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# Transboundary governance of climate adaptation

**Enabling and constraining characteristics for cross border cooperation  
on climate adaptation between the policy arrangements of the  
Netherlands and North Rhine-Westphalia, knowledge gaps and policy  
recommendations.**



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## 1. Introduction

This report summarizes the research outcomes of deliverable 5.2.2 of 'Kennis voor Klimaat' and provides recommendations for further research and climate adaptation policy across borders. More details, results and an encompassing theoretical background can be found in the document of deliverable 5.2.2: *'Understanding transboundary governance of climate adaptation: enabling and constraining characteristics of the policy arrangements of the Netherlands and North Rhine-Westphalia for cross border cooperation on climate adaptation'*.

### 1.1 Research background

Scholars state that climate change will affect river basins in a variety of ways. Periods of floods and droughts could be intense and frequent. Also changes in temperature and ecology are expected to happen (IPCC, 2007; Kabat and van Schaik, 2003). These and other effects of climate change do not respect man made borders, so adapting to climate change in itself is a transnational challenge. Climate adaptation exists of initiatives and measures for reducing the vulnerability of natural and human systems against actual or expected climate change effects (IPCC, 2007; Pachauri and Reisinger, 2007). Transboundary governance is of significant importance for dealing with issues that transcend governmental boundaries. The development and level of transboundary governance will be influenced by various enabling and constraining factors, which should be analyzed to understand and possibly improve cross border cooperation for climate adaptation.

### 1.2 Research approach

The research objective of deliverable 5.2.2 was to gain a better understanding of cross border cooperation on climate adaptation governance by identifying characteristics of policy arrangements that enable or constrain transboundary governance on climate adaptation in order to possibly improve cross border cooperation in the future. Those characteristics were identified by comparing the policy arrangement of North Rhine-Westphalia (henceforth: NRW) and the Netherlands in the Rhine catchment (figure one). We expect that a high level of similarities (congruence) (see Boonstra, 2004) between regions enables cross border cooperation, while dissimilarities will hinder transboundary governance. The Rhine catchment was specifically chosen as it is one of the most densely populated, industrialized and economically important regions in Europe and it is expected that climate change will have a significant impact on the entirety of this catchment (Becker et al., 2013; Bubeck et al., 2010; Dieperink, 1998; Kruse, 2008; Lindemann, 2008; Pfister et al., 2004; Philip et al., 2008). The region has a long history in dealing with upstream-downstream issues (Meijerink, 2008; Moss, 2004; Steenhuisen et al., 2007; Termeer et al., 2011; Wiering, 2010). And several authors are positive about the transboundary cooperation in the area (Dieperink, 1998; Becker et al., 2013; Krysanova et al., 2010; Lindemann, 2008).

### 1.3 State-of-the-art of transboundary governance

Key examples of cross border cooperation between the Netherlands and NRW are the International Commission on Protection of the Rhine (ICPR) (1963), the Borders Water Commission (1960), the Dutch-German working group on high water (1997) and various INTERREG and Euregio projects that exist at the national, regional and local level involving both private and public actors (Becker, 2009; Gilissen, 2009; te Linde et al., 2012; Lindemann, 2008; Lulofs and Coenen, 2007; Monstadt and Moss, 2008; Raadgever and Mostert, 2005; Steenhuisen et al., 2007). It is notable that most cross border activities and projects are focusing on flood protection and water management, while other climate adaptation issues are hardly addressed by transboundary governance between Germany and the Netherlands. This

research analyzes which factors influenced the development of cross border cooperation among the Netherlands and NRW.

### 1.4 Research method

By applying the Policy Arrangement Approach, a comparative case-study research was executed (figure one, green box). In this report, first an outline of both policy arrangements is described. After that, the outcomes of the case-study comparison are shown; the enabling and constraining policy arrangement characteristics. Next section describes the probable influence of EU governance and normative principles and this report will end with a concluding section and recommendations. Deliverable three (figure one, red box) will continue with this research by analyzing the impact of EU normative principles.

