Institutional change in water management cooperation: implementing the European Water Framework Directive in the Eastern German Odra basin

(Draft version. Please do not cite without consulting the authors.)

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The transposition of the Water Framework Directive requires institutional change, in order to comply with its substantive and procedural requirements. This paper investigates changes in water governance in Germany with regards to the configuration of actors involved and the scope and spatial extent of issues considered in water management. In comparison to water planning and management according to administrative boundaries the WFD demands for the re-scaling of River Management to ecosystem units. Based on qualitative methods the paper presents the illustrative case study of the Odra river basin and the governance of nutrient pollution, whose origins are located all along the river and which impacts the coastal zones specifically. We look at public administrations operating within different administrative boundaries, the role of environmental NGOs and the agricultural sector, and formal and informal institutional change concerning their interrelation. To capture these changes we construct a conceptual framework to evaluate institutional change at three levels: formal institutional change, institutional change concerning the formal and informal interfaces between actors, and changes in actors' mental models. We explain complex institutional change as a product of multiple dynamics, including the content of shared mental models and their normative contents for action, and a benefit-cost calculation, including the consideration of transaction costs concerning compliance with substantive and procedural prescriptions that the WFD makes. Empirically, the paper describes institutional change in each of these spheres.

Keywords: Water governance, Integrated Water Resource Management, participation, transaction costs, agricultural nutrient pollution, re-scaling

1 INTRODUCTION

European water management is in the process of being deeply restructured. The European Water Framework Directive (WFD) (CEC 2000) was adopted in the year 2000 and needed to be transposed into national legislations in the European member states by 2003 to make it binding (Grabitz/Hilf 2005: § 249 Rn. 124). Currently, member states are integrating substantive and procedural prescriptions into existing practices of water management. The procedural prescriptions of the WFD follow the paradigm of Integrated River Basin Management (IRBM). Water resources shall be considered in their integrity and administered within their

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hydrological boundaries and not within administratively determined boundaries (CEC 2002). By 2015 a *good status* for all water bodies[3, 4] in Europe is to be achieved. The basic unit for all water planning and management actions is the river basin or River Basin District (RBD)[5,6]. A *"combined approach"* is introduced including the control of the overall quantity of emissions into and its concentration in the receiving water body. To this end, member states were asked to fix pollution values for the whole River Basin District encompassing point sources as well as diffuse sources (Art. 10 WFD). The approach is expected to specifically address diffuse sources of pollution, emerging from agriculture and urban run-off.

With its prescriptions of an ecosystem approach and integrated river basin planning, the WFD addresses what academics analyse as the problem of "fit" (Young 2002). Where problems of fit/ mismatch emerge, *"human responsibility does not match the spatial, temporal, or functional scale of natural phenomena, unsustainable use of resources is likely, and it will persist until mismatch of scales is cured"* (Lee 1993 quoted in Folke 1998). Main aspects of the WFD implementation are the need for interaction of spatial land use planning with the WFD and for integration of water goals (especially quality goals) into sectoral policies (Frederickson et al. 2008). In order to address these concerns we argue that scale issues involved into the implementation of the WFD gain in importance (see also Moss 2004). Secondly, beside WFD's specific emphasis on horizontally and vertically integration of water resource management, broad participation of intervening sectors and stakeholders is required (BMU 2007).

Concerning the implementation of the WFD in Germany many legal and scientific papers have been published addressing its implications (Breuer 2002, Holzwarth/Bosenius 2002, Solf 2006, Cynowski/Reinhardt 2007, Irmer/von Keitz 2002, Quast et. al. 2002). Only in recent years have publications on economic and socio-economic considerations been released (Moss 2003, Röhring 2003, Kastens 2003, Petry 2008), dealing with various aspects of the implementation. A benchmark publication is by Moss (2003 and 2004) who addresses problems emerging throughout the early stages of the transposition and demonstrates several issues of misfit (2003). Firstly, ecosystem management had previously not been closely followed because before the implementation of the WFD, water was managed within the existing German federal administrative structures. When the Directive was implemented the administrative structures were kept (Fichtner 2003) and structures for coordination and cooperation were added. Misfits were observed concerning the coordination of different resource systems (Moss 2003). Up until now only limited adjustment among the various political areas concerned existed (as e.g. agricultural

[3] In the WFD different status categories are given (high, good, moderate etc.). They measure the degree of deviation of a water body from its original, natural condition, i.e. without human impacts.

[4] Derogations only for specific bodies of water so affected by human activity and natural conditions that achievement of good status would not be feasible or disproportionately expensive. Deadlines may be extended in similar conditions.

[5] In the case of transboundary waters inside of EU territory International RBDs are to be set up which have to be managed in a co-ordinated manner.

[6] With the development of River Basin Management Plans for all RBDs and coastal waters the Directive's overall objective is the achievement of "good status" for all of Europe's water bodies until 2015. Plans have to characterise "water bodies" and key environmental pressures. A programme of "basic" (Those include measures already required by the previously existing 11 water-related Directives.) and "supplementary"(Measures that are necessary in addition to the usual ones for achieving good water quality status.) measures for achieving or maintaining "good status" has to be designed and an economic analysis of water use has to be undertaken in order to identify the most cost-effective combination of measures and developing water pricing policies (Adequate incentives for an efficient use of water, principle of cost recovery for water services, incl. environmental and resource costs by 2010).

politics and environmental politics), even though the WFD requires greater coordination. Also, Moss (2003 and 2004) argues that participation, consultation and information requirements of the public had previously not been sufficiently followed. Lipinski/Igras (2006) made a similar evaluation of the transposition of the WFD for the case of Poland. In a more recent study Louka (2008) characterises the WFD as an exercise in horizontal and vertical coordination and states that major problems may emerge from what she calls institutional "roadblocks". She specifically highlights power and bargaining as important for the development of organizations and coordination mechanisms. Key factors affecting the implementation are outlined as administrative and political capacity, centralisation and decentralisation issues, the existing institutional structure and fit and misfit, as well as the coordination among the political actors and the possible constraints (Louka 2008).

Moss found that the implementation of the Water Framework Directive in Germany provides a good case for studying re-scaling as the *"approach challenges the traditional management of water courses in Germany …and will require far more intensive cooperation and coordination between the various responsible authorities within a River Basin District"* (Stratenwerth 2002, p.324, translation, quoted in Moss 2004). In particular, regarding the spatial coordination of the different uses upstream and downstream, the WFD suggests 3 principles: (1) the inclusion of all human influences and demands into the development of integrated policies and thus the need for the water administration to consult with all sectors using water, (2) intra- and interstate, transboundary coordination within the administration, (3) public participation, involving the agricultural sector and environmental NGOs. Actors involved are situated at different levels and operate on different spatial scales. Thus, at what level of administration and within what spatial delimitations is the use of water coordinated, and at what level are the corresponding decisions made? In the recently concluded phase of implementation of the WFD River basin plans were completed in Germany. For us, this provides a first window of opportunity for assessing to what extent changes in water management practices become manifest and thereby take a step forward in relation to those papers which analysed the initial phase of WFD implementation. By now it appears most relevant to understand if and why the assumptions and ideas regarding re-scaling and enhanced cooperation and coordination have been fulfilled or not.

