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ORIGINAL ARTICLE

Toward legitimate governance strategies for climate adaptation in the Netherlands: combining insights from a legal, planning, and network perspective

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Abstract In general, the issue of climate change is characterized by uncertainty, complexity, and multifacetedness. In the Netherlands, climate change is in above highly controversial. These characteristics make it difficult to realize adaptation measures that are perceived as legitimate. In this article, we analyze the main difficulties and dilemmas with regard to the issue of legitimacy in the context of climate adaptation. We conceptualize legitimacy from a legal, a planning, and a network perspective and show how the concept of legitimacy evolves within these three perspectives. From a legal perspective, the focus is on the issues of good governance. From a planning perspective, the focus is on the flexibility, learning, and governance capacity. From a network perspective, issues of dialogue, involvement, and support are important. These perspectives bring in different criteria, which are not easy compatible. We describe and illustrate these legitimacy challenges using an in-depth study of the Dutch IJsseldelta Zuid case. From our case study, we conclude that, from a legitimacy perspective, the often acclaimed necessity to be adaptive and flexible is quite problematic. The same holds true for the plea to mainstream adaptation into other policy domains. In our case study, these strategies give rise to serious challenges in relation to good governance and consensus—two indispensable cornerstones of legitimacy.

Keywords Climate adaptation · Governance strategies · Legitimacy · Legal perspective · Planning perspective · Network perspective

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Introduction

Climate adaptation is emerging as a new policy domain. Its guiding principles, instruments, and procedures are still under construction. Nevertheless, a lot has been achieved during the last decade, and the governing capacity in many countries has been increased. However, the governance of adaptation will also face some major challenges in the near future (Biesbroek et al. 2010; Bauer et al. 2012). As Lemos and Agrawal state (2006 p. 315), climate change is a typical example of a complex multiscalar environmental problem, requiring "a diversity of actors across the state–society divide." Furthermore, adaptation strategies need to respond to partly uncertain developments. Uncertainty is thus an important context factor in the definition of adaptation problems for the near- and longer-term future and in the identification of possible solutions. It is obvious that in such circumstances, there will be different interpretations of vulnerability in climate adaptation discourses and also different views on the most desired course of action (O'Brien et al. 2007). Communities value things differently, and these different interpretations must be taken into account if adaptation is to be effective and legitimate (Adger 2009; Barnett and Campbell 2009); but from another point of view also, the incorporation of a variety of stakes and interests is necessary. To be implemented, climate adaptation strategies have to compete with a variety of societal issues that are often seen as more urgent. The only way out seems to be to embed adaptation strategies in broader programs and to connect them to other issues and values (Termeer et al. 2011; Adger et al. 2005; Ward et al. 2012). A final challenge is that the climate change issue and the need for adaptation demand a long-term commitment that goes beyond the election terms of politicians. This creates the specific implementation problem of how to

make a long-term strategy attractive to politicians who need to score in the short term. Long-term adaptation is usually also a contested issue in terms of the question of whether investment is needed now, or whether we can first solve the acute problems in other domains (Few et al. 2007).

In our view, *legitimacy* is a key issue in developing and implementing (mainstreaming) climate adaptation policies and measures, in addition to effectiveness, equity/fairness, and efficiency. Many studies emphasize the importance of equity, resilience, and effectiveness for the long-term success of adaptation (Adger et al. 2005). But at the same time, many difficulties regarding implementing and mainstreaming climate adaptation measures are related especially to their (perceived) legitimacy (Few et al. 2007; Francesch-Huidobro 2012). Not only the specific characteristics and complexities of climate adaptation but also the many aspects of legitimacy make it difficult to realize legitimate adaptation strategies.

Research objectives and methodology

In this paper, we explore the specific challenges of realizing *legitimate climate adaptation strategies* by confronting the characteristics of climate adaptation with different aspects of legitimacy. Ultimately, legitimacy has to do with "a generalized preparedness to accept, within a certain margin, a decision whose content is not yet known" (Luhman 1975: 25). However, the concept of legitimacy is very broad and defined rather differently dependent upon the perspective or democracy model that is used (Weatherford 1992; Klijn and Skelcher 2007).

In this article, we distinguish three different disciplinary angles: a legal, planning, and network perspective. These perspectives are chosen deliberately. They are frequently used in the analyses of planning and decision making, but mainly separately. We use them together because in our view, these perspectives are complementary: they shed light upon different aspects of legitimacy which are all relevant in climate adaptation processes.

From a legal perspective, we focus upon the legal principles and procedural requirements adaptation measures have to come up with. From a planning perspective, the issue of legitimacy is connected to the problem-solving and learning capacity of adaptation measures (Füssel 2007; Smit and Wandel 2006). Within a network perspective, the focus is on the issues of participation and democracy (deliberation and consensus) (Tompkins et al. 2008). Especially, these domains seem to be relevant for the practices of climate adaptation at the regional and local levels, because these practices evolves in a context dominated by formal rules, planning procedures, and associated interactions between involved public and private stakeholders. These perspectives provide us with complementary yardsticks to assess the legitimacy of adaptation strategies. Together, they do justice to the multifaceted and somewhat ambiguous concept of legitimacy and address the main issues that influence the legitimacy of adaptation policies and measures.

At the same time, our selection of perspectives does not cover the variety of approaches to legitimacy entirely. For instance, from a more political process perspective, legitimacy is often focused upon the rules of the game how to aggregate preferences and decide on outcomes (Scharpf 1997). From a sociological perspective, the main focus is on social acceptance of decisions and support of stakeholders (Tompkins 2004; Adger et al. 2009). However, these and other perspectives are not mutually exclusive but interrelated. Nevertheless, for the clarity of our argument, we will use these perspectives apart.

In the next section, we present these three perspectives on legitimacy. We then explain how legitimacy relates to four main characteristics of climate adaptation: uncertainty, controversy, multiplicity, and complexity. This elaboration results in specific challenges to realizing legitimacy in adaptation processes.

The challenges to legitimate adaptation strategies are identified in an illustrative Dutch case study of adaptation: the realization of a high water channel (bypass) near the city of Kampen to enlarge the river discharge capacity of the River IJssel for the long term. The case was selected as one of the few adaptation projects available with an explicit long-term horizon and aiming to anticipate future flood risk forecasts (2050), whereas many river flood risk strategies are aimed at the short term. The Kampen case, which is approaching implementation, enables us to assess the various elements of legitimacy. Furthermore, it will help us formulating concrete recommendations how to address legitimacy issues in the process of formulating climate adaptation policies.

This case analysis is based upon a variety of sources. First of all, we conducted an evaluation study—based upon extensive document analysis and 15 in-depth interviews with key players—of the decision-making process between 2004 and 2009 (van Buuren et al. 2009). These interviewees were representatives of the main public and societal stakeholders in this network, such as the Kampen alderman, the deputy for Overijssel province, the responsible water board governor, the manager and the communication officer of the project team, and the main representatives of the various stakeholder groups. They were selected on the basis of an extensive network analysis (van Buuren et al. 2009). This study was complemented by an extensive document and media analysis for the period 2006–2012, whose findings have already been reported (van Buuren et al. 2010; Warner and van Buuren 2011). Additionally, a

study was undertaken on legal aspects of the decision making (de Gier and van Rijswick 2011). Finally, we conducted a secondary analysis of existing sources with regard to the planning process (Louters et al. 2005; Sokolewicz et al. 2011; de Kort 2009; Neuvel and van der Knaap 2010; Schuwer and van der Knaap 2008).

