Level

From a values perspective we can expect that the dominant values of the actors in the network (as opposed to their own interests) can be relevant for the distribution of governance over the various levels.

From a cognitive perspective we can expect that the dominant policy vision of the actors in the network can be relevant for the distribution of governance over the various levels.

From a resources perspective we can expect that the dominant actors in the network will also influence the distribution of governance between the administrative levels and that this distribution will be a reflection of the relative position of the dominant actors.

3.7 Summary hypotheses scheme

To conclude this section we present the twenty-five hypotheses, for reasons of overview in one single scheme. The cells are filled with very short descriptions that are more meant to provide aids to memory than as a complete presentation of the expectations.

Influence Of On	Level	Network	Ambition	Strategies	Resources
Level	Perpetuation	Dominance of Strongest actors	Dominant paradigm has level implications ²	Target group covenants are national	Implementation (un)attractive
Network	Logical sequence	Perpetuation	Fragmentation creates openness	Multilateral can lead to corporatism ³	Resource sharing motive for co-operation
Ambition	'Composition' of problems aspects	Logical Sequence	Perpetuation	'Solutions in search for a problem'	Ambitions on the 'Procrustus bed' of resources
Strategies	Mirroring the fragmentation of levels	The 'Network-Instrumentation model' ⁴	Logical sequence	Perpetuation	Making them 'fit for use' (bottom up argument)
Resources	Dominance of strongest level	'Who gets what' games	Symbolical allocation	Logical Sequence	Perpetuation

This hypotheses scheme will be used to analyze the differences between Florida and the Netherlands concerning their governance patterns regarding the protection of groundwater and the production of drinking water. This analysis takes place in the next two sections.

² Compare for instance 'sustainability' and 'residential environmental quality' (leefomgevingskwaliteit).

³ Which means both extra openness for some and closedness for others.

⁴ Cf. Bressers 1998, Bressers & O'Toole 1998, Ligteringen 1999.

4 Multilevel groundwater management in Florida and the Netherlands

4.1 *Introduction*

Having constructed a model of governance made up of five elements, and having made our assumptions explicit, we now use this model to analyze our case and examine the tenability of our assumptions. Our case concerns policies for the protection of the groundwater and drinking water in Florida and the Netherlands. Specifically, we examine protection against pollution of the groundwater by nitrates and pesticides used in agriculture, which can damage the quality of drinking water. This issue can be broken down into a number of components, or subproblems. Here, we identify four subproblems that are linked together, whereby the fourth subproblem precedes the third, the third precedes the second, and the second the first; a chain of interlocking problems. Interventions made earlier in the chain (closer to the source) will act more to prevent the ultimate problem arising. Nevertheless, the core of the whole issue is the final impact that arises at the end of the chain. The first subproblem (the final problem) is that contaminated drinking water can damage the health of the consumer. The second subproblem, which precedes this, is the entry of contaminated groundwater into the drinking water supply system. The third subproblem, which precedes the second, is the contamination of groundwater by a certain form of agricultural land use. And finally, the fourth subproblem, the root cause of all this, is that the type of agricultural production pursued requires certain substances in certain concentrations which become problematic when they leach into the groundwater.

In principle, a policy response can be devised to address each of the four subproblems (whichever country is being considered), and each subproblem can be an intervention point for policy. The further down the problem chain a policy is applied, the more 'effect-oriented' (or 'end-of-pipe') it is called; policy is more 'source-oriented' the earlier in the problem chain it is applied. If a policy is directed at an early stage of the problem chain, at the first two subproblems, it will address agriculture (farmers) as the land user and consumer of pesticides and nitrates. If a policy is applied at a later stage of the problem chain, at the last two subproblems, it will be directed at those involved in the provision of drinking water (those abstracting the groundwater, the water companies and consumers). A dual-purpose policy towards the target groups is therefore conceivable that includes more effect-oriented and more source-oriented interventions.

We will use these four intervention points as a basis for comparison, not only to compare Florida and the Netherlands as states but also the five elements of governance separately for each intervention point. The first intervention point (§ 4.2) revolves around the consumption of drinking water and

protecting the consumer using quality standards. The second intervention point (§ 4.3) revolves around the production and distribution (abstraction) of drinking water, as well as promoting better management of the source and supply of drinking water. The third intervention point (§ 4.4) revolves around the land use (application of pesticides and nitrates in relation to the groundwater), as well as the protection of groundwater against contamination through water quality standards and liability for the type of land use. The fourth intervention point (§ 4.5) revolves around farm management and promoting better agricultural management, as well as the production and distribution of pesticides and nitrates.

The information required for this comparison was obtained as follows. Information for the Netherlands was collected during the course of two international comparative water management studies. The first of these was called 'Networks for Water Policy' and was funded partly by a subsidy from the American Council for European Studies. The study was concluded in 1994 with the publication of a special issue of the journal *Environmental Politics* (Bressers, O'Toole & Richardson 1994). The second study, 'Water Supply Authorities Preventing Agricultural Water Pollution', was funded by the EU's Fourth Framework Programme and resulted in the publication of a book (Schrama 1998). The material used in this study is drawn from these publications (Bressers, Huitema & Kuks 1994; Kuks 1998a, 1998b).

For Florida, the information was obtained from 80 interviews with the relevant people in Florida conducted by one of the authors during the autumn of 1995 while he was a guest researcher at the University of Florida in Gainesville. Additional information was obtained from reports by other researchers, government documents, documents produced by other organizations and further information obtained from the Internet.

Despite the considerable similarity between Florida and the Netherlands in relevant policy areas such as the hydrology and the importance of agriculture, including the risks this has for the groundwater, etc., there are also various differences between the two areas. Within the scope of this paper we focus primarily on the differences to be found in the multilevel nature of the pattern of governance in each of the three subsectors. As we have shown in section 3, we assume that the elements of the pattern of governance are not independent of each other. This means that many of the differences between the two areas in this regard will also be connected. If all the differences could be explained entirely by differences in the other elements of governance, or were a consequence of other differences, then it would not matter which difference we took as the starting point of the analysis. However, we do not wish to go that far.

For each topic we begin by analyzing the extent to which there is a difference in the distribution of governance between the various scale-levels. Taking this difference as our starting point we will examine which differences in other elements of governance are related to this and then which other elements of governance may further the differences in governance between levels.

4.2 *Quality standards for drinking water and the treatment of groundwater*

Scale-levels

Regarding quality standards for drinking water and the treatment of groundwater the distribution of governance over different administrative levels is in many respects the same in both areas. Both the American federal government and the European Union impose minimum standards for the quality of drinking water. These standards are comparable and global experts, particularly from the World Health Organization, have played an important role in developing them. In the 'translation' of these standards to the level of the (member) state (Florida and the Netherlands) there have been no great differences either. In both states, the standards are applied to the drinking water companies. There appears to be a uniformity of approach, but this is deceptive. There is a small difference, but with significant consequences.

