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NATIONAL ADAPTATION STRATEGIES, WHAT ELSE?

COMPARING ADAPTATION MAINSTREAMING IN GERMAN AND DUTCH WATER MANAGEMENT

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Abstract

Over the past decade, governments in many countries began to integrate or mainstream climate change adaptation into a range of sectors. Comprehensive multi-sectoral adaptation strategies have emerged as the preferred approach across Europe. The German Adaptation Strategy is a prominent example for such a comprehensive strategy. It addresses 14 sectors with national key issues and measures, and it provides orientation for other (mainly sub-national) actors. Against this trend, the Netherlands has pursued climate change adaptation mainly through a sectorally focused approach: the Dutch Delta Programme. Building on existing programmes it facilitates analysis and strategy development for long-term water management at a national scale with a strong regional focus. The present paper compares the two dissimilar governance approaches mainly with regard to how and to what degree they mainstream adaptation into water and coastal zone management in selected regions. After discussing strengths and weaknesses of the two approaches, we conclude that the more common multi-sectoral approach applied in Germany and most other OECD countries is not necessarily superior to sectorally focused approaches. Although the Dutch and the German cases appear to resemble alternatives, we highlight that their combination holds the promise to compensate for each other's weaknesses. Overall, we argue that diversity in the governance of climate change adaptation is desirable because it can help to prevent that several countries fail in similar ways.

Keywords

climate change adaptation, adaptation governance, adaptation mainstreaming, water management, the Netherlands, Germany, National Adaptation Strategy, Delta Programme

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Table of contents

1 THE EMERGING GOVERNANCE OF ADAPTATION TO CLIMATE CHANGE

Over the past decade, adaptation to climate change has been added to the climate policy agenda around the world (Adger et al. 2007; Ford and Berrang-Ford 2011; Klein and Smith 2003; Massey and Huitema 2013). Governments in many countries have developed national and sub-national adaptation strategies with the aim to integrate or mainstream climate change adaptation into a range of sectors in coordinated ways (Bauer et al. 2012; Biesbroek et al. 2010; Burton 2011; Wolf 2011). Comprehensive multi-sectoral adaptation strategies (usually referred to as national adaptation strategies or NAS) have emerged as the preferred governance approach across the OECD (Bauer et al. 2012; Biesbroek et al. 2010; Swart et al. 2009; Termeer et al. 2012). The German Adaptation Strategy is a prominent example for this "standard approach". It addresses 14 sectors with national key issues and measures, and it provides orientation for provincial as well as local policy-makers and non-state actors. Against this trend, the Netherlands focuses its adaptation governance mainly on a sectoral approach: the Dutch Delta Programme. It facilitates analysis and strategy development for long-term water management along current implementation programmes at a national scale with strong regional orientation. Although the Delta Programme is often regarded as a functional equivalent to a NAS or national adaptation action plan (Climate-Adapt 2014; OECD 2013, 181), it is a sectoral programme that puts strong emphasis on mainstreaming climate change adaptation into water as well as coastal zone management, and adjunct issues such as spatial planning.

The present paper compares the German NAS approach with the Dutch Delta Programme as dissimilar approaches of governing adaptation to climate change, here also referred to as adaptation governance. Although this seems to be a "comparison of apples and oranges" (Dupuis and Biesbroek 2013), we regard it as meaningful because the dissimilar objects of comparison (multi-sectoral versus sectoral governance approaches) share a similar aim: to mainstream climate change adaptation, i.e. to integrate adaptation into one (Dutch approach) or more (German approach) other policy fields that are usually not concerned with climate issues. Comparing them in an exploratory way (Levy 2008) allows us to answer the following research questions: How and to what degree do the two dissimilar governance approaches mainstream adaptation concerns into Dutch and German regional water and coastal zone management? What are their key strengths and weaknesses?

Water management is well suited for the analysis of mainstreaming adaptation because it is among the most relevant themes of the emerging adaptation policy field in at least three respects (European Environment Agency 2012; OECD 2013). First, more extreme weather events are expected to result in higher risks for floods in inland waters in many areas across Europe. Second, sea-level rise and the related risk of storm surges question the adequacy of coastal protection infrastructures and measures in many coastal states. Third, an increased seasonal risk of droughts and water scarcity is expected for many areas across Europe. Hence climate change "creates a wide range of adaptation needs for water resources management, flood control and coastal protection" in Germany (The Federal Government 2008, 20), and even more so in the Netherlands (V&W et al. 2010).

Around 60% of the Netherlands is vulnerable to flooding either from the sea or from the rivers Rhine, Scheldt, Maas and Ems and respective disruptions in freshwater supply (IenM and EZ 2012, 14). After a major flood disaster in 1953, the Dutch government has invested significantly in flood protection infrastructures in subsequent years. However, after near-floods in 1993 and 1995 it was again questionable whether traditional technical interventions (such as dikes and pumping water out of polders) could counter the effects of a rising sea level in the long run (de Vries 2006; Voogd 2006; Wiering and Immink 2006). Thus, the Dutch government started to reassess the status quo (van der Brugge et al. 2005) and launched the Delta Programme in 2010 (V&W et al. 2010).