Building on the mentioned identifying challenges for implementation and existing knowledge gaps, we want to map the emerging cooperation and coordination structures and find reasons for their shape and functioning in this paper. Nevertheless, we are not yet in the position to evaluate the performance of re-scaled water governance, for substantive outcomes can only be appreciated in the more distant future. Thus, in this paper we only take stock of the way the WFD changes water management as an outcome of river basin planning. Specifically, we want to evaluate the effects of the requirement for IRBM and the above mentioned principles on the spatial level at which specific issues are considered, across which actors effectively collaborate and exchange information and negotiate solutions and the spatial extension of problem perceptions. Therefore we look at diffuse nutrient pollution from agriculture, as it is specifically significant for the successful implementation of the WFD, and focus on institutional change within the *States'* water administrations (coordination of the administration) and the relations between the agricultural sector (consideration of multiple human influences), environmental NGOs (public participation) and the water administration. By means of the illustrative

examination of the changes in the way these actors interrelate we investigate institutional change as unleashed by the WFD. Particularly we assess if and how water management was re-scaled and that which explains the specific path of re-scaling of water management that was adopted. Based on a strategy of in-depth data gathering we present and explain formal and informal institutional change as well as changes in mental models concerning the vertical, horizontal, and sectoral interfaces defining overlapping resource management practices and actors involved.

2 CASE STUDY SELECTION AND METHODOLOGY

In order to make our case study illustrative with regards to the effects of the WFD on re-scaling of River Basin Planning in Germany, the following aspects informed case study selection: a) the nature-related "transaction", or environmental problem needed to be considered as unresolved but its treatment at an appropriate scale is agreed to be a facilitating factor for its resolution, b) the socio-political sphere is clearly aware of the scale issues and has made efforts to address it, c) the procedural precepts of the WFD were currently being implemented. Within Germany addressing diffuse pollution emerging from agriculture and urban run-off is considered significantly important for the successful implementation of the WFD and attainment of good ecological status by 2015. Based on these criteria we selected the case study of the Odra River in Eastern Germany.

We focus the analysis on a small part of the river basin, the interaction between the neighbouring adjacent *States* Brandenburg (upstream) and Mecklenburg-Vorpommern (coastal/ downstream). Our study focus on institutional changes concerning the collaboration of the latter two in order to cover the areas of source (inland agriculture) and impact (coastal wetlands) involved into diffuse pollution. To top the overall picture off we consider to some extent the *States'* cooperation with Poland but did not systematically gather data from Polish actors. The *States'* water administrations, the agricultural sector, and environmental NGOs are the principle actors that must be coordinated in order to lower nutrient and phosphorous pollution in the river's delta as they represent the polluting actors, the actors regulating pollution, and the actor claiming less pollution.

We collected data through an in-depth case study relying on qualitative methods to research institutional changes. The empirical data covers river basin planning and management up to May 2009. We analysed documents and legislations and undertook semi-structured interviews. We interviewed 12 experts (actors of relevant groups) from Mecklenburg-Vorpommern and Brandenburg. Eight state-actors were chosen from all environmental administration levels, two from the *States'* farming associations, and complemented by two experts from national environmental NGOs. Interview partners were selected following a guided snow-balling approach. The guiding questions were defined following two pre-test interviews. The questionnaire was continuously customized while data collection. Interviews were transcribed and analysed using specific coding software.

Table 1: Interviewed experts from Mecklenburg-Vorpommern and Brandenburg

	Mecklenburg-Vorpommern	**Brandenburg**
Ministries for Environment	MULV MV, 27.10.2008 Schwerin, 1 expert	MULV Bbg, 06.10.2008 Potsdam, 2 experts
Environmental Agencies, Spatial Planning Agencies	LUNG MV, 18.09.2008 Güstrow ,1 expert ARLV , 24.07.2008 Greifswald, 1 expert	LUA Bbg, 06.10.2008 Potsdam, 1 expert LUA Bbg, 12.08.2008 Berlin (phone), 1 expert LUA Bbg, 15.09.2008 Berlin (phone), 1 expert
Environmental NGOs, Research Institutes	BUND, 23.09.2008 Berlin, 1 expert EUCC/IOW, 03.11.2008 Warnemünde, 1 expert	
Farmer Associations	06.10.2008 Berlin (phone), 1 expert	02.10.2008 Berlin (phone), 1 expert

3 THE SETTING FOR RE-SCALING IN THE ODRA BASIN

In the following section, we briefly explain the study setting, including the constitutional setting and collective choice rules in the River Basin District, and the problems of nutrient pollution. Before the reunification, in the German Democratic Republic (GDR), indeed water resources were managed at the level of river basins (Apolinarski 2003) but ecological questions hardly played a role (Bernhardt 2003). After the reunification the GDR water management system was adapted to the Western federal regime, based on sectoral management. Within the Federal Republic of Germany the *Federal State*[7] enacts a legal framework (Wasserhaushaltsgesetz: WHG) and the *States'* legislations detail the way water is administered (Czychowski/Reinhardt 2007, Breuer 2002). *States* legislate as long as no rulings are made by the *Federal State*. *States'* administration has either two or three tiers in each Land. Highest authority on the federal or state level is the respective ministry (environmental department) supported by a specialised agency. Since 1956 the *Federal State* and the single *States* have been cooperating under the LAWA[8] (Working Group on water issues of the Federal States and the Federal Government) composed of technical committees on various technical and governance aspects of water management (UBA 2008). The Odra River Basin District is situated within three member states of the European Union: Germany, Poland and the Czech Republic. Within Germany three *States* are concerned: Sachsen (Saxony), Brandenburg, and Mecklenburg-Vorpommern where the Odra reaches the sea.

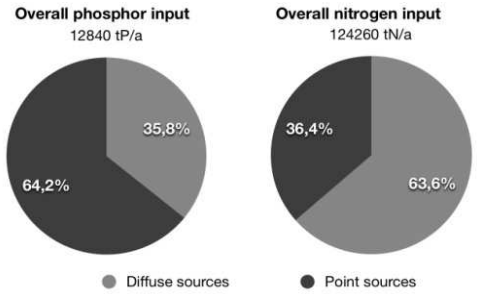
The total Odra River Basin District area comprises 122 512 km², of which 87.6 % are situated in Poland, 5.9 % in the Czech Republic and 6.5% in Germany. Its delta, the Stettiner Haff, is heavily affected (97%) by run-off from the Odra (IKSO 2004). The River Basin District is considered near-natural with relatively significant biodiversity and different natural environments providing habitats for many species (Köhler/Chojnacki 1996; Löser/Sekescinnska 2005). More than 16 million people are living in the Odra Basin (14.08 million in Poland, 1.55 million in the Czech Republic, and 758 000 in Germany) (Löser/Sekescinnska 2005). GDP amounts to 80 million Euro, employing 5.63 million people. Agriculture accounts only for 3.9 % of it but plays a major role in water management in the basin (IKSO 2005). The most

[7] The German federal state consists of a central Federal Government and 16 federal states (here: *States*). The Basic law lays out which issues fall within the ambit of the Federal Government and which devolve to the federal states.

