The Institutional Design of River Basin Organizations – Introducing the RBO Institutional Design Database and its main Findings

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Abstract: This paper presents the RBO Institutional Design Database, available under the framework of the Transboundary Freshwater Dispute Database (TFDD). This database provides comprehensive information on institutional design of RBOs – including their organizational set up and their water resources governance mechanisms. Such information is relevant to water governance researchers, requiring institutional design data in order compare different RBOs or to comprehensively assess the contributions RBOs can make to better governing shared watercourses. It is important for policy-makers as well, facing the challenge of establishing new or reforming existing RBOs for more sustainable river basin governance. The paper provides an introduction to the database's underlying analytical framework and the database design. In addition, it summarizes some of the key observations made on the basis of the database concerning the institutional design of RBOs and the relevance of certain organizational structure characteristics and water resources governance mechanisms.

1 Introduction

Over the last decades and, in particular, since the 1990s, riparian states to internationally shared watercourses have established an ever growing number of River Basin Organizations (RBOs). With the establishment of institutionalized forms of joint river basin governance, riparian states aim to overcome challenges that are related to the fact that watercourses often transcend international boundaries and thus create international governance problems when the use of the watercourse and its resources by one riparian actor affects the opportunities of others. And indeed, cooperation over shared watercourses has been significantly more common than conflict (Wolf et al. 2003). Moreover, a large variety of problems were addressed in a cooperative manner that could not have been resolved by unilateral action. They include transboundary flood forecasting on the basis of shared hydrological data as, for instance, in the case of the Mekong River; the allocation of water in a fair manner avoiding disputes among riparians over scarce water resources, as done, for instance, by India and Pakistan in the Indus River Basin; the joint prevention of or restoration after pollution spills that move downstream as, among others, in the Danube River Basin; the improvement of water quality along entire rivers, including the restoration of regional seas as, for example, in the Elbe River and the North Sea; or the restoration of depleted fish stocks as in the case of the Lake Victoria. In all these cases, RBOs have played a significant role in bringing together riparian states and providing them with forums for negotiation, providing data and information for decision-making or solving disputes eventually occurring along the way.

The success of RBOs in solving water-related problems or in strengthening collaborative water resources governance among riparian states has, however, varied considerably across basins and institutions. While exogenous factors might account for some of this variation, RBOs themselves can

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be expected to determine, to a considerable degree, whether and to what extent they will be successful in governing a shared watercourse.

While exogenous factors influencing water resources governance have been addressed by various scholars (Bernauer 1997; Marty 2001; Zawahri 2008; Dinar 2009), research on the institutional design of RBOs has been surprisingly limited so far. Scholars that have embarked into the analysis of RBOs have usually addressed one or very few institutional design features only (Chenoweth et al. 2001; Kliot et al. 2001; Aberthny 2005; Lautze et al. 2012), have restricted their analysis to a limited number of RBOs or specific case studies only (Kibaroglu 2002; Backer 2006; Dombrowsky 2007; Bernauer/Siegfried 2008), or provide more general theoretical accounts for the institutional design of RBOs (Marty 2001; Bernauer 2002).

The black box of RBOs thus remains relatively closed to us. Consequently, our understanding of how RBOs work, what they contribute to governing the river basin in which they have been established and – ultimately – whether they are effective, remains limited. This also limits the possibility to develop policy advice on how to improve RBOs and thus better govern internationally shared basins.

Emphasizing the importance of RBOs for governing internationally shared watercourses and thus assuming that RBOs themselves make a difference in governing shared waters, this paper focuses on the institutional design of RBOs. It provides an analytical framework based on which RBOs and their institutional design can be captured (2), allowing for opening the black box of RBOs and studying the different features of RBOs. Furthermore, it presents empirical findings on the institutional design of RBOs that have been gathered in the context of a larger research project that investigated the influence of various factors – the nature of the water-related problem, the constellation of riparian actors and the institutional design of RBOs – on river basin governance effectiveness (Schmeier, 2013). Based on a comprehensive database, the RBO Institutional Design Database (described in chapter 3) that is made available under the framework of the Transboundary Freshwater Dispute Database (TFDD), the paper also provides insights into the organizational set-up of an RBO (4) and the mechanisms it provides for river basin governance (5).

2 Analytical Framework

The analysis of RBOs in this research project relies on more general neo-institutionalist analyses of the design of international institutions. Studying the design of international institutions as well as the effects of specific design on these institutions' effectiveness, institutional research – and especially research focusing on international environmental institutions – has provided important insights into the analysis of institutional design characteristics (Mitchell 1994b; Wettestad 1999; Koremenos et al., 2001; Mitchell/Keilbach 2001; Underdal 2002; Raustiala 2005). This provides a helpful starting point for the analysis of RBOs' institutional design.

