

Water governance regimes: Dimensions and dynamics

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The concept of water governance is distinctive through its focus on not only public intervention, but also on self-organisation as a way to deal with water issues. This article first elaborates a framework with five dimensions to describe governance regimes. Thereafter it illustrates and uses this analytical framework with a cross country comparison of the evolution towards more integrated water governance regimes. Furthermore four qualities of such regimes are introduced and used to assess the degree to which a governance regime is supportive for integral and adaptive water management. Lastly the article explores how governance regimes evolve over time and what forces shape this combination of stability and dynamics.

Keywords: dynamics of governance, international comparison, good governance assessment, adaptive water governance.

1. Introduction

Water governance is defined by the Water Governance Facility of the UNDP as ‘the political, social, economic and administrative systems that are in place, and which directly or indirectly affect the use, development and management of water resources and the delivery of water service at different levels of society’ (Water Governance Facility, 2012). In this article, we focus on the way in which water governance in a country is organized and evolves, to be seen as a ‘water governance regime’. This implies that the perspective from which we observe water governance regimes is that of institutions and social structures. We see the governance regime as a context within the various actors in water management processes interact, influenced but not determined by this context. Laferty (2004: 4–7) states that linguistically ‘governance’ is derived from Latin and Greek term for ‘steering’ or ‘piloting’ a ship. Modern theories and discourses have however expanded the connotation to emphasize bottom-up approaches, multi-level, multi-actor arrangements and mixes of ‘old’ (directive) and ‘new’ (enabling) policy instruments (Jordan, Wurzel, & Zito, 2003).

The concept of water governance is distinctive through its focus on not only public intervention, but also on self-organization as a way to deal with water issues. It combines a top down perspective from governmental agencies with the bottom up perspective of

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stakeholders having an interest in water management. There are lots of examples of bottom up organizations in water management¹. Ostrom (1990) emphasizes the importance of regional and local institutional arrangements (common pool resource arrangements) which are often based on a long tradition of informal but commonly shared water rights. In Europe, Barraqué (1995, 1998) made an analysis of the influence of water rights on the administration in various European countries. He remarks that the local character of “customary institutions makes them less visible to those who primarily focus on legal systems or regulations at State level” (Barraqué, 1998: 353–354). In their book on water use principles in the Middle East, Allan and Mallat (1995) remark that such water use principles are often based on old Islamic rules and customs. “Water in these regions tells the story of society and its modes of being shared are still today a real document on social order” (Allan & Mallat, 1995: 6–9). However, self-regulation often takes place in “the shadow of hierarchy” (Scharpf, 1997), which means in the context of the possibility of public intervention. Generally speaking, self-regulation does not only result from “laissez-fair” but can also result from the credible alternative threat of public intervention.

In this article we will illustrate and use our analytical framework on water governance regimes with a cross country comparison. The empirical basis for this comparison stems from an EU funded study on water governance in six countries. In Section 2 we will first explain what dimensions the concept of governance regimes entails and how these relate to the concept of public policy. This way we will stipulate in what ways our conceptualization of governance and governance regimes differs from the concept of public policy. We will do this with the application on water problems in mind. Thereafter in Section 3 we explore how governance regimes evolve over time and what forces mediate these dynamics towards a more adaptive water resources management. In both sections we include empirical illustrations from cross country comparisons we did over the years.

2. Dimensions of a governance regime as an analytical framework for cross-country comparison

2.1. Introduction

Water governance deals with the protection and modification of water systems and water sanitation chains to support human and ecological needs. Though this may seem like a straightforward goal, in reality it's not. There are numerous issues, for instance

¹ Many of them have a long history of self-organization, like the ‘Waterschappen’ in the Netherlands, the ‘Wateringues’ in Belgium (Wallonia), the ‘Wasserbehörde’ and ‘Wasserverbände’ in Germany, the ‘Agences de l’Eau’ in France, the ‘Confederaciones Hidrográficas’ and the ‘Tribunales de las Aguas’ in Spain, or the organizations for water irrigation (Les Bisses/Suonen) in Switzerland (Canton of Wallis). But also outside Europe, we can find many of such bottom up organizations, for instance the Water Management Districts in the American state of Florida (Kuks & Bressers, 2003).

matters of scale and the confluence of impacts from various organizations operating at these levels (Bressers & Rosenbaum, 2003) and matters of networked actor relations, implying the necessary confluence of various perspectives (Bressers, O'Toole, & Richardson, 1995). Still the starting point to see water governance as a purposeful activity is helpful to develop a model of its dimensions that helps to capture the essence of its contents. It enables to develop the concept of "governance" as an modification and extension of the concept of "policy" (Bressers & Kuks, 2003). Like with policy it should not be seen as a static, monolithic and unilateral statement, but is in fact a dynamic result of streams of various influences from a variety of actors. To develop the concept of governance from a starting point in an older concept makes it possible to be more precise about where thinking in terms of governance adds new elements to the much narrower concept of policy and discuss the relationships with issues in water governance. It also specifies the position that we think "governance"-analysis should have in the model of public affairs: as a more structural context for (inter)actions in not a singular, but a wider category of processes dealing with concrete and specific issues, like the implementation of projects that are affecting the water system (de Boer & Bressers, 2011). The concept of governance that is developed and used in this article has its roots in both policy studies and more specific governance literature and can be seen as an attempt to organize the multiplicity of aspects mentioned in those literatures into an concise framework.