[8] Länderarbeitsgruppe für Wasserangelegenheiten

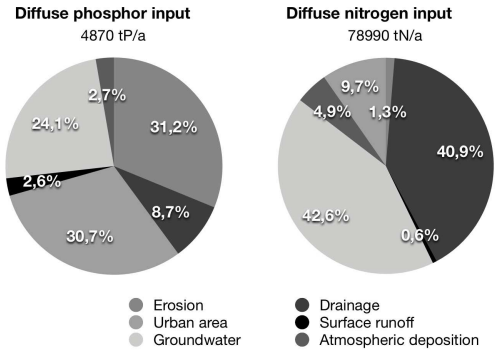
significant anthropogenic uses are withdrawal of water for public water supply, and wastewater disposal (IKSO 2005, Röttger 2006). Pollution significantly affects the lagoon responsible for water quality and eutrophication (Löser/Sekescinnska 2005, Schernewski et al. 2005). According to IKSO (2005) quality goals for the coastal areas of the Odra district cannot be fulfilled due to upstream nutrient charges. Thus, nutrient discharge is one of the crucial challenges for water management. Significant discharges of phosphorous (35.8%) and nutrients (63.6%) arise from diffuse sources.

Figure 1: Diffuse and point source shares of overall nutrient input into the Odra River Basin (cf. Berendt et al 2001: 198)



Diffuse phosphorus discharge is mainly caused by groundwater intake as well as erosion (Behrendt 2001). Regarding IKSO (2005) 51% of diffuse nutrient input originates from groundwater and 20% from drainages. Further, more than 30% of all phosphorous input is caused by erosion.

Figure 2: Diffuse input paths of overall diffuse nutrient input into the Odra River Basin (cf. Berendt et al 2001: 190)



Agriculture is the main water user in the German part of the Odra catchment area (522300 ha, 2102 farms, 12200 employees) and diffuse nutrient input (fertilizer input) primary arises from agricultural production and annual nutrient surplus on farmland (Behrendt et al. 2001, IKSO 2005). Most farmers are organised in agricultural associations (DBV 2009). In addition, more than thirty national and international environmental NGOs are active in the area (e.g. WWF, action group “Zeit für die Oder”, NABU, BUND, Grüne Liga).
The administration of Mecklenburg-Vorpommern and Brandenburg is two-tiered with a ministry for agriculture, environment and consumer protection and subordinated

environmental authorities at the level of counties and independent cities. In 2009 *State*-level agricultural administrations were integrated with their environmental counterparts (water administration) into one entity in both *States*. Below the ministry, on the subordinated agency-level, administrations were kept separate (Solf 2006: 126-129).
Furthermore, two administrative bodies, which already existed before the adoption of the WFD, link and interlink the *Federal State* and *State* interactions at a national and international level. The main international body is the International Commission for Protection of the Oder against Pollution (ICPO). The ICPO member countries, the Federal Republic of Germany, the Republic of Poland and the Czech Republic, are represented by respective experts from their administrations. German experts are mainly from the *States.* The other member countries of the ICPO are unitary and dispatch delegates from their central government. Within Germany the LAWA is the overarching body for cooperation (cf. above). Moreover, for a better coordination of WFD implementation some *States* that share a basin founded a new body for collaboration through an administrative agreement, such as, e.g. the River Basin Community ELBE (FFG Elbe 2004). German abutters of the Odra River did not sign a separate administrative agreement for the Odra River Basin. But they are all members of the FFG Elbe.

4 THEORETICAL FRAMEWORK

On a conceptual level we want to explain changes in environmental governance. Paavola defines environmental (and water) governance as "*the establishment, reaffirmation or change of institutions to resolve conflicts [or to coordinate] over environmental resources"* (Paavola 2007: 94).[9] The physical water use transaction whose governance we want to analyse is diffuse pollution of surfaces waters by farmers in the Odra River and its interdependence with services enjoyed by users, specifically on the adjacent Baltic coast. We conceptualise the setting which governs diffuse pollution with recourse to New Institutional Economics applied to environmental and resource problems (Challen 2000, Paavola 2005, Vatn 2005, Hagedorn et al. 2002 and 2008, Beckmann 2002) and describe it using Ostrom and colleagues' Institutional Analysis and Development (IAD) framework (Ostrom et al 1994). Interaction between participants in the action situations is structured by a nested system of rules (Ostrom 2005)[10] which define the interrelation between "participants" in a specific action situation. We consider principally the level of collective choice and operational rules. In particular we focus on formal [legal origin] as well as informal rules [origin in social practice] concerning the way they constitute the spatial level at which water transactions are governed. Evolution of institutions is a function of both formal and informal processes (Schmid 2004). We look at the way institutions influence the spatial extent at which the ecosystem is considered as origin and destination of diffuse pollution and the way actors concerned interrelate.

[9] It comprises what Paavola (2007) named "generic governance functions", i. e. "1) exclusion of unauthorized users; 2) regulation of authorized resource uses and distribution of their benefits; 3) provision and the recovery of its costs; 4) monitoring; 5) enforcement; 6) conflict resolution and collective choice". We are interested in the implications of each of these functions on water use planning concerning the river basin, rather than day-to-day water management.

[10] "[W]hat is a whole system at one level is a part of a system at another" (Ostrom, 2005: 11) "The term holon may be applied to any stable sub-hole in an organismic or social hierarchy, which displays rule-governed behaviour and/ or structural Gestalt constancy" (Koestler, 1973 quoted in Ostrom, 2005:11).

Therefore we also ask for changes in mental models, heuristics and ideologies structuring participants' and actors' behaviour in decision-making as interrelated with institutional change.[11] Mental models are the *"internal representations that individual cognitive systems create to interpret the environment"* (Denzau and North, 1994:1). They are of specific relevance to water governance as choices at hand are often unique, of great complexity, have relatively little effect on decision makers, and information regarding the implications of decisions on resource users is limited. In such cases *"people cannot optimize [but] rely on routines, habits, intuition, and rules of thumb"* Gigerenzer and Engel (2006: 31). In summarising this multi-faceted conceptualisation of institutional change processes Schmid (2004: 8) writes that *"[i]nstitutions change as people interact with each other in the context of changes in population, resources, technology, and people's subjective perception and imagination. These changes cause people to change their behaviour which, when aggregated and regularized, become new informal institutions. Those behaviours, which become conscious, may result in pressure for formal institutional change as well."*

In our case top-down change in formal rules governing water management is added as source of changes in people's interactions. One of the prevalent facts to be explained is that of path dependence as the path of change is heavily influenced by past changes (Schmid, 2004).

Further, we explain formal and informal institutional change concerning re-scaling of collective choice rules. The logic of action selection applied is partly determined by the fact that we are dealing with what Schmid (2004) calls administrative transactions (of legal unequals) as opposed to bargained transactions (of legal equals). Thus, competitive pressures to find the most efficient way of organising water management are not the key driver but superior (constitutional) rules oblige the *Federal State* and the *States* to implement the WFD in specific ways. Thus, action is based on defining what is normatively appropriate rather than on return expected from outcome as in the case of logic of action selection dominated by rationality (Hall and Taylor 1996)[12].