Among the most common institutional design characteristics addressed by neo-institutionalist scholars are questions concerning the number of member states to an international institution (Snidal 1985; Wettestad 1999; Koremenos et al. 2001b; Mitchell/Keilbach 2001; Corbetta/Long 2008), the number of issues these institutions focus on (Peterson 1997; Koremenos et al. 2001a; Biermann/Bauer, 2004), the role of international institutions' secretariats (Andresen/Skjaerseth 1999; Bauer 2004; Biermann/Siebenhüner 2009), the compliance of member states with an institution's principles and rules (Peterson 1997; Raustiala 2005), the mechanisms through which decisions are taken among the institutions' members (Wettestad 1999; Breitmeier et al. 2006;

Underdal 2008; Blake/Payton 2009), and the tool applied for solving disputes that might occur among participating actors (Keohane et al. 2000; Ostrom 2005; Koremenos 2008).

However, neo-institutionalist analysis – even if looking at the study of international environmental institutions only – is very broad, covering a wide range of institutions in a variety of policy fields, including global institutions for addressing global climate change as well as local-level institutions aiming at managing migratory species between two countries. In order to be more precise and to take into consideration the various characteristics of the water sector, this analytical framework also relies on more water-specific approaches. Among them, hydropolitics research focusing on International Water Treaties (IWTs) and RBOs has been particularly informative, although often only focusing at the emergence of cooperative arrangements (e.g. Dinar 2004; Espey/Towfique 2004; Song/Whittington 2004; Tir/Ackermann 2009) and less on their actual design or even their impact (for some exceptions, refer to Marty 2001; Bernauer 2002; Dombrowsky 2007).

Based on institutionalist research and the more water-specific approaches taken into consideration when developing this analytical framework, a number of institutional design factors for RBOs have been identified. They can be differentiated into two groups of institutional design characteristics: 1) the organizational structure of an RBO, and 2) the river basin governance mechanisms an RBO provides. While the former one captures the infrastructure of an RBO, that is the way the RBO actually looks and is set up, the latter one comprises the instruments for governing the respective basin provided by the RBO.

The first category consists of:

1) The membership structure
2) The functional scope
3) The international water law principles on which the RBO relies
4) The level of institutionalization and legalization of the RBO
5) The RBO's organizational set-up
6) The Secretariat
7) The financing of the RBO

The second category comprises:

1) Decision-making mechanisms
2) Data and information sharing mechanisms
3) Monitoring mechanisms
4) Dispute-resolution mechanisms
5) Mechanisms for stakeholder involvement

For each of these design characteristics, information was gathered for each RBO in the world's transboundary rivers. The following chapter explains how this data was gathered, organized and analyzed.

3 Methodology and Database Design

In order to gather and analyze information on the aforementioned institutional design features of RBOs, a database has been developed by the author in the context of a larger research project (see

Schmeier 2013). This database maps the information on the institutional of RBOs for the entire population of RBOs.

First of all, the entire population of RBOs had to be identified since no comprehensive list of all RBOs governing internationally shared watercourses was available (while a number of researchers have focused on comparative analyses of institutionalized water resources governance, e.g. Bakker 2007; Dombrowsky, 2007; Gerlak/Grant 2009, a list of all RBOs did not exist so far). The identification of RBOs, as a first step in the analysis, was therefore based on a number of different sources in which information on international environmental and/or water-specific cooperation had been gathered, including

1) the International Environmental Agreements (IEA) Database Project, developed by Ronald Mitchell at the University of Oregon,
2) the TFDD's Treaty Database, which provided information on international agreements signed over shared watercourses, with some of them establishing the legal foundations of RBOs to be established,
3) the International Water Law Project's List of Transboundary Water Management Institutions,
4) numerous secondary literature, analyzing institutionalized cooperation in different international watercourses (for a comprehensive literature review, refer to Dinar & Dinar 2003; Schmeier 2010a; Schmeier 2013: 7-17)

Based on these sources, the author was able to compile a comprehensive list of all currently existing institutions governing internationally shared watercourses (as of 2011) – presented in Annex 1 to this paper[2].

In order to gather information for each of these institutions, a database has been developed that collects information for each of the 12 institutional design features mentioned above. For each unit of analysis – coded as RBO in a specific river basin (captured by its TFDD River Code), so called RBO-RIV-pairs[3] – information on each design feature is captured through a number of variables. The figure below provides an example for how the information for the membership structure of RBOs has been gathered and coded according to variables of interest, namely the laterality and the inclusiveness of RBOs: In addition to basic information on the RBO, it contains the names (RIP_NAMES) and the number of the river's riparian states (NO_RIP) and the RBO's member states (MEMB_NAMES and NO_MEMB), allowing for a judgment on the RBO's laterality (LAT_RIP, bilateral with two member states or multilateral with three or more member states) and its inclusiveness (INCL_RIP, inclusive, bringing together all riparian states to the basin, or non-inclusive, consisting of a sub-set of riparians only).

[2] This paper understands RBOs as "institutionalized forms of cooperation that are based on binding international agreements covering the geographically defined area of international river or lake basins characterized by principles, norms, rules and governance mechanisms". It is not the aim of the paper to engage in the discussion of what an RBO actually is. Instead, the paper acknowledges that for a number of institutions covered by the database the notion RBO might not be the utmost correct one, e.g. because these institution do not possess all constitutive elements of an RBO as defined in Schmeier et al. 2013. For a more detailed discussion of the concept of RBOs, refer to Schmeier et al. 2013.