Due to its geography, adaptation in German water management is more diverse than in the Netherlands. While river flooding is a main concern in Southern and Eastern Germany, rising sea levels, storm surges and freshwater supply are main adaptation concerns in the coastal areas of Northern Germany (The Federal Government 2008). The diverse challenges of mainstreaming adaptation into German water management are addressed in a multi-sectoral national adaptation strategy adopted in 2008 and in numerous provincial adaptation strategies.

To better address the strong regional (or even local) connotations of climate change adaptation (Amundsen et al. 2010), we focus both case studies on highly active regions that face comparable climate change impacts. The Dutch case study focuses on the Rhine-Estuary-Drechtsteden region. It is one of the nine sub programmes of the Delta Programme that features a very high level of adaptation activities by provincial and municipal actors. The city of Rotterdam, for example, has already developed its adaptation strategy and is considered not only as a Dutch but also a worldwide frontrunner (Dircke et al. 2012). In Germany, we explore adaptation mainstreaming into water and coastal zone management in Lower Saxony, a region at the North Sea coast for which the climate change impacts are similar to those in the Dutch Rhine-Estuary-Drechtsteden region.

The two case studies are mainly based on key policy documents and 16 semi-structured interviews. Key documents for the Dutch case include the three annual Dutch Delta Programmes adopted between 2011 and 2013 as well as related documents (see IenM and EZ 2011b; IenM and EZ 2012; V&W et al. 2010). Key documents for the German case are the National Adaptation Strategy (The Federal Government 2008), its Action Plan (Die Bundesregierung 2011), the regional climate change strategy of Lower Saxony (Regierungskommission Klimaschutz 2012) and recommendations for a regional adaptation strategy (Niedersächsisches Ministerium für Umwelt Energie und Klimaschutz 2013a). For the Dutch case, we interviewed representatives of the two ministries involved in the Delta Programme, the director of the Rhine-Estuary-Drechtsteden sub-programme and municipal as well as non-governmental actors involved in it. For the German case, we interviewed representatives of the Ministry of Environment and the Environment Agency (responsible for the NAS and its Action Plan), representatives of the Environment and Agricultural Ministries of Lower Saxony, and water sector representatives. Interviews with ministerial representatives and the director of the Rhine-Estuary-Drechtsteden sub-programme focused on the origins, governing structures, activities and (expected) outcomes of the respective governance approaches. Interviews with sectoral, municipal and non-state actors focused on their motivations, activities and benefits of being involved in adaptation governance.

The paper proceeds as follows. Section 2 introduces adaptation mainstreaming in more detail. Based on the heuristic frame developed here, sections 3 and 4 describe and analyse the main national and sub-national adaptation governance approaches and their relevance for water management in the two case study regions. Section 5 provides a concluding comparison of the two cases and discusses the pros and cons of multi-sectoral versus sectoral approaches of mainstreaming climate change adaptation.

2 MAINSTREAMING CLIMATE CHANGE ADAPTATION

Integrating or mainstreaming climate change adaptation into sectors usually not concerned with climate issues is now high on the agendas of governments because a variety of climate change impacts are expected for various sectors. Building on the concept of Environmental Policy Integration/EPI (Jordan and Lenschow 2010), the notion of Climate Policy Integration (CPI) or climate mainstreaming (here regarded as synonymous) can be differentiated into a conceptual, a process- and an output/outcome-oriented dimension (Adelle and Russel 2013). Conceptually, EPI and CPI postulate the integration of climate change horizontally across a variety of sector policies (Burton et al. 2006; European Commission 2007; Yohe et al. 2007), but also vertically across various levels of government (Gupta 2007; Gupta et al. 2007; Yohe et al. 2007). With regard to processes, climate mainstreaming is concerned with actors, institutions and governance mechanisms relevant for coordinating policies. The ultimate purpose of adaptation

mainstreaming is, however, to deliver the outcome of enhanced resilience in all sectors affected by climate change, among them, water and coastal zone management, spatial planning, and public infrastructure (Burton et al. 2006; European Commission 2007; Huntjens et al. 2010; Yohe et al. 2007).

Since it is still too early to assess whether adaptation mainstreaming has actually enhanced sectoral resilience towards climate change, Brouwer et al. (2013) suggest assessing mainstreaming outputs (such as policy documents, programmes and projects) not based on their impacts but by using the criteria of inclusion, consistency and weighting. Inclusion refers to the extent climate policy objectives and/or impacts have been considered in sectoral policies, and its scores range from impacts ignored to extensively considered. Consistency refers to the degree contradictions between adaptation and sectoral policy goals have been identified and addressed, and its scores range from "contradictions ignored" to "no contradictions found/adaptation as integral part of the agenda". Finally, weighting refers to the relative importance of climate change adaptation, and its scores range from "priorities not decided" to adaptation "takes precedence" (Brouwer et al. 2013, 136). We will conclude the case studies with a qualitative assessment based on these three criteria.