There are quite big differences in the way the water companies themselves operate, which has important consequences for the pattern of governance. In the Netherlands all the water supply companies have sufficient public support for using a variety of sources of water and, eventually, for making use of advanced water purification techniques so that meeting the drinking water quality standards is not in danger – at least not in the short term, and as long as people are prepared to pay considerably more for their water. In Florida a distinction has to be made between the urban and the rural areas. The urban areas are served by large water companies, but in the rural areas most drinking water is supplied by very small companies, or is even entirely decentralized and in the hands of (small groups of) end users; in contrast, the largest water companies in the Netherlands are found in the rural areas. Because of the decentralized production of drinking water in the Florida countryside it is often impossible to meet stricter quality standards by mixing water from different sources or turning to alternative sources. As a result the quality standards are by no means always met.

Consequences

The consequences of this are not to be found in the first instance in the element of the *actors in the network*. We have already seen that within the relevant network it is the key actors, even the global WHO, who play a dominant role.

But there are recognizable clear consequences for the *perception of the problem and policy ambition*. Because in Florida meeting the quality standards cannot be guaranteed in all cases, the public debate has stressed the health risks to consumers. It is also seen as a live issue, not a future threat. This has been boosted by incentives from outside the governance system in the form of incidents of contaminated drinking water which have attracted much media attention. In contrast, in the Netherlands there is hardly any such concern. The water supply companies do make use of predictions that a number of wells will become unsuitable for use if pollution of the groundwater continues unchanged to make a case for a preventive approach to dealing with groundwater contamination (Bressers, Kuks & Huitema 1994: 34). They have been successful in getting this problem on the political agenda as one of sustainability rather than public health. This other perception of the problem has also led to different ambitions regarding the objectives of policy,

which in the Dutch case is no longer targeted at the consumers of groundwater but at the polluters.

Of course this has also had consequences for the *strategies followed and the instruments used*. In the Netherlands this has led to great emphasis being placed on preventive measures geared to restricting any further contamination of the groundwater. Indirectly, there have also been consequences for the network because their initiative has, in a number of cases, given the water companies a role in the implementation of this preventive policy. Given that this preventive policy in fact belongs to the next two subjects to be treated in this section, these issues are not discussed further here. In Florida, however, part of the strategy pursued has been to fit additional filters at the wells that do not meet the quality standards, particularly where pesticides are the main cause of the contamination.

Regarding *the responsibilities and resources for implementation* it can be stated that, based on the information on the quality of the individual sources supplied by the counties, the engineering department of Florida state itself visits the water supplier to fit the required equipment. The financial and information costs of this strategy are very high, and a high level of resources are needed. There is, in fact, insufficient money and time for a systematic monitoring of the quality of the decentrally produced drinking water. This phenomenon is not unique to Florida, and has prompted the federal government to establish a subsidy programme to encourage improvements in the quality of the small-scale drinking water supplies. Although this involves no formal shift in competence between administrative levels, it nevertheless indicates a gradually more active attitude at the federal level.

And this brings us back again to the beginning of the governance model. We now look at the difference in levels we remarked on at the start from the other side: where does this difference come from? And why have large water companies become established in the rural areas in the Netherlands and not in Florida?

Background

We begin our brief review of the background to this in both states with an aspect that lies outside the governance model: the geographical and demographic circumstances. Although Florida is a relatively densely populated state by American standards, the Florida countryside is considerably more sparsely populated than areas considered to be rural in the Netherlands. This is further heightened by the fact that a large part of the Florida population lives in the big cities of Miami, Tampa/St. Petersburg and Jacksonville. As a result, it is much commoner for small communities and some individual farms to be so far from a water mains that connection to a mains water supply would be prohibitively expensive.

In addition to this factor we return again to the *actors in the network*. Since 1975 the Dutch provinces have played an active role in bringing about a series of water company mergers (Bressers, Kuks & Huitema 1994: 30-31). One of the reasons behind this was the belief that bigger companies would be better able to guarantee a high standard of drinking water than the many small companies there were previously. The provinces derived their authority to stimulate such mergers partly from private law, as shareholders in the

companies. The provinces were also able to influence the water companies in which municipalities held shares through their supervisory role over the municipalities. However, the role of the provinces was mainly one of taking the initiative and leading the way in meetings between the parties involved. If a government authority were to assume such a supervisory role over a business sector in Florida it would probably not be so readily accepted.

In addition to the generally much lower level of tolerance towards government authority in the United States than in Europe, and certainly in the Netherlands, perhaps the element of the *perception of the problem* also plays a role. More so than in the Netherlands, many people living in the rural areas of Florida believe that groundwater, by definition, is 'purer' than water that has been subjected to all sorts of industrial treatment. This is best illustrated by the positive image many people have in the Netherlands of 'spring water' or 'mineral water', while 'groundwater' is more readily associated with all sorts of risky soil pollution, making thorough control of the quality of the water by experts and water companies a highly desirable thing. The image that many people in Florida have of groundwater as 'mineral water' means there is little public tolerance of intervention by public authorities.

4.3 *Preventing contaminated groundwater being used in the drinking water supply*

Scale-levels

For this topic the federal/EU level hardly plays a role in either state. In both states there is a system whereby water abstraction areas are defined in relation to the supply of drinking water. In the Netherlands this task is carried out by the provinces, and these water abstraction areas must be reflected in municipal land use plans. In Florida the five Water Management Districts (WMDs) are responsible for designating areas together with the counties, which visit the small producers and advise the WMDs. All in all, there appears to be no significant difference between Florida and the Netherlands regarding the division of responsibilities between the various administrative levels. In both cases the lower level has quite an important but secondary task, and the emphasis lies with the intermediate level between the state and the local community. The consequences of identifying areas, though, are different in the two states: in the Netherlands this leads to additional restrictions designed to protect the quality of the groundwater; in Florida this leads to extra restrictions on the use of groundwater.

Actually, we could end the discussion of this subtopic now because we have already concluded that there is no difference in the distribution of multilevel governance between the various administrative levels. But although there may be no 'objective' difference, there *is* a 'subjective' difference, and that makes it interesting to dwell a little longer on this topic. In the Netherlands it is considered quite normal to draw up physical plans and designate special areas at the national level, in outline at least, and then to specify these further at the provincial level and finally fill them in in detail at the local level. The distribution of multilevel governance regarding the designation of groundwater protection areas fits into this picture and so does not invite further debate. In Florida the more or less equal division of responsibilities between the various

administrative levels, however, is seen as a step towards more centralized control. Here, the basic approach is not top-down, but bottom-up. In principle, all responsibilities lie at the local level and interference by higher administrative levels is soon considered inappropriate. The consequences of there not being a difference in the allocation of responsibilities between administrative levels cannot, of course, be investigated; but it may be interesting to examine how, despite the difference principles at work in Florida, it has been possible to arrive at such an equal division of responsibilities.

Background

Looked at from the position of the *actors in the network* what stands out is that there is no question local administrators closing ranks against the increasing influence of the state and the WMDs. Local administrators and local water suppliers in the countryside may not be happy, but the urban administrations and the large drinking water companies are much less dismissive of the situation.