The empirical section describes the evolution of the case over the last 10 years. We reconstruct the extent of the occurrence of the characteristics of climate adaptation presented in the previous section. We analyze how the challenges described in this section work out in reality. In the final section, we reflect upon the dilemmas faced in realizing legitimate climate adaptation that become manifest from our analysis and formulate some prescriptions for realizing legitimacy in climate adaptation policies.

Three perspectives on legitimacy

Legitimacy from a legal perspective: from legality to legitimacy

Although legitimacy from a legal point of view is strongly related to justice and fairness (Rawls 1971), the main focus used to center on legality as the main basis for legitimacy. Governmental action has to be based on attributed powers, formally laid down in legislation or even the constitution (Prakke and Kortmann 2004). Legality offers legal certainty and avoids the abuse of power.

Legality based on the rule of law is the prerequisite for legitimacy (Weber 1976), but, in addition, legitimate action must fit in with principles of propriety and good governance (Fuller 1964; Addink 2005). These principles are both procedural and substantive. It is government's duty to use powers only for the reasons for which they are granted, to avoid the abuse of power, and to create a fair, reasonable, and proportionate balance of public and private interests (for example: Article 5 paragraph 4 of the Treaty on the European Union). Legitimate decision making must be based on adequate and relevant information from research and stakeholder consultation. Citizens must be informed and must have the opportunity to put forward their views and interests (Ebbesson 2010; Van Hoecke 2002). Government's decisions have to reflect how different views have played a role. These requirements of propriety and good governance should ensure that decisions are procedurally fair.

Substantive fairness depends on the content of legislation and governmental action itself (Driessen and van Rijswick 2011). It implies that interests, including those of minorities, have been taken into account (Peter 2008). Citizens should be convinced that they ought to behave in conformity with current legislation (Hayek 1973–1979; van Rijswick and Salet 2012) and must recognize the eventual use of enforcement instruments as fair and just.

Enforceability requires legal obligations to be formulated in a way that will enable them to be enforced; enforcement can be hampered by vague words, uncertain obligations, uncertain governmental responsibilities, a lack of appropriate powers, or a lack of adequate resources. Legislation can become an instrument for political ambitions lacking legitimacy (van Rijswick and Salet 2012).

We see shifts in the scope of legal legitimacy, which provide both for more legitimacy, such as the introduction of the principles of good governance, or for less legitimacy. Examples of decreasing legitimacy are the use of legislation as a responsive policy instrument without any normative guidance (Hayek 1973–1979; Nonet and Selznick 1978). Also, the shift from substantive fairness toward mainly procedural fairness decreases legitimacy. Furthermore, paying attention to efficiency improves legitimacy, but not if efficiency focuses only on cost-benefit analysis. Nowadays, efficiency attracts more attention than substantive fairness and the normative principles that lie behind governmental decision making (Cook and Tauschinski 2008; Driessen and van Rijswick 2011), as illustrated by the growing role of the market and market-based instruments in climate adaptation policies. Finally, laws that have come into force by way of democratic decision making are no longer sufficient to assure citizens that they have been made in the public interest. Even laws that fulfill the requirements of legality may lack legitimacy if they have to be implemented in a complex and integrated adaptation policy. Citizens want to be assured that the government has taken their particular private interests into account (Rosanvallon 2011), but this is hard to discern in the case of integrated policies. To assure legal legitimacy in adaptation policies, it would be preferable to try to get the right balance between the several aspects of legitimacy.

Legitimacy from a planning perspective: from engineering to learning

The planning perspective takes the legal interpretation into account, but adds the implementation challenge to it. From this perspective, the question is whether the resources, instruments, and arrangements are available to develop and implement solutions. With regard to climate adaptation, the challenge is to generate adaptation capacity: to take measures oneself or force others to take the desired actions (Mees et al. 2012). Capacity is the ability to obtain necessary resources from public and/or private actors and to apply procedures and practices necessary to implement desired strategies (Scharpf 1997). Governments that lack this capacity will lose their legitimacy. Citizens will become doubtful about the reliability of the adaptation agenda.

Capacity is a central concept for understanding the rise and fall of legitimacy. Some scholars frame this as *governance capacity*, others as *institutional capacity* (Kirchoff 2006), and some as *adaptive capacity* (Smit and Wandel 2006; Gupta et al. 2010). Governance capacity refers most clearly to the ability to govern or the ability to intervene in societal processes in order to realize collective goals. From the work of Healey (1997), Potter and Brough (2004), Kirchoff (2006), and Gupta et al. (2010), five governance capacities can be distinguished:

- institutional: presence of legal provisions and decision-making procedures;
- organizational: allocation of responsible public and/or private organizations and leadership;
- resource: availability of policy instruments and financial resources;
- collaborative: ability to ensure collaborative action between actors on different administrative levels and policy domains and in public and private domains;
- learning: capacity to monitor, evaluate, and improve governance actions.

In the planning literature, two approaches to implementation can be distinguished: a conformance approach and a process-oriented approach (Mastop and Faludi 1997). The conformance approach is an object-oriented approach where a plan is regarded as a blueprint that needs to be followed to reach an intended end-state (Mastop and Faludi 1997). It assumes that plan goals and objectives translate straightforwardly into policies and methods that are implemented to address specific problems and yield expected outcomes (Laurian et al. 2004). In this approach, a strategic master plan is divided into one or more projects that will be implemented accordingly. Capacity is about securing planned action. The original plan is perceived as "the right path" to adaptation. Legitimacy in securing adaptation action is realized by conformity: the actions are in line with original adaptation goals.

In a process-oriented approach, planning is seen as an incremental, continuous process of transformations, adjustments, and decisions (Mastop and Faludi 1997). Resources are spread over a variety of actors, so connecting the capacities of different actors is a central issue. Moreover, governing actions have to be adjusted to changing circumstances. Deviations from plans are not per se perceived as problematic; rather, they are often needed to achieve results.

Implementation policies agreed on without the flexibility to adjust to new circumstances are both desired and problematic. Changing original plans can have a negative impact on legitimacy: governments are not acting as they said they would (see the controversy concerning the German government and the energy industry on the closure of nuclear power plants). At the same time, it can have a positive effect on legitimacy: governments are doing what is needed in a new situation and do not continue to apply old solutions.

Legitimacy from a network perspective: from representation to deliberation

Depending upon which model of democracy they espouse, authors highlight different aspects and sources of legitimacy in network governance settings. Liberal and competitive models of democracy emphasize the accountability of elected officeholders to others. Participatory models of democracy tend to emphasize participation aspects; decisions are democratic when they have been achieved in processes that involve active citizen participation. Deliberative models of democracy add to this the importance of deliberation and open debate (Dryzek 1990). The democratic legitimacy of public decision-making processes ultimately stems from three aspects (Skelcher and Sullivan 2007; van Buuren et al. 2012):

- Accountability: public actors are accountable for decisions and the decision-making process and can also be held accountable.
- Voice: citizens are able to exercise their voice and influence decisions.
- Due deliberation: interaction processes are organized (procedures and rules of the game) in such a way as to ensure fair entry, reciprocity, freedom from coercion, open information access, and transparency.