[3] This acknowledges that some RBOs cover more than one watercourse. This is, for instance, the case with the International Joint Commission (IJC) that covers 11 different rivers that cross the US-Canadian border, or the International Commission of International Rivers (ICIR), governing Spanish-Portuguese transboundary rivers. At the same time, one watercourse can be covered by more than one RBO as we find, for instance, in the case of the Orange River Basin, which is covered by four different RBOs of different geographic and functional scope, or the Zambezi River Basin, covered by two different RBOs of different geographic and functional scope.

RBO	RIV	RIV_NAME	RBO_NAME	RIP_NAMES	NO_RIP	MEMB_NAMES	NO_MEMB	LAT_RIP	INCL_RIP
GTIX	TUMN	Tumen	Greater Tumen Initiative	China, North Korea, Russia	3	China, Mongolia, Russia, Korea	4	Multilateral	Inclusive
ICPO	ODER	Oder	International Commission for the Protection of the Oder River against Pollution (ICPO)	Czech Republic, Germany, Poland	3	Czech Republic, Germany, Poland	3	Multilateral	Inclusive
MARC	GANG	Mahakali	Mahakali River Commission	India, Nepal	2	India, Nepal	2	Bilateral	Inclusive
MRUX	MANA	Mano-Morro	Mano River Union	Guinea, Liberia, Sierra Leone	3	Liberia, Sierra Leone	2	Bilateral	Non-inclusive
ZRAX	ZAMB	Zambezi	Zambezi River Authority	Angola, Botswana, DR Congo, Malawi, Mozambique, Namibia, Tanzania, Zambia, Zimbabwe	9	Zambia, Zimbabwe	2	Bilateral	Non-inclusive

Figure 1: Database Example – The Membership Structure of RBOs

In many cases, information was not only captured just in quantitative terms, but has also been complemented by qualitative descriptive information that could then be coded according to specific categories. The figure below presents the example of the decision-making mechanism variable. For each RBO in each basin, it was captured whether an RBO has defined its decision-making mechanisms at all (DECMAK_SPC). If this was the case, the provisions for decision-making have been described (DECMAK_NAMES) and coded as majority, consensus or unanimity-based decision-making (DECMAK-MEC) and with regard to the bindingness of decisions once taken (DEC_BIND).

RBO	RIV	RIV_NAME	RBO_NAME	DECMAK_SPEC	DECMAK_NAMES	DECMAK_MEC	DEC_BIND
CUFW	OLNG	Olanga	Finish Russian Commission on the Utilization of Frontier Waters	yes	Decisions are made unanimously and are binding on both sides; if the Commission cannot reach mutual understanding it conveys the issue to the government of both parties	COS	BDG
GLCX	SLAW	St. Lawrence	Great Lakes Commission	yes	Each state delegation shall be entitled to three votes; presence of commissioners from a majority of party states shall constitute a quorum for the transaction of business at any meeting of the Commission; actions of Commission shall be by a majority of votes cast	MAJ	not specified
GMSX	MEKO	Mekong	Greater Mekong Sub-Region	no	n/a	n/a	no
PHYC	STUM	Struma	Permanent Yugoslav-Greek Hydroeconomic Commission	yes	decisions require the assent of at least 3 people of each party's delegation; decisions become binding after approval by both governments	COS	BDG

Figure 2: Database Example – The Decision-Making Mechanisms of RBOs

In order to capture the complexity of water resources governance in internationally shared basins, the RBO database is also linked to other data gathered within the TFDD, namely TFDD's Spatial Database, providing information on geographic characteristics of transboundary watercourses, and TFDD's Treaty Database, comprising data on international agreements signed over transboundary watercourses. Linkages to other databases within the TFDD can be established in the future as well, allowing for the development of a holistic and comprehensive database that addresses the very different aspects of transboundary water resources governance.

Gathering, coding and analyzing institutional design information for the entire population of RBOs has also allowed for a comprehensive analysis of RBOs' institutional design. The next sections present the most interesting findings from this analysis per institutional design feature, focusing on both the organizational set-up of RBOs (4) and the river basin governance mechanisms RBOs provide (5). It is by no means a comprehensive analysis – instead, it aims at providing a first glance of RBO design

features that hopes to trigger further interests in the design of RBOs and its influence on the governance of internationally shared river basins.

4 Observations I: The Organizational Set-Up of RBOs

The Membership Structure of RBOs

One of the most obvious characteristics of an RBO's institutional design describes how many riparian states are members of the RBO and whether the RBO covers the entire basin or only a sub-set of riparians. Especially the question whether an RBO includes all riparian states to a river basin or brings together a sub-set of riparians only can be expected to be a key determinant of river basin governance given its close linkage to the question of whether cooperation is easier to achieve and to maintain effectively with a smaller number of actors or whether successful river basin governance requires an integrated approach amongst all riparian states (Just and Netanyahu 1998; GWP 2000; Kliot et al. 2001b; Mostert 2003b; Dombrowsky 2006).