In addition, and best observable for formal institutional change a benefit-cost or cost effectiveness calculus ruled the way the WFD was introduced. Thus, institutional change was to minimize running costs of alternative arrangements and costs of shifting towards them. Dixit conceptualises such reasoning in what he called Transaction Cost Politics (Dixit, 1997: 49)[13]. Dixit interprets transaction costs as *"comparative costs of planning, adapting, and monitoring task completion under alternative governance structures"* (Williamson, 1989: 142). Furthermore, *"'transition*

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[11] For analysing the "holon" action situation Ostrom suggests seven clusters of variables (participants, positions, potential outcomes, action-outcome linkages, control that participants exercise, types of information generated, costs and benefits assigned to actions and outcomes. We analyse change of water governance at a moment in time, when its physical outcome cannot be evaluated yet.

[12] Concerning institutional change this may mean that they strive towards an institutional choice which is more efficient than other arrangements taking production and transaction costs into account. Hereby the most efficient institutional arrangement is also a function of the other arrangements in the institutional structure and different sources of changes such as changes in the institutional choice set, changes in technology, long-run changes in relative factor and product prices, and changes in the other institutional arrangements {Lin 1989: 14}. Instead, in the context of administrative transactions we would argue that individuals follow

[13] . Transaction Cost Politics differs from Transaction Cost Economics as "political contracts [which we consider equivalent with formal and informal agreements on collective choice rules implied into water governance] are rarely between two clearly identifiable contractors; they have multiple parties … on at least one side of the relationship….., their terms are generally much more vague than those of economic contracts. They leave much room for interpretation….", "… [P]olitical contracts are even less complete than economic ones, and bounded rationality has more serious bite" {Dixit, 1997: 53} and "complexity and uncertainty is even more pronounced" {idem}.

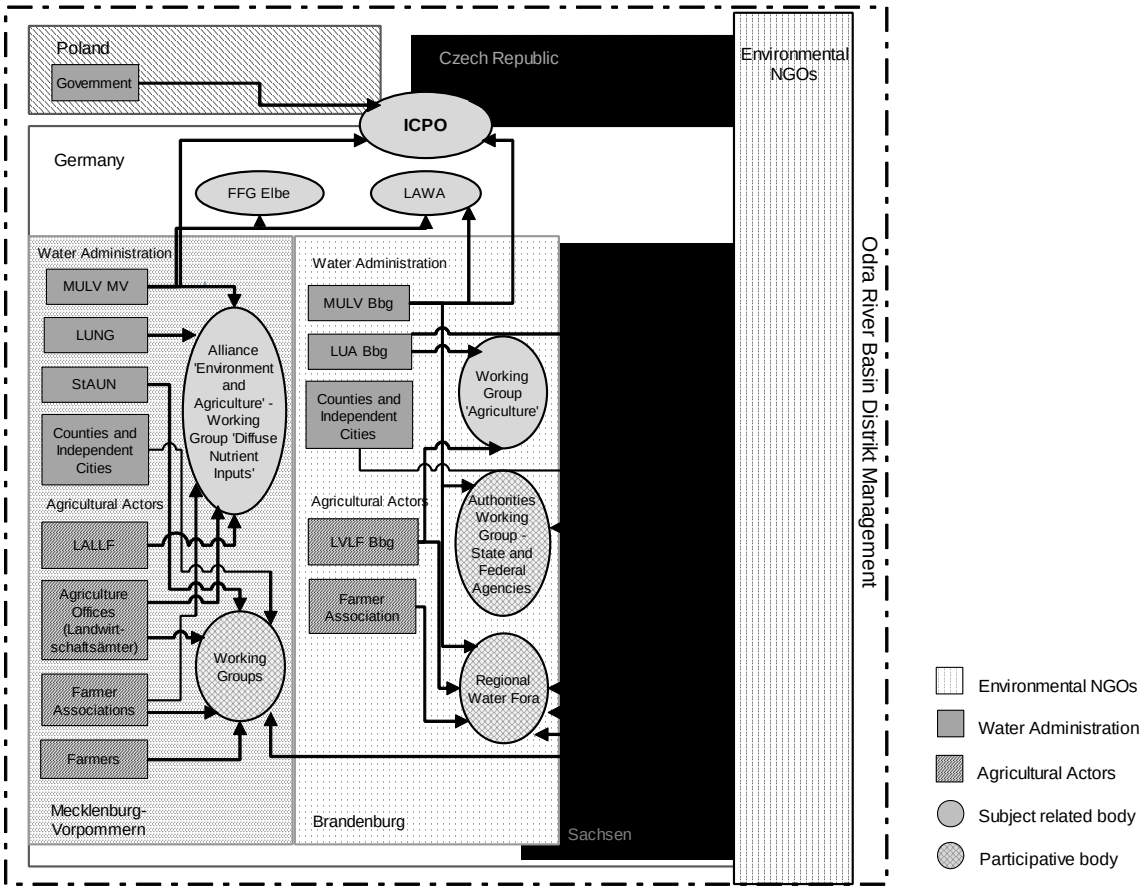
costs' of moving to a new institutional structure[14]" play an important role (Challen, 2000: 177). They are widely recognised as barriers to institutional change and determined by the nature of the proposed institutional change, the institutional status quo and the process by which an institutional change is implemented. They emerge from actual expected costs from institutional restructuring as well as political repercussions and side payments. Although we rely on a transaction and transition costs framework to explain institutional change costs are not understood in a monetary sense but in the sense of perceived efforts which are related perceived returns of various kinds. Thus, similar to Dixit (1997) and many others we use it as loose conceptual framework.

5 INSTITUTIONAL CHANGE IN THE RIVER BASIN – CASE STUDY RESULTS

In the following section, we present our findings on institutional change in terms of interfaces within the water administrations and the relations between the agricultural sector, environmental NGOs and the water administration. For the first we present an overview of all international and national actors, bodies and interrelations. In the following we focus particularly on (i) formal institutional change, (ii) informal institutional change, and (iii) changes in mental models.

[14] Direct costs of developing an innovation (research, drafting, community consultation, etc.), costs of pushing the innovation through the political collective, and political costs from the innovation not pleasing all of a political electorate {Challen, 2000:177}. Challen divides dynamic transition costs into two categories: "(i) the transition costs of decision making and implementation for institutional change in the current period, … as a function of the institutional status quo; and (ii) the intertemporal costs arising where institutional change in the current period increases the transition costs of possible future institutional changes, i.e. current institutional change reduces the flexibility of the institutional structure to respond to changing circumstances in the future. Both types of dynamic transaction costs emerge as a result of path-dependencies and irreversibilities in institutional change" {Challen, 2000: 179}.