Within governance networks, the principles of legitimacy are difficult to apply. One of the problems faced is that no clear *demos* exists (Esmark 2007). Networks often extend over various governmental levels (municipalities, countries, and even national governments) and include several actors. Several authors have attempted to reinterpret the classical criteria of legitimacy for application to networks (Edelenbos 2005; deLeon 2005; van Buuren et al. 2012).

Legitimacy in a network approach has three specific elements. The first element of legitimacy in networks is the opportunity for actors to participate and to influence the scope of decision making. This element is called input legitimacy (Scharpf 1997). The second element relates to the quality of interaction and the extent to which stakeholders attempt to understand one another and reflect upon their own assumptions and perceptions. It is argued that these two qualities of social learning and frame reflection are preconditions for a process that is identified by participants as legitimate (Dryzek 1990; Pahl-Wostl et al. 2008). The third element, called output legitimacy,

indicates the extent to which outcomes of processes reflect the inputs of stakeholders (Scharpf 1997). Ultimately, legitimacy depends on stakeholders' judgment. An open and interactive process (element two) is a necessary but not sufficient precondition for legitimate outcomes. The latter is dependent upon the willingness of politicians and authorities to adopt the outcomes (Edelenbos 2005).

Characteristics of climate adaptation

The consequences of climate change are multiple and depend on the geographical context in which it becomes manifest. Both the exposure and the vulnerability due to climate change can differ significantly depending on local differences in physical and socioeconomic conditions (IPCC 2012). Because exposure and vulnerability exhibit both temporal and spatial dynamics, climate adaptation is anything but easy. Summarizing the literature on the characteristics of climate change and the challenges for adaptation, we can formulate four typical attributes of climate change that challenges the legitimacy of adaptation (cf. Mees et al. 2012): climate change is uncertain, controversial, multifaceted, and complex.

Uncertain

Although substantial knowledge has been gathered about climate change and its impacts, it is still surrounded with uncertainties (Füssel 2007). Both the level of agreement and the available evidence with regard to climate extremes or impacts are often medium or even low (IPCC 2012). Some long-term changes are known within tolerable degrees of certainty. Still, it is often unknown how these changes are caused, or how they will evolve, and in what time frame. It is conceivable that we are ignorant of future climate change and its consequences (Dessai et al. 2009a, b). Uncertainty will often be a stimulus for indecisiveness and hesitation (Moser and Dilling 2007). At the same time, however, indecisiveness can become an important driver of a decline in legitimacy.

As a consequence, it is debatable whether adaptation is needed or whether it is enough. Acting too late and acting too early will both have a negative impact on the legitimacy of the climate adaptation strategy. A well-designed strategy can become illegitimate if the changes that it aims to counter do not occur, or occur earlier and more excessively. Uncertainty urges decision makers to think about flexible and reversible strategies that can be adjusted to new understandings (Hallegatte 2009), but this can also contribute to the image of a hesitant and opportunistic government.

Controversial

The uncertainty of climate change and its long-term character is important explanations for the inherently controversial character of climate adaptation. It fuels debates about necessity and consequences. Even in a situation of relative certainty about flooding statistics, there will still be inherent value conflicts and major differences in how people frame climate change and the necessity for adaptation (Hulme 2009; O'Brien et al. 2007). Adaptation requires the reallocation of scarce resources, be they financial, organizational, or spatial, and thus is controversial because it unravels conflicting interests and diverging values (Wilson 2006).

In the event of controversy, legitimacy in terms of fairness and support is difficult to realize. In particular, when adaptation measures have a negative impact upon existing rights of citizens, it is difficult to convince them about the necessity and rightness of measures (Adger et al. 2006). This issue poses additional challenges to organizing participation and interaction (Lynch et al. 2008).

Multifaceted

Climate change is a multifaceted phenomenon, and its consequences are heterogeneous. Some developments within parts of the broader climate system can have opposite effects. Some of these effects will be desired, others less. Agriculture in some countries may profit from climate change as a result of more favorable weather conditions, whereas agriculture in other countries may be confronted with problems like saltwater intrusion, peat oxidation, and freshwater shortage. Furthermore, drought and water nuisance due to extreme rainfall are two sides of the same phenomenon as we see in, for instance, Australia. The same holds true for many adaptation measures. "For instance, dike systems can reduce flood exposure by offering immediate protection, but also encourage settlement patterns that may increase risk in the long term" (IPCC 2012 p. 9). Its multifaceted character challenges legitimacy (Paavola and Adger 2006) because it provokes institutional ambiguity: a wide variety of public actors have to be activated in order to realize effective action (Mees et al. 2012).

Complex

The aforementioned characteristics partly contribute to the complexity of climate adaptation (Garrelts and Lange 2011; Willows et al. 2003). The characteristic of complexity embodies the nonlinear and erratic nature of climate change and the nonlinear feedback loops caused by climate change. However, the complexity of climate change also

relates to the interconnectivity of this item with other domains and functions (Teisman et al. 2009), the unexpected consequences when climate change coincides with other trends such as globalization (O'Brien and Leichenko 2000), and the huge contextual differences that impact upon the concrete consequences of climate change (Brunner and Lynch 2010). Adaptation measures cannot be implemented as single-purpose strategies, but have to be aligned to other developments to be effective. Mainstreaming thus is an important precondition (Uittenbroek et al. 2012; Klein et al. 2007; Swart and Raes 2007).

Complexity is an important challenge to legitimacy; it makes telling the story in a convincing way a rather difficult task. Additionally, it puts high demands upon mobilizing sufficient authoritative knowledge to enable the taking of evidence-based decisions that can be defended against stakeholder criticisms.

Challenges to the legitimacy of climate adaptation in practice

The three perspectives on legitimacy, described in "Three perspectives on legitimacy" section, attempt to deal with the four characteristics presented in "Characteristics of climate adaptation" section. In order to deal with the growing complexity of societal issues, all three perspectives have expanded their definition of legitimacy by including more aspects. The focus of the juridical perspective on legality has been broadened to include aspects of good governance, fairness and effectiveness, and flexibility. At the same time, the multiplicity and complexity of climate change make it difficult to demonstrate unambiguously the substantial fairness and effectiveness of climate adaptation strategies, especially because climate change means different things for different groups (O'Brien and Wolf 2010). The planning perspective has been broadened to include issues of governance capacity and performance, and the network perspective has been broadened to include issues of deliberation and consensus.