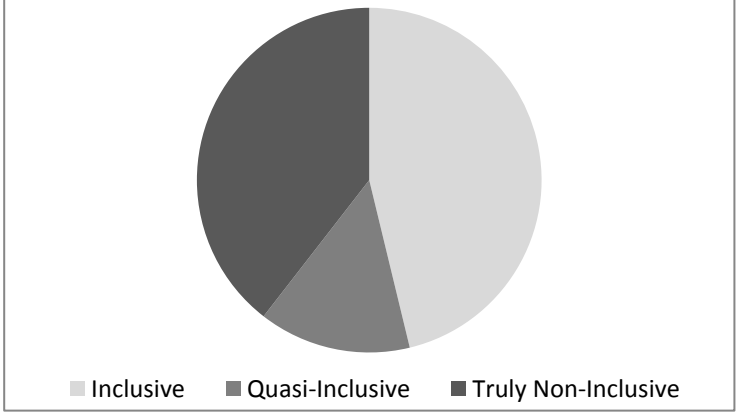
Most generally, it can be observed that the number of member states varies considerably across RBOs. While some RBOs bring together only two states, other RBOs have member numbers as high as 14 (for the International Commission for the Protection of the Danube River (ICPDR)), followed by 11 for the Danube Commission (DC), the Niger Basin Authority (NBA), and the Nile Basin Initiative (NBI) respectively, or eight for the Organization of the Amazon Cooperation Treaty (OCTA) and the Zambezi Watercourse Commission (ZAMCOM) respectively.

In addition to the mere number of riparians, the basin coverage, that is, the inclusiveness of an RBO, is an important institutional design feature. Within the 119 institutions included in the database, only 55 include all riparian states to the respective watercourse in the RBO, thus being inclusive. These are, most obviously, RBOs in bilateral river basins, such as the Great Lakes Commission (GLC), between Canada and the US, the International Water and Boundary Commission (IBWC) covering transboundary rivers between the US and Mexico, or the Mahakali River Commission (MARC), managing the Mahakali River that is shared by India and Nepal. However, many RBOs also include all riparians in larger river basins, such as, for example, the Commission International pour la Protection de la Moselle (CIPM), bringing together all three riparians to the river (France, Germany and Luxemburg), the Lake Tanganyika Authority (LTA), managing the lake between its four riparians (Burundi, the Democratic Republic of Congo, Tanzania and Zambia) or even the NBA, bringing together all 11 riparians to the Niger River (Algeria, Benin, Burkina Faso, Cameroon, Chad, Guinea, Ivory Coast, Mali, Niger, Nigeria, and Sierra Leone).

On the other hand, 64 RBOs bring together a sub-set of riparians only. Examples include the Central Commission for the Navigation of the Rhine (CCNR), bringing together only five out of the nine riparians of the Rhine River, the Lake Chad Basin Commission (LCBC), including only four of the eight riparians to the lake, or the Mekong River Commission (MRC), managing only the Lower Mekong Basin and not including upstream China and – until 2012 – Myanmar. In some cases, this non-inclusive membership is said to have led to a number of problems, largely related to the lack of geographically integrated water resources management (for more detailed analysis, refer, among others, to Goh 2007; Zawahri and McLaughlin Mitchell 2009).

Linking the analysis of the inclusiveness of RBOs to spatial data gathered in the TFDD's Spatial Database has, however, shown a very interesting phenomenon: For a considerable number of RBOs (17 out of the 64 non-inclusive ones) exclude riparian states that share only a very small part of the basin, with the threshold set at less than 1% of the basin's total territory. Examples include North Korea, which only covers 0.01% of the in the Amur River Basin and is not a member of the Amur River Basin Coordination Committee (ARBC), Austria and Poland, covering 0.54% and 0.56% of the Elbe River Basin respectively, and not being members of the International Commission for the Protection of the Elbe (ICPE), or Chile, which shares only 0.74% of the Lake Titicaca and is not a member of the Binational Autonomous Authority of the Lake Titicaca for the TDPS (BALT). Apparently, the inclusion of states with a very minor share of the basin and thus a very limited influence on the basin's water resources is thus less problematic. We can hence distinguish between truly non-inclusive RBOs (47 out of 64 non-inclusive RBOs), leaving relevant riparian states out of the institutionalized governance framework, and quasi-inclusive RBOs (17 out of 64), bringing together all relevant riparians and only excluding riparians of minor importance to the basin (see figure 3).

Figure 3: The Inclusiveness of RBOs



The Functional Scope of RBOs

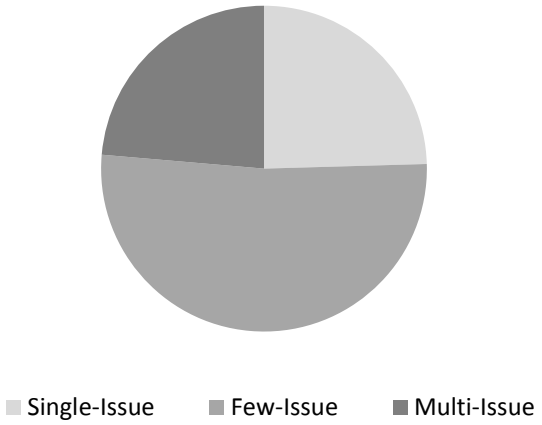
Another key characteristic of RBO is the institution's functional scope, capturing the issues the RBO deals with. While generally mandated to govern the watercourse, the issues RBOs deal with actually differ considerably. While some RBOs focus exclusively on navigation, others are mandated to manage fisheries while yet others have the task to allocate water and monitor the use of water according to previously agreed upon principles. Often, though not always, these issues are clearly linked to the key collective action problem the river basin faces.