Figure 3: International and national actors, bodies and interrelations in the Odra River Basin District. (own source)



5.1 Water administration

The national implementation of the WFD requires adjustments of the national and sub-national laws. In Germany the WHG transposes the WFD into federal law (WHG) and identifies the River Basin Districts as the unit in which management and coordination of objectives needs to be carried out, including all water bodies and the coastal zone. The *States* such as Mecklenburg-Vorpommern and Brandenburg issued their own water laws. The new legal framework[15] includes obligations and responsibilities of the water administration (e.g. a management plan, programme of measures). The implementation of these new formal rules requires changes in the interfaces of the actors. In this section we describe institutional change and change in mental models among the different tiers of the water administration in-between and within the two States, at the federal level and at the cooperation level between Germany and Poland. The creation of management plans and programmes of measures is the responsibility of the ministerial level while lower levels implement measures. Furthermore, the subject-related cooperation to create the respective documents for the WFD is undertaken in the ICPO, LAWA and through consultation of the diverse administrative bodies at some stage. The participation of concerned

[15] §§ 1 Abs.1; 2 Abs. 1, 3; 106; 110; 130 Abs.3; 130a LWaG (State law Mecklenburg-Vorpommern) and §§ 2 Abs. 2; 2a; 24 Abs. 1; 25 Abs. 1; 103 Abs.1, 124 Abs. 1,2; 125 BbgWG (State law Brandenburg)

parties takes place within a range of newly set up bodies. Table 2 below lists changes in formal and informal institutions.

Table 2: New collective choice rules: water administration Mecklenburg-Vorpommern and Brandenburg. (own source)

Water Administration	*New collective choice rules: public authorities involved in water management*
International cooperation (subject related)	*The national implementation of the WFD and the transposition of the respective law require* ***changes in informal and formal collective choice rules.***
ICPO (International Commission for the Protection of the Odra River against Pollution), ICPO Convention	*Transfer of the international cooperation activity within the River Basin District Odra to the ICPO, transfer of competencies* ***(formal rules)***
ICPO: Restructuring, new cooperation rules	*Steering Group G1 is coordinating the WFD, responsibilities: among others timetable for elaboration of the river basin management plans, elaboration of strategies for public information, assignment of duties to other working groups. (Working Groups - Art. 10 Rules of Procedure of the ICPO)* ***(formal rules)***
New manners in cooperation	*ICPO: different treatment of nature conservation associations* *Among countries: Better information exchange* ***(informal rules)***
National cooperation (subject related)	
Federal States: New processing rules	*New administrative processes* ***(formal rules)***
Federal States: New mechanisms of cooperation among state administrations	*Contacts among the administrations are more frequent, the working visits are increasing etc., arrangements within FFG Elbe* ***(informal rules)***
Federal States: Transfer of cooperation to LAWA,	*Collaboration regarding WRRL implementations takes place within the LAWA* ***(formal rules)***
Federal States: Coordination of the Federal States within the ICPO	*Agreements of the German states concerned before the ICPO referendum takes place*[16] *(informal rules)*
Regional cooperation	
Mecklenburg-Vorpommern	
Alliance “Environment and Agriculture” (subject related)	*Participation of water administration, agricultural administration, farmer associations and nature conservation associations* ***(formal rules)***
Extended working groups (participatory)	*Possibility of participation for administration concerned, interest groups (agriculture, nature conservation), single farmers* ***(formal rules)***
Brandenburg	
3 Regional water panels (participatory)	*Possible inclusion of all administrations concerned, associations, stakeholders, user groups* ***(formal rules)***
Working group of the agencies (participatory)	*Inclusion of federal and state agencies* ***(formal rules)***

5.1.1 Formal institutional change

International cooperation for implementation of the WFD takes place within the ICPO which already existed before (cf. above), but was significantly developed and

[16] The German members of the ICPO meet before official referendum and enter into agreement for the German part.

adjusted to implement the WFD. Its Steering Group coordinates the WFD (timetable and working groups)[17].
Even if in Germany the basic administrative structures have not changed, work loads for the water administration have increased and tasks have altered[18]. New procedures are necessary to fulfil the new obligations and standards[19]. The work on the implementation of the WFD is carried out within specific and specially formed working groups of the LAWA (e.g. on the identification of the biologic processes, valuation of biologic parameters). Mutual visits of representatives of States have intensified.[20] In Mecklenburg-Vorpommern as well as Brandenburg, the lower water administration is not involved in the subject related planning of measures regarding nutrient inputs but it is kept informed by the federal ministry as it will need to implement measures that concern the reduction of nitrate inputs[21]. Furthermore all administrations are involved in the participation efforts (panels, working groups)[22]. In Brandenburg a working group of agencies secures participation of all public sector entities at federal as well as at *State*-level. Furthermore, for the purpose of intra-*State* participation, three regional water forums have been founded, which include all administrative entities involved in the implementation of the WFD, interest groups, farmer associations, nature protection associations, etc.[23] Reorganisation in Mecklenburg-Vorpommern worked out in a similar fashion. All public authorities concerned as well as lower implementing authorities, interest groups and single farmers participate in newly set up working groups.[24]

5.1.2 Informal institutional change

The above described formal institutional change brought about significant changes in informal cooperation and coordination among the administrations and stakeholders concerning all levels of governance. In terms of international cooperation in the ICPO it has been commented that good cooperation and a constructive working atmosphere has become more important as cooperation intensified[25]. But still, the level of cooperation within countries seems to vary, for example Poland and Germany. Difficulties in the administrative cooperation with Poland have been reported for reasons of the centralistic character of the Polish state and changing contact persons and leading staff on the Polish side.[26] Delays caused by the Polish administration occur especially where economic issues are concerned.

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[17] Interview MULV MV 27.10.2008 Schwerin, Interview BUND 23.09.2008 Berlin

[18] Interview LUA Bbg 12.08.2008 Berlin (phone), Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam

[19] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam, Interview LUNG MV 18.09.2008 Güstrow ,

Interview IOW 03.11.2008 Warnemünde

[20] Interview LUNG MV 18.09.2008 Güstrow

[21] Interview LUNG MV 18.09.2008 Güstrow, Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam

[22] Interview LUNG MV 18.09.2008 Güstrow, Interview MULV Bbg and LUA Bbg 06.10.2008 Postdam

[23] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam

[24] Interview LUNG MV 18.09.2008 Güstrow

[25] Interview MULV MV 27.10.2008 Schwerin, Interview BUND 23.09.2008 Berlin

[26] Interview MULV MV 27.10.2008 Schwerin, Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam, Interview ARLV 24.07.2008 Greifswald

Within and among the *States* informal cooperation among state agencies has intensified and the number of contacts has significantly increased[27] as the outcome of additional working groups within the LAWA. Furthermore, many issues are informally coordinated within the FFG Elbe[28]. Also, the intensity of the intra-state collaboration of water agencies at different levels has improved[29] as working groups are well attended by administrations[30].