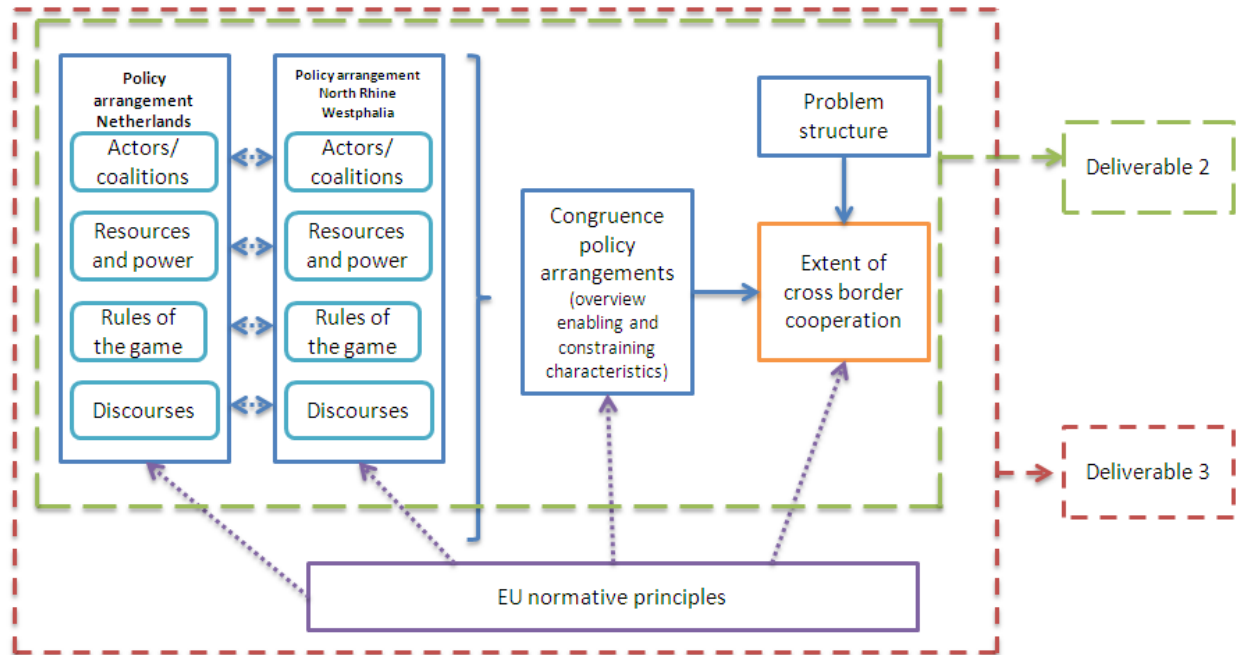


Figure 1: Conceptual model, based on Wiering et al. (2010)

## 2. Policy arrangement of the Netherlands

The Dutch policy arrangement can be characterized as unitary, functionally and decentralized with various (mainly public) actors participating in climate adaptation governance, although the water sector is strongly dominating Dutch climate adaptation policies (Havekes and van Rijswijk, 2010; Toonen, 1987). Key actors are the national water authority (*Rijkswaterstaat*) and water boards. To a lesser extent the national government (particularly the Ministry of Infrastructure and Environment), provinces and municipalities are also involved. The Netherlands has a long history managing water, however climate adaptation as such has been a relatively new concept to it. After 2004, the first policy documents on climate adaptation have been published, such as the national adaptation strategy (ARK programme) and the Delta Programme of the Second Delta Committee (Biesbroek et al., 2013; Veerman, 2008). In the Netherlands, the government is responsible for safety of inhabitants and various financial and knowledge resources are available to address climate adaptation and particularly water issues. For example the Ministry has its own budget and next to this comes the Delta funding. Important formal legislation in this field are the Delta Act and the Dutch Water Act (national water plan) (van der Grijp, Bergsma and Gupta, 2012). One of the defining characteristics as regards to Dutch water law and flood

protection is that protection standards are implemented in national law (Steenhuisen et al., 2007). Climate adaptation governance in the Netherlands is rather informal and horizontal and can be typified as a consensus-oriented style of policy making (van Waarden and Hildebrand, 2009). Key element in the Dutch policy arrangement is that climate adaptation has been primarily concerned with water safety, with all other interests, however important, coming second (Steenhuisen et al., 2007). At this moment, Dutch climate adaptation governance can be characterized by a 'Safe Delta' story line, with the older 'Room for the River' concept remaining to exist alongside. Over the last years there was a clear shift from a more ecological room for the river 'living with water' story line, via an integrated and encompassing 'climate proofing and accommodating' story line to a more focused and sector based 'safe delta' story line (van den Berg, 2013). Overall, climate adaptation and mitigation is exclusively framed with regard to the water sector. Significant principles in the Dutch policy arrangement are sovereignty and multi-layer safety (Boezeman et al., 2013; van den Brink et al., 2013; Meijerink and Dicke, 2008).