In governance literature a big variety of interpretations is presented (e.g. Björk & Johansson, 2000; Rosenau, 2000; Kooiman, 1993; Peters & Pierre, 1998). Rhodes (1996) already listed six difference categories of publications on governance. Some of them are more relevant for private organizations, like "corporate governance", or are mostly normative, like "good governance" that is especially used in development cooperation studies. Also in other publications governance is sometimes used as a normative concept. Governance is then opposed to public policy in the sense that governance is seen as better, while it implies more participation of stakeholders and since the multi-level and multi-actor character of the way sectors of society are governed is acknowledged. The normative approaches almost always imply that a more limited role of government authorities delivers better governance. In contrast our position is that "governance without government" (Peters & Pierre, 1998: 223) is not a goal in itself and we strive to develop a model of governance that more neutrally enables to describe its contents and characteristics that produce the setting for the (inter)actions of the stakeholders involved. Governance is not used here as a normative concept or as a hypothesis of developments in government-society relationships (Howlett, 2011: 7–10), but as a neutral, yet enlarged understanding of the scope of (often national level) policy that forms a setting for actors to (inter)act. Also institutional rules can be considered as part of the arena in which actors operate. This means that many of the rules-in-use, customs and traditions, property rights, etcetera, can be seen as part of the governance regime (compare Young, 1994: ix and 163). Therefore, we will treat institutional approaches as sources of elements that fill the dimensions of governance, just like other parts of policy science form such a source.

2.2. *Governance regime dimensions*

The dimensions we discern start as announced with a simple concept of policy. Basically goals and means are the essential ingredients of any policy. Goals are however rooted in perceptions about the problems at hand. In fact in most situations different perceptions are brought into the debate, and around water issues this is surely the case. The perspective of governance makes it also harder to overlook that part of the means component is in fact the organization and facilitation of the implementation, rather than the policy instruments to impact the relevant sector of society. Part of the governance literature even is predominantly linked to that public management perspective (Lynn, Heinrich, & Hill, 2000a, 2000b). Although they set themselves the task of developing a broad and comprehensive model of governance, their background is clearly present in their thinking. They begin by noting that policy programs are implemented in a web of many diverse actors, an assumption that marks it out from the rest of the literature. As a consequence, the model of governance they develop concentrates not only on the objectives (including output indicators) and instruments ('treatment') of policy, but also the resources and organization of implementation, influencing the motivations, cognitions and resources of the stakeholders involved in such processes and thereby their course and effects.

Next to these three dimensions we include the multi-level and multi-actor dimensions that are so often mentioned in the debate that these almost seem like the obvious prefixes to 'governance'. In our opinion, based on the reasoning above, the dimensions of governance are:

1. Levels and scales (not necessarily administrative levels): governance assumes a general multi-level character of all other dimensions;
2. Actors: governance assumes the multi-actor character of the relevant network(s);
3. Perceptions of the problem and goal ambitions (not just the objectives): governance assumes the multi-faceted character of the problems and ambitions;
4. Strategies and instruments: governance assumes the multi-instrumental character of the strategies of the actors involved;
5. Resources and organization of implementation: governance assumes the complex multi-resource basis for implementation.

Using these five dimensions, we believe the governance regime can be described for a certain policy field in a specified place and time. But what should be described within the framework of these five dimensions? Which questions can specify these dimensions? The governance literature itself gives no clear answer and thus we turned to various theories of the policy process to inspire this contents. In a previous publication of the authors (Bressers & Kuks, 2003) the concept has been elaborated on the basis of a variety of classics in policy studies literature (Allison, 1971; Axelrod, 1976; Baumgartner & Jones, 1993; Davis & Lester, 1989; Dror, 1971; Dryzek 1987, 1997; Fischer, 1995; Fischer & Forrester, 1993; Hogwood & Peters, 1983; Kingdon, 1995; Kiser & Ostrom,

1982; Milbrath, 1993; Ostrom 1990, 1999; O'Toole, 2000; Sabatier 1988, 1991, 1999; Sabatier & Jenkins-Smith 1993, 1999; Scharpf, 1997; Schön, 1983; Schön & Rein, 1994; Thompson, Ellis, & Wildavsky, 1990, and Zahariadis, 1999). While it is impossible in the context of this article to elaborate very much on the way all these authors contributed to the specification of the five dimensions in our model, here we just present this specification in the form of relevant questions and key concepts from literature. This lead to the following elaboration that we deem especially relevant for water governance:

1. *Multiple levels and scales.* Which levels of governance dominate the policy discussion? What is the accepted role of government at various scales? Which other organizations are influential in the governance activities on these levels? Who decides or influences such issues? How is the interaction between various levels of governance organized? In water governance this specifically refers to the relation between watershed boundaries and administrative boundaries on various scale levels. Literature on multi-scale issues refers to polycentric governance and nested arrangements to describe the degree of integration of levels and scales.
2. *Multiple actors in the stakeholder network.* This is about the openness and closedness (for special groups) of networks. Who is allowed in and who not? How are stakeholder involvement and representation organized? What role do experts play? We also think of the intensity of network relations, and of trust circles. Literature on policy networks refers to iron triangles, policy communities, epistemic communities, issue networks, advocacy coalitions to indicate various aspects of the degree of integration of networks.
3. *A multiplicity of problem definitions and related ambitions.* What are the dominant perceptions on reality? To what degree do the actors accept uncertainty? Is the policy problem regarded as something individuals must deal with, or is it a problem for society in a collective sense? Where coordination is required with other fields of policy, what are the links accepted by the actors? Fragmentation is often the result from rivalry between different policy sectors dealing with the same policy problem. Water issues for instance are often partly affected by agricultural policy and partly by environmental policy considerations. They all have their own institutions, competences, agendas, approaches, while dealing with the same subject. Literature on policy perspectives and ambitions refers to policy assumptions, advocacies, discourse approaches, narrative approaches, and cultural theory to describe the degree of integrations of problem perceptions.
4. *Multiple instruments constituting a policy strategy.* Which instruments belong to the relevant strategy or strategies of the influential stakeholders involved? What are the target groups of the instruments, and what is the timing of their application? What are the characteristics of these instruments? To what extent are relevant property and use rights modified by public instruments? Various policy styles exist for public decision making and public intervention, for instance a hierarchic style