The background to this lies in the *perception of the problem* at hand, particularly the interplay between the quality and quantity aspects. The enormous growth of the cities, which all happen to lie on the coast, makes the principle that every local community takes care of meeting its own water needs untenable. Abstracting groundwater to supply drinking water to the big cities like Miami and Tampa would quickly lead to falling water tables and result in the penetration of salt water from the sea into the subsoil. To prevent salination of the groundwater it is important to be able to import water from inland areas to supply the cities. This requires coordination at a level higher than the local administrations (i.e. coordination at state level) and an approach based on hydraulic engineering principles (ie implementation by the five big Water Management Districts). This is in the interests of both the big cities and the continuity of the larger urban water companies.

4.4 *Emissions to the groundwater and restrictions placed on agricultural activities*

Scale-levels

In this discussion we restrict ourselves initially to contamination by nitrates. At the state level, both Florida and the Netherlands have quality standards for groundwater. However, there is an important difference. In the Netherlands the nitrate standards are imposed by the European Union and can be enforced by the EU. The Netherlands is obliged to implement these standards and to check whether they are being adhered to. In Florida the drinking water quality standards have been adopted voluntarily as standards for nitrate in groundwater. The federal government of the USA does nothing in this respect, but is not so silent when it comes to contamination by pesticides.

Consequences

Regarding the *actors in the network*, this has repercussions for the relations between actors who represent the interests of the environment and those who represent the interests of farmers. In the national debate the environmental

movement and other actors who defend environmental interests in the Netherlands can always fall back on externally fixed standards, and so those opposing firm measures are forced to make a strong case that more lenient measures can also achieve the stated goal. It proved almost impossible for them to depart from the goal itself once European standards had been introduced, something they had succeed in doing for some time. In Florida representatives from the farming community were not bound by such limitations because the standards were set at their 'own' state level and so could be relaxed.

This brings us to the area of *problem perception and policy ambition*. Because there is little influence from environmental groups, certainly regarding nitrates in groundwater, occasional excessive use of fertilizers in Florida is not seen primarily as a problem of pollution by farmers but rather as a question of sensible business management (or not). As a consequence, restrictions on emissions do not readily spring to mind when setting policy objectives. In terms of strategy and instruments this has not resulted in the imposition of emission standards on farmers in Florida; instead, Florida has a somewhat curious instrument called the 'curative liability'. This means that if it can be proven that the levels of nitrate in the groundwater are too high as a result of the activities of one or more individual farmers, these farmers can be held liable for the damage. However, it is incredibly difficult, and in many cases impossible, to trace such cause-effect relationships back to individual farmers.

In effect, this instrument requires such a high level of *resources to implement* (information and/or money) that in most cases it is impossible to apply to cases of nitrate pollution in the groundwater. In practice, therefore, it is a very weak instrument for changing farming practices, and is a mere formality.

Background

If we look into the background of the passive role adopted by American federal administrative level regarding the emission of nitrates we quickly come to the different development stages and meta-policy (transcending the atmosphere surrounding groundwater protection and other policy areas) of the USA and the EU during the 1980s. While in America the Reaganite New Federalism set out to push back the boundaries of government, particularly at the federal level, similar developments took place in Europe mainly at the level of the nation state. At the EU level there was, in contrast, an expansive European Commission at work under the strong leadership of Jacques Delors, who was quite successful in encouraging further integration within the European Union. Despite similarities of content, the principle of subsidiarity must not be seen as a counterpart to New Federalism. The principle of subsidiarity is more of a (soft) brake on the integration process and was introduced from the bottom up by the member states rather than being expression of firm resolve for decentralization by the 'federal' level itself. At the EU level there is still a powerful majority in the European Parliament, the European civil service and the Commission for further integration.

Regarding the element of the *network of actors* we can observe that the environmental movement in most American states is in a structurally weaker position than in the Netherlands, particularly when issues other than

nature and human health are at stake. The absence of a federal standard for nitrate concentrations in the groundwater reinforces this inequality in this specific case, but is also a reflection of this inequality.

A similar situation can also be observed regarding the *perception of the problem and the policy ambition*. Placing restrictions on the use of private property is a much more sensitive issue in the United States than in the Netherlands. In the USA private property is not just an economic concept that reflects certain benefits and disadvantages; it also has an ideological side to it. Another aspect that has an effect on the perception of the problem within the governance system is the fact that overfertilization with nitrate in the Netherlands is a consequence of the need to get rid of waste (manure). In the United States, at least in Florida, it is the consequence of the overabundant supply of nutrients to plants. This is much less readily regarded as an act of pollution than dumping manure on the land, which, quite apart from the objective environmental consequences, 'reeks' more of pollution in the minds of the general public.

5 A dominant multilevel difference between Florida and the Netherlands

5.1 Introduction

If we survey the large number of differences between Florida and the Netherlands in the policy arenas we have investigated, the question that arises is whether there is a dominant difference that makes the governance structures of the two states substantially different, and that binds together a number of observed differences. The main assumption that we formulated in part 3 of this paper is that there will be mutual adjustment between the five elements of governance and that this mutual adjustment can be traced back to an orderly number of internal mechanisms in the governance system. Changes in a governance system take place when external factors intervene in one of the five elements of the system and the other elements adjust to the resulting changes. The analysis of the case study in this paper focuses primarily on the first element of governance, the multilevel aspect of the governance system. The question we put to ourselves here, therefore, is whether there is a multilevel aspect that makes the governance structure in both states substantially different.

5.2 Regulation of land use: bottom-up or top-down?

Looking at the policy arena addressed by our research, what stands out is that in the USA the protection of groundwater against agricultural pollution is seen primarily as a responsibility of the lower levels of administration. In this respect, great importance is attached to the autonomy of the states and local authorities (Rosenbaum 1995; Cahn 1995). Measures to protect the groundwater often relate directly to the nature of the land use and because 'land use decision making' is seen to be the exclusive domain of the lower levels of government, the federal government at least is reluctant to take any direct action. It is extremely rare for the federal government to directly prohibit the use of a particular piece of land for a particular purpose; such interference is politically unacceptable to many people (Portney 1992).

This reluctance at the federal level may be explained partly by the philosophy of New Federalism that brought about a decentralization of government tasks under the Reagan administration during the 1980s. In many other countries, it was during the 1980s that national legislation for soil and groundwater protection was introduced (a policy field that was given a basis in law somewhat later than many other environmental sectors), while in the USA the New Federalism was able to hold off similar developments. This reluctance to legislate for groundwater protection can even be found in the legislation of the state government of Florida. This reluctance may be explained by a lack of state authority to control land use, a topic we return to later.