Although many adaptation measures are in the self-interest of particular sectors, mainstreaming can nevertheless be challenging, in particular when it requires changes in long-established structures, routines or practices, or when it requires anticipatory action to often uncertain future impacts (Hallegatte et al. 2011; Smit et al. 2000). Anticipatory adaptation is particularly important (and difficult) in sectors characterised by long-term investments (such as public infrastructure in general and flood protection in particular) because reactive adaptation can be very costly.

Adaptation pressures and responses cut not only horizontally across sectors but also vertically across different governmental layers, from the international via the national to the provincial and local levels of policy-making (Klein et al. 2007, 747). Since adaptation policies at these levels are not always coordinated well, the climate change literature speaks of 'cross-scale interdependencies' that are not matched with adequate 'cross-scale linkages' (Adger et al. 2005, 79f). Establishing these vertical linkages between levels of government is another key aspect of adaptation mainstreaming, in particular in water management (Daniell et al. 2011). While most countries have similar horizontal (or sectoral) divisions of labour, vertical arrangements are very much country-specific. Germany, for example, is a federal state in which the provinces (in German referred to as 'Laender') have significant responsibilities in water management, whereas the Netherlands is a centralized state with significant responsibilities for decentralized water boards.

Integrated, multi-sectoral strategies represent the most common approach governments employ to address mainstreaming challenges in complex policy fields such as sustainable development, climate change mitigation and adaptation (Bauer et al. 2012; Biesbroek et al. 2010; Burton 2011; Casado-Asensio and Steurer 2013; Rayner and Howlett 2009; Wolf 2011). While integrated strategies on sustainable development have been in decline since the late 2000s (Casado-Asensio and Steurer 2013; Steurer and Berger 2011), those on adaptation have mushroomed rather recently. Since the European Commission (2013a, 6) encourages "all Member States to adopt comprehensive adaptation strategies" (European Commission 2013b), their diffusion and implementation is likely to continue, at least throughout this decade. Comprehensive adaptation strategies represent policy documents, governance processes and capacity building efforts that aim to align different sectoral policies at various levels of government towards common goals so that they "support rather than undermine one another in the pursuit of those goals" (Rayner and Howlett 2009). Integrated strategies state key principles and policy objectives and they provide details on measures and policy instruments, either in the strategies themselves or in follow-up documents such as action plans. While sectoral strategies (for instance on poverty reduction, employment or forestry) can (and should) consider other sector goals and policies that lie beyond their immediate concern, integrated strategies have by definition a cross-sectoral character (Casado-Asensio and Steurer 2013). The Dutch Delta Programme does not meet these criteria and therefore represents an alternative rather than an equivalent to comprehensive adaptation strategies as applied in Germany. In the following

sections we compare how the two dissimilar governance approaches performed in mainstreaming climate change adaptation into water management at different levels of government.

3 ADAPTATION STRATEGIES AND WATER MANAGEMENT IN GERMANY

3.1 Federal adaptation governance and policies

In Germany, the National Adaptation Strategy (NAS) adopted in 2008 and its Action Plan adopted in 2011 are the main governance approaches for mainstreaming climate change adaptation at the federal level. The German NAS was formulated by an informal group of representatives from all Federal Ministries in consultation with Laender representatives from 2006 onwards. The process was led by the Environment Ministry (Department for water management, waste management and soil protection) and supported by KomPASS, a unit of the German Federal Environment Agency (UBA) that serves as a "Competence Centre on Climate Impacts and Adaptation" (Stecker et al. 2012). The key objective of the German NAS is "to reduce vulnerability to the consequences of climate change, to maintain or improve the adaptability of natural, social and economic systems, and to take advantage of any opportunities" (The Federal Government 2008, 5). For this purpose, the NAS states more specific adaptation goals, the state of knowledge on expected climate change impacts in 14 areas of action (including water management, flood and coastal protection), an overview of the international context and Germany's contribution to adaptation in other parts of the world (The Federal Government 2008).

The Action Plan from 2011 further substantiates the NAS with adaptation options. To advance horizontal mainstreaming, the informal group that formulated the NAS was institutionalized as an inter-ministerial working group in May 2009. A year later, vertical adaptation mainstreaming was institutionalized through a coordinating adaptation committee within the working group "Climate, Energy, Mobility and Sustainability" (BLAG KliNA) of the Conference of Environmental Ministers that joins federal and provincial politicians (Stecker et al. 2012, 197). The Environment Ministry formulated the Action Plan together with these formalised institutions, and it consulted non-state stakeholders via sectoral dialogues, status conferences and various consultations (Stecker et al. 2012, 198). Nevertheless, the adaptation options outlined in the Plan are mainly in the competence of the federal government (Die Bundesregierung 2011, 4). They are mainly concerned with building capacities for adaptation via research, communication and networking, setting legal, technical and funding frameworks and standards for adaptation across the country, and with international and EU responsibilities (Die Bundesregierung 2011). Regular evaluations and updates of the Action Plan on the basis of the latest scientific findings are foreseen, for the first time in late 2014 (Die Bundesregierung 2011, 7).