In sum, attention seems to be shifting from substantive, objective, and static yardsticks based upon formal elements (for example, legislation, norm and standard setting, planning documents, democratic institutions and public participation, and access to justice) toward more process-oriented and dynamic criteria based upon more informal and interaction-based elements (such as learning, continuous adjustment, and capacity building), which are required to bring together the necessary capacity for implementation. In a context of climate adaptation, such an adaptive and reflexive approach seems to be indispensable, but it also generates additional challenges to legitimacy because adjustments in scope and content once again require stakeholders to be consulted and societal support to be built. Finally, the developments in thinking about legitimacy point to the growing importance of stakeholder participation in the processes of policymaking and implementation, and the formulation of principles and criteria to do justice to their rights and resources, without omitting the everlasting relevance of representational democracy and the primacy of the rule of law and politics. Formulating adaptation strategies in a context of controversy and multiplicity puts additional demands on how interaction with stakeholders is organized, but also necessitates some form of public leadership to safeguard decisive action (Giddens 2009).

Bypass Kampen IJsseldelta: case introduction

After the river floods of 1993 and 1995, the Dutch government decided to implement a program aimed at enlarging the discharge capacity of Dutch rivers. After years of preparation, the Dutch parliament approved the *Plan for the Rivers* in 2006. The procedure was based upon formal national planning law, and the chosen strategy fits within the water legislation (van Rijswick and Havekes 2012).

One of the 39 projects was the bottleneck in the River IJssel near the city of Kampen that could cause serious flooding. The program management considered widening the riverbed as an adequate short-term (2025) solution. This solution was ratified by parliament. At the same time, they considered a bypass of the river south of Lake Vossemeer, a necessary long-term measure due to expected higher river discharge rates in the future (2050–2100) as a consequence of expected climate change. A spatial reservation was proposed to forestall other spatial developments in this area (Louters et al. 2005). However, the spatial reservation hindered the ambitions of the provincial and local authorities to develop this area for housing. They tried to push forward the long-term option of the bypass as the most effective measure for the short term and pointed out that other housing and infrastructural investments were already intended for this area, and that if the two projects could be pursued in tandem, it would reduce costs. The regional authorities underlined the desirability of not postponing long-term adaptation measures in favor of more incremental short-term measures.

From 2006 onwards, the regional and local authorities formed the enthusiastic engine driving the project to develop an integral plan including the bypass, housing development, recreation, and nature development. An intensive process was started in which five possible scenarios were developed by a small intergovernmental team, with minimal interaction with the wider public. Finally, the

scenarios were presented to stakeholders and citizens. Loud criticism was heard at several information meetings. To counter the criticism, the provincial deputy invited the citizens to develop their scenario. A sixth, grassroots-led scenario was incorporated into the preferred scenario (de Kort 2009).

The master plan was elaborated into a formal intention agreement between the participating authorities before the formal planning process began and involved the amendment of the provincial and local zoning plans. A strategic environmental assessment (SEA) was conducted at this stage. The SEA had to answer important questions about the necessity and value of additional housing, the sustainability of the bypass, and the viability of alternative development options for the area (Projectorganisatie IJsseldelta-Zuid 2007; Provincie Overijssel 2008).

A debate arose with regard to the exact design of the bypass. Regional and local authorities preferred an open, dynamic bypass with possibilities for recreational use and houses alongside running water. The regional water authority and the farmers' association proposed a closed bypass, which would only be used in times of disaster. The farmers' association worried about its water interests. The regional water authority was anxious about the negative hydrological impacts of the bypass and the possible consequences in terms of its legal duty of care and eventual liability, and started contra-research to support its opinion. After long deliberations, the closed bypass was chosen as the preferred alternative (Schuwer and van der Knaap 2008). The bypass was incorporated into both the local and provincial planning documents. Overijssel province opted explicitly for this more time-consuming route to emphasize the local autonomy of the city of Kampen and the constructive relationship in this planning process. Figure 1 represents the ultimate composition of the bypass in its wider environment.

The proposed development of many houses in the bypass area gave rise to another difficult debate. The area south of Kampen is the domain of dairy farmers and an area of considerable natural beauty. Inhabitants of the area united themselves in a rather successful interest group (Werkgroep Zwartendijk) to prevent the development of houses behind the historical, unique, and vulnerable landscape around Zwartendijk, a dike that functioned as a coastal defense mechanism from the fifteenth century until the early twentieth century. They mobilized much media and political attention. Consequent to the worsening economic context, the total number of new houses was significantly reduced from 4,000 to 1,300. There had been different prognoses with regard to the future need for additional houses, and these prognoses were heavily criticized by citizen groups because they were perceived as much too ambitious.

The SEA was carried out to fine-tune the details of the development plan for the area and to underpin the adjustment of the Provincial Zoning Document. However, as always, the SEA also fuelled new discussions, especially in relation to the way the bypass was to be realized. The SEA writers concluded that a so-called blue (navigable) bypass with a direct connection between the River Ijssel and Lake Vossemeer had the most beneficial consequences and the fewest negative external effects (Provincie Overijssel 2008). However, the regional water authority had difficulty accepting an open, blue bypass because of its duty of care in relation to the region's hydrological regime and the groundwater levels.

The last 3 years have witnessed many complications that have caused serious delays. These complications concern serious doubts about the safety consequences of the bypass. Furthermore, complications have arisen with regard to the short-term discharge ambitions and the long-term adaptation ambitions; because of various delays in the implementation of the bypass, the riverbed still has to be deepened to meet the current safety norms in time. However, new calculations have revealed that such a deepening would seriously hamper freshwater supply in the floodplain, and so the deepening has had to be further adjusted. However, these adjustments would also diminish the effectiveness of the deepening and thus the water authorities demanded the (partial) realization of the bypass to be brought forward.

However, the partial realization of the bypass has also caused new problems. The completion of the necessary sluices was postponed to 2016, for financial reasons. However, that also means that it would not be possible for the bypass to be used in the preceding years, although the bypass itself would already be completed. This was interpreted by citizens as a serious risk; the primary dike would be breached but the necessary substitutive measures would be realized later.

The Secretary of State has recently decided to implement the bypass in two steps. However, regional and local authorities have already started various preparatory activities, including the legal procedures to undertake the work. Dutch water law offers water authorities an integrated procedure for the construction or modification of a water management structure, enabling concentrated public participation, decision making, and access to justice, with great benefits for the public because of a greater transparency (van Rijswick and Havekes 2012). Nevertheless, the provinces and municipalities avoided this legitimate procedure and prepared fragmented applications by several provincial and municipal authorities for several water permits to construct the bypass, for financial reasons. Research showed that choosing these alternative procedures would have a great impact on the participatory rights