5.1.3 Changes in mental models

However hard it is to assess mental models methodologically, we interpret several comments by interviewees as evidence that mental models have similarly changed among collaborating members of various administrations. The water administration identifies with the project of implementing the WFD, which conveys a sense of unifying project[31]. Good and constructive collaboration within the ICPO was declared as an overarching common goal by all interviewees[32] because awareness for cross-sectoral and transboundary has increased. Interviewees confirm that their perspective on water management has changed. The river in its entirety is increasingly viewed for purposes of integrated management.[33] Still, in Germany problems are solved very differently from the way they are solved in Poland because Germans are said to be more solution-oriented.[34] However differences could be observed which are of specific relevance for nutrient input and transport. Thus, the awareness of the interconnectedness and interdependence of the coastal zones with inland nutrient input is much stronger in the coastal Mecklenburg than in the interior Brandenburg.[35] Interviewees from Mecklenburg-Vorpommern indeed stress that this interconnection was always addressed by the administration, not least due to the requirements of the Helsinki Commission (HELCOM) and the Baltic Sea Action Plan[36]. In Brandenburg awareness of the corresponding issues seems to be much lower. Its administration will not consider quality requirements set out in the Action Plan in its first management plan of 2009 and may only consider its relevance in the second or even third management plan[37]. Thus, formal and informal institutional change as the outcome of the WFD changed mental models of water managers but did not create one overarching common mental model concerning spatial interrelations considered in water management.

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[27] Interview LUNG MV 18.09.2008 Güstrow, Interview IOW 03.11.2008 Warnemünde, Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam

[28] Interview LUNG MV 18.09.2008 Güstrow, Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam

[29] Interview LUNG MV 18.09.2008 Güstrow, Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam

[30] Interview LUNG MV 18.09.2008 Güstrow, Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam

[31] Interview LUNG MV 18.09.2008 Güstrow, Interview LUA Bbg 12.08.2008 Berlin (phone), Interview MULV MV 27.10.2008 Schwerin, Interview LUA Bbg 15.09.2008 Berlin (phone)

[32] Interview MULV MV 27.10.2008 Schwerin, Interview BUND 23.09.2008 Berlin

[33] Interview LUA Bbg 15.09.2008 Berlin (phone), Interview ARLV 24.07.2008 Greifswald, Interview LUNG MV 18.09.2008 Güstrow

[34] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam, Interview BUND 23.09.2008 Berlin

[35] Interview LUNG MV 18.09.2008 Güstrow, Interview ARLV 24.07.2008 Greifswald, Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam

[36] [36] Interview LUNG MV 18.09.2008 Güstrow

[37] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam

5.2 The agricultural sector

The WFD requires the achievement of new objectives in water management, which significantly affect the agricultural actors[38]. Brandenburg and Mecklenburg-Vorpommern adopted these new objectives of water resource management[39]. Achievement of *"good ecological and chemical status"* in the Odra demands a reduction of nutrient input from agriculture as significant overall input reductions are only possible through the farming sector after water treatment had been modernised.[40] In the following section we focus on the agricultural sector which consists of the agriculture administration (the *State* ministries for agriculture, its agencies and lower authorities), (ii) farmer associations as lobby group, and (iii) individual farmers. The agricultural sector is affected by institutional changes concerning interfaces with several other actors to change nutrient input policy and management. Creating and adopting new rules for improving the status of water bodies, design measures, and comply with intake treatment demands requires new forms of cooperation and consultation.

Table 3: New collective choice rules: Agricultural sector. (own source)

Agriculture	*New collective choice and operational management rules in the agricultural sector*
Cooperation agriculture agencies/water agencies	
Mecklenburg-Vorpommern	
Alliance ‚Umwelt und Landwirtschaft', working group ‚Diffuse nutrient inputs, new cooperation rules *(formal and informal rules)*	*Cooperation (subject-specific) of water and agriculture administration. Contacts more frequent, more focussed, measures for certain areas* ***(informal and formal rules)***
Brandenburg	
Administrative working group *"Agriculture"*	*Cooperation of LUA and LVLF (subject-specific), determining problem areas, possible measures, efficiency of measures* ***(formal rules)***
Working Group of the Agencies	*Participation of federal and state administrations* ***(formal rules)***
Cooperation farmers (lobbyists)/water administration	
Mecklenburg-Vorpommern	
Working groups	*Farmers and farmer associations may participate* ***(formal rules)***
Participation of farmer associations, farmers	*Regular participation of the associations and farmers* ***(informal rules)***
Brandenburg	
Regional Water Panels	Farmer associations may participate, appointments to talk things over, discussion and information circles ***(formal rules)***
Participation of farmer associations	*Regular participation of the associations* ***(informal rules)***

[38] On the federal level they were declared by following formal rules: §§ 25a Abs. 1-3, 25b Abs. 2-3, 33a Abs. 1-3 WHG. § 36 b Abs. 2 WHG

[39] §§ 1 Abs.1, 24 Abs. 2, 25 Abs. 1, § 26 BbgWG (Brandenburg) and §§ 130a Abs. 1, 130a, § 130b, 130c LWaG (Mecklenburg-Vorpommern).

[40] Interview MULV MV 27.10.2008 Schwerin, Interview LUNG MV 18.09.2008 Güstrow, Interview BUND 23.09.2008 Berlin, Interview LUA Bbg 15.09.2008 Berlin (phone)

5.2.1 Formal institutional change

States need to establish management plans which also address diffuse water pollution. These formal rules influence interaction between agricultural actors and the water administration. New instruments and participatory bodies have been created to enhance their interaction. In Mecklenburg-Vorpommern**,** an "Alliance Environment and Agriculture" was founded to improve the cooperation of actor groups and enable the transposition of the WFD. One working group of the alliance is specifically dedicated to diffuse nutrient inputs from agriculture. It coordinates the reduction of inputs concerning problem areas and necessary measures. Members of the alliance are the water authorities and associated agencies, an agricultural consultancy, the federal state institute for agriculture and fisheries, farmer and nature conservation associations. In addition, to enhance participation, all parts of the water administration, agriculture administration, farmer associations, and single farmers cooperate in newly founded working groups.[41]
In Brandenburg the issue related cooperation is organised in the working group "Agriculture" with representatives from the LUA and the LVLF working on diffuse nutrient input and determining problem areas, measures and their efficiency. This collaboration is to facilitate the integration of management plans and agricultural subsidy programmes. This type of collaboration has been described as entirely new.[42] On the participatory level, the whole agricultural sector (administration, associations, farmers) is represented in 3 regional "panels" where all actors concerned may participate. Moreover all administrations involved in the implementation of the WFD, at the federal as well as at the individual state level, have the possibility to attend the working group of the agencies.[43] Furthermore, an online information platform has been created, 'WasserBLIcK', which makes data accessible to the public and the water administrations. Data collection in Germany and exchange with the EU is organised through this instrument, which neighbouring countries also have access to.[44]

5.2.2 Informal institutional change

As a result of the implementation of the WFD and subsequently implemented consultative and participatory bodies, a profound cooperation of agricultural and water administrations regarding nutrient inputs has been initiated. The complexity of the issue, and cross-level and cross-sectoral division of competencies required intense communication and coordination. In Mecklenburg-Vorpommern contacts between the different agencies already existed and have intensified in the course of the WFD implementation[45]. In addition agricultural associations now play a much more significant role in the working groups on water as cooperation and collaboration has intensified and farmer associations regularly attend the working groups[46]. In Brandenburg the cooperation of the expert agencies in terms of nutrient inputs is

[41] Interview LUNG MV 18.09.2008 Güstrow

[42] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam, Interview LUA Bbg 12.08.2008 Berlin (phone)

[43] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam

[44] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam, Interview LUNG MV 18.09.2008 Güstrow