3.2 Adaptation governance and policies in Lower Saxony

Since the NAS and the Action Plan focus on federal responsibilities, the German Laender have initiated their own adaptation strategies, although with noticeable differences regarding status (formal versus informal), sectoral scope (narrow versus broad) and progress made so far (Die Bundesregierung 2011, 61). According to our interviewees, the formulation of the strategy in Lower Saxony was unique because it involved state and non-state actors from various sectors on a broad scale. For this purpose, the Lower Saxon government established a climate change commission that included representatives from business associations, businesses, labour unions, science, environmental NGOs, churches, municipal associations, and the provincial administration. One of the four working groups (led by the Ministry for Food, Agriculture and Consumer Protection) was tasked to assess the regional impacts of climate change and to identify

provincial adaptation measures. The work was divided into eight thematic sub-groups that met frequently over two years. One of the sub-groups was concerned with flood protection, in particular technical flood prevention, the management of flooded areas and after care. The sub-groups first assessed the climate change impacts for Lower Saxony (Regierungskommission Klimaschutz 2012, 12) and then developed goals and recommendations for future adaptation policies. The latter were discussed and decided on by the entire commission in a consensus vote. Overall, the commission elaborated around 600 adaptation measures that concern not only the provincial administration but also municipalities and private actors (Regierungskommission Klimaschutz 2012). The commission submitted its recommendations to the Lower Saxon government in July 2012. In January 2013, the provincial government adopted its climate strategy. With regard to adaptation, it includes most measures recommended by the commission (Niedersächsisches Ministerium für Umwelt Energie und Klimaschutz 2013b). To facilitate the implementation of the provincial adaptation strategy, the participatory process of the commission will be continued and an inter-ministerial working group will be established. However, no additional budget is foreseen to implement the strategy.

3.3 How mainstreaming adaptation works in German water management

How exactly do the federal and provincial adaptation strategies aim to mainstream adaptation into the water sector, and with what effects? Both adaptation strategies are comprehensive multi-sectoral strategies that frame adaptation as a mainstreaming task for a variety of sectors, including water management. In the German NAS, “water regime, water management, coastal and marine protection” is one sectoral chapter among 14. As the other chapters, it explores “impacts on nature and society” as well as “action options”, such as “adapting the infrastructure”, “efficient use of water”, and “support of individual precautions in the flood control sector” (The Federal Government 2008). In the action plan, water management is not a separate chapter but respective actions are prominently mentioned throughout the document (in the section capacity building, the action plan mentions, for example, a research programme on climate change impacts for waterways and navigation). In addition, the action plan mentions a few activities undertaken by the German Federal Government in cooperation with the Laender (such as contributions to rural development programmes) (Die Bundesregierung 2011). In contrast to federal adaptation policies, water management is the key theme in the Lower Saxon adaptation strategy: 309 of the 600 measures are concerned with water management, and another 19 measures are concerned with coastal protection. Almost half of these measures lie within the responsibilities of Lower Saxony (mainly the Environment Ministry), about a third concerns municipalities, and the rest semi-public operators (such as water works and dike associations), businesses, counties and citizens. Major concerns within water management are flood protection (100 measures), management of low tide and water ecology (84 measures), ground water protection (73 measures), and sanitary water management (51 measures).

The procedural aspects of adaptation mainstreaming in German water management can be summarised as follows. Horizontal coordination between all federal ministries was assigned to the inter-ministerial working group. While the water sector was very open-minded towards adaptation and took the lead in formulating and implementing the German NAS (Stecker et al. 2012), other sectors (such as health, energy or nature protection) were more hesitant, as an interviewee reported. The same applies to Lower Saxony’s adaptation working group in the climate change commission: while experts on water management were among the most interested ones, some other sectors (in particular industry and tourism) were difficult to engage with. Regarding vertical mainstreaming across different levels of government, the federal and provincial strategy processes are formally independent from each other, and the linkages between them are weak. Laender representatives are involved in the national adaptation process through existing and newly established committees (such as the Conferences of Environment Ministers). An interviewee explains that early exchanges mainly aimed to raise awareness for adaptation among provincial actors because most of them were less familiar with the new challenge than federal ones. After the formulation of the federal strategy and its action plan, the collaboration shifted towards the development of a common

monitoring system (aiming to strengthen vertical coordination via reporting and benchmarking), and the coordination of research activities, knowledge exchange and funding programmes for adaptation (Die Bundesregierung 2011, 45).

While provincial experts are involved in the national adaptation process, national representatives are not involved in the adaptation process of Lower Saxony. In line with one of the key purposes of the NAS (Die Bundesregierung 2011, 7), interviewees in Lower Saxony reported that the federal strategy provided crude orientation when they began to formulate their own adaptation strategy. Later on, however, it proved to be of little use, and for some even disappointing. Provincial actors also hardly resort to federal experts when they need assistance in advancing adaptation. Asked about the usefulness of KomPASS, the central information platform on adaptation at the national level, provincial representatives said that it is not important for their work because it is too "far away", "too academic", or even "biased towards wrong options". Overall, however, interviewees described the collaboration between federal and Laender representatives as open and non-hierarchical.