### **3. Policy arrangement of North Rhine-Westphalia**

The NRW policy arrangement is characterized as federal and decentralized with multiple actors, levels and especially sectors participating in climate adaptation governance. This leads to a fragmentation in knowledge and financial resources, programmes, strategies, power, rules et cetera. On the other hand, this also ensures an integrated approach of climate adaptation governance. Typical for Germany and NRW is the balancing of different interests, such as safety and ecology (Steenhuisen et al., 2006, 2007). However, also Germany is still struggling to include all sectors in an integrated approach (Hasse, 2013). Examples of important actors are the federal government with multiple ministries and supporting institutions, the State (Länder) government, administrative districts, municipalities, water authorities on multiple levels, dike associations et cetera. Overall, public actors play a central role in Germany's climate adaptation policies and a lot of responsibilities are with the local or regional authorities (Becker et al., 2007; van Duijn et al., 2009; Garrelts and Lange, 2011; Greiving, 2008; Hasse, 2013; Monstadt and Moss, 2008). NRW is unique as a State in Germany, as they have the Wassergenossenschaften (Hartmann, 2013). Also non-governmental actors are involved in climate adaptation governance, for instance the media did raise attention after flood events (Garrelts and Lange, 2011). The availability of knowledge and financial resources is generally adequate to address climate adaptation, yet especially financial resources are fragmented (Garrelts and Lange, 2011; Stecker et al., 2012). Knowledge generation is stimulated via several institutions and projects (Bowyer and bender, 2013; Huitema et al., 2012; van Liempt, 2009), yet is also diffused among different actors and organizations (Hasse, 2013). NRW and Germany have various formal rules of the game for each governmental level and sector, examples are the national adaptation strategy, a related action plan, flood control act and the adaptation strategy of NRW (Biesbroek et al., 2010; Bowyer and Bender, 2013; Garrelts and Lange, 2011; Greiving, 2008; Meister et al., 2009). Climate adaptation policies in NRW are hierarchical and formal (Lulofs and Coenen, 2007; Verwijmeren, 2007). Another characteristic of this policy arrangement is that citizens have an individual responsibility concerning flood management and climate adaptation, although they are supported by the government (Garrelts, 2013; Steenhuisen et al., 2006, 2009). More attention, priority and resources are provided to climate mitigation instead of adaptation (Bender et al., 2012; Bowyer and Bender, 2013; Huitema et al., 2012; Stecker et al., 2012). Besides that, floods are framed as natural phenomena that cannot be prevented, so policies should focus on damage reduction, mitigation and recovery (Rademakers, 2013; Steenhuisen et al., 2007). Important principles and concepts that are applied in the policy arrangement of NRW are the river basin management approach, 'Room for the River' and the precautionary-, subsidiarity-, federalism- and solidarity principle (Becker, 2009; Garrelts

and Lange, 2011; Hartmann, 2009; Johnson and Priest, 2008; Kruse, 2008; Monstadt and Moss, 2008; Mostert, 1998).

#### **4. Enabling and constraining characteristics of policy arrangements for transboundary governance on climate adaptation**