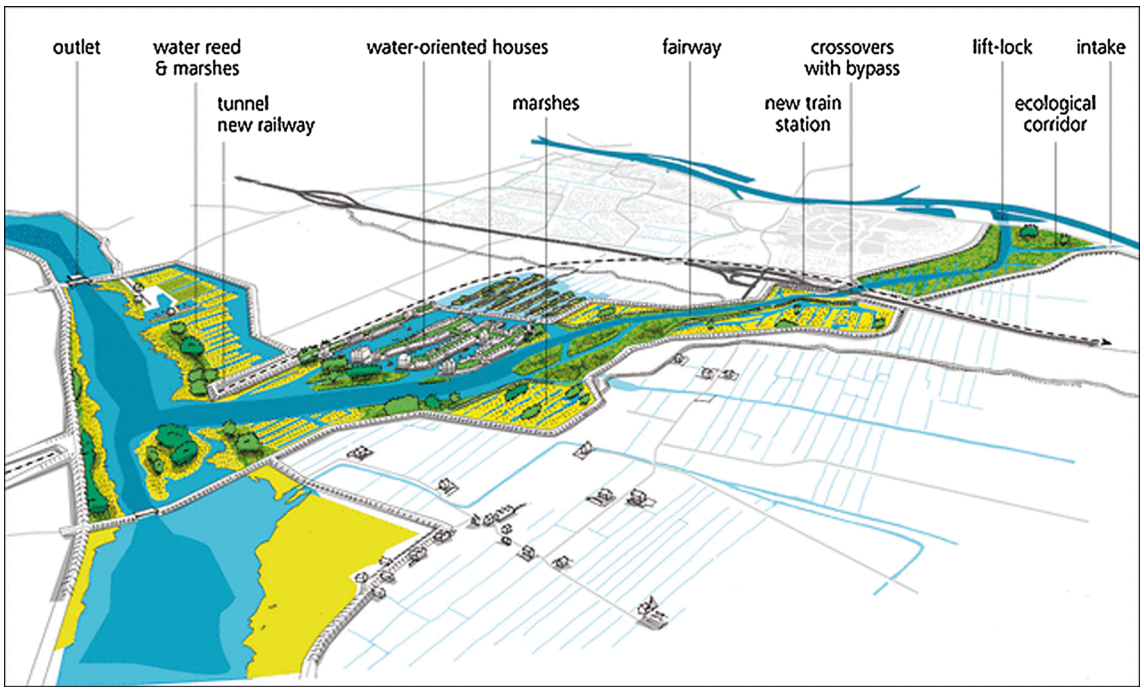

Fig. 1 The design of the bypass (*source* http://www.dhv.nl/)

of citizens and the possibility of having an integrated court decision on the whole project. After this research, the authorities decided to choose the appropriate procedure from the Dutch Water Act. Because this envisaged abuse of procedures almost succeeded, the Dutch legislature decided to change the Water Act in such a way that the construction of major water works will always have to follow the coordinated procedure because it offers more procedural fairness for citizens and therefore increases the legitimacy of major water works.

The adaptation challenge of IJsseldelta Zuid

Uncertainty

The case reveals uncertainties that caused problems in defining collective strategies. Serious doubts were raised with regard to the possible victims if the bypass breached the dike. In 2010, public concern was raised due to the so-called bathtub effect of the bypass; the area would become a trap with more victims, compared to the situation without a bypass. Although this effect (in terms of more victims) would be caused by the increase in the number of houses, public opinion remained suspicious. Overall Dutch sentiment dictates that flood risk safety should not be compromised. A second opinion sought by the regional water authority could not restore confidence in the project. Interestingly, these uncertainties are only partly related to the consequences of climate change; they are also partly related to the impact of the ambition to build more houses.

Controversy

The case study indicates several controversies. Remarkably, only a few relate to the climate adaptation measures. The results of the SEA on future population growth generated more controversy. Some environmental stakeholders and community associations criticized the assumptions behind the SEA. Although the governments involved adjusted their plans for the number and location of the houses to be built, much controversy remained because the contrary views and expert opinions gathered by the stakeholder groups were not authoritatively refuted.

Also, the need for the bypass was questioned. Citizens united in action groups emphasized the lack of clarity with regard to the added value of the bypass for flood safety in the long run. Experts were not unanimous about the necessity to realize measures to enable river discharges higher than 16,000 cubic meters.

Multifaceted

The case indicates the multifaceted character of climate adaptation. Although in the IJsseldelta there is a serious flood risk problem, Lake IJssel is considered as a strategic freshwater reservoir for the Western part of the Netherlands. It was therefore necessary for the bypass to conform

to new safety norms and changing (future) water system characteristics because of the plans of the newly established Delta Committee (with a brief to develop ideas about the long-term climate robustness of the Netherlands), which proposed to raise the water level of the lake by 1.5 m. This proposal could have serious consequences for the effectiveness and safety of the bypass. A second opinion was necessary to calculate the possible incompatibility of both plans but concluded that the bypass could be realized regardless of a possible rise of the Lake IJssel water level. Some additional investments in a "delta dike" were deemed necessary to ensure that the bypass would meet the optimum specifications.

Complex

The case shows various complex elements. One of them relates to the interconnectedness of the short-term measure and the long-term measure and the unexpected feedback relationships between both (Sokolewicz et al. 2011). This meant that during the process, various important changes had to be accomplished, which also caused new and unforeseen complications. However, the case complexity was also caused by the dissonance between various elements of the whole program, that is, infrastructural, agricultural, water management, ecological, and housing components, with their different time frames, procedures, and legal constraints.

The legitimacy challenge of IJsseldelta Zuid

In this section, we reflect on the challenges with regard to legitimacy in the IJsseldelta case. We apply the three perspectives presented in "Characteristics of climate adaptation" section.

Legal perspective

Legal legitimacy is about legality, with elements of good governance, effectiveness, flexibility, and adaptability added. In this case, the traditional elements of legality are not very problematic. From a legal point of view, it can be concluded that most of the formal procedures followed do serve legitimate decision making. As far as substantial elements are concerned, flood protection was broadly accepted as being in the public interest. It should be noted that the Dutch are used to large waterworks that serve as protection against flooding, although traditionally more technical solutions (building dikes) were chosen. Problems were caused by uncertainty with regard to the factual underpinning of the bypass, and its consequences for the safety of the surrounding area as a result of the so-called bypass effect. This decreased public support for the project because opponents questioned the effectiveness of the proposed measure. Doubts and protest rose in relation to broadening the project with the building of houses, decreasing possibilities for agriculture, and causing harm to vulnerable nature conservation areas. Stakeholders' arguments concerned substantive elements, such as appropriate protection against flooding, protection of agricultural interests, and nature conservation. The effectiveness and the efficiency of the proposals were debated. A positive element was that procedural fairness and principles of good governance were fully respected in the end; this can be attributed to the fact that the ideas of stakeholders led to a change in the original plans, and the procedure chosen offered the public the best way for public participation and access to justice.

There is a clear conflict between the inherent uncertainty with regard to climate change and the complex, interconnected character of adaptation measures. This made it difficult to convince stakeholders of the effectiveness and (substantive) fairness of the project. Because of its complexity, officials involved in the IJsseldelta project faced difficulties in explaining the project to the citizens, and there were many misinterpretations of the information provided.

Planning perspective

The planning process studied was characterized by the adjustment and redefinition of its scope and ambitions. This flexibility was necessary because time and again new plans were made and new questions were raised with regard to the feasibility of the bypass. There was serious criticism regarding the availability of the necessary means to realize the bypass as well as the profitability of the planned development. Interest groups like Bye–Bye Bypass and the Werkgroep Zwartendijk continuously underlined the expensiveness of the bypass and the fact that the necessary resources were not available. The Secretary of State hesitated year after year to make the necessary resources available.