In addition to the mere listing of issues RBOs deal with, we can also distinguish different categories of RBOs, ranging from single-issue RBOs that focus on one very specific issue only to multi-issue RBOs, working on a broad range of issues: Single-issue RBOs focus on one specific water resources governance issue only. That is, their activities are targeted to one specific collective action problem in one specific sector. Examples in this category are, for instance, the CCNR, dealing with navigation among Rhine riparian states, the Great Lakes Fisheries Commission (GLFC), governing fisheries issues between Canada and the US, or the Zambezi River Authority (ZRA), managing hydropower projects on the Zambezi River.

Multi-issue RBOs, on the other hand, focus on a broad variety of issues in different sectors that are not necessarily interlinked. One typical example is the LCBC, which covers water resources governance issues in a broad sense, including environmental protection, biodiversity, groundwater management, navigation and the overall promotion of cooperation among its member states. Similarly, the NBA, focusing on issues as diverse as agriculture and irrigation, fisheries management, transport, communication, industrial development, river-related health, energy generation, navigation as well as flood and drought management. Likewise, the Organisation pour la Mise en

Valeur du Fleuve Sénégal (OMVS), dealing with agriculture and irrigation, hydropower generation, navigation and the construction of joint infrastructure schemes for these purposes, as well as fisheries, climate change adaptation, environmental protection and the overall promotion of regional integration of its member states. The majority of RBOs (57 out of 110[4]; see figure 4) is situated between these two extremes, focusing on few issues. Such RBOs work on a set of few interdependent and closely related issues – such as water quality, environmental protection, hydromorphological alterations and floods in the case of the International Commission for the Protection of the Danube River (ICPDR) or the International Dnieper Basin Council (IDBC), working on environmental protection along various lines, with a strong focus on environmental monitoring and data gathering.

Figure 4: The Issues-Specificity of RBOs



Building on research done on the benefits joint water resources governance can provide (Sadoff and Grey, 2002; Sadoff and Grey, 2005), we can also distinguish between RBOs that focus on issues to the river and RBOs that focus on issues beyond the river (or both). Issues to the river concern issues that are clearly linked to water resources governance in the narrow sense, that is, for example, water allocation, flood management and mitigation or fisheries management. Issues beyond the river, on the other hand, concern activities of the RBO that go beyond water resources governance, including, for instance, the facilitation of trade, the promotion of economic integration or the advancement of regional tourism. The latter category is found exclusively in the developing world or among emerging economies. Examples are the Mano River Union (MRU) which aims at implementing an economic and customs union among the riparian states of the Mano-Morro River, or the Greater Mekong Sub-Region (GMS), which works on the strengthening of economic integration through trade, transport and other sectors among states of the Mekong Region.

Combining data on the issue-specificity and river focus provides a comprehensive picture of the functional scope of RBOs (see figure 5): Single-issue RBOs most often focus on issues related closely to the river. Examples include Mosel Commission (COMO)'s sole focus on navigation or the ZRA's singular emphasis on hydropower development. Due to the mere amount of issues covered, multi-issue RBOs, on the other hand, obviously tend to also cover issues that go beyond the river. The NBA provides an insightful example, covering a large number of issues both related to the river (including flood and drought management, fisheries and navigation) and clearly going beyond the scope of water resources management (such as industrial development, transport promotion or the strengthening of communication networks in the basin).

[4] Overall, 27 single-issue RBOs, 26 multi-issue RBOs and 57 few-issue RBOs have been identified. For 9 institutions out of the set of 119 RBOs, information was insufficient for classification of the functional scope – they have therefore been excluded from this analysis, reducing the population size to 110 institutions.

	Single-Issue	Few-Issue	Multi-Issue	Total
To the River	23	49	4	**76**
To and Beyond the River	0	5	15	**20**
Beyond the River	4	3	7	**14**
Total	**27**	**57**	**26**	**110**

Figure 5: Issue-Specificity and River Focus on RBOs' Functional Scope

In some cases, RBOs exclusively focus on issues beyond the river as it is, for instance, the case with the GMS with addresses economic integration and development topics ranging from the improvement of transport infrastructure in the region to the promotion of tourism or the strengthening of communication links. In such cases, it is doubtable whether such institutions actually classify as RBOs or should rather be perceived as institutions geographically tied to river basins but not necessarily governing their water resources (for a detailed discussion of this matter, refer to Schmeier et al. 2013).