As described in the introduction, differences and similarities between the policy arrangements of NRW and the Netherlands are expected to hinder and stimulate cross border cooperation in climate adaptation. A comparison of both policy arrangements and the identification of the potentially enabling and constraining policy arrangement characteristics is summarized in table one and will be shortly addressed in this section. Both policy arrangements show various similarities and are reasonably likely minded countries. Similarities distinguished are the involvement of multiple actors on multiple levels, the high level of decentralization in both regions, the availability and division of knowledge resources, the relative high feeling of urgency with regard to climate change and adaptation in both regions and the overlap of and mutual understanding with regards to concepts, views and principles. This relative high degree of congruence might have stimulated transboundary governance of adaptation. For example, the fact that multiple types of actors on multiple levels are concerned with climate adaptation in both regions, did ease the establishment of cooperation structures on various levels, such as Viking, the Dutch-German working group on high water as well as cooperation within the ICPR. However, the relative high level of cross border cooperation between the policy arrangements mainly took place in the water sector, while transboundary governance on other aspects of climate adaptation is still relatively weak (e.g. ecology and heat stress). This can be explained by referring to the dominance of the water sector in the policy arrangement of the Netherlands. This dominance in the Netherlands versus the balancing of interests and sectors in NRW is an influential discrepancy that both indirectly and directly might complicate cross border cooperation between the two countries. Other factors that might have hindered cooperation so far are the dominance of public responsibility in the Netherlands with regards to safety versus mostly private responsibility of citizens in NRW, as well as the dispersion in amount and division of financial and power resources, the amount and type of formal and informal rules of the game and differences between existing programmes and strategies in both regions. For example, the Netherlands has one policy, the Delta Programme that specifically focuses on water management, while NRW developed policies, strategies and plans for all sectors concerned with climate adaptation. The dominant risk approach also differs between both regions, since NRW has a broad approach for flood strategies, incorporating and balancing all types of interests with varying safety standards across regions, while the Netherlands has a multi-layer-safety approach and uniform safety standards that mainly focus on flood defense and water interests.

#### **5. EU normative principles**

Europeanization theories state that EU governance influences Member States' policies. On one hand the EU can act as a supra-national, hierarchical authority by drafting Directives and regulations. On the other hand, the EU could also influence national policies via the provision of their logic and meaning of action by soft and flexible law (Knill and Lenschow, 2005; Radaelli, 2004). In both approaches EU normative principles can play a role. Normative principles can be defined as '*abstract ideals to be interpreted and realized through concrete policies*' (Correljé et al., 2007; Van Rijswijk and Havekes, 2012). They can influence Member State's policies by defining a desired situation or an ideal process (Dworkin, 1986; Knill and Lenschow, 2005). Besides the constraining and enabling factors for

<b>Dimension</b>	<b>The Netherlands</b>	<b>Comparison</b>	<b>North Rhine-Westphalia</b>
<b>Actors and Coalitions</b>			
<b>Institutional structure</b>	Unitary decentralized	Small difference	Federal decentralized
<b>Public-private relation</b>	State secures safety	Significant difference	Citizen responsibility
<b>Multi-actor</b>	Multiple actors are involved	Similarity	Multi-actor involvement
<b>Multi-level</b>	Participation of multi-level actors	Similarity	Involvement of actors on multiple levels
<b>Multi-sector</b>	Sectoral approach Dominance of public, water sector	Significant difference	Integrated approach All types of sectors involved, trade off
<b>Resources and Power</b>			
<b>Financial resources</b>	High amount, concentrated in Delta fund	Important difference	Lower amount of resources and diffused
<b>Knowledge resources</b>	High quantity of knowledge available Various actors involved Focusing on water management	Similarity Similarity Difference	High quantity of knowledge available Various actors involved Research covers various themes
<b>Power</b>	Central (e.g. Delta commissioner)	Difference	Diffuse (no over coupling institution)
<b>Rules of the Game</b>			
<b>Formal rules</b>	One plan & law (Deltawet and plan) Uniform safety standards Mainly rules in the water field	Difference	Diffuse plans, policies and programmes Safety standards differ across regions All aspects of climate adaptation
<b>Political culture</b>	Consensus style, 'polder' model. Informal and rather horizontal.	Difference	Hierarchical and formal policy style
<b>Discourses</b>			
<b>Program and strategies</b>	Delta programme	Difference	Various strategies and programs

<b>Feeling of urgency</b>	Relatively high, focus on flood risks	Similarity and difference	Relatively high, focus on climate issues (particularly mitigation)
<b>Risk approach</b>	Shift from Flood Defense towards Multi-Layer-Safety approach	Difference	Broad approach of flood strategies, incorporating other interests as well
<b>Concepts</b>	Mainly: 'Safe Delta', also still 'Room for the River'	Similarity and difference	'Room for the River', ecological focus and aim for resilience
<b>Principles</b>	Sovereignty, solidarity, retain-store-drain and multi-layer-safety	Both	Precautionary, solidarity, federalism, subsidiarity