versus a consensual style. These styles or strategies determine the way in which decision making arrangements, collective choice arrangements, and conflict resolution mechanisms do function. It affects the way in which use functions of a natural resources are deliberated. What role do private property rights play in the arrangements? This dimension can also be about the choice of finance principles to build up a budget, like solidarity and affordability principles versus profit principles. Literature on policy instruments refers to the confluence of various instrument in the relevant sector of society to describe the degree of integration of instruments and strategies (Bressers & O'Toole, 2005).

5. *Multiple and fragmented responsibilities and resources for implementation.* Which organizations (including government organizations) are responsible for implementing the arrangements? What is the repertoire of standard reactions to challenges known to these organizations and how well can they adapt to new circumstances? What authority and other resources are made available to these organizations? With what restrictions, for instance in the use of property rights together with public authority? Various resources are needed and have to be mobilized in order to make policies effective. We think of legal rights and authorities, but also of mutual trust, but also organizational capacity and expertise. Next information based on monitoring, policy learning, ex post and ex ante (forecasting), budget needed to finance measures, but also allowed time often is needed as a resource. Literature on responsibilities and resources refers to mutual dependencies to describe the degree of integration of this dimension.

Concluding this subsection: the concept of governance consists in our model of five dimensions. These five provide answers to the five central questions of governance: Where? Who? What? How? and With what? Furthermore, a characteristic feature of modern 'governance' systems is that they have many aspects. They are multi-level, multi-actor, multi-faceted, multi-instrument and multi-resource-based. The assumed relationships between the five dimensions are based on the basic principle that the dimensions of public governance each form part of the context of the others and that they will tend to adjust to each other. In general, we expect the dimensions of public governance to exert a stabilizing influence on each other. This stabilizing influence occurs through processes of mutual adaptation of values, cognitions and resources. While changes in a dimension of the governance pattern can be caused by changes in other dimensions, ultimately these changes often have external sources affecting one or more aspects of dimensions from the outside. Mutual adaptation mechanisms that, without external 'disturbances', have a stabilizing influence then become the mechanisms by which substantial changes in one of the elements are followed by responding changes in other dimensions, resulting in complete regime changes. 'Changes from within' are not impossible though, since the variety within the dimensions of governance can be so great that new emergent linkages can cause new patterns to arise.

In Section 3 we will revisit this basic idea on how stability and dynamics in water governance regimes evolve. First we will illustrate the use of the five dimensions of governance as a framework to describe water governance regime changes towards more 'integration' that is often regarded as a move towards more institutional sustainability. The IWRM (Integrated Water Resources Management) approach that is often referred to as a good standard for water management is characterized by the emphasis on both integration within the realm of water issues and with relevant other sectors.

2.3. Water governance regime evolution towards more integration

Thinking of ways to develop a governance regime towards more institutional sustainability, one could think of the following directions for institutional change:

1. Restructuring levels and scales (positioning the river basin level and organizing water management based on watershed boundaries);
2. Changing network composition (developing participatory arrangements for involvement of all users and stakeholders with an interest);
3. Reformulating the policy problem (developing an integral vision including all water values);
4. Integrating policies (using integrated water legislation, integrated planning and integrated water resource management);
5. Redistributing resources (limiting property and use rights, internalizing costs, full cost recovery).

The development over time of the national governance regime of water management has been described for France, Switzerland, The Netherlands, Belgium, Spain and Italy (Kissling-Näf & Kuks, 2004; Bressers & Kuks, 2006), and later also for the United Kingdom (Kuks, 2006), Palestina (Gaza) (Zoarob & Bressers, 2007), Greece (Kampa & Bressers, 2008), Romania (Vinke-de Kruijf, Kuks, & Augustijn, 2010), and Vietnam (de Boer, Bressers, & Filatova, 2011). It also has been applied in many case studies in water governance (e.g. Kuks & Bressers, 2003; Bressers & Kuks, 2004; Bressers & Lulofs, 2010; de Boer & Bressers, 2011; de Boer, 2012).

As an illustration of how the five dimensions lead to specific observations, here we will confine ourselves to some results of the first mentioned study:

1. With respect to the multi-level dimension we concluded that most countries are struggling to develop an effective structure for co-governance between the various administrative levels involved in water management. The French and Dutch structures are the most elaborate; Belgium has set its final structure more recently with the institutional reform in 1993; Spain is still struggling with interventions in the autonomous regions from the central level; Italy is weak on providing integration from the central level; Switzerland is struggling with incoherence between federal attempts to integrate and a strong cantonal autonomy, on which the implementation of federal initiatives depends completely.