There is no such reluctance in the field of drinking water quality and protection of surface water, but regulations in these areas have far fewer direct consequences for the ownership rights of individual citizens. At the federal level the Safe Drinking Water Act, which dates from 1974, lays down the basis for setting drinking water quality standards. The Clean Water Act, passed in 1977 (and which began as an amendment to the Federal Water Pollution Control Act of 1972) sets a number of quality standards on discharges to surface waters. Florida has a longer tradition of legislation to protect water quality.⁵

Although the state of Florida has always amended its own water legislation to keep it in line with federal legislation, the state has not just taken a wait-and-see attitude but has acted early on its own responsibilities. In an attempt to classify the American states according to their degree of state institutional capacity to absorb decentralized programmes and the degree of state dependence on federal grants designed to support environmental programmes, Davis & Lester grouped the states into four categories. In this classification Florida belongs in the group of states which 'have developed strong institutional capabilities and are not heavily dependent upon federal aid for implementing state environmental programs. In this instance, states rely on their own fiscal resources, political institutions and state policy formulation in the environmental area. They have established themselves as leaders in the environmental sphere and have often enacted environmental standards that exceed national standards (Davis & Lester 1989).

If we compare the picture at the federal level of government in the USA with that of the European Union, one clear difference is that the EU (and its forerunner, the EEC) has issued directives on water policy that the member states are compelled to implement in their own national legislation within a certain period of time. Here too, these directives are directed primarily at maintaining the quality of drinking water and of surface waters in the Union. In general, these directives are of two basic types. Either they concern water use and are designed to protect the quality of water intended for particular uses; or they concern water pollutants, and are designed to control the emissions of particular pollutants to water (Brand, Hanf & Lipman 1998).

The EU took a clearly different path from the USA in 1991 when the Nitrate Directive was issued. The purpose of this directive is to reduce water pollution by 'the application and storage of inorganic fertilizers and manure on farmland'. It is aimed at both safeguarding drinking water supplies and preventing wider ecological damage in the form of eutrophication of freshwater and marine waters in general (Haigh 1992). With this directive the EU has not only taken on the regulation of the use of farmland at the supranational level, but adds the argument that such regulation, besides safeguarding the quality of drinking water, also serves wider ecological interests. This is a controversial directive in the Netherlands, as we noted in

⁵ In 1916 a Pollution of Waters Act was passed in which the state set out its own responsibility for public health, and in consequence for the quality of the drinking water supply and the discharge of sewage and effluents. In 1967 this was followed by the Florida Air and Water Pollution Control Act. This was supplemented in 1972 by the Florida Water Resources Act and in 1977 by the Florida Safe Drinking Water Act.

the previous part of this paper, because the Netherlands has not succeeded in fully meeting the implementation requirements of this directive (Kuks 1998).

If we compare the Netherlands as a member of the EU with the position of Florida described above, we see a clear similarity in that the Netherlands has not waited for European initiatives, but has developed its own legislation on water quality at an early stage. We can state that the Netherlands, like Florida, has adopted a proactive stance over the years.⁶

But here, too, a substantial difference between the two states arose in 1987, when the Soil Protection Act came into force in the Netherlands. This act regulates the quality of the groundwater, not only to protect water resources used for the supply of drinking water, but also to secure wider ecological protection. Moreover, this act allows restrictions to be placed on the use of farmland in the form of a set of fertilization standards. The intention is to implement the EU Nitrate Directive at the national level through these fertilization standards. And this is the fundamental difference with the situation in Florida, where both the federal and state authorities have no possibilities for regulating the use of farmland in order to protect groundwater quality.

In the USA, government decisions that affect farming practices, like land use decisions, are by definition sensitive. The Floridian legislation contains principles that grant a certain freedom to adopt agricultural practices as long as these do not lead to contamination of the 'common waters' beyond the permitted standards. The state can only intervene when agricultural pollution of the 'common waters' is found to have taken place. Even then individual farmers can only be held liable if this pollution can be traced back to them. Although there is no 'right to pollute', farmers may not be hindered in the running of their farms. As long as farmers adhere to 'best management practices' and follow the instructions on the pesticide packaging they are indemnified against liability for any damage. The Florida Right-To-Farm Act (823.14, Florida Statutes) restricts nuisance suits against farmers by providing that no farm, which was not a nuisance when it was established, will constitute a public or private nuisance after one year of operation. Change of ownership does not affect the provisions of the act. However, the act does not extend protection to unsanitary conditions and health hazards or changes of use, either in type or intensity (Olexa & Carricker 1992).

Our conclusion now is that there is a dominant difference between Florida and the Netherlands regarding the possibilities for regulating the use of farmland and farming practices from a centralized level with a view to protecting groundwater quality. Using a number of observations, we now examine to what extent we can find evidence to support this conclusion. In doing this we delve somewhat deeper into some of the issues touched upon in part 4.

⁶ Since 1957 drinking water quality in the Netherlands has been regulated by the Water Supply Act; since 1970 the quality of surface waters and discharges to surface waters has been regulated by the Surface Water Pollution Act; and since 1954 the abstraction of groundwater has been regulated by the Groundwater Act (which was amended and extended in 1984 and is comparable with the 'consumptive use permitting' under the Florida Water Resources Act 1972).

5.3 *Tendency towards specific versus generic legislation*

The main feature of the groundwater protection policy introduced in the Netherlands is that in 1987 generic national legislation was introduced that prescribes the amount of nitrate that may be applied to agricultural land. In 1989 these were supplemented by regional generic standards (by the provinces) that apply to groundwater protection areas. These standards define the maximum amount of manure that may be spread onto agricultural land, depending on the type of farmland in question. The standards are expressed in kilograms of phosphate per hectare per year, and different standards apply to three types of land: arable land for maize cultivation, grassland, and other arable land. Initially the standards covered only phosphate, but in the 1990s nitrogen standards were also introduced. A characteristic feature of the Dutch policy, therefore, is the choice of a generic regulation with limited differentiation according to geographic and hydrological conditions; this is seen to be a way of treating farmers equally in law.

This policy takes account of three different environmental problems that stem from the same source. The three problems are: the emission of ammonia from manure spread on the land, which contributes to acidification of the environment; leaching of phosphates from manure spread on the land into ditches, which results in the eutrophication of surface waters; and leaching of nitrogen from manure into the groundwater, which leads eventually to nitrate levels in excess of the quality standard. Nitrate standards for drinking water form part of the argument for setting these manure standards. In the Netherlands, therefore, the standard for nitrate in drinking water does not only apply to the suppliers of drinking water, but also forms the basis for a set of generic standards that place restrictions on agricultural practices (Kuks 1992, 1998).

A characteristic of the groundwater protection policy in Florida is that it sets no such generic standards. It is true that Florida state has, on its own initiative and without pressure from the federal government, translated the nitrate standard for drinking water into an equally stringent nitrate standard for groundwater covering the whole state. This is comparable with the EU directive covering nitrate in groundwater, which is applicable to the whole of the territory of the Netherlands (and the shallow groundwater zones). But the scope of this standard goes no further than a generic environmental quality standard, with no direct consequences for individual farms.