*Table 1: A comparative overview of the Dutch and North Rhine-Westphalian policy arrangements on climate adaptation*

transboundary governance on climate adaptation that were described in last section, EU-principles could also have an effect on climate adaptation policies in individual Member States and on transboundary governance (figure one). One of the goals of EU governance is to harmonize Member State's policies, which will probably ease transboundary governance. Normative principles are not specific and directly binding rules, nor do they change the distribution of resources among actors, but they could rather alter existing beliefs as regards to climate adaptation policy. Such framing policy can increase similarities, or congruence, among Member States' policies. We expect that a higher level of congruence between policy arrangements will lower the barriers for developing transboundary policy (Wiering et al., 2010; Van Os et al., 2013). Examples of EU normative principles that concern climate adaptation (indirectly) and which are to a greater or lesser extent implemented in the Dutch and NRW policy arrangements are the solidarity, subsidiarity and precautionary principle as well as the river basin management approach. Implementation in both arrangements stimulates for example mutual understanding, which will positively influence congruence and therefore also cooperation between both regions. However, actual implementation could differ in practice. This is for instance the case for the solidarity principle as the Netherlands understands solidarity as uniform safety and standards for all regions, while Germany does not apply uniformity across regions (Becker, 2009; van Eerd, 2013; Huitema et al., 2012; Monstadt and Moss, 2008; Moss, 2004; Steenhuisen et al., 2006, 2007; Verwijmeren; 2007; Wolsink, 2006).

Based on this research, the hypothesis can be formulated that EU normative principles will have an effect on individual policy arrangements, as well as on congruence between Member States and on transboundary governance of climate adaptation. An example is that the EU Flood Directive and the included principles could possibly increase transparency and communication regarding flood risk management among Member States and cross border regions, leading to a higher degree of mutual understanding and where possible alignment, which will increase and enable transboundary governance. It is important to test this hypothesis in order to gain a more complete understanding of the development of climate adaptation policies, cross border cooperation and constraining and enabling factors (figure one, red box).



## **6. Preliminary conclusions**

Various similarities of policy arrangement characteristics were found during the comparative analysis of the Netherlands and NRW that will probably enable and ease transboundary governance on climate adaptation in this region. Examples are that climate change adaptation is decentralized in both countries, multiple actors on multiple levels are involved in climate adaptation governance and both have an adequate availability of knowledge resources. Also discrepancies between both regions were found, which are expected to hinder cross border cooperation with regard to climate adaption. For instance, differences in risk approach and standardization of norms between both regions exist, the sectoral water focus of the Netherlands and their public responsibility versus the integrated and trade-off approach of NRW with a focus on private responsibility were the most significant constraining features of policy arrangements. All similarities and differences identified can be found in table one. EU governance and normative principles will probably affect the development, implementation and maintenance of transboundary governance on climate adaptation as was described in last paragraph.

## **7. Recommendations for further research and policy practice**

Cross border cooperation in the field of climate adaption is important and progress could be hampered by a lack of congruence between national policy arrangements. Increasing congruence between adjacent arrangements seems to be a good step forward. Emphasis should be laid on discursive changes as the other dimensions seem to be less flexible. Discursive changes could be reached by organizing knowledge exchange via workshops, platforms, field trips and conferences. This might result in a joint framing of adaptation issues and solutions and a higher understanding of each riparian's interests. Existing international commissions can play a key role in this.

Our research results are preliminary, so we have to better scrutinize the impacts of enabling and constraining factors on actual cooperation in the Rhine river basin. In order to generalize our findings, the role of enabling and constraining characteristics of policy arrangements should be researched in other catchments as well. Furthermore, the role, implementation and influence of EU governance and particularly normative principles should be studied empirically. In the next research step (deliverable 3) we will assess how EU normative principles influence transboundary governance between the Netherlands and NRW (figure one). We will, among others, try to specify the path of influence. Do EU-principles harmonize national policies, which define a good level playing field for international cooperation, or do they address directly this cross border cooperation? Moreover, we will try to assess the relative impact of the EU principles versus the more specific substantive and procedural rules of the EU.