2. With respect to the multi-actor dimension, we found in all countries an increased participation of new users, environmental NGOs, and the general public in water issues. However, the degree to which this participation is institutionalized varies a great deal among the countries: participation is more institutionalized in the Netherlands, France and Switzerland than it is in Belgium, Spain and Italy.
3. With respect to the multi-perspective dimension we concluded that all countries are rather similar in the evolution of extent. From the 1950s on the demands for resource use increase strongly and various new use types and use functions are added to the regime extent. This is due to a rapidly growing population and related economic growth, industrialization and urban expansion. In the 1960s we see that a growing attention for natural aspects of water resources was followed by the incorporation of environmental aspects into water management in the 1970s, and ecological aspects in the 1980s. In the 1980s, besides surface water issues, groundwater issues were also getting into the spotlight. Around 1985 we see first attempts towards integrated water management in most countries. Although there are great ambitions for water management in all countries, the effectiveness of this ambition very much depends on the two dimensions related to the availability of policy instruments and resources for implementation.
4. With respect to the multi-instrument dimension and considering the adoption of integrated water legislation as an important indicator, we see that the Netherlands and France have adopted such streamlined legislation, considering the resource as an integral one (in terms of quantity, quality, surface and groundwater, as well as the ecological aspects of the water system) in 1989 (Netherlands) and 1992 (France). Italy and Switzerland show attempts at integrated legislation in 1989 (Italy) and 1992 (Switzerland). Although these attempts have an integral appearance, they are based on an incomplete integral approach. Belgium and Spain had not yet developed integrated legislation.
5. With respect to the multi-resource dimension we concluded that countries show a huge variation. The availability of resources for implementation partly depends on the creation of an effective structure for co-governance between the various administrative levels. It also depends significantly on the availability of money for implementation, important indicators of which are the public expenditure per capita on water management and the application of full cost recovery of water services. We noticed that the Netherlands, France and Switzerland have a much greater public expenditure and have more strictly applied the full cost recovery principle than Belgium, Spain and Italy.

2.4. Relevant regime 'qualities' beyond 'integrated'

The five dimensions of a governance regime can be used to systematically describe the contents of a governance regime in a certain area concerning a certain issue, like the

water system. Since the delineation is not top down, for instance “the water governance regime”, but preferably bottom up, for instance “what multiplicity of aspects governs these kinds of processes”, more than one societal sector can be seen as providing relevant aspects to the contents. Internal and external integration of water management (IWM and IWRM) acknowledge that without taking all uses and users into account inevitably the sustainability of the water resource is at risk. But in fact, when the governance regime for a certain water body becomes more encompassing, affecting more uses and users, it is likely to become more complex and runs the risk of becoming fragmented, providing a set of contradicting incentives to the stakeholders involved. Consequently, next to a sufficient *extent* or scope of the governance regime’s contents, also its *coherence* is crucial. Integration in water governance should be the combination of both, but the second quality is often insufficiently recognized and in fact much more difficult to realize than adding issues of attention to the governance regime’s contents. In all countries we analyzed a lack of coherence in water governance proved to be a serious bottleneck, least so in The Netherlands and France.

When the challenge is not to keep the water system in a stable sustainable status, but to change it to adapt to changing situations like population growth and climate change, water management will further increase in complexity and dynamics, to the point that any linear plan and realize approach is doomed to fail. Applying adaptive water management (AWM) in practice is then essential. This is not only true on a macro level: e.g. gradually adapting the water system to climate change. When the governance regime is envisaged as the structural context for water management in practice, as we do, than it surely also applies to this water management implementation practice.

But the necessary adaptiveness comes with additional governance regime requirements. When the regime is for some part rigid in what it required, for instance by detailing various sub-goals and timeframes, the degrees of freedom for water management in practice may shrink to unworkable conditions. This is the more so while various stakeholders, from agriculture, ecology, flood protection, city planning etcetera, might all have different “boundary judgments” on what they think should belong to or coordinated with processes of water management (Bressers & Lulofs, 2010). Some will debate that ecology should have a place next to water supply and water safety. Others might on the other hand see a lot larger domain as relevant and require that the cultural history of the region and the development of tourism and recreation is given a place among the considerations. Water management processes in practice thus require applying “adaptive boundary spanning strategies”.

To enable these, the governance regime should not only have sufficient extent and coherence, but also provide sufficient *flexibility* (de Boer, 2012). Flexibility is defined here as “the degree to which the regime elements support and facilitate adaptive actions and strategies in as far as the integrated (et al. multi-sectorial) ambitions are served by this adaptiveness” (de Boer & Bressers, 2011). Consequently it is also the degree to which hindrances for such adaptive behavior are avoided. The addition “in as far as. . .”

is needed to discern implementation that is just weak from a genuine attempt to make the most of the situation.

Given the dynamic and change oriented nature of some policies, like river renaturalization, there is yet another regime quality that can be influential for the practical process. That is the obvious, but no less important aspect of *intensity*. Intensity is “the degree to which the regime elements urge changes in the status quo or in current developments”. In policy studies’ terms intensity is related to the size of the task to create new dynamics by creative cooperation, or conflict. Consequently this urges change of conservative motivations or overcoming them by power, changing cognitions including widening of boundary judgments regarding the issues at stake, and developing new availabilities and combinations of resources. In other words: with more intensity the urge to use clever adaptive strategies to deal with and change the setting of the process increases. On the other hand, inevitably there will be some limitations to flexibility induced by an increase in intensity, in ambitions and stimuli to further change.

2.5. *A checklist to assess the capacity of water governance regimes to support adaptive water resources management*

On the basis of the five dimensions of governance and the four qualities that were stipulated in the subsection above, it is possible to specify a tool for the assessment of the degree to which the water governance regime can be expected to be supportive for actors in adaptive water management processes. We elaborate this checklist by discussing each dimension and therein the key questions to be posed regarding the four regime qualities.

At first we distinguish a *multi-level dimension*. There is not a single level of government relevant for water management, but many layers of government on national, regional/provincial and local scale. In terms of *extent* we could question: How many levels are involved and dealing with an issue? Are there important gaps or missing levels? In terms of *coherence* we could question: Do these levels work together and do they trust each other between levels? In terms of *flexibility* we could question: Is it possible to move up and down levels (up scaling and downscaling) given the issue at stake? In terms of *intensity* we could question: Is there a strong impact from a certain level to change behavior?