It may appear from this that the state of Florida has chosen a much more generic policy than the Netherlands, but the Floridian standard can only be made operational by legally demonstrating that emissions from an individual farm are responsible for excessive levels of nitrate in the groundwater. Proving a direct link is very difficult, though, because it is almost impossible to demonstrate that certain concentrations of nitrate in groundwater are due to leaching from specific sources. But a more fundamental feature of the policy is that the standard implicitly differentiates between specific conditions on each individual farm. Nitrate from any one farm only becomes a problem after the local soil and hydrological conditions

have done their work. This is not the only example of a regulation in which specific conditions are expressly taken into account; it illustrates a much wider tendency within Floridian governance in the field of groundwater protection. We now add three observations to this argument.

The first observation concerns the way monitoring data on groundwater quality are used. An evaluation of the Ground Water Quality Monitoring Program (DeHaan 1995), which has been running since 1983, found that 'Since the publication in 1992 of the report on data collected between 1984 and 1988, there has not been a written analysis of data collected since that time. The program currently does not have solid strategies for developing a summary report on each monitoring cycle that would aid, especially the non-technical users in making decisions.' It has not been possible, therefore, to draw any policy-relevant conclusions from the data collected. 'The 1984–1988 sampling cycle indicated the findings of 18,861 instances where contaminant levels exceeded water quality standards. Although this figure represents only 2.5 per cent of incidents documented (thus indicating a 'good' background water quality), the program does not have the strategies to trace these detections to their sources or track their movement and fate.' This means that only the bare facts have been registered, without drawing any conclusions from these about the source or the effects of the detected contamination. When considering the level funding, the authority that commissioned the programme was not aware of the results that could be achieved with the money that was made available.⁷

Licensing authorities do not make use of the data generated by the monitoring programme because the data do not make a sufficient link to the source of the pollution and because the monitoring programme focuses primarily on the deep groundwater.⁸ The author of the report concludes that 'data will have to be extremely site-specific and source specific to be of any use to regulatory (permitting) or policy decisions by local, regional or state agencies' because it would be too easy to mount a legal challenge to a land use decision.

According to the report there appear to be two cases in which groundwater monitoring data have had consequences for the policy pursued. 'The GWIS [the database containing all the monitoring data] has contributed to the identification of regional ground water contamination in two areas of the state (Polk County and Suwannee River Basin) for contamination with bromacil and nitrates, respectively. These findings have been useful in

⁷ 'The 1995 audit [of the program] reported that the Department's evaluation of program achievement does not provide any assessment of the effectiveness of the ground water quality monitoring program activities. Consequently, neither the Department nor the Legislature is able to evaluate program accomplishments in relation to the budget request as intended.'

⁸ 'In interviewing districts Water Facility Administrators and their staff about the utility of this program to their daily activities, none of them could recall a case where program data were used to augment their permit evaluation needs. [...] Those who were familiar with the ground water monitor networks, cited the fact that the majority of network wells were deep Floridian wells that did not reflect impacts of permitted facilities on shallow or surficial aquifers water quality. Another reason mentioned for the limited utility of monitoring network data, is one of scale. The fact that the network is designed to obtain an idea of the regional impact of land use was described as being of "little use" to the permit writers.'

generating regulation by DACS (agriculture department) prohibiting bromacil use in certain highly permeable soil types. The nitrate findings have resulted in closer coordination between DEP (environment department), DACS and the Suwannee River Water Management District in developing agricultural and dairy Best Management Practices (BMP's). The monitoring report, however, puts the value of monitoring data in these types of case into perspective by quoting one frustrated interviewee who complained that '... all that resulted from these cases was recommendations for BMPs which must once again be site-specific. Did we need to spend millions of dollars to tell us that agriculture generate nitrates and pesticides that demand better management practices that must be site-specific to be effective?'

A second observation that is illustrative of the tendency in Florida to take more account of specific circumstances in its pesticides policy than the Netherlands concerns the policy on pesticides. We should first note that the way in which pesticides are approved for use (on the market) in Florida and the Netherlands is roughly the same.

However, in the Netherlands an additional policy was introduced in the Multi-year Crop Protection Plan in the form of a voluntary agreement, or 'covenant', with the agricultural sector. The settlement aims at a decrease in the structural dependence on pesticides for crop protection and at a general reduction in the use of pesticides. Besides these generic goals, the plan contains more specific objectives for the year 2015. First, the overall use of pesticides has to be reduced by 50% by 2000 (compared with the amount used in 1987). Second, harmful pesticides must be removed from use altogether. Indicators for the predicate 'harmful' are 'underground mobility', 'persistence' (degradability) and toxicity (how harmful they are in an aquatic system). In fact, pesticides that have the potential to leach into the groundwater must be reviewed for re-registration. It has been left to the sector itself to determine how to reach these goals (Kuks 1998).

In Florida such a generic approach geared to banning pesticides or achieving a general reduction in the use of pesticides does not seem to be feasible. In an interview, the senior civil servant responsible for the pesticides policy from the agriculture department (DACS) in Florida gave the following answer: 'We shy away from a percentage in reduction. The numbers don't say something about a reduction in risk. With the variety in commodities you have a big variety in crops. It is more important to work on several risk reductions. There are a lot of variables that we can't control, and that is influencing the effects. There is never one overall BMP.' In short, it is seen as an achievement that the pesticides regulations make distinctions according to the crop and type of application. Instead of generic pesticides reduction goals a holistic approach has been chosen in the form of 'integrated pest management' geared to 'safer use', but not a 'ban on pesticides'.

A third observation that is illustrative of the tendency in Florida to take more account of specific circumstances than in the Netherlands is the decision to regulate nitrates in covenants with the agricultural sector which define 'best management practices' (BMPs).

These covenants are made with the target groups and signed by the departments involved (DACS for agriculture, DEP for environment, DHRS for

public health), the relevant 'commodities' (organizations represent specific agricultural sectors) and the Florida Farm Bureau as general representative of the agricultural sector. The basis for these covenants is the Nitrate Bill, introduced in 1993 (adding Chapter 576 to the Florida Fertilizer Law). When individual farms sign a BMP covenant they agree to comply with best management practices in exchange for exemption from liability for any groundwater pollution originating from their farm. In effect, the farmers receive a 'waiver of liability' in return for a commitment that does not place any firm restrictions on farming practices, but is intended to bring about the most effective use of nitrates and pesticides by the farmer as possible. Detailed specifications for achieving this are drawn up first in the form of separate documents for each farm type. Within each BMP there are further opportunities to elaborate on these to suit individual farms and specific soil conditions.

We should mention here that an attempt was also made in the Netherlands to prevent any further tightening up of the nutrient standards, which were actually needed in order to meet the requirements of the EU Nitrate Directive. A system of nutrient accounting was introduced in which farms attempt to reduce the application of nutrients through more efficient farming practices, but the EU considered that this system relied too much on intent rather than results, and consequently found it to be inadequate (Kuks 1998).

5.4 The political position of the environment department

Our original proposition was that there is a dominant difference between Florida and the Netherlands regarding the possibilities for centrally regulating agricultural use of the land and farming practices with a view to protecting groundwater quality. Using observations we have tried to substantiate the argument that in Florida there is a greater tendency to draw up regulations for specific conditions than establish generic measures. The assumption here is that centralized regulation goes hand in hand with generic measures. In this section we expand on our original proposition in a different direction. We will try to show that environment departments in Florida and the Netherlands have different political positions and consequently differ in their ability to control events.