## References

- Becker G. (2009). *Germany: transitions in flood management in the Rhine basin*, in: Huitema D. and Meijerink S. (2009), *Water Policy Entrepreneurs: a research comparison to water transitions around the globe*, Edward Elgar Publishing Limited, IWA Publishing London
- Becker G., Aerts J. and Huitema D. (2007). *Transboundary flood management in the Rhine basin: challenges for improved cooperation*, *Water Science Technology* 56 (4), page 125-135
- Becker G., Aerts J. and Huitema D. (2013). *Influence of flood risk perception and other factors on risk reducing behavior: a survey of municipalities along the Rhine*, *Journal of Flood Risk Management*
- Bender S., Bowyer P. and Schaller M. (unknown). *CSC report 4: Bedarfsanalyse Klimawandel: fragen and die Land- und Wasserwirtschaft*, Climate Service Center, Hamburg
- Van den Berg M. (2013). *Translating the global climate change discourse to the local: an analysis of Dutch storylines on adaptation*, in: de Boer C., Vinke-de Kruijf J., Ozerol G. and Bressers H.T.A., *Water governance, policy and knowledge transfer: international studies on contextual water management*, Routledge, page 207-223
- Biesbroek G.R., Swart R.J., Carter T.R., Cowan C., Henrichs T., Mela H., Morecroft M.D. and Rey D. (2010). *Europe adapts to climate change: comparing national adaptation strategies*, *Global Environmental change* 20, page 440-450
- Biesbroek G. R., Termeer C.J.A.M., Klostermann J.E.M. and Kabat P. (2013). *Analytical lenses on barriers in the governance of climate adaptation*, *Mitigation and Adaptation Strategies for Global Change*
- Boezeman D., Vink M., Leroy P. (2013). *The Dutch Delta Committee as a boundary organisation*, *Environmental Science and Policy* 27, page 162-171
- Boonstra F.G. (2004). *Laveren tussen regio's en regels: verankering van beleidsarrangementen rond plattelandsontwikkeling in Noordwest Friesland, de Graafschap en Zuidwest Salland*, Koninklijke van Gorcum te Assen
- Bowyer P. and Bender S. (2013). *Interview with Paul Bowyer and Steffen Bender: Climate Service Center Hamburg, 23-7-2013*
- van den Brink M., Meijerink S., Termeer C. and Gupta J. (2013). *Climate-proof planning for flood prone areas: assessing the adaptive capacity of planning institutions in the Netherlands*, *Regional Environmental change*, January 2013
- Bubeck P., te Linde A., Dekkers J. and Ward P. (2010). *Flood risk developments and adaptation strategies in the Rhine-Meuse delta*, in: Kabat P and Vellinga P., *Abstracts Scientific Programme Deltas in Depth*, International conference Rotterdam, the Netherlands 29 September-1 October 2010
- Correljé A., Francois D. and Verbeke T. (2007). *Integrating water management and principles of policy: towards an EU framework?*, *Journal of cleaner production* 15, page 1499-1506
- Dieperink C. (1998). *From the open sewer to salmon run: lessons from the Rhine water quality regime*, *Water policy* (1), page 471-485
- van Duijn H., de Vuijst S. and Bonte R. (2009). *Chapter 4: Germany*, in: *WAVE joint action* (Eds), *International inventory: water and spatial planning policies*
- Dworkin R. (1986). *Is law a system of rules?*, the philosophy of law, Oxford
- Van Eerd (2013). *A dive into floods: assessment of factors influencing the implementation of the EU Flood Directive in the Netherlands*, Master Thesis, Utrecht University
- Garrelts H. (2013). *Interview with Heiko Garrelts: University of Bremen, 6-8-2013*
- Garrelts H. and 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* 40, page 200-209
- Gilissen H. K. (2009). *Internationale en regionaal grensoverschrijdende samenwerking in het waterbeheer*, Den Haag, SDU Uitgevers