Secondly we distinguish a *multi-actor dimension*. Actors that are involved do mostly not act on their own, but also on behalf of backbenchers or interest groups behind them which they represent. It is relevant to consider the network linkages around actors and the coalitions that exist. In terms of *extent* we could question: Are all relevant stakeholders involved? Who are excluded? In terms of *coherence* we could question: What is the strength of interactions between stakeholders? In what way are these interactions institutionalized in joint structures? What is the history of working together and is there a tradition of cooperation? In terms of *flexibility* we could question: Is it practiced that the

lead shifts from one actor to another? In terms of *intensity* we could question: Is there a strong impact from an actor or actor coalition on water management?

Thirdly we distinguish a *multi-perspective dimension*. Different actors have different perspectives on a policy problem. There are various discourses in which groups of actors perceive and discuss a problem. Also goal ambitions vary among actors. In terms of *extent* we could question: To what extent are the various problem perspectives taken care off? In terms of *coherence* we could question: To what extent do the various goals support each other, or are they in competition? In terms of *flexibility* we could question: Are there opportunities to re-assess goals? In terms of *intensity* we could question: How different are goal ambitions from the status quo?

At fourth we distinguish a *multi-instrument dimension*. To be effective, it is necessary to have a strategy for goal achievement, including a variety of policy instruments to be applied. In terms of *extent* we could question: What types of instruments are included in the policy strategy? In terms of *coherence* we could question: To what extent is the resulting incentive system based on synergy? In terms of *flexibility* we could question: Are there opportunities to combine or make use of different types of instruments? Is there a choice? In terms of *intensity* we could question: What is the implied behavioral deviation from current practice and how strongly do the instruments require and enforce this?

At fifth we distinguish a *multi-resource dimension*. It is not sufficient to have a policy strategy on paper. It needs implementation to become effective. Implementation often takes place at another, lower level of government. The effectiveness depends on the responsibilities (competences, mandates) that are assigned and on the resources that are available at or provided to that lower level of government. Important resources are: authority, trust, property rights, financial means, organizational capacity, human resources, expertise, information and knowledge, time. In terms of *extent* we could question: Are responsibilities clearly assigned and sufficiently facilitated with resources? In terms of *coherence* we could question: To what extent do the assigned responsibilities create competence struggles or cooperation within or across institutions? In terms of *flexibility* we could question: What is the flexibility within the assigned responsibility to apply resources in order to do the right thing in an accountable and transparent way? In terms of *intensity* we could question: Is the amount of applied resources sufficient for the intended change?

All in all, in this section we introduced the five dimensions of governance as a structural context for water management in practice. Next to guiding the description of the contents of the regime, we also identified four qualities that are important to be assessed while analyzing the aptness of a governance regime in a certain situation: extent, coherence, flexibility and intensity. These criteria qualify the regime in terms of its impact on the motivations, cognitions and resources of actors in real life water management processes and thereby their ability to pursue ‘adaptive water management’.

3. Dynamics of a governance regime

3.1. *Introduction: Stability and dynamics can only be understood in junction*

We are not only interested in what qualifies a regime, but also in what changes a regime or what restraints regime change. There are many theories on policy change and institutional reform, developed by authors in the field of political science and public administration. For instance, much debated are the ‘punctuated equilibrium’ theory by Baumgartner and Jones (1993), the ‘social learning’ theory by Hall (1993), and the ‘advocacy coalition’ theory by Sabatier and Jenkins-Smith (1993). These three theories consider policy processes as prolonged periods of incrementalism, succeeded by relatively short periods of radical policy changes. These radical policy changes are focused on as dependent variables. The origins of radical changes are mostly identified outside the policy system (Yesilkagit, 2001). Several explanations for the occurrence of change can be found in literature. Incremental institutional adaptation is normally considered as the result of gradual social, economic and political developments (North, 1990). Besides explanations for gradual adaptations of institutional structures, crises are often considered as an important trigger for more radical change. During a crisis the institutional structure itself becomes highly criticized, which softens institutional resistance to change and opens up a ‘window of opportunity’ for the introduction of institutional reform (Kingdon, 1995). However, not every crisis leads to change. Even if a crisis unfreezes institutional rigidities, key officials cannot take decisions without considering the past of the sector (Boin & 't Hart, 2000). In fact, this is a statement that institutional change always will be path dependent.

In this context, Armingeon (1996a, 1996b) states that major reforms rarely occur as a reaction to international pressures. Political institutions in OECD countries tend to persist. Internationalization or globalization has not changed much, contrary to the early hypotheses of the globalization literature predicting major changes and the convergence of politics and institutions in nation states. Immergut (1992) identifies ‘domestic veto points’ as inhibitors to change. Veto points result from the dispersion of otherwise centralized and concentrated political power. They refer to those institutions and actors who are able and willing to hinder reform. Examples are direct democracy, strong regional governments, and corporatist arenas. North, Wallis and Weingast (2009) identify three ‘doorstep conditions’ (1. rule of law for elites; 2. creation of a perpetual state; 3. political control of the military) that determine if a natural state will begin a transition towards an open access order. The transition is difficult to begin. Most developing countries remain natural states. Only a few developing countries are in the transition.

Regimes could be rather stable, without changing much or rather gradual (incremental change). Long periods of stability could be succeeded by short periods of radical change, caused by external factors like a natural or a political crisis. However, not every crisis leads to radical change, and not every change needs to be caused by a crisis. In other words, there could be many triggers for change, but it depends on the condi-

tions if a trigger, or a combination of triggers, results in change. It also depends on the conditions if triggers result in more radical or more incremental change. For a theory on regime change we need to identify such conditions, which determine the effect of triggers.