County and municipal representatives are targeted by federal and provincial activities independently from each other, except for a few joint initiatives. Federal actors aim to raise awareness for adaptation in municipalities, for instance through conferences organized by KomPASS. In Lower Saxony, counties, municipalities and their associations were involved in the working group that prepared the provincial adaptation strategy because they play important roles in regional and spatial planning, water supply, and flood protection. Consequently, around 130 of the 300 measures for water management listed in the provincial adaptation strategy mention counties or municipalities as key actors (Niedersächsisches Ministerium für Umwelt Energie und Klimaschutz 2013a). However, since the Lower Saxon government cannot enforce county or municipal implementation, the relevance of its adaptation strategy for these levels of government resembles the fate of the NAS: it provides orientation at best. Although water management features prominently in both federal and provincial adaptation strategies (see above), a closer look suggests that most measures have a short- to medium-term time-horizon and hardly go beyond the state-of-the-art in water management. The only long-term measures that aim to address climate change not in reactive but in anticipatory ways are concerned with research. While interviewees acknowledged the need for long-term adaptation, they were confident that short-term impacts of climate change are managed adequately by current policies. Several interviewees emphasised that in Lower Saxony, dikes are built already higher and can be reinforced in the future. In this vein, an interviewee warned against dramatization and radical changes in water and coastal zone management: "In water management we do not have to put aside everything we did up to now and do something completely new, but it [climate change] is one factor that counts into it". Since mainstreaming adaptation in provincial water policies is regarded as a continuation of existing management practices and risk strategies (plus new research efforts), we conclude that advanced levels of mainstreaming are not reached yet: while the inclusion and consistency of short- and medium-term adaptation in water management tends to be well under way, long-term concerns are still marginalised. Regarding weighting, adaptation considerations are taken on board when they overlap with traditional approaches of water management but they usually do not take precedence, certainly not in long-term perspectives.

4 THE DELTA PROGRAMME IN THE NETHERLANDS

Like most countries, the Netherlands started to organize its national adaptation efforts around a NAS ("Make space for climate") in 2007 (VROM 2007). The strategy was a rather vague policy document that was supposed to be operationalized in a National Adaptation Agenda later on (Swart et al. 2009, 233). However, this never happened. Instead, a politically highly salient approach emerged: the Delta Programme, a large-scale water management programme named after a similarly large programme from the 1950s.

4.1 The Delta Programme as a sectoral approach of adaptation mainstreaming

In 2007, the Dutch government appointed the Delta Committee (an independent Committee of the State) to advice on flood protection and flood risk management in the Netherlands in the next century. In September 2008, the Delta Committee recommended to legislate a Delta Act that establishes a Delta Programme, a Delta Programme Commissioner and a Delta Fund. The Delta Commissioner and the Delta Programme were established in 2010 even before the Delta Act came into effect on 1 January 2012. The Delta Fund that finances the Delta Programme was established in 2013 under the responsibility of the Ministry of Infrastructure and the Environment. Until 2020, resources of the Infrafonds earmarked for water safety and freshwater supply are transferred to the Delta Fund. From 2020 onwards, the Delta Fund will be fed "with a minimum of € 1 billion a year in order to ensure momentum in the implementation of the Delta Programme" (Government of the Netherlands 2014).

The Delta Programme is a collaborative programme of the Dutch government, the provinces, water boards and municipalities. It is organized in nine individual sub-programmes: three nation-wide (i.e. Safety, Freshwater, New Urban Developments and Restructuring) and six regional ones (Rhine Estuary-Drechtsteden, South-Western Delta, IJsselmeer Region, Rivers, Coast and Wadden Region), either in the responsibility of the Ministry of Infrastructure and the Environment (IenM) or the Ministry of Economic Affairs, Agriculture and Innovation (EZ). The regional sub-programmes are not identical with the provincial jurisdictions but framed around themes and challenges. Apart from public authorities the sup-programmes also involve scientists, business associations and civil society organizations (V&W et al. 2010).

The aim of the Delta Programme is to develop and implement policies that protect the Netherlands against flooding from rivers and the sea, and to ensure a sufficient freshwater supply (V&W et al. 2010). The Delta Programme consists of two parts: implementation programmes for current safety and freshwater supply, and the development of long-term strategies addressing future climate change impacts. The implementation programmes existed already beforehand and concern for example dikes, other measures of coastal defence, and riverbed renaturation. Up to now, the long-term dimension of the Delta Programme is mainly concerned with analyses and options on how to respond to expected climate change impacts (IenM and EZ 2011a, 3; V&W et al. 2010). Here, the Delta Programme follows a sequential process that proceeds from an initial problem analysis (2011) to the development of possible (2012) and the identification of preferential strategies (2013) that should lead to proposals for five key "Delta Decisions" in 2015 on the following issues: (1) updating safety standards for primary flood defence systems (i.e. dikes); (2) a freshwater strategy that should guarantee long-term water supply in the Netherlands; (3) long-term water level management of the IJsselmeer; (4) protection of the Rhine-Meuse Delta, and (5) a national policy framework for spatial development (V&W et al. 2010, 5).