- Greiving S. (2008). *German Country report*, in: Greiving S., Fleischhauer M. and Wanczura S., Report on the European scenario of technological and scientific standards reached in spatial planning versus natural risk management, ARMONIA Project, Dortmund
- Van der Grijp N.M., Bergsma E.J. and Gupta J. (2012). *The Dutch focus: a Delta Act for climate adaptation*, page 312-328 in: Peeters M., Stallworthy M. and De Cendra de Larragan J. (Eds.), *Climate Law in EU Member States: Towards nataion legislation for climate protection*, Cheltenham/Northampton, UK: Edward Elgar
- Hartmann T. (2009). *Clumsy Floodplains and the Law: towards a responsive land policy for extreme floods*, Built Environment 35 (4), page 531-544
- Hartmann T. (2013). *Interview with Thomas Hartmann*, Utrecht University, 24-7-2013
- Hasse J. (2013). *Interview with Jens Hasse*, Radboud University Nijmegen, June 27 2013
- Havekes H.J.M. and van Rijswick H.F.M.W. (2010). *Waterrecht in Nederland*, Deventer, Kluwer
- Huiteima D., Mees H., Vermeer K., Storbjörk S., Garrelts H., Greksch K., Wingses M. and Rayner T. (2012). *Handling adaptation governance choices in Sweden, Germany, the UK and the Netherlands*, IVM Institute for Environmental Studies, Knowledge for Climate, theme 7 Governance of Adaptation, Workpackage 6, Deliverable 6A, June 2012
- Intergovernmental Panel on Climate Change (IPCC) (2007). *Climate change 2007: Synthesis report, fourth assessment report: intergovernmental panel on climate change*
- Johnson C.L. and Priest S.J. (2008). *Flood risk management in England: a changing landscape of risk responsibility*, International Journal of Water Resources and Development, 24 (4), page 513-525
- Kabat P. and van Schaik H. (2003). *Climate changes the water rules: How water managers can cope with today's climate variability and tomorrow's climate change*, The Netherlands
- Knill C. and Lenschow (2005). *Compliance, communication and competition: patterns of EU environmental policy making and their impact on policy convergence*, European Environment 15, page 114-128
- Kruse S. (2008). *The restoration of a floodplain on the Upper Rhine: managing the interface of large scale policy and small-scale implementation*, in: Moss T. And Monstadt J., *Restoring Floodplains in Europe: Policy Contexts and Project Experiences*, IWA Publishing
- Krysanova V., Dickens C., Timmerman J., Varela-Ortega C., Schlüter M., Roest K., Huntjens P., Jaspers F., Buiteveld H., Moreno E., de Pedraza Carrera J., Slámová R., Martínková M., Blanco I., Esteve P., Pringle K., Pahl-Wostl, C. and Kabat P. (2010). *Cross-comparison of climate change adaptation strategies across large river basins in Europe, Africa and Asia*, Water Resources Management 24 (14), page 4121-4160
- van Liempt H. (2009). *Science-policy interactions for climate change adaptation in Germany*, Utrecht, 14 15 September 2009
- Te Linde A.H., Moors E.J., Droogers P., Bisselink B., Becker G., ter Maat H. and Aerts J.C.J.H. (2012). *ACER: Developing adative capacity to extreme events in the Rhine basin*, Climate Changes Spatial Planning 046/12
- Lindemann S. (2008). *Understanding water regime formation- a research framework with lessons from Europe*, Global Environmental Politics 8 (4), page 117-140
- Lulofs K. and Coenen F. (2007). Chapter 4: cross border co-operation on water quality in the Vecht river basin, in: Verwijmeren J. and Wiering M. (2007). *Many rivers to cross: cross border co operation in River Management*, Delft, Eburon Academic Publishers
- Meijerink S. (2008). *Explaining continuity and change in international policies: issue linkage, venue change and learning on policies for the river Scheldt estuary: 1967-2005*, Environmental Planning 40 (4), page 848-866