The case reflects the supposed trade-off between learning and implementation: continuous fine-tuning of the project was necessary to prevent planning failures and future criticism, but caused serious delays and growing doubts about the desirability of the whole project. Securing resource capacity was especially problematic and caused legitimacy problems for the planned developments.

In "Challenges to the legitimacy of climate adaptation in practice" section, we pointed to a shift from more or less substantive, objective, and static yardsticks based upon formal issues (such as legislation, norms, and standard setting) toward process-oriented and dynamic criteria

based upon informal and interaction-based elements. The case supports this shift and shows its consequences: interaction-based adaptive planning challenges output legitimacy.

Network perspective

In the case, new coalitions between citizens and political parties emerged (on the local, regional, and national level). The distinction between participatory and representative democracy seems to have become a matter of new coalitions and interactions, rather than a conflictive situation of coexistence.

Participation changed in intensity and character: from relative isolation in the phase of elaborating alternatives, to collaborative in the period of making a master plan, to adversarial in the implementation phase. Especially when resistance became intense, the team in charge tended to work more in isolation, and especially because of the technical complexities, it was difficult for them to sustain the involvement of citizens and stakeholders. When the latter were critical, adversarial strategies were more in evidence.

The case indicates a tension between stakeholder participation and traditional representative democracy, but in a way other than expected. The tension was caused by new coalitions emerging between both spheres; opponents within city councils joined interest groups and citizen associations and formed a powerful coalition under the flag, Bye–Bye Bypass. Although responsibility for decision making was located in the representative institutions, citizens and stakeholders exerted influence by casting doubt on proposed measures and forcing politicians to provide more factual underpinning. This resulted in the postponement of decision making.

Conclusion: dilemmas for the legitimacy of climate adaptation

In this paper, we tried to uncover the specific difficulties to realize legitimate adaptation policies given the complicated characteristics of climate adaptation. The confrontation between our conceptual and empirical analysis reveals that there are at least three dilemmas that comes into play when trying to formulate legitimate adaptation measures. They have to do with the perceived need to embed adaptation measures into packages of spatial investments (Wilson 2006) and to be considered "in concert with existing decision processes and structures" (Lynch et al. 2008 p. 170); the emphasis within the adaptation literature on learning and regular adjustment (Folke et al. 2005); and the call to take into account the complex characteristics of physical systems affected by climate change (Bohensky and Lynam 2005).

First of all, coupling adaptation measures to other policy ambitions is a delicate act. On the one hand, couplings enable the mobilization of resources for implementation. Couplings seem indispensable to achieve adaptation. From a planning perspective, this is an important issue. Realizing the necessary governance capacity is a cornerstone for legitimacy. Coupling, however, also contributes to controversies (as indicated in the case). The bypass was disputed, mainly because of non-climate-related aspects such as housing and its impact on the landscape and nature. Connecting adaptation to other—potentially controversial—issues can generate unintended additional resistance because non-climate-related values come into question and mobilize new stakeholders who are not affected by a bare, mono-functional climate adaptation strategy (O'Brien and Wolf 2010).

Secondly, adaptation trajectories are erratic and time-consuming. From a planning perspective, we can value this in terms of adaptive capacity, flexibility, and learning. From the perspective of citizens and stakeholders, however, it does not contribute to credibility; they interpret time delays as signals that there are doubts. These signals fuel resistance. Nearly everything remains uncertain before the final decision making by the responsible minister. There is a trade-off between flexibility and learning on the one hand, and clarity, legal certainty, and formulating decisive long-term goals on the other.

Finally, the problems realizing legitimacy in the case studied had to do with the inherent characteristics of complexity. Interventions in one part of a physical system affected by climate change will often have repercussions on other parts. The repercussions are difficult to predict and often nonlinear and unexpected. The general public is aware of system uncertainties and can easily use these connections to question specific adaptation strategies and put pressure on politicians to give more guarantees. Realizing robust adaptation strategies thus requires a transparent dialogue with stakeholders (Dessai and Hulme 2007).

The literature on climate adaptation is strongly dominated by the idea that continuous learning and flexibility are essential to act effectively in the face of climate change (Folke et al. 2005; Pahl-Wostl 2006; Gunderson 1999). At the same time, we can conclude that continuous learning (from the sight of policymakers) in order to realize robust adaptation strategies can easily damage legitimacy by provoking new controversies and doubts on the part of the general public. Continuous learning has to be a joint effort: it necessitates an ongoing dialogue in which values and preferences of all stakeholders are included (Hulme et al. 2007).

The same holds true for the issue of mainstreaming. The dominant belief is that adaptation ambitions have to be mainstreamed or connected with other policy domains (Smit and Wandel 2006; de Kok and de Coninck 2007). However, mainstreaming is not a panacea due to many institutional challenges (Yamin 2005). Moreover, our case shows that making connections can cause additional problems for realizing legitimacy because of the controversies that accompany the coupled issues: making adaptation strategies part of integral spatial programs gives rise to additional challenges to legitimacy because such programs affect unexpected values and agendas.

The question then comes what promising strategies are to realize legitimate adaptation policies. From our analysis, we can conclude that the legal aspects are normally safeguarded due to the common procedural requirements that have to be met in each planning process. The aspects of legitimacy regarding continuous learning and stakeholder dialogue are more problematic because of their interferences with aspects of decisiveness and representative democracy.

Organizing legitimate adaptation processes which are at the same time vigorous and decisive depends upon the ability of decision makers and politicians to find a good balance between dealing with complexity by making connections and seizing opportunities, and at the same time investing in procedural guarantees that prevent for setbacks and volatility (Edelenbos et al. 2013; Van Buuren et al. 2013). As Adger et al. (2003 p. 1099) state: "Legitimacy can be gained and compromised through the process of making environmental decisions." That means that especially the *processes* of formulating adaptation measures are important. These processes should be managed as cooperative and deliberative processes, with clarity about public and private responsibilities, transparency of the procedures of decision making, and accountability of the final decisions.

In this paper, a multiple perspective on legitimacy was used. Such an approach takes into account the many elements the concept comprises and enabled us to make the legitimacy challenges of adaptation more specific and detect dilemmas. It reveals that important legitimacy challenges have to do with finding an appropriate balance between a focus upon adaptation and combining adaptation with other planning ambitions, and between adaptive planning and decisiveness in a context of procedural fairness.

For a more thorough understanding of the difficulties related to gaining legitimacy for adaptation, more in-depth and comparative research is necessary. This research project only shows insights from one case study in which the adaptation measure was quite controversial and in which it was connected to a very ambitious spatial program. Other studies of less controversial and complex adaptation measures can refine our insight into the legitimacy dilemmas of climate adaptation.