In the Netherlands the environment and agriculture ministries have for a long time essentially operated independently of each other. The environment ministry tried to get the manure problem onto the political agenda in the 1970s but it only succeeded in 1984. Until then the agricultural sector had worked closely with the agriculture ministry and farmers representatives in key political positions in an 'iron triangle', and could simply ignore the problem. Actually, the Dutch agriculture ministry had recognized the problem much earlier and had attempted to prepare draft legislation with cooperation from its own natural constituency, while expressly keeping the environment ministry out of the discussions.

Meanwhile, the environment ministry was preparing its own manure legislation as part of new integral soil protection act. When both ministries put forward

their own draft legislation, political pressure was put on them to work together. In 1982 a new environment minister was appointed who was a strong political figure. He gave his ministry considerable political clout, and from that time on the environmental issue was tackled more as a management issue and the environment ministry developed a more cooperative attitude towards the target groups in society. Partly because of this, the two ministries were able to reach a compromise in 1984 in which they agreed to continue both legislative processes but link them together.

From that moment the environment ministry developed the Soil Protection Act, which formed the basis for the standards for the application of manure on agricultural land in order to protect the soil and indirectly the air, surface waters, the groundwater and ultimately drinking water. The agriculture ministry developed the Manure Act, which was primarily geared to dealing with the surplus manure that would result from these application standards. The act also contained preventive measures based on innovative agricultural practices designed to reduce the amount of manure produced. Both laws were passed in 1987 and from that moment the level of cooperation between the two ministries has grown. Both ministries have created departments to give further shape to the cooperation between environment and agriculture through a series of detailed discussions.

We can state, therefore, that from 1984 the environment ministry (VROM) has gained and held a position from which it can exert increasing influence over environmental legislation aimed at the agricultural sector. We see also that since then agriculture has come under increasing pressure from the environmental legislation. In 1995 this resulted in both the agriculture and environment ministries forcing the livestock farming sector to reduce the volume of manure it produces (Bressers & Kuks 1992; Kuks 1998).

It is a remarkable resemblance with the Netherlands that during the same period in Florida also some sort of co-operation has grown between the environmental department (DER, after 1993 called DEP) and the agricultural department (DACs). Like in the Netherlands, this co-operation in Florida is having its origins in an authority conflict, in the first instance not regarding the regulation of nitrates but regarding the regulation of pesticides. In 1982 officials discovered that drinking water wells had been contaminated by the commonly used pesticide Temik. These discoveries led the state's Commissioner of Agriculture to ban use of the pesticide temporarily. In the summer of 1983 still more drinking water wells were discovered to be contaminated, this time by a pesticide called EDB (ethylene dibromide), a substance in common and extensive use for at least twenty years, even by the Florida Department of Agriculture and Consumer Services itself, as a nematocide on buffer areas surrounding commercial citrus groves. Again, the Commissioner of Agriculture was stirred to action and banned use of the chemical. The Florida legislature addressed many of these problems in the Water Quality Assurance Act of 1983. The act was conceived to assure to the greatest extent possible the future protection of the quality of Florida's water resources.

The Water Quality Assurance Act gave the environmental department almost \$120 million, principally for the creation of new programs to help

preserve the quality of the state's waters. It created within the department more than 100 new positions and the need to promulgate scores of new rules to interpret new statutory language (Fernald and Patton 1985). The Water Quality Assurance Act gave the Department of Agriculture and Consumer Services (DACS) primarily authority for review and regulation of pesticides with DEP relegated to a review-and-comment role. DACS became the state leading agency for pesticides regulation⁹ and a Bureau for Pesticides was established at DACS. Also a nine-member Pesticide Review Council was created within DACS and charged with reviewing data on restricted-use pesticides that are presently registered in the state, and reviewing all applications for registration of restricted-use pesticides. Procedures were established for requiring field testing of restricted use pesticides in Florida under criteria developed by the state. The final determination of whether a restricted-use pesticide should be registered for use in Florida lies with DACS (Olexa and Carricker 1992).

In the meantime, DEP reacted to the highly visible issue of pesticides discoveries in groundwater by creating a 'pesticides section'. At that time questions were asked, by both DACS and the industry, as to DEP's jurisdiction on pesticides and agrochemicals in general. DEP countered these arguments at the time by saying that they (not DACS) were responsible for water quality deterioration by contaminants, to which DACS responded by the statement that pesticides and fertilizers were beneficial products, not contaminants, and that contamination results only from misuse for which they were solely responsible. DACS felt that DEP's need for involvement in agricultural issues could be satisfied by their membership on the Pesticides Review Council (PRC) (DeHan 1995). In 1985 this provoked both departments to sign a Memorandum of Mutual Understanding on how to deal commonly with pesticides issues, making it possible for DACS to use DEP's authority (DEP is collecting data, the regulatory part is turned over to DACS). In 1986 new discoveries of EDB and Aldicarb in groundwater got also the health department (DHRS) involved in the pesticides registration process and the Pesticide Review Council.

The same sort of process was happening after discoveries of unacceptable levels of nitrates in groundwater in the late eighties (around 1989). DEP wanted to start with the creation of a database on nitrate contaminations in an effort to prepare regulations to minimize the impact of nitrates on drinking water quality. DEP could make use of its authority to delineate areas with groundwater contamination where consumptive water use would be subjected to permitting by the five regional water management districts (WMDs). DACS on the other hand, fearing too much control over the nitrates issue by DEP, wanted to put forward its own authority on basis of the already existing Fertilizer's Act. However this act wasn't providing yet a basis for regulation of nitrates. In 1992 an Ag Water Policy Group was created within DACS to handle nitrates issues and to establish a focal point for cooperation with DEP and the WMDs. Although DEP remained statutorily responsible for exercising oversight over the WMDs, DACS got unofficially involved in the control over the WMDs from this moment on. A high official of

⁹ Like DEP had already been entitled to be the state leading agency for drinking water regulation since 1977 with the Florida health department (DHRS) relegated to a review-and-comment role

DEP, responsible for dealing with the WMDs, even moved to the office of the Commissioner of Agriculture to continue the same kind of work in another department.

In 1993 the Nitrate Bill was passed, added as a new chapter to the Fertilizer's Act, in which the Florida legislature placed the statutory responsibility for fertilizer regulation, like the responsibility for pesticides regulation, in the hands of DACS. So, DACS also became the state leading agency for that. The Nitrate Bill made it possible for farmers to agree on so-called Best Management Practices (BMPs) for their farm in order to get a waiver of liability for unacceptable levels of nitrate emissions (coming from their farming practices) to groundwater. The Nitrate Bill also established more involvement for the WMDs, by creating a participatory role for them in the Pesticides Review Council. In 1994 the Office of Water Policy was established at DACS close to the Commissioner, to have a more formal basis for overseeing the role WMDs are playing on agricultural issues. And also in 1994 the rivalry between DEP and DACS on nitrates issues ended up in another Memorandum of Mutual Understanding on how to deal with nitrate BMPs. Both departments agreed on implementation of the Nitrate Bill through voluntary based agreements with farmers (prepared through negotiations with farmer commodity groups and developed on the basis of research), allowing farmers to choose between a liability for groundwater emissions (leaving the burden of proof to DEP) or a waiver of liability together with BMPs. DEP is offering the waiver of liability, DACS is doing the implementation of the BMP-program.