- Meijerink S. and Dicke W. (2008). *Editorial: the public-private divide in flood management*, International Journal of Water Resources Development 24 (4), page 491-493
- Meister H.P., Kröger I., Richwien M., Rickerson W. and Laurent C. (2009). *Schwimmende Häuser und Moskitonetze: Weltweite Strategien zur Anpassung and den Klimawandel*, Meister Consultants Group, IFOK, November 2009
- Monstadt J. and Moss T. (2008). *Policy innovations in the aftermath of a disaster: contexts of floodplain restoration in Germany*, in: Moss T. And Monstadt J., Restoring Floodplains in Europe: Policy Contexts and Project Experiences, IWA Publishing
- Moss T. (2004). *The governance of land use in river basins: prospects for overcoming problems of institutional interplay with the EU Water Framework Directive*, Land Use Policy 21, page 85-94
- Mostert E. (1998). *River basin management and planning*, 4<sup>th</sup> national congress on water resources- Portuguese Water Resources Association, Lisbon, March 27 1998
- Van Os et al. V., Dieperink C. and Wiering M. (2013). *Go with the flow? On the development of transboundary policy climate change adaptation in the Rhine basin*, deliverable 1 KvK WP 5.2
- Pachauri R.K. and Reisinger A. (2007). *Climate change 2007*, synthesis report, Contribution of Working groups I, II and III to the fourth assessment report of the Intergovernmental Panel on Climate Change, IPCC, Geneva, Switzerland
- Pfister L., Kwadijk J., Musy A., Bronstert A. and Hoffmann L. (2004). *Climate change, land use change and run off prediction in the Rhine-Meuse basins*, River Research and Applications 20 (3), page 229-241
- Philip R., Anton B. and Schraffl F. (2008). *Local governments and integrated water resources management in the Rhine River basin in Germany*, project LoGo Water, March 2008
- Raadgever T. and Mostert E. (2005). *Transboundary river basin management: state-of-the-art review on transboundary regimes and information management in the context of adaptive management*, NeWater Report Series No. 10, TU Delft,
- Radaelli C. (2004). *Europeanization: solution or problem?*, European Integration Online Papers 8 (16), page 1-23
- van Rijswijk H.F.M.W. and Havekes H.J.M. (2012). *European and Dutch water law*, Groningen, Europa Law Publishing
- Stecker R., Mohns T. and Eisenack K. (2012). *Anpassung an den Klimawandel-agenda setting and politikintegration in Deutschland*, Zeitschrift für Umweltpolitik and Umweltrecht 35, page 125 248
- Steenhuisen B., Dicke W. and Tijink D. (2006). *Veiligheid verwaterd? Een narratieve analyse van Nederlands en Duits hoogwaterbeleid*, Bestuurswetenschappen 60 (3), page 227-247
- Steenhuisen B., Dicke W. and Tijink D. (2007). *'Trade-offs' versus 'Safety First': How national differences in flood policy can be bridged*, Water International 32 (3), page 380-394
- Termeer C., Dewulf A., van Rijswijk H., van Buuren A., Huitema D., Meijerink S., Rayner T. and Wiering M. (2011). *The regional governance of climate adaptation: a framework for developing legitimate, effective and resilient governance arrangements*, Climate Law 2, page 159 179
- Toonen T.A. (1987). *The Netherlands: A decentralized unitary state in a welfare society*, West European Politics 10 (4), page 108-129
- Veerman C. (2008). *Samen werken met water: een land dat leeft, bouwt aan zijn toekomst: bevindingen van de Deltacommissie*, Deltacommissie 2008
- Verwijmeren J. (2007). *Chapter 5: Cross border co-operation and the Dutch-German Working Group on High Water*, in: Verwijmeren J. and Wiering M. (2007). Many rivers to cross: cross border co-operation in River Management, Delft, Eburon Academic Publishers

- Van Waarden F. and Hildebrand Y. (2009). *From corporatism to lawyocracy? On liberalization and juridification*, Regulation and Governance 3 (1), PAGE 259-286
- Wiering M. (2010). *Grenzen aan de samenwerking in het Rijnstroomgebied: Duits-Nederlandse werkgroep hoogwater*, Geografie, June 2010
- Wiering M., Verwijmeren J., Lulofs K. and Feld C. (2010). *Experiences in regional cross border co operation in river management. Comparing three cases at the Dutch-German border*, Water Resource Management 24, page 2647-2672
- Wolsink M. (2006). *River basin approach and integrated water management: governance pitfalls for the Dutch Space-Water-Adjustment Management Principle*, Geoforum 37 (4), page 473-487