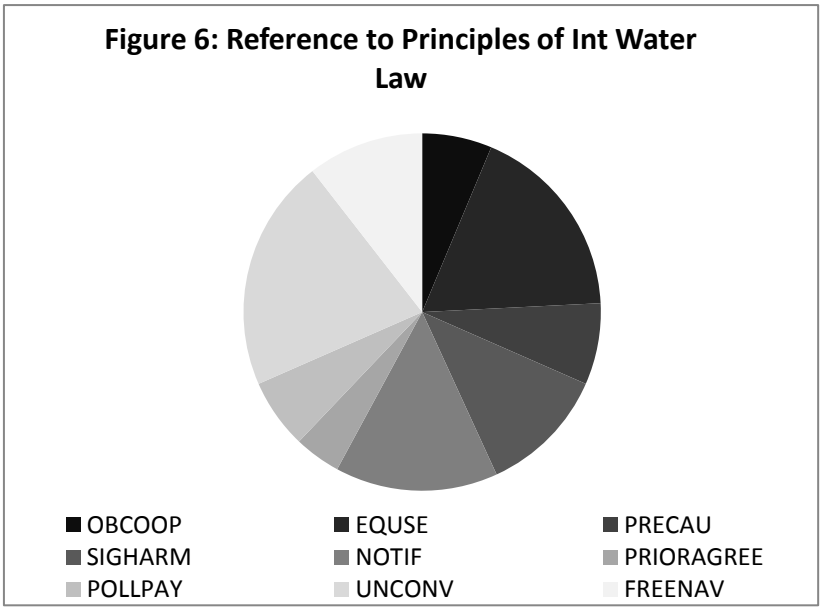
These empirical findings can also inform further research on the issues an RBO should focus on and how broad their scope should be (refer to Bernauer 1997: 183-185; Kliot et al. 2001b: 315-322; Marty 2001: 23-29; Dombrowsky 2007: 101-105), showing a broad variation of the functional scope of RBOs that can be studied further with regard to its contribution to successful river basin governance in the respective basin.

The Reliance on Principles of International Water Law

International principles and rules concerning shared watercourses often inspire riparian states when establishing RBOs as the institutionalized bodies for jointly governing these watercourses. Especially international water law principles – both customary and codified – can thereby provide important input in how to share, govern and/or protect a watercourse. The database has therefore focused on the key international water law principles as indicators for this institutional design variable – most notably the principle of the freedom of navigation, the principle of equitable and reasonable use, the obligation not to cause significant harm and the principle of prior notification (as well as the 1992 United Nations Economic Commission for Europe (UNECE) Water Convention and the 1997 United Nations (UN) Convention on the Non-Navigational Use of Transboundary Watercourses (1997 UN Convention) as framework conventions including the aforementioned principles). For each RBO, agreements and treaties as well as relevant policy documents such as strategic plans, annual plans or program documents have been analyzed for their reference to principles of international water law, thus capturing the de iure incorporation of them.

The inclusion of international water law principles in RBOs' underlying agreements, treaties or policy documents does, however, vary considerably: out of the sample of 119 institutions, 49 do not make any reference to water law principles. Among them are some that merely classify as RBOs themselves and that are not so much concerned with governing the non-navigational use of watercourses – such as ASEAN's Mekong Basin Development Cooperation (MDBC) which focuses on economic integration rather than water resources governance in the narrow sense and therefore does not rely explicitly on water law principles.

Among the ones referring to water law principles, it can be distinguished between water law principles pertaining to the navigational use of shared watercourses and principles focusing on the non-navigational use.



Very often, reference to more than one international water law principle occurs, especially if the respective RBO is dealing with more than one water resources management issue. Therefore, figure 6 depicts the overall distribution of water law principles RBOs refer to. It shows that the principle of equitable and sustainable use (EQUSE), the principle of prior notification (NOTIF) and the obligation not to cause significant harm to co-riparians (SIGHARM) are the most commonly referred to principles, surpassed only by reference to specific UN Conventions (UNCONV) that capture more than one water law principle in a comprehensive manner, namely the 1997 UN Convention and the 1992 UNECE Water Convention. Other principles, such as the obligation to cooperate (OBCOOP), the principle of prior agreement among riparians before a project is initiated (PRIORAGREE) or the polluter pays principle (POLLPAY), are less commonly referred to.

Particular cases are RBOs dealing exclusively with navigational issues, therefore only focusing on the freedom of navigation: The freedom of navigation is explicitly included in the underlying agreements of all navigation-specific RBOs – CCNR, COMO, DC and the International Commission for Boating on the Lake Constance (ICBL). The Danube Navigation Convention, for instance, states that "navigation on the Danube shall be free and open for the nationals, vessels of commerce and goods of all states" (Art. 1). Similarly, the Moselle Navigation Agreement determines that "navigation on the Moselle […] is free" (Art. 29). Other RBOs that govern navigation alongside other issues have often included the principle of free navigation as well – among them the Commission Internationale du Bassins Congo-Oubangui-Sangha (CICOS), the International Joint Commission (IJC) and the OCTA.