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References

Addink H (2005) Principles of good governance, lessons from administrative law. In: Curtin DM, Wessel R (eds) Good governance and the European Union. Reflections on concepts, institutions and substance. Intersentia, Antwerp, pp 21–48

Adger WN (2009) Commentary: four reasons for concern about adaptation to climate change. Environ Plan A 41:2800–2805

Adger WN, Brown K, Fairbass J, Jordan A, Paavola J, Rosendo S, Seyfang G (2003) Governance for sustainability: towards a 'thick' analysis of environmental decision-making. Environ Plan A 35:1095–1110

Adger WN, Arnell NW, Tompkins EL (2005) Successful adaptation to climate change across scales. Glob Environ Change 15:77–86

Adger WN, Paavola J, Huq S, Mace MJ (2006) Fairness in adaptation to climate change. MIT Press, Cambridge

Adger WN, Dessai S, Goulden M, Hulme M, Lorenzoni I, Nelson D, Nass O, Wolf J, Wreford A (2009) Are there social limits to adaptation to climate change?'. Clim Change 93:335–354

Barnett J, Campbell J (2009) Climate change and small island states: power, knowledge and the South Pacific. Earthscan, London

Bauer A, Feichtinger J, Steurer R (2012) The governance of climate change adaptation in 10 OPEC countries: challenges and approaches. J Environ Plan Policy Manag. doi:10.1080/1523908X.2012.707406

Biesbroek GR, Swart RJ, Carter TR, Cowan C, Henrichs T, Mela H, Morecroft MD, Rey D (2010) Europe adapts to climate change: comparing national adaptation strategies. Glob Environ Change 20(3):440–450

Bohensky E, Lynam T (2005) Evaluating responses in complex adaptive systems; insights on water management from the Southern African Millennium Ecosystem Assessment. Ecol Soc 10(1):11. http://www.ecologyandsociety.org/vol10/iss1/art11/

Brunner RD, Lynch AH (2010) Adaptive governance and climate change. The University of Chicago Press, Chicago

Cook R, Tauschinski E (2008) Accommodating human values in the climate regime. Utrecht Law Rev 3:18–34

de Gier AAJ, van Rijswick HFMW (2011) Aanleg bypass Kampen: projectplan of watervergunning? Advies aan de provincie Overijssel over de aanleg van de Bypass Kampen. Universiteit Utrecht, Utrecht

de Kok M, de Coninck HC (2007) Widening the scope of policies to address climate change: directions for mainstreaming. Environ Sci Policy 10:587–599

de Kort I (2009) Designing a strategic plan development approach for integrated area development projects. PhD dissertation, University of Twente, Enschede

deLeon P (2005) Social construction for public policy. Public Adm Rev 65(5):635–637

Dessai S, Hulme M (2007) Assessing the robustness of adaptation decisions to climate change uncertainties: a case study on water resources management in the East of England. Glob Environ Change 17(1):59–72
Dessai S, Hulme M, Lempert R, Pielke R (2009a) Do we need better predictions to adapt to a changing climate? EOS 90(13):111–112
Dessai S, Hulme M, Lempert R, Pielke R (2009b) Climate prediction: a limit to adaptation. In: Adger N, Lorenzoni I, O'Brien K (eds) Adapting to climate change: thresholds, values, governance. Cambridge University Press, Cambridge, pp 64–78
Driessen PPJ, van Rijswick HFMW (2011) Normative aspects of climate adaptation policy. Clim Law 2(4):1–23
Dryzek JS (1990) Discursive democracy. Politics, policy, and political science. Cambridge University Press, Cambridge
Ebbesson J (2010) The rule of law in the governance of complex socio-ecological changes. Glob Environ Change 20:414–422
Edelenbos J (2005) Institutional implications of interactive governance: insights from Dutch practice. Governance 18(1):111–134
Edelenbos J, Klijn EH, Van Buuren MW (2013) Connective capacities of network managers: a comparative study of management styles in eight regional governance networks. Public Manag Rev (print) 15(1):131–160
Esmark A (2007) Democratic accountability and network governance—problems and potentials. In: Sørensen E, Torfing J (eds) Theories of democratic network governance. Palgrave Macmillan, London, pp 274–296
Few R, Brown K, Tompkins EL (2007) Public participation and climate change adaptation: avoiding the illusion of inclusion. Clim Policy 7(1):46–59
Folke C, Hahn T, Olsson P, Norberg J (2005) Adaptive governance of social-ecological systems. Annu Rev Environ Resour 30:441–473
Francesch-Huidobro M (2012) Institutional deficit and lack of legitimacy: the challenges of climate change governance in Hong Kong. Environ Polit 21(5):791–810
Fuller LL (1964) The morality of law. Yale University Press, New Haven, CT
Füssel HM (2007) Adaptation planning for climate change: concepts, assessment approaches, and key lessons. Sustain Sci 2(2):265–275
Garrelts H, Lange H (2011) Path dependencies and path change in complex fields of action: climate adaptation policies in Germany in the realm of flood risk management. AMBIO J Hum Environ 40(2):200–209
Giddens A (2009) The politics of climate change. Polity Press, Cambridge
Gunderson L (1999) Resilience, flexibility and adaptive management—antidotes for spurious certitude? Conserv Ecol 3(1):7. http://www.consecol.org/vol3/iss1/art7/
Gupta J, Termeer C, Klostermann J, Meijerink S, van den Brink M, De Jong P, Nooteboom S, Bergsma E (2010) The adaptive capacity wheel: a method to assess the inherent characteristics of institutions to enable the adaptive capacity of society. Environ Sci Policy 13:459–471
Hallegatte S (2009) Strategies to adapt to an uncertain climate change. Glob Environ Change 19(2):240–247
Hayek FA (1973–1979) Law, legislation and liberty (3 vol). Routledge and Kegan Paul, London
Healey P (1997) Collaborative planning; shaping places in fragmented societies. MacMillan Press, London
Hulme M (2009) Why we disagree about climate change: understanding controversy, inaction and opportunity. Cambridge University Press, Cambridge
Hulme M, Adger WN, Dessai S, Goulden M, Lorenzoni I, Nelson D, Wreford A (2007) Limits and barriers to adaptation: four propositions. Tyndall Center for Climate Change Research, Norwich
IPCC (2012) Summary for policymakers. In: Field CB, Barros V, Stocker TF et al (eds) Managing the risks of extreme events and disasters to advance climate change adaptation. A special report of working groups I and II of the IPCC. Cambridge University Press, Cambridge, pp 1–19
Kirchoff D (2006) Capacity building for EIA in Brazil: preliminary considerations and problems to be overcome. J Environ Assess Policy Manag 8(1):1–18
Klein RTJ, Eriksen SEH, Naess LO, Hammill A, Tanner TM, Robledo C, O'Brien KL (2007) Portfolio screening to support the mainstreaming of adaptation to climate change into development assistance. Environ Polit 12(3):1–22
Klijn EH, Skelcher C (2007) Democracy and governance networks: compatible or not? Public Adm 85(3):587–608
Laurian L, Day M, Backhurst M, Berke P, Ericksen N, Crawford J, Dixon J, Chapman S (2004) What drives plan implementation? Plans, planning agencies and developers. J Environ Plan Manag 47(4):555–577
Lemos MC, Agrawal A (2006) Environmental governance. Ann Rev Environ Resour 31:297–325
Louters T, Pierey J, Van Ellen T, Otten A (2005) Future of the IJsseldelta: an example of Dutch modern river basin management. DHV, Amersfoort
Luhman N (1975) Legitimation durch verfaren. Luchterhand, Darmstad
Lynch AH, Tryhorn L, Abramson R (2008) Working at the boundary: facilitating interdisciplinarity in climate change adaptation research. Bull Am Meteorol Soc 89(2):169–179. doi:10.1175/bams-89-2-169
Mastop H, Faludi A (1997) Evaluation of strategic plans: the performance principle. Environ Plan B Plan Des 24:815–832
Mees HLP, Driessen PPJ, Runhaar HAC (2012) Exploring the scope of public and private responsibilities for climate adaptation. J Environ Policy Plan 14(3):305–330
Moser SC, Dilling L (2007) Creating a climate for change: communicating climate change and facilitating social change. Cambridge University Press, Cambridge
Neuvel JMM, van der Knaap W (2010) A spatial planning perspective for measures concerning flood risk management. Water Resour Dev 26(2):283–296
Nonet Ph, Selznick Ph (1978) Law and society in transition. Harper & Row, New York
O'Brien KL, Leichenko RM (2000) Double exposure: assessing the impacts of climate change within the context of economic globalization. Glob Environ Change 10(3):221–232
O'Brien KL, Wolf J (2010) A values-based approach to vulnerability and adaptation to climate change. Wiley Interdiscip Rev Clim Change. doi:10.1002/wcc.30
O'Brien K, Eriksen S, Nygaard LP, Schjolden A (2007) Why different interpretations of vulnerability matter in climate change discourses. Clim Policy 7:73–88
Paavola J, Adger WN (2006) Fair adaptation to climate change. Ecol Econ 56(4):594–609
Pahl-Wostl C (2006) Transitions towards adaptive management of water facing climate and global change. Water Resour Manag 21(1):49–62
Pahl-Wostl C, Mostert E, Tàbara D (2008) The growing importance of social learning in water resources management and sustainability science. Ecol Soc 13(1):24. http://www.ecologyandsociety.org/vol13/iss1/art24/
Peter F (2008) Democratic legitimacy. Routledge, New York
Potter C, Brough R (2004) Systemic capacity building: a hierarchy of needs. Health Policy Plan 19(5):336–345