Comparing the Floridian case and the Dutch case, it seems to us that there is a remarkable difference in political interest in an effective groundwater protection policy at the state or national level. Especially if we look at the position and control capacity of both environmental departments, it is clear that the Dutch department VROM obtained a much stronger position in regulating farming practices for groundwater protection reasons, while the Floridian department DEP finds its role much more restricted. There are at least four indications for this weaker position of the Florida environmental department.

First of all, we should realize that the political attention given to pesticides in the early eighties and the passage of the Water Quality Assurance Act in 1983 was impelled by bad publicity about Florida's pollution problems, including embarrassing stories in national magazines as 'Time' and 'Sports Illustrated'¹⁰. Several politicians saw opportunities in such public attention and quickly moved to associate themselves with the movement for environmental action. In contrast to the legislature's overwhelming support for the WQAA itself, there was deep disagreement over how to fund the law. Although 1983 was 'the year of water quality', funding from general revenues could easily be cut back in following years, when the legislature's attention focused on other

¹⁰ : Williams and Matheny (1995) are describing how the 'Time' cover story was particularly damaging. 'Entitled 'Paradise Lost', it chronicled not only environmental problems, but ethnic strife and drug and crime problems as well. 'Sports Illustrated', in analyzing Florida's daunting water problems, suggested that drinking from a tap in the Sunshine State was like hooking up the kitchen faucet to the toilet.'

hot issues. After 1983, there were few dramatic, visible disasters to keep the issue in the spotlight, and other pressing public issues - e.g. drugs and crime - drew media attention in subsequent years (Williams and Matheny 1995).

Although the WQAA has strengthened DEPs position as the state leading agency for drinking water issues, the passage of the act appeared to be a symbolic gesture of the Florida legislature. Only temporarily budgets for monitoring activities were provided and the WQAA was mostly heading for clean up activities, not so much for preventive policies and not at all for a prevention oriented regulatory approach. In the US political attention for environmental control is often driven by media attention. Many states lack the technical resources to develop numerical standards for many groundwater contaminants and instead depend on evidence of environmental damage or public health risks before acting to control these substances (Rosenbaum 1995).

Also Cahn (1995) thinks that as a result of high public anxiety over water pollution, policy elites have marketed water policy as bold regulation, satisfying public demand, though the policies themselves are problematic: enforcement is weak and discretionary; standards are weak; and only a fraction of waterborne pollutants are monitored.¹¹ In Florida the creation of a pesticides section in DEP in response to brush fires caused by aldicarb, and later on by EDB, is regarded as an example of management by crisis abatement instead of planing (DeHan 1995).

Secondly, nitrates didn't get the media attention which had been given to pesticides. Pesticides seem to be more scary to people, and most concern has been about pesticides being dangerous and badly managed, while nitrates simply were no concern in terms of being noxious. The nitrates issue also came up in a different context (separate statutes, separate programs). For example there is no federal vehicle for nitrates like there is for pesticides (FIFRA) or like the nitrate directive for groundwater in the EU. At that time DEP was also struggling with its regulatory image: many people (especially farmers) in Florida were sick of public regulations, which other people were describing as a 'get-of-my-back-syndrome'. DEP was desperately seeking for non-regulatory actions and had a preference for voluntary based programs. Therefor DEP felt itself dependent upon DACS for getting a fertilizer policy accepted by the farming community.

In an evaluation of the Ag Source and Water Well Management Section within DEP, it was stated that DEP is playing second fiddle to DACS which is the Department statutorily responsible for pesticides and fertilizer regulation in Florida. The effectiveness of DEP is considered to be limited because of the placement, by the Legislature, of the nitrate BMP research responsibility in the hands of DACS; the placement of the responsibility of drafting, development, and implementation of the Pesticides and Ground

¹¹ Cahn (1995) is comparing the symbolic aspects of water policy to those of air policy. 'Both followed mass public demand for improved environmental conditions. And both air and water policies were enacted with strong standards and strict deadlines - even though few legislators expected compliance. Clean water policies focus on establishing standards requiring expensive control technologies and then inviting voluntary compliance, resulting in what can only be called regulatory stalemate.'

Water State Management Plan required by EPA in the hands of DACS; the fact that the Pesticides Review Council is only an advisory body to the Commissioner of Agriculture and that DEP is only a participating member (DeHan, 1995).

Thirdly, even though DEP is statutorily responsible for exercising the oversight over the WMDs, the department is faced with the political and financial reality of WMDs independence. The WMDs started already around 1984 on the issue of nutrients on basis of the SWIM Act (Surface Water Improvement and Management Act). Since that time they have been a principal agency in management of surface water and land use. Every agricultural operation that expands had to have a permit from a water management district.

Thus, a very clear distribution of authority has grown through the years, in which DEP and the WMDs are both natural resources oriented, however with restricting the authority of DEP to regulating water quality, while the WMDs are having the authority to regulate on-site operations, like water well construction, water use and land use. Only DACS (being industry oriented) is entitled to regulate farming operations. With this distribution of authorities, it is very hard for DEP to proof cases of groundwater contamination caused by farming practices. Even for the delineation of contaminated areas, with the purpose of preventing inhabitants to consume contaminated water, DEP is dependent upon the WMDs.

Centralization of the authorities attributed to the lower administrative levels is still controversial, both in the case that WMDs are taking over authority that has been originally in the hands of the counties as in the case that the state level is taking over authority that has been originally in the hands of the WMDs. On the other hand, both tendencies are taking place. We were mentioning already that DACS is trying to get more control over the WMDs. DEP is having more problems with that. For example in 1988, the federal government (EPA) sewed the WMD South to better protect the Everglades by regulating agricultural practices in the Everglades Ag Area, south of Lake Okeechobee, which actually should have been done by DEP. This case is being referred to as the Everglades Ag Case.

A fourth indication for a weaker political position of the Florida environment department is concerning the department's prestige. Although the department is rather proactive in developing environmental policy programs, compared to other US-states, and has a good performance in developing environmental policy programs, compared to other US-states, the image of DEP-people in general seems to be that they don't believe in cost share or incentive programs; that they prefer heavily control, although they don't have funding sources and staff for that; that they are more occupied with paperwork; that they are more occupied with domestic and industrial waste.