The Delta Commissioner is responsible for implementing and monitoring the Delta Programme, and is supported by several governing and consultation bodies. At the national level, the Ministerial Steering Group and the National Water Consultation Committee (NBO) oversee and fine-tune the programme (IenM and EZ 2011a, 51). The National steering group advices the Delta Commissioner and agrees on annual programmes and the Delta Decisions. The directors of the sub-programmes meet once a week to discuss progress and coordinate their activities (IenM and EZ 2011a, 51). The Delta Programme is presented to and adopted by the Parliament annually (IenM and EZ 2011a). Likewise, the Delta Decisions will be presented to and decided by the Dutch Cabinet and Parliament. Their decisions will be embedded in the next National Water Plan that will govern flood risk management and freshwater supply after 2015 (IenM and EZ 2012).

The Rhine Estuary-Drechtsteden (RED) sub-programme we selected for a closer analysis of adaptation mainstreaming is in the responsibility of the Ministry of Infrastructure and the Environment. Its main task is to develop "a longer-term strategy for flood risk management and freshwater supplies in a synergetic relationship with a sustainable and vital spatial development of the Rhine Estuary-Drechtsteden region"

(IenM and EZ 2011a, 37). The RED sub-programme involves national authorities (i.e. the IenM and the EZ), important water management organisations such as Rijkswaterstraat (the executive arm of the IenM and responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands) and water boards (i.e. decentralized government authorities responsible for local and regional water management, operationally independent and supervised by the provinces (Lazaroms and Poos 2004, 137)), provincial (South Holland) as well as municipal authorities (Rotterdam and Dordrecht), and a few private sector representatives, notably the port of Rotterdam. In addition, the RED collaborates with scientific organisations and societal stakeholders such as business associations, social and environmental NGOs (IenM and EZ 2011a, 37). The RED steering group is chaired by the mayor of Rotterdam and also involves national government representatives. Working teams (for instance on spatial development, knowledge, problem analysis and participation) prepare decisions to be taken in the steering group (IenM and EZ 2011a, 37).

4.2 How mainstreaming adaptation works in the Delta Programme

As Verduijn et al. (2012) emphasise, the fact that the Delta Programme focuses explicitly on long-term climate change impacts is a remarkable contrast to its predecessor from the 1950s, and to smaller programmes since then. While the historic Delta Programme was a reactive policy response to a dramatic storm surge in 1953 that killed 1835 people, the new Delta Programme is not a response to actual events but it aims to anticipate future climate change impacts relevant for Dutch flood protection and freshwater supply. Consequently, it framed its existence mainly around a long-term "climate adaptation narrative". As Verduijn et al. (2012) illustrate with numerous quotes, the key message of the Programme was and is as follows: "The Netherlands delta is safe, but preserving this safety over the long term involves action now" (the Deltacommissie, quoted in Verduijn et al. 2012, 474). Likewise, a representative of the Delta Programme stated:

"It is the first time in the Netherlands that we make such a long-term plan before something happens. For instance in 1995 there was almost flooding in the Netherlands and then the government said 'yeah we have to make a plan' and then there was action and they made a large plan for the rivers in a short period of time. Now they have said, we have to think now about the future and we have some time to do that but take this time and think about this in a good way. For the Netherlands it is something new".

Yet, how is this new mainstreaming approach delivered procedurally, in particular with regard to time-frames, the mainstreaming of adaptation policies horizontally across sectors and vertically across levels of government? Regarding time-frames, it is to note that adaptation mainstreaming occurs mainly through the long-term analysis and strategy development of the Delta Programme. Its short-term implementation programmes that are concerned with current flooding threats and freshwater supply hardly address adaptation. However, since the Delta Commissioner oversees and other experts work on both, short- and long-term programmes, they can strengthen linkages between them when deemed necessary. However, long-term adaptation decisions have not been taken yet: they are under preparation and expected for 2015 ("Delta Decisions").

Regarding horizontal mainstreaming, the Delta Programme represents a sectoral governance approach that considers climate change impacts extensively, and that sees no contradictions but mostly synergies between water management and adaptation. Since the adaptation framing of the Delta Programme was a prerequisite for political commitment and funding pledges, mainstreaming was easily triggered from within the sector. According to Brouwer et al. (2013), this represents advanced adaptation mainstreaming. Yet, what about mainstreaming into other sectors affected by climate change? The Delta Programme strives for a better integration of long-term water management and spatial planning. According to one interviewee, this cross-sectoral linkage is another new aspect of Dutch water management. Accordingly, the RED sub-programme includes representatives from the spatial department of the Ministry of Infrastructure and Environment, in particular in one of its working team clusters that explicitly addresses spatial development.

However, some interviewees criticized that addressing spatial planning in a separate cluster with limited exchange to other issues leaves room for improvement. Apart from the integration of spatial aspects, the Delta Programme also strives for coordinating adaptation in water management with economic and nature protection concerns. The Ministry of Economic Affairs, Agriculture and Innovation leads two sub-programmes (the Wadden and the South-West Delta) and participates in other sub-programmes such as the RED.