In search of such conditions, let's have a closer look at the theories by Baumgartner and Jones, Hall, and Sabatier and Jenkins-Smith. The punctuated equilibrium theory (Baumgartner & Jones, 1993) argues that stability results from the existence of a policy community with a dominant position (policy monopoly) within the policy sector. The equilibrium will change if a rival policy community succeeds in challenging the legitimacy of the dominant policy program which is in force, by mobilizing individuals or groups with indifferent opinions. The social learning theory (Hall, 1993) argues that the political establishment in a policy sector is following a paradigm, which is the basis for their perceptions and argumentations resulting in a policy program. Such a policy program is constantly being adapted on basis of social learning. The basic paradigm remains in force as long as adaptations are a matter of incremental change based on routine learning processes. Radical change, which is the replacement of a paradigm by another one, is based on a process of more fundamental rethinking, motivated by ideological or political-tactical considerations. The advocacy coalition theory (Sabatier & Jenkins-Smith, 1993) argues that a policy sector remains stable as long as rival policy coalitions (advocacy coalitions) within the policy sector are competing on the basis of their own set of values and beliefs. This rivalry will only result in incremental changes. Radical change can only result from a crisis or a changed power configuration at the more central collective choice level under which the policy sector operates. Comparing these three theories we find that they all identify both intellectual based and power configuration based causal mechanisms leading to policy change, which in fact goes back to Hecló's distinction between 'puzzling' and 'powering', meaning that policy processes are about ideas and learning as well as about power and interest constellations (Hecló, 1974; Yesilkagit, 2001). We also learn from these theories that radical change seems to be a fundamental change of the underlying power configuration or a fundamental rethinking of the underlying intellectual perspective or paradigm, or both.

In search for conditions which, as underlying or intermediate mechanisms, determine the change effects of triggers, we identify in our theory on the stability and dynamics of governance systems three causal mechanisms for stability or change (Bressers & Kuks, 2003). Our main assumption is that stability in a governance system results from mutual adjustment between the five dimensions of such a system (see Section 2). Changes within a governance system occur because external change agents or internal tensions that have gradually built up, affect one or more of these five dimensions to such an extent, that this disturbance of the status quo cannot be encapsulated anymore, but other aspects of the governance regime and its dimensions need to adjust to them, thus changing the regime as a whole.

Whether a mutual adjustment really takes place depends in our model on three causal mechanisms. The first mechanism is that adjustment arises from the tendency of actors to act from a set of constant and coherent values (objectives: 'will'; normative component). The second mechanism is that adjustment arises from the tendency of actors to use a common reference frame to interpret cognitions (information: 'knowledge'). The third mechanism is that adjustment arises from the dependence of actors on each other's resources (power: 'ability'). Each of these three mechanisms could be an explanation for stability and resistance towards change. On the other hand, each mechanism also could be triggered to become a generator of change when external influences or internal tensions are strong enough.

In the subsections below we will separately deal with each of these 'mechanisms'. We will also illustrate this each time with some relevant observations from the six country study from which we have also reported in Section 2.3 the dependent variable: the water governance regime changes. In this project the dynamics that were the object of study were the changes towards more integrated water governance regimes, implying both more extent and more coherence. Each time first results are given on a country level from the six country study (Kissling-Näf & Kuks, 2004) and thereafter the results from the 24 cases studies from the same project (Bressers & Kuks, 2004).

3.2. Dynamics and stability of values

In the case of the first mechanism, there could be a specific arrangement of water rights in a nation, based on some specific set of values. For instance, there could be a strong value placed on keeping water in the public domain, or on water being controlled as common property, or on privatization of water services. It could be assumed that the stronger the value to keep water in the public domain, the better rivalries are managed in terms of taking care of all uses involved, or the better the non-institutionalized users are protected. In this context, the openness of the legal system to 'protective interests' is mentioned as a kind of catalyst to participation (Jänicke & Weidner, 1997). Even the influence of a national policy style is mentioned. A cooperative policy style (with participatory values) is good for policy innovation, because innovators are integrated earlier into the decision-making process than is the case in countries with a more confrontational tradition (Jänicke & Weidner, 1997; Richardson, 1982; Vogel, 1986). However, Arentsen, Bressers and O'Toole (2000) warned that closed forms of neo-corporatism may hamper policy learning, due to the screening of strong incentives from the outside. Furthermore, one could think of adherence to specific water principles like the polluter pays principle, the principle of affordability of water prices, or the principle of full cost recovery, as examples of values adopted by a nation. It could be assumed that rivalries are better managed when these principles are adhered to because they are based on public values, like incorporating the costs of externalities and guaranteeing access to all interested users in the society on the basis of equity. Also social mechanisms for dispute settlement should be regarded as based on values.

Young (1982) mentions a few types of social choice mechanisms which are most relevant to the allocation of resource harvests (for instance in the fisheries, or oil and gas extracts). One of the simplest solutions is to rely on the principle of ‘first come, first served’ or the law of capture. The basic idea here is to honor the claims of those actors getting the resources first. Alternatively, these allocations can be made through some process of administrative decision making. Under this option, interested parties could submit proposals pertaining to the harvesting or the exploitation of resources, designated administrators make selections among these proposals, and permits or licenses are issued to successful applicants. A third method of allocating limited resource supplies is to rely on explicit bargaining. The essential idea here is to create a competitive auction for permits, licenses, or leases granting exclusive rights to portions of the total possible harvest. Young emphasizes that resource regimes have few mechanisms which are unique to themselves. Instead, they may share these mechanisms with other regimes or rely heavily on the institutional arrangements of society as a whole in coming to terms with specific problems of social choice.