[45] Interview LUNG MV 18.09.2008 Güstrow

[46] Interview LUNG MV 18.09.2008 Güstrow, Interview ARLV 24.07.2008 Greifswald

new but the ongoing discussion process has been depicted as constructive[47]. Agricultural actors are represented within the regional panels. In addition the option to arrange individual meetings between the agricultural sector and the administration is available.[48] Nevertheless, significant change in collaboration has thus far not been observed[49]. Despite the above described inter-sectoral cooperation, consultative and participatory bodies' agreement on targets and ways to reduce nutrient inputs have not yet been achieved. However, interviewees from various sectors agree that this will be possible in the future.[50] So far, an important barrier to active involvement of agricultural actors is costs of measures in relation to the expectation of insufficient benefits.[51]

5.2.3 Changes in mental models

Even if the main mental obstacles in the collaboration have been considered as misunderstandings emerging from different professional backgrounds[52] and the fact that the agricultural administration views itself basically as a representative of farmers[53], similar to the water administration the agricultural sector and administrations have meanwhile accepted that the Odra is to be managed at the scale of the entire basin and the awareness of the WFD among farmers seems to be high[54]. However, we also found differences in the perceptions of the interconnection and interrelation of the quality of coastal waters and farming inland. This interrelation is well accepted in Mecklenburg-Vorpommern while much less so in Brandenburg.[55] In contrast, all administrators interviewed share the idea that diffuse pollution and nutrient loads are among the principal problems that the WFD needs to address, and agriculture understands its important role.[56]. Nevertheless there are differences in the perception of the gravity of nutrient inputs, due to doubts about the methods of modelling the influences, which are known as too academic and complicated.[57] While farmers and farmer associations in both States agree that a solution to the problem must be found, they stress that society should compensate them[58]. They argue that agriculture provides food for society and that they should not be the only ones liable for negative externalities[59].

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[47] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam

[48] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam

[49] Interview Farmer Association Bbg 02.10.2008 Berlin (phone)

[50] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam, Interview LUNG MV 18.09.2008 Güstrow

[51] Interview LUNG MV 18.09.2008 Güstrow, Interview LUA Bbg 15.09.2008 Berlin (phone), Interview Farmer Association Bbg 02.10.2008 Berlin (phone), Interview Farmer Association MV 06.10.2008 Berlin (phone), Interview BUND 23.09.2008 Berlin

[52] Interview LUNG MV 18.09.2008 Güstrow

[53] Interview LUNG MV 18.09.2008 Güstrow, Interview BUND 23.09.2008 Berlin

[54] Interview LUNG MV 18.09.2008 Güstrow

[55] Interview LUNG MV 18.09.2008 Güstrow,), Interview Farmer Association Bbg 02.10.2008 Berlin (phone)

[56] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam, Interview LUNG MV 18.09.2008 Güstrow, Interview Farmer Association MV 06.10.2008 Berlin (phone), Interview LUA Bbg 12.08.2008 Berlin (phone)

[57] Interview Farmer Association MV 06.10.2008 Berlin (phone), Interview LUA Bbg 12.08.2008 Berlin (phone)

[58] Interview Farmer Association MV 06.10.2008 Berlin (phone)

[59] Interview Farmer Association Bbg 02.10.2008 Berlin (phone), Interview Farmer Association MV 06.10.2008 Berlin (phone)

5.3 Environmental NGOs

Environmental NGOs have already requested for a long time for a reduction in the nutrient inputs from agriculture to the benefit of coastal waters. They represent a particular downstream interest in an improvement of water quality in the lagoon. The WFD also led to formal and informal institutional change concerning the role and participation of environmental NGOs. Germany as well as the single States set the obligation for participative measures in their water laws[60]. The multitude of environmental NGOs relevant in the case study area act at all political levels, from the local to the international. Institutional changes at interfaces with other actors have therefore been observed at all levels.

Table 4: New collective choice rules for environmental NGOs. (own source)

Environmental NGOs	New collective choice rules: empowerment of environmental NGOs
ICPO	
Changes in cooperation rules	*Larger acceptance of opinion* ***(informal rules)***
Mecklenburg-Vorpommern	
Working groups, Alliance	*Involvement* ***(formal rules)***
Changes in cooperation rules	Changes in value of comments, changed acceptance ***(informal rules)***
Regular Participation	***(informal rules)***
Brandenburg	
Regional water fora	*Involvement* ***(formal rules)***
Changes in cooperation rules	Changes in value of comments, changed acceptance ***(informal rules)***
Regular Participation	***(informal rules)***

Environmental NGOs clearly gained in importance as a consequence of the reinforcement of participation. They traditionally have the right to file complaints with the European Commission in cases where Member state authorities do not comply with European legislations. Furthermore, even before the introduction of the WFD, they have obtained a seat as observers in the ICPO.[61] In Mecklenburg-Vorpommern nature conservation societies participate in the working groups and the *"Alliance"*. In Brandenburg they participate in the regional water forums[62]. These formal institutional changes led to changes in informal institutions as new networks[63]. For example representatives of environmental NGOs within the ICPO reported that Czech and Polish administrations initially had to get used to environmental NGOs in the international committees. Gradually, also as civil servants in these committees change environmental NGOs are taken more seriously, not least as the outcome of the WFD. Pressure on the implementing authorities has increased and the nature protection associations are sometimes effective in monitoring.[64] Also on the national and sub-national levels environmental NGOs have an enhanced indirect role in

[60] § 36b Abs. 2 WHG (federal law), § 130b LWaG MV (Mecklenburg-Vorpommern), § 26 BbgWG (Brandenburg)

[61] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam, Interview BUND 23.09.2008 Berlin

[62] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam

[63] Interview ARLV 24.07.2008 Greifswald

[64] Interview BUND 23.09.2008 Berlin

emerging networks of exchange on water management issues[65] indicating increasing acceptance of environmental NGOs also at this level. Today, they regularly participate in meetings on the implementation of the WFD. Nonetheless, voluntary local environmental associations especially have difficulties to participate because they lack time and human resources.[66]

6 DISKUSSION AND CONCLUSION

Top down changes in formal institutions seemed to follow a relatively plain benefit cost calculus. In addition, the process seems to be dominated by what institutionalists call path-dependency, thus, the influence of past arrangements on (the political and financial costs of) ongoing institutional change. In order to explain this formal institutional change and resulting changes in informal institutions and mental models (cf. our theoretical framework), we want to start with the decision to implement the WFD the way it was done in Germany. We argue that the administration here followed a cost benefit calculus, which considered alternatives such as a) drastic reconfiguration of water service provision, for example by redrawing the boundaries of areas of competencies and changing the water management level, b) non-implementation, or, as we found, c) complementing the existing institutions for managing water at the single state level with a structure to secure the deepening of cross-sectoral, cross-level and cross-boundary collaboration of the public and private stakeholders. Non-implementation of the Directive and specifically its requirement for IRBM and greater coordination and participation at the overall basin level would have caused an EU infringement proceeding. The reporting obligation to the EU commission as well as the complaint procedure open to NGOs and any other actor provides monitoring for the implementation. In order to avoid the political costs of reputation loss in terms of EU policy transposition and financial costs in terms of penalties, the *Federal State's* and the *States'* ministries implement the WFD. They address River Basin planning and coordinate management to achieve set standards concerning good ecological and chemical status. In compliance with these quality objectives they provide additional incentives for enhanced cooperation. Secondly, with greater coordination some water managers identify potential for benefits as greater coordination between uses may lead to more efficient water management and a redistribution of the burdens associated with the fulfilment of the water quality objectives.[67] Still, a more in-depth reconfiguration of the water management in Germany through the introduction of basin authorities which transcend the *State's* boundaries was similarly out of question. Thus, our findings are in line with Louka (2008: 124) who acknowledges that the ease and extent with which a directive is adopted *"…depends on the 'institutional fit' between the prescriptions of the directive and the institutional structure that is already in place…"*. Political costs of stripping the *States* of the competencies for water management are prohibitive and, in addition, transition costs of such a reconfiguration are considered too high. As part of the public administration the agriculture administration cooperates with the water administration on the