Regarding vertical mainstreaming, the Delta Programme is a national effort that involves sub-national authorities with relevant responsibilities. Among them are, for example, the provincial and municipal representatives with responsibilities in spatial planning and housing regulations (both potentially affected by the Delta Decisions on dikes), and water boards responsible for (regional) water management in general, and for the co-financing, management and maintenance of coastal dunes and dikes in particular. The different levels of public authority convene in various governing bodies of the Delta Programme as such, and in the six regional sub-programmes. As several interviewees emphasised, the continuous cooperation of national, provincial and local actors throughout the programme, in particular in the sub-programmes, is another new aspect of Dutch water governance. According to a representative of the RED sub-programme, before the Delta Programme

“The national government made policy plans and […] in a rather late stadium when the project was already […] rather clear on the national level […] they talked to the cities. But now, we started together at the beginning, and that was also the focus of the national government to do that, but it is also more difficult. Now you have to learn from each other, how do they think, what they want. We have to find each other in this process and that's working positive for all parties”.

Several interviewees regarded vertical coordination as crucial for the success of the Delta Programme, not only because sub-national authorities have relevant responsibilities but also because some of them (in particular large cities) have acquired important local expertise. According to an interviewee, the RED sub-programme benefitted from adaptation experiences in the cities of Rotterdam and Dordrecht (both cities had formulated their adaptation strategies and implemented a range of adaptation projects before the launch of the Delta Programme). Although local and regional policies are hardly linked to or influenced by the Delta Programme and, vice versa, most decisions in the latter will be taken by national actors, our regional and local interviewees had the impression that national authorities take their expertise seriously. Nevertheless, some interviewees noted critically that municipalities with less experience on adaptation are not directly involved in the RED sub-programme, which could hamper its implementation.

5 CONCLUDING COMPARISON AND DISCUSSION

Water management and coastal protection are policy areas with long-established institutions and rich experiences in the Netherlands and Northern Germany. With regard to mainstreaming the relatively new concern of climate change adaptation into these traditional policy areas, the two countries pursue markedly different approaches: As endorsed by the European Commission (2013a, 6), Germany follows the common approach of comprehensive, multi-sectoral adaptation strategies at the federal level and in the Laender. Although the federal and provincial strategies are meant to complement each other, the linkages between them are weak. Despite the fact that the water sector plays a leading role in mainstreaming adaptation in Germany, its representatives regard continuity or “business as usual” as an adequate response to climate change in the short- to medium term, and they tend to pay relatively little attention to long-term challenges and strategies so far. In contrast, the Netherlands focuses its adaptation agenda on a large-scale national programme with a long-term sectoral orientation that takes relevant cross-sectoral aspects into account and has strong regional connotations. The Delta Programme is not comparable with its predecessor from the 1950s because it is expected to turn Dutch water management from a reactive top-down to an anticipatory and more interactive governance approach with a long-term perspective up to 2100.

The main strengths and weaknesses of the two adaptation governance approaches come to the fore in the following five differences. First, the Delta Programme and the German strategies differ in their political status. The Delta Programme has a statutory role given through the Delta Act whereas the German NAS and action plan as well as the adaptation strategies of the Laender are non-binding strategy papers adopted by governments but not by parliaments. Second, the stronger political backing of adaptation in water management in the Netherlands is also reflected in the fact that the Netherlands has already dedicated a considerable budget for the implementation of adaptation measures from 2020 onwards. In contrast, no additional budget has been allocated to adaptation strategies and most measures in Germany so far. Consequently, adaptation measures in Germany often represent ”business as usual” rather than significant policy changes. This leads us to the relevance of long-term perspectives as a third key difference. While the Dutch Delta Programme stands out with its approach to develop and decide on long-term strategies, the German strategies focus rather on short- and medium-term (often existing) approaches and measures. Fourth, while the Delta Programme is primarily concerned with water safety and management and, with the exception of spatial planning, ignores other sectors that may be affected by climate change (the Dutch court of auditors criticized this as a weakness, see EUROSAI-WGEA 2012, 55), the German adaptation strategies aim to mainstream adaptation in a broad range of sectors. However, a comprehensive strategy does not necessarily imply better cross-sectoral coordination, in particular when adaptation strategies are structured sectorally, or when they are not implemented properly (see our conclusions below). Fifth, with regard to vertical coordination, the Dutch Delta Programme has a strong top-down character that pays close attention to regional actors and particularities. In Germany, the national government serves as a facilitator that sets the general frame for action, and lower levels develop their own adaptation strategies with weak linkages to federal ones. Since this difference reflects the fact that the Netherlands is a unitary and Germany a federal country, both approaches have potential strengths in their respective political context.