Dynamics towards a more integrated water resource regime: In our comparative study of national water regimes in six European countries we found that the following values and value-based institutions favor regime change towards more integration:

- A strong value placed on community spirit, including willingness to restrict individual autonomy to achieve equitable distribution of water access rights.
- Common adherence to the polluter pays principle and the principle of full cost recovery.
- A cooperative policy style (with participatory values), including openness of the water policy community to rival interests.
- A strong environmental awareness in society, including a protective orientation and openness of the legal system to ‘protective interests’.

On a more specific case level (24 cases in the six countries studied) we found the following factors to be relevant for the start of an orientation towards cooperation:

- A dominant policy ideology that supports integration.
- Positive examples of integration known by the actors involved.
- Mutual respect and trust in ‘fair play’ by the actors involved.

All in all we observed that the strongest change towards more integration took place in situations where the initial context was already relatively favorable.

3.3. Dynamics and stability of the cognitive reference frame

In the case of the second mechanism, the common reference frame to interpret cognitions could be the way in which water resources and water issues are perceived in a nation. The national orientation is probably determined by the appearance of water resources in a country. Arid countries in the Mediterranean area will have a different

perception of resources and availability than the more humid countries in Northern Europe. Countries that are dependent on transboundary inflows (like the Netherlands) might have a different view than countries that do not (like France). In policy science literature it has been recognized that such an 'image' of natural resources will influence the national policy style (Eberg, 1997; see also literature on cultural theory). Also Jänicke and Weidner (1997) recognize the societal interpretation of the environmental situation as what he calls a 'cognitive-informational framework condition' (a condition, under which environmental knowledge is produced, distributed, interpreted and applied). The leading paradigm of policy actors or 'the structure of available knowledge and thinking' is seen as increasingly important in policy research.

An additional way to understand the meaning of a cognitive reference frame of a nation is to consider the way in which the boundaries of a resource regime are formulated. Young (1982) differentiates among three distinct dimensions in thinking about boundaries of resource regimes. First, there is the dimension of functional scope or issue area. For instance, issues of water quantity and quality could be dealt with quite separately in a country, which could mean that separate regimes are functioning for the same water resource. A second, spatial dimension involves the geographical coverage or catchment area of a regime. For instance, this is the way the European Union would like to think of water resources, advocating a river basin or water catchment approach, which might require an expansion of the geographical scope of a resource regime. A third dimension focuses on the membership or beneficiary group associated with any given regime. For instance, a use-driven development of a resource regime may lead to over-exploitation and certain blindness for ecological aspects and non-economic values of the resource. Young recognizes that these three distinct dimensions, although helpful for analytical purposes, are apt to be highly interdependent under real-world conditions.

Instead of national leading paradigms, water institutions or networks also could have a dominant cognitive reference frame. As examples of such networks, we could think of the existence in the water sector of policy communities (Rhodes, 1985; Jordan, 1990), iron triangles (Jordan, 1981), advocacy coalitions (Sabatier & Jenkins-Smith, 1993), and expert communities (Jasanoff, 1990) or epistemic communities (Haas, 1992). Such policy networks could be rather closed and difficult to enter for new actors with an interest in water management. For instance, the developed level of expertise in civil engineering or flood risk management could have built an expert community having problems with the entrance of other disciplines in water management. On the other hand, new water issues could help to develop issue networks resulting in the opening of policy communities which have been rather closed before (Hecló, 1978; Bressers, O'Toole, & Richardson, 1995). The openness of the scientific community to new problems and paradigms as well as the openness of the media to new issues are important for the development of new policy directions. We should understand openness also as adaptive and innovative capacity.

A cognitive reference frame can also be identified as a 'discourse'. A discourse could be defined as "a shared way of apprehending the world. Embedded in language, it enables those who subscribe to it to interpret bits of information and put them together into coherent stories or accounts. Each discourse rests on assumptions, judgments, and contentions that provide the basic terms for analysis, debates, agreements, and disagreements" (Dryzek, 1997: 8). Dryzek distinguishes three discourses as alternative approaches to solving environmental problems, which he labeled as administrative rationalism (leave it to the experts), democratic pragmatism (leave it to the people), and economic rationalism (leave it to the market). These discourses are also recognizable in water management. Kissling-Näf and Kuks (2004) mention the restraint of a traditional engineering approach in water management, resulting in artificial solutions for water resource problems and, by that, generating other resource problems. For instance, engineered systems for irrigation and drainage lead to improvement for specific purposes, but they also cause water depletion and disrupted ecosystems of watercourses.

In Spain we see that the very uneven seasonal and geographical distribution of water supply and demand has led to the construction of an extensive water storage and redistribution infrastructure. In the Netherlands, we see that the need to protect the land from high water and the tradition of artificially draining low-lying areas have given the country a complex hydraulic infrastructure. The flow and level of almost every water system in the country is artificially controlled. In many countries we see that the traditional approach to providing flood protection has been strongly biased in favor of providing engineered measures (embankments, canalization, and so on) to keep floodwaters away from human settlements. However, water management does not anymore exclusively belong to the domain of technical experts and civil engineers (expert discourse). The acknowledgment that water management is dealing with rival interest brought social engineers into the domain. Water management has also become a matter of debate with the public, a matter of social engineering, aiming to get all stakeholders involved (people discourse). Water management needs interactive policy making, working in coalitions with other stakeholders involved in land use decision making. This requires skills in dealing with social and institutional complexity. Also a 'market discourse' can be perceived. It claims that water management is a matter of delivering water services against a price that should be competitive. This perspective focuses on the importance of incentives, market forces and semi-market competition (for instance benchmarking) in the public sector. It advocates cost transparency, cost reduction and continuous efficiency improvement. Considering these three discourses, all three perspectives are relevant for water management in terms of effectiveness (expert discourse), legitimacy (people discourse) and cost recovery as well as efficiency (market discourse) (Kuks, 2006, 2011).