[65] Interview BUND 23.09.2008 Berlin

[66] Interview BUND 23.09.2008 Berlin, Interview LUA Bbg 12.08.2008 Berlin (phone)

[67] Interview LUA Bbg 15.09.2008 Berlin (phone)

implementation of the WFD and achievement of its objectives in order to avoid political and financial costs.
Complex discussion and the various contact persons necessitate intensive communication of all stakeholders. Nevertheless, given opposing interests and problem understandings bargaining seems to face obstacles and is considered time consuming, resulting in elevated transaction costs. Gradually e.g. the attitudes of farmers and their associations change. Reasons we found were over-all societal recognition of the influence of diffuse nutrient input. Secondly, on the one hand farmers increasingly want to save money and use nutrients as efficient as possible and, on the other, they are hoping for compensations in return for less nutrient use. Participatory bodies have been created in order to facilitate exchange and ease the implementation. Stakeholders, such as farmers, are included to reduce the transaction costs of implementing measures which require farmers' cooperation. Among other things they participate in the working groups to benefit from information about the possibilities of financial support. The complexity of the WFD – which is impossible to master at the *State*-level when rivers cross several *States* - requires further increased reconciliation and therefore an intensification of information flows. In order to lower associated information costs new means of communication are introduced such as the German internet platform "WasserBLIcK". Nevertheless, differences in understandings and mental models persist, especially regarding environmental administration and the agricultural sector. In one interview a representative of the water administration stated: *"They are always telling us: 'We all want to eat something' and we answer: 'We all want to drink something'*[68]. Similar to our study, Kastens and Newig (2007) found in their study of the implications of the implementation of the WFD for the farming sector in North Western Germany that agricultural stakeholders are increasingly aware of their responsibility concerning water resource protection. They also diagnose an important role for historical perceptions of the role of farming for economic development in the area and food security. Also, in their area the crucial difficulty lies in finding structures that integrate the various actors and interests in order to coordinate actors with different resources and interests. Substantial improvements concerning the achievement of quality targets further require genuine motivation from actors involved to improve the quality of the water bodies. Similar to the starting point of this paper they diagnose that success will crucially depend upon adequate representation of different sectors, including environmental NGOs, and the scale at which coordination takes place (see also Borowski et al. 2008). In their as well as in our case, structures come into existence or are already in place, the involvement of actors is improving and mutual understandings seem to emerge informally as an outcome of formal requirements for coordination. In regard to the role of participatory processes and coordinating structures, Mostert et al. (2007) also found out that participatory processes resulted in better understanding and greater support of the RBM idea, enhanced trust and better relations among stakeholders.
It seems that institutional change towards the greater inclusion of environmental NGOs was desired by the public administration in order to fulfil the WFD but also to exploit NGOs as a valuable source of information and useful counterpart to the agricultural sector. Their presence facilitates negotiations on the WFD objectives and

[68] Interview LUNG MV 18.09.2008 Güstrow

reduces transaction costs. Also, policy is supposed to gain greater legitimacy in that way. For the European Commission similarly, environmental NGOs reduce monitoring costs for they provide a source of information alternative to the public administration. NGOs themselves benefit from better access to information and participation facilitating their role. Nevertheless, they are often overburdened with the human resource and knowledge requirements of participation. Thus, in the case of environmental NGOs we cannot yet speak of participation on equal footing with other, principally public actors.

The described ways of coordinating actors and changes in institutions have led to the general acceptance of the need for coordination at the scale of the entire river basins and overall basin management. In contrast, targeted consideration of specific relations of spatial interdependence varies. Accordingly, coastal water managers in Mecklenburg-Vorpommern openly address farmers to deal with problems of diffuse pollution which leads to the eutrophication of the Baltic Sea. Here farming is clearly identified as having a significant impact on coastal tourism and ecosystems. In inland Brandenburg in contrast, where much of diffuse pollution has its source, this interdependence is considered of much less importance. We presume that for Brandenburg this issue is of less importance, being an upstream Land it does not carry the costs of diffuse pollution. The field work further showed that differences in the appreciation of the need to consider upstream effects for coastal waters at the level of the overall basin also depend on the distance of actors to the coast. De Jonge et al. 2006 similarly emphasize problems emerging from such mismatches regarding the assessment of key factors influencing quality marine waters.

On the transnational level actors perceive mutual benefit from the cooperation in the implementation of the WFD in the context of ICPO. Cooperation is facilitated by easily accessible information and increasing network building in the context of the implementation of the WFD. Both further lower transaction costs of cooperation and enhance trust and common understandings between actors, as shown above. Nonetheless, difficulties in the administrative cooperation with Poland persisted because of different political and economic structures. They can be explained with transaction costs of finding the right negotiation partner in an unknown administrative system where politics work differently and the administrative structure is different (see also the findings of Dombrowsky 2007) or as institutional roadblocks (e.g. already established institutions that view new authorities with suspicion) which endanger the implementation process (cf. Louka 2008). We assume that the deficit in mutual understanding and knowledge is reinforced by differences in historical and cultural background[69] which we associate also with differences in mental models (see also: Galaz 2005). Nevertheless, interaction with younger polish delegates seems to be easier, which illustrates that the processes unfolding as part of the WFD lead to an approximation of understandings in water management across boundaries.[70]

Even if it could increase the validity of the results to have a larger sample, our study clearly shows the basic progress of WFD implementation in terms of re-scaling and institutional change in water management cooperation regarding agricultural nutrient pollution so far. Thereby the main driving forces and obstacles for change, namely

[69] Interview MULV Bbg and LUA Bbg 06.10.2008 Potsdam, Interview BUND 23.09.2008 Berlin

[70] Interview BUND 23.09.2008 Berlin

benefit cost calculus, transaction costs and mental models, are presented and associated. Nevertheless, only the long term will show if the described enhancement of coordination and institutional change at the level of river basins due to an upgrading of coordination structures and participatory channels will in fact lead to the substantive improvements in the outcome of water management. They require an effective coordinated implementation of the plans of measures that have meanwhile been agreed among responsible actors and sufficient amounts of time to lead to biophysical effects on the ground.

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