Especially among farmers, DEP is having a bad image and regarded to be traditionally regulatory and enforcement oriented. It is the nature of their authority and their programs, farmers are saying. It explains why DEP is desperately seeking for actions that are non-regulatory. The lack of financial means for implementation (as we described before) is also resulting in relatively lower salaries and lower status for employees of the department, compared to similar positions in neighbouring states (Alabama and Georgia)

as well as to similar positions of county or city environmental officials. We also noticed already that the department is lacking a commissioner of cabinet officer to make it more political influential.

6 Conclusion: three mechanisms by which the dominant difference takes effect

In this paper we have developed a model of governance to allow us to compare governance systems in different states or countries as they relate to a certain policy arena. We identified five elements of governance, one of which relates to the multilevel aspect. Moreover, we made a main assumption that mutual adjustment will take place between the five elements of governance and that this mutual adjustment can be traced back to three internal mechanisms (secondary assumptions) in the governance system. Changes in a governance system take place when outside factors intervene in one of the five elements of the governance system and the other elements adjust to this new situation.

We then used this model to make a comparison between the governance structure for groundwater and drinking water protection in Florida and the Netherlands. More specifically, we looked at protection against nitrate and pesticides used in agriculture and which, via the groundwater, can cause contamination of the drinking water supply. In doing this we asked ourselves to what extent different states with similar policy problems develop a similar policy response, to what extent there may be striking differences and how these differences can be explained by the workings of the governance system.

In addition to a number of clear similarities regarding the distribution of governance between the various administrative levels, we have seen that there is a dominant difference between Florida and the Netherlands regarding the possibilities for central regulation of agricultural land use and farming practices with a view to protecting the quality of the groundwater.

In the USA and Florida, land use decisions are primarily seen as belonging within the competence of the lowest, or most local, tier of government (counties and municipalities). The federal government and the state of Florida have hardly any influence over land use decisions, while at the regional level the growing restrictions being placed on land use by the water management districts are controversial. In contrast, we have seen that there is active intervention from the center in groundwater protection issues in the EU and the Netherlands, involving restrictions being placed on the use of agricultural land and on farming practices. In Florida intervention from the center is only permitted to the agriculture department and only then for incentives not restrictions (through the use of voluntary agreements on best management practices).

The environment department can only achieve something in the agricultural sector if it adheres closely to the strictures of the agriculture department. In contrast, we have seen that, over the years, the agriculture ministry in the Netherlands has had to let itself be guided by the environment ministry and has gradually had to give in to restrictive measures being imposed on farmers, despite the presence of an influential agriculture lobby in the Netherlands, as in Florida. The Dutch environment ministry receives much more political support and guidance than the environment department in Florida.

In Florida the environment department's powers are limited primarily to setting quality standards for drinking water and, in cooperation with the water management districts, delineating vulnerable water abstraction areas. The environment department has been able to strengthen its position in this policy arena in relation to the agriculture department mainly because of a number of major incidents of groundwater contamination during the 1980s. These attracted much media attention and threatened the image of Florida's main tourist attraction, its undamaged and exceptionally varied wetland ecosystems. The public demand for action following these incidents, however, resulted in partly 'symbolic' policy: a temporary financial injection for monitoring activities and a curative policy response (clean-up program). Little in the way of preventive policy came out of it. We also saw how the centralized approach in Florida is hampered by a fragmented water supply system, with many individual and small-scale drinking water suppliers. This has led to a policy in the first instance geared to implementing curative measures to protect public health and much less concerned with preventive measures. Moreover, centralization of water management in Florida, in which the autonomy of the counties is restricted by the water management districts and that of the water management districts by the state, is controversial.

As all the water supply systems in the Netherlands are large in scale, more attention is paid to safeguarding water resources for the future and so has the policy has a preventive character. We also noticed that that in Florida there is a tendency for regulations to be highly specific to certain conditions and, in contrast with the Netherlands, generic measures are avoided.

The presence or otherwise of a tendency towards a centralized approach seems to be a crucial difference between Florida and the Netherlands. This difference does not only work consistently through the governance subsystem at each of the four intervention points, but also within a governance system from one element to another. This suggests that it is a feature that typically leads to adjustment between elements of a governance system, thus giving that system a 'genetic' imprint. It is also interesting to examine which mechanisms are at work during this process. We stated that our main assumption rested on three mechanisms (secondary assumptions).

The first mechanism (secondary assumption 1) is that adjustment arises from the tendency of actors to act from a set of constant values. In Florida, this mechanism relates primarily to the value places on freedom; the equivalent in the Netherlands is the value placed on community spirit. Of course, this is a relative difference. For example, In Florida this value is expressed in the many small-scale water supply systems and by an aversion to public utilities. It is also expressed as an anti-government sentiment and a dislike of generic regulations. This weakens the position of environment department and forces them to take a voluntary incentive-based approach, and it leads at all levels of government to measures geared to specific conditions. It is also expressed in the different meanings attached to the administrative concepts of New Federalism in the USA and subsidiarity in the EU. New Federalism recognizes the autonomy of local politics and believes that centralized levels of government add little value. Subsidiarity, in principle, recognizes collective values and states that collective decisions should be taken at that level at

which the common interest is served, and accepts the limitations this places on individual autonomy.

The second mechanism (secondary assumption 2) is that adjustment arises from the tendency of actors to use a common reference frame to interpret cognition. In the case study this mechanism mainly relates to the way the policy problem of 'groundwater contamination by pesticides and nitrates' is interpreted. In Florida this problem is interpreted mainly in terms of public health, which leads to a curative approach involving clean-up measures and defining water abstraction areas where drinking water consumers can be regulated. In the Netherlands the problem is interpreted mainly in terms of long-term sustainability, in which the concern is the need for a lasting, and thus preventive, solution. Water abstraction areas, for example, are identified for the purpose of ensuring extra regulation of activities that may be a source of pollutants. Preventive measures to control sources of groundwater pollutants are also implemented outside these areas.

The third mechanism (secondary assumption 3) is that adjustment arises from the dependence of actors on each others resources. Such dependence is clearly expressed in the demarcation of powers between administrative levels and between administrative actors. A striking feature in Florida is that the lower levels of government (both the counties and the water management districts) operate largely autonomously, while in the Netherlands these authorities (municipalities, water boards and provinces) execute many of their tasks jointly. Moreover, in Florida the competence of the environment department to act remains limited to setting environmental quality standards and its enforcement; there is little support for measures aimed specifically at target groups that go beyond a voluntary incentive-based approach. The department is totally subordinate to the agriculture department or to the water management districts, certainly as far as agriculture is concerned or where control over land use is involved. In the Netherlands the environment ministry has been able to break the power monopoly held by the 'iron triangle' in the agriculture sector and has been accepted as an influential partner in the administration of agricultural affairs.

The analysis in this paper has shown that 'governance' involves more elements than policy objectives and the means to implement policy. These elements are not simply the sum of individual aspects but are closely interlinked. We have tried to illustrate how these interrelations work. The case study we used for this was the comparison between the Netherlands and Florida regarding the protection of the quality of groundwater and drinking water. The high degree of similarity between both states highlights the differences, which exist as well. The interrelations between these differences can be understood by using our hypotheses of the mechanisms by which they work.

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