Prakke L, Kortmann CAJM (eds) (2004) Constitutional law of 15 EU member states. Kluwer, Deventer

Projectorganisatie IJsseldelta-Zuid (2007) Notitie reikwijdte en detailniveau partiële provinciale planherzieningen IJsseldelta-Zuid, Provincie Overijssel

Provincie Overijssel (2008) IJsseldelta-Zuid: PlanMER partiële provinciale planherzieningen, startnotitie besluitMER, Zwolle

Rawls J (1971) A theory of justice. Harvard University Press, Cambridge

Rosanvallon P (2011) Democratic legitimacy. Impartiality, reflexivity, proximity. Princeton University Press, Princeton

Scharpf FW (1997) Games real actors play: actor centered institutionalism in policy research. Westview Press, Boulder

Schuwer D, van der Knaap W (2008) Dealing with developments during the spatial planning key decision process of "space for the river": cases Kampen and Zutphen. Paper for the Freude am Fluss Final Conference. Nijmegen, 22–24 Oct 2008

Skelcher C, Sullivan H (2007) Public partnerships, citizen participation and democratic governance. Paper for the 'public partnerships and collaborative governance—the citizenship challenge' seminar. Manchester University, 18th May 2007

Smit B, Wandel J (2006) Adaptation, adaptive capacity and vulnerability. Glob Environ Change 16:282–292

Sokolewicz M, Louters D, Otten A (2011) Modern integrated river flood management for climate change in the Netherlands: the IJssel Delta project. Int J River Basin Manag 9(2):141–149

Swart R, Raes F (2007) Making integration of adaptation and mitigation work: mainstreaming into sustainable development policies? Clim Policy 7(4):288–303

Teisman GR, van Buuren MW, Gerrits LG (2009) Managing complex governance systems. Routledge, London

Termeer CJAM, Dewulf ARPJ, van Rijswick HFMW, van Buuren MW, Huitema D, Meijerink S, Rayner T, Wiering M (2011) The regional governance of climate adaptation: a framework for developing legitimate, effective and resilient governance arrangements. Clim Law 2:159–179

Tompkins EL, Adger AN (2004) Does adaptive management of natural resources enhance resilience to climate change? Ecol Soc 9(2):10. [online] URL: http://www.ecologyandsociety.org/vol9/iss2/art10

Tompkins EL, Few R, Brown K (2008) Scenario-based stakeholder engagement: incorporating stakeholders preferences into coastal planning for climate change. J Environ Manag 2008(88): 1580–1592

Uittenbroek CJ, Janssen-Jansen LB, Runhaar HAC (2012) Mainstreaming climate adaptation into urban planning: overcoming barriers, seizing opportunities and evaluating the results in two Dutch case studies. Reg Environ Change. doi:10.1007/s10113-012-0348-8

van Buuren MW, Edelenbos J, Klijn EH (2009) Kampen—IJseldelta. Hoe ambities elkaar kunnen versterken. Erasmus Universiteit, Rotterdam

van Buuren MW, Edelenbos J, Klijn EH (2010) Gebiedsontwikkeling in woelig water: over water governance bewegend tussen adaptief waterbeheer en ruimtelijke besluitvorming. Lemma, Utrecht

van Buuren MW, Klijn EH, Edelenbos J (2012) Democratic legitimacy and new forms of water management. Int J Water Resour Dev 28(4):629–645

Van Buuren MW, Driessen PPJ, Van Rijswick HFMW, Rietveld P, Salet WGM, Teisman GR (2013) Towards adaptive spatial planning for climate change. Balancing between robustness and flexibility. J Eur Environ Plan Law 10(1):26–50

van Hoecke M (2002) Law as communication. Hart Publishing, Oxford

van Rijswick HFMW, Havekes HJM (2012) European and Dutch water law. Europa Law Publishing, Groningen

van Rijswick HFMW, Salet WJM (2012) Enabling the contextualization of legal rules in responsive strategies to climate change. Ecol Soc 17(2):18. doi:10.5751/ES-04895-170218

Ward PJ, Pauw WP, van Buuren MW, Marfai MA (2012) A tale of two cities: governance lessons for flood risk management in a time of climate change—the cases of Jakarta and Rotterdam. Environ Polit. doi:10.1080/09644016.2012.683155

Warner J, van Buuren MW (2011) Implementing room for the river: narratives of success and failure in Kampen, the Netherlands. Int Rev Adm Sci 77(4):779–802

Weatherford, MS (1992) Measuring political legitimacy. The American political science review, 149–166

Weber M (1976) Wirtschaft und Gesellschaft. Mohr, Tübingen

Willows RI, Connell RK (eds) (2003) Climate adaptation: risk uncertainty and decision-making. United Kingdom Climate Impacts Programme, Oxford, UK

Wilson E (2006) Adapting to climate change at the local level: the spatial planning response. Local Environ 11(6):609–625

Yamin F (2005) The European Union and future climate policy: is mainstreaming adaptation a distraction or part of the solution? Clim Policy 5(3):349–361