While this data provides some first insights into the incorporation of international water law principles into RBOs and their work, more research is required to better understand whether and under which conditions RBOs actually incorporate water law principles and to what extent they translate de iure commitments into de facto water resources governance activities. Such advances in research will require closer interdisciplinary collaboration between water governance and water law scholars as it has been initiated lately (e.g. Conca et al. 2006; McIntyre 2007; Sadoff et al. 2008).

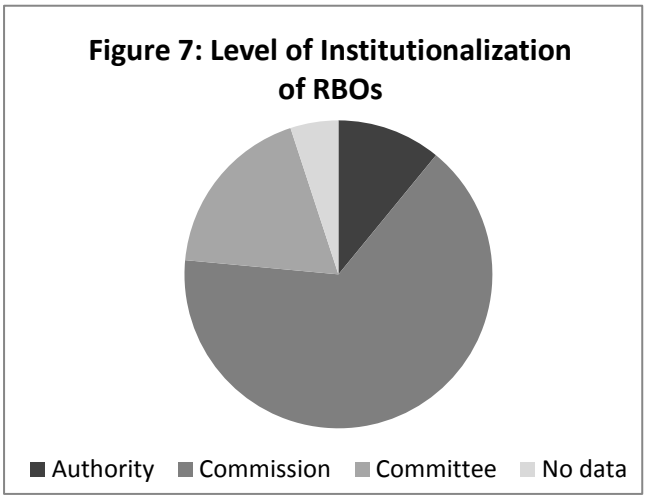
The Legalization and Institutionalization of RBOs

This institutional design characteristic refers to the level of legalization and institutionalization of an RBO, that is, the degree to which it is capable of developing and implementing river basin governance activities vis-à-vis its member states and other actors in the basin. It is captured by 1) the legal personality of an RBO and thus the question whether the RBO is a subject of international law, and 2) the level of institutionalization, captured by the depth of institutionalization and thus the position of an RBO vis-à-vis its member states.

Among the RBOs studies, a considerable number of RBOs (58) are explicitly equipped with legal personality through their underlying agreements. 35 RBOs, however, explicitly lack legal personality, indicating that they have not been established as independent actors in the international system (for the remaining 26 institutions, data was too limited to categorize their level of legalization on the basis of their legal personality).

The second component of this institutional design feature refers to the type of RBO, differentiating between authorities, commissions and committees. While this distinction has been criticized for being imprecise (Lautze et al. 2012), it nonetheless provides a helpful means for grouping RBOs into specific institutional design categories that can inform future analysis and has therefore been captured in the database as well.

Figure 7: Level of Institutionalization of RBOs



It can be observed that most RBOs are institutionalized at a medium level, hence being more than mere inter-governmental coordination bodies without any actor quality but, at the same time, also being limited in their powers vis-à-vis their member states. Such types of RBOs are generally referred to as Commissions. They represent 78 RBOs within the sample of 199 institutions (see figure 7). Authorities having more power vis-à-vis their member states and often possessing an independent implementation role, on the other hand, are not as common (13 out of 119). They are mostly found in Africa when riparian states decided to establish an RBO in order to foster economic development through joint river basin development projects (such as in the case of the NBA, the OMVS, the Volta Basin Authority (VBA) or the ZRA). Committees, the lowest level of institutionalization, are found all over the world in river basins where cooperation remains relatively low and states have only accorded a very limited responsibility to a joint institution.

The Organizational Structure of RBOs

In order to function as institutions and fulfill their mandate, RBOs require a certain infrastructure of organizational bodies, performing different functions in river basin governance. Most RBOs thereby rely on a three-fold organizational set-up, consisting of a high-level decision-making body, an intermediate body that operationalizes political decisions into implementable programs and projects, and a secretariat that provides administrative services.

High-level decision making bodies usually come in the form of *Councils or Commissions* (the latter ones not to be confused with the notion of Commissions when classifying the level of institutionalization), consisting of ministerial-level representatives of the RBO's member states. They are mandated to provide political guidance to the RBO and making long-term strategic decisions on water resources governance in the respective basins. Examples include the Comité de Ministres of the CICOS, the Commission of the International Commission for the Protection of the Rhine River (ICPR), the Conseil des Ministres of the NBA, or the Council of Ministers of the ZRA.

Eight RBOs also possess an even higher level organizational body, taking water resources governance issues up to the *Heads of State and Governments'* level. This is, for instance, the case with the Autorité de Développement Integré de la Région du Liptako-Gourma (ALG)'s Conférence des Chef's d'Etat, the Meeting of Presidents of the OCTA, or the Assembly of Heads of State and Government of the VBA.

At the intermediate level, RBOs most often possess some form of *Committees* that operationalizes the political decisions taken at higher levels into specific programs, projects and activities of the RBO and decides on more technical issues of river basin governance. Such Committees most often consist of high-ranking government officials with technical expertise from the respective ministries in the RBO's member countries. Examples include the Management Committee of LTA, the Joint Committee of the MRC, the Basin Steering Committee of the Okavango River Basin Water Commission (OKACOM), or the Technical Committee of the ZAMCOM. The fact that a large number of RBOs (39) possesses such intermediate technical bodies underlines the importance of linking political decisions about water resources governance in a shared basin to technical knowledge and turning this linkage into specific programs and projects that can be implemented by the RBO.