Although the governance approaches analysed here are very different, four similarities stand out. First, water management is a key issue of adaptation in both countries. The existence of the Delta Programme signifies that long-term adaptation concerns are not only fully integrated in Dutch water management: they are the very reason for why the Delta Programme came into being. Although the German water sector does not have its own adaptation strategy or programme, respective actors and/or issues play a key role in both national and regional adaptation efforts, at least in the short- and medium-term. Second, vertical coordination in both countries is dominated by national actors and their strategies or programmes. Obviously, the often-emphasised subsidiarity of adaptation is still overshadowed by some kind of top-down leadership (see also Urwin and Jordan 2008). Third, while water managers in Germany and the Netherlands put different emphasis on long-term policy changes, they both emphasize continuity in the short and medium term: current infrastructures and risk management approaches are regarded as adequate to deal with current or near-future climate change impacts. Fourth, adaptation measures already implemented in the two countries concern predominantly research and analysis. This is reflected in the multi-annual process of long-term analysis and strategy development in the Netherlands, and the many research activities foreseen in the German strategies.

The discussion of similarities and differences demonstrates that each approach has its strengths and weaknesses. The Dutch sectoral approach is well suited to advance adaptation in a particular sector. Priorities are clear, political commitment, institutionalisation and sectoral ownership are strong, and additional resources (financial as well as personnel) are budgeted. However, the downside of a sectorally focused approach is that adaptation challenges in other sectors are potentially overlooked. In contrast, the conventional approach employed in Germany addresses adaptation comprehensively with multi-sectoral strategies, but their long-term perspective is not as explicit and resources not as abundant as in the Dutch Delta Programme.

In how far are our findings generalizable for other countries and sectors, and what conclusions can we deduce from them? While the strengths and weaknesses of the German standard approach are typical for comprehensive multi-sectoral strategies across Europe (see below), the findings for the uncommon Dutch

approach are most relevant for countries and sectors where similar vulnerabilities are at stake (see section 1), and where a sector is open to adaptation (for success factors of adaptation in flood protection, see also Brouwer et al. 2013). Since the Delta Programme institutionalised adaptation from within the water sector, the question unanswered here is how sectoral approaches of adaptation mainstreaming perform when they are demanded from the outside (e.g. from adaptation units).

With this limitation in mind, we draw two conclusions for the future of adaptation governance: First, the respective weaknesses of the two governance approaches can be alleviated by treating them not as alternatives to be found in different countries, but as complementary approaches in the same country. This complementarity is under way in the Netherlands: here, the national government seems to cave in to European (peer) pressure by updating its NAS. In combination, comprehensive adaptation strategies could mark one of the first steps in adaptation policy-making that raises awareness and builds capacities for adaptation, in particular in sectors that are not already aware of likely climate change impacts and the need to respond proactively. As soon as sectoral actors recognise their self-interest in adaptation, they could proceed with sectoral programmes that set clear sectoral priorities, clarify responsibilities, and demonstrate (or help to develop) sectoral ownership. While a sectoral approach as the one applied in the Netherlands can be helpful in creating and maintaining sectoral momentum for adaptation (Verduijn et al. 2012), co-opting sectoral efforts under integrated strategies can be counterproductive in this regard (Nordbeck and Steurer forthcoming).

Second, since it is too early to assess the effectiveness of adaptation in improving resilience towards climate change, we cannot conclude that the one approach is superior to the other. What we can conclude, however, is that the Dutch approach represents a credible alternative or supplement to the “one-size-fits-all” standard approach of adaptation mainstreaming via comprehensive, multi-sectoral strategies for at least two reasons. On the one hand, adaptation through sectoral approaches is feasible because respective measures are usually in the best interest of the sectors affected by climate change. Here, climate change adaptation contrasts sharply with mitigation where sectoral self-interest exists only in relatively rare win-win constellations (e.g. improving energy security by substituting fossil fuels with renewable energy sources). On the other hand, a sectoral adaptation programme appears even more promising when we take the poor performance of other, long-established and similarly comprehensive multi-sectoral strategies into account. As numerous assessments of sustainable development and climate change mitigation strategies across Europe suggest, the shortcomings of the German NAS are not country-specific but globally symptomatic for this type of instrument. As Casado-Asensio and Steurer (2013, 23) conclude, comprehensive, multi-sectoral strategies “are usually not capable of implementing the policies necessary to meet the targets they specify” because once adopted they decay into “comparatively weak administrative routines (or informational policy instruments), preoccupied with low-key communication rather than high-profile policy coordination”. As first signs from across Europe (although not explicitly from Germany) suggest, adaptation strategies run the risk of perpetuating this legacy (Casado-Asensio and Steurer 2013).

Irrespective of what approach is preferable and how they should be designed or linked with each other: The governance of climate change adaptation does not have to, and perhaps even should not follow a one-size-fits-all approach, in particular not since similarly comprehensive strategies have already failed to deliver in other contexts. Since adaptation policy-making is still in an infancy state, governance diversity is important for learning through experimentation, and ultimately for improving resilience. In this sense we conclude with Ostrom et al. (1999, 281) that “Protecting institutional diversity related to how diverse peoples cope with CPRs [Common-Pool Resources] may be as important for our long-run survival as the protection of biological diversity”, or as actual adaptation to climate change respectively.

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