Dynamics towards a more integrated water resource regime: In our comparative study of national water regimes in six European countries we found that the following paradigms and cognition-based institutions favor regime change towards more integration:

- A common understanding of water problems in terms of resource sustainability and not in terms of isolated problems that can be resolved with curative solutions (treatment of the symptoms).
- A water planning tradition and the presence of a supportive learning system (in the sense of national statistics, science and research).
- The ability to adapt existing water institutions to an expanding extent (to innovate within existing water institutions and broaden their scope).

On a more specific case level of 24 cases within the six countries we found indications for the relevance of ‘joint problems and joint opportunities’:

- Common knowledge bases from respected sources on problems and opportunities.
- Information symmetry between the actors involved on these points
- A sense of responsibility for the future with the actors involved and a sense of respect for each other’s interests among the actors involved.

Again, we observed that the strongest change towards more integration took place in situations where the initial context was already relatively favorable.

3.4. Dynamics and stability of the power configuration

In case of the third mechanism, the dependence of actors on each other’s resources should be understood as the power configuration reflected in the structure of the water sector in a nation. Such dependence is not only expressed in the demarcation of powers between administrative levels and authorities (centralism/decentralism) and in the power positions of specific public actors. It is also expressed in institutional links (networks) between public authorities and non-public actors or the civil society. Jänicke and Weidner (1997) mention two ‘political-institutional conditions’ which seem to be important indicators for our power configuration based mechanism: the ‘participative capacity’ and the ‘integrative capacity’ of a nation. The participative capacity refers to the input structures of the policy process, on which it depends if all water uses have an equal opportunity to become expressed and recognized. Decentralization and strong local communities are seen as a favorable condition for participation, which is especially the case in countries which have adopted subsidiarity, a multilevel governance structure (Switzerland, Germany, Belgium, Netherlands, Nordic countries). The integrative capacity refers to intrapolicy coordination (i.e. the internal integration of the policy field), to interpolicy coordination (i.e. the cross-sectorial integration of conflicting policies), and to external integration of environmental policy institutions and non-governmental actors, including consultations with target groups. Integrative capacities together with participative ones offer possibilities for describing types of political systems. Examples might be the open, but fragmented American system, or the closed and highly integrated French system, or the relatively open and integrated systems of smaller democracies such as the Netherlands, or Norway.

Dynamics towards a more integrated water resource regime: In our comparative study of national water regimes in six European countries we found that the following power configuration factors favor regime change towards more integration:

- A tradition of effective co-governance between central and decentral authorities (in which central authorities take responsibility for integration and decentral authorities are equipped with sufficient resources for the implementation and the differentiation to specific circumstances).
- A tradition of citizen participation and public debate on water issues (in which participation is not restricted to general elections, but in which participation rights are instituted regarding water policy making and planning).
- A strong environmental policy sector (with environmental divisions at all administrative levels and environmental subdivisions in all relevant ministries and water administrations).
- A strong position of 'green' NGOs.
- Free and alert mass media to induce awareness of challenges to the system.

On a more specific case level we found indications for the relevance of 'institutional interfaces':

- Clarity of assigned responsibilities (to prevent territorial battles).
- Legal or practical possibilities to protect negotiated compromises from continuous litigation.
- Actors, independent or within the administration, with solely process objectives (brokers).

Again, we observed that the strongest change towards more integration took place in situations where the initial context was already relatively favorable.

While seen from a perspective of regime dynamics these outcomes might feel disappointing, the study learned that external change agents actually do have only a limited effect on regime change. New European and national policies and problem pressures were proven to be related to a growth in extent, but not in coherence of the dimensions of governance (Bressers & Kuks, 2004: 258). To attain more coherence, not only external change agents, but also rather favorable initial conditions proved to be important.

4. Conclusions

In this article we discussed in Section 2 an analytical framework for cross country comparison of water governance regimes. We derived from policy science literature five dimensions that are relevant for the characterization of a governance regime. We also formulated four criteria that are important for the quality of a regime: extent, coherence, flexibility, intensity. On this basis we developed a checklist to assess the capacity of water governance regimes to support adaptive water resources management.

In Section 3 we explored how governance regimes evolve over time and what forces shape this combination of stability and dynamics. The five dimensions of a governance regime adjust to each other according to three path dependency mechanisms: (a) a dominant set of values (motivation), (b) a dominant cognitive frame of reference (cognitions), and (c) a dominant power configuration (mutual dependencies between actors). These three mechanisms create stability in a regime, which beyond a certain point can also be pathways for changes. Dynamics come into a governance regime through external triggers or internal built up tensions disturbing the regime stability. As soon as external triggers affect one of the five dimensions, it is assumed that change in each of the other dimensions will follow. This change is however not independent from a context of initial conditions. In this way, we can follow the evolution of a water governance regime on a timeline marked by transitions.

Future research will need to probe deeper into this interaction between external influences and dynamic responses and the way varying context conditions can let similar impulses produce very dissimilar changes in water governance. This is for instance a major topic when considering ‘export’ of ‘best practices’ to other countries. Also the role of internal tensions between dimensions of the governance regime as change agents is still underexplored. In some cases practitioners might actually be able to work around difficulties created by incoherencies. To study these water governance practices, the incorporation in the governance assessment of the regime qualities of ‘flexibility’ and ‘intensity’ can provide a good basis.

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