Other RBOs leave the technical coordination work to *Expert or Working Groups*, bringing together technical experts from the member countries in order to come to technically informed decisions on how to achieve politically given goals and objectives. Such organizational bodies are most common among European RBOs such as the Working Groups of the International Scheldt Commission (ICBC), the Expert Groups of the ICPDR, or the Working Groups of the International Commission for the Protection of the Oder (ICPO)[5]. RBOs in other parts of the world have, in some cases, established similar mechanisms for bringing together technical expertise from the member countries in order to inform water resources governance decisions at the RBO level and develop the respective activities. Examples include the Working Groups of the Lake Victoria Fisheries Organization (LVFO), the Technical Expert Committees of the NBA or the Working Groups of the Orange-Senqu River Commission (ORASECOM).

The Role of RBO Secretariats

Among the different organizational bodies of RBOs the Secretariats have proven to play a particularly critical role in the implementation of jointly agreed upon water resources governance strategies. This is in line with more general analyses of the role of Secretariats in institutionalized international (environmental) politics (Andresen/Skjaerseth 1999; Bauer 2004; Bauer/Biermann 2007; Biermann/Siebenhüner 2009).

First, most RBOs (94 out of 119) have established Secretariats that fulfill some sort of administrative and secretarial functions. RBOs without Secretariats tend to be RBOs of very limited institutionalization, often merely going beyond inter-state coordination bodies such as the International St. Croix River Board (ICRB), or institutions attached to larger international organizations that fulfill administrative functions for them (an example is the GMS attached to the

[5] The Working and Expert Groups of the ICBC, the ICPDR and the ICPO bring together experts for different topics relevant to river basin governance by the RBO. These are the Incidental Pollution, Communication, Cartography, Surface Water, Groundwater, Cost Efficiency Analysis, Floods/Droughts for the ICBC, River Basin Management Group/Hydromorphology, Economics, Pressures and Measures, Monitoring and Assessment Expert Group (including Groundwater and Accident Emergency Warning System), Flood Protection, Information Management and GIS, and Public Participation for the ICPDR, and EU Water Framework Directive (EUWFD), Floods, Accidental Pollution, Legal Issues, Monitoring, Planning and Management, Economic Analysis, Reporting for the ICPO.

Asian Development Bank (ADB) where the latter one provides the entire organizational and administrative framework for the former one).

The role of RBO Secretariats does, however, vary considerably across the population of RBOs, ranging from the mere provision of administrative and financial services to the execution of full-fledged project implementation activities including their monitoring and reporting or the engagement in scientific research and data analysis and provision. Generally, the role if Secretariats is linked to the RBO's functional scope and, most importantly, its specific role in either coordinating member states' activities (so-called coordination-oriented RBOs) or implementing water resources management activities (implementation-oriented RBOs; for this distinction, refer to Schmeier 2010b).

One of the basic secretarial functions comprises the provision of *administrative services* such as the organization of meetings of governance bodies, the provision of support to Working and Expert Group Meetings, or the documentation and dissemination of the RBO's work. The Secretariat of the Commissions International pour la Protection de la Sarre (CIPS), for instance, is in charge of preparing, organizing and documenting all meetings of the Commission as well as the dissemination of information on decisions taken at the Commission's meetings. The ICPO's Secretariat is charged to translate documents and provide simultaneous and/or consecutive interpretation at meetings of the Commission.

Similarly, Secretariats often provide *financial support* such as the drafting of the RBO's budget (usually approved by the RBO's governance bodies), the management of the RBO's revenue and expenditure or the financial management of specific programs and projects. The Secretariat of the ICPDR, for instance, prepares budget and calculates income and expenditure of ICPDR per year (Art. 9 Rules of Procedures of the Secretariat). And the Secretariat of ZAMCOM, for instance, prepares and submits annual budget to Technical Committee and Council (Art. 11 ZAMCOM Agreement). For RBOs supported by external financial resources, Secretariats often fulfill a fund raising and donor coordination and management function. The NBI Secretariat, for instance, plays a key role in donor coordination and in the acquisition of funds from donor agencies.

In addition to these merely administrative tasks, a number of RBO Secretariats also engage in the *planning of river basin governance* (e.g. through the formulation of strategic plans for river basin development) and the *development of programs and projects* supporting the overall goals and objectives of river basing governance. Some RBO Secretariats also implement such programs and projects by themselves. The Secretariat of the LTA has the task to oversee *implementation of program and project activities* (Art. 26 LTA Convention). The Secretariat of the NBI coordinates and oversees the implementation of the Shared Vision Program and NBI's investment programs (Eastern Nile Subsidiary Action Program – ENSAP and Nile Equatorial Lakes Subsidiary Action Program – NELSAP). In a number of RBOs, Secretariats also fulfill *coordination and harmonization functions*, aiming at harmonizing the water resources policies and strategies among RBO members in order to ensure the integrated governance of the basin. ZAMCOM, for example, has the task to make recommendations to Technical Committee on harmonization of national water policies and laws (Art. 11 ZAMCOM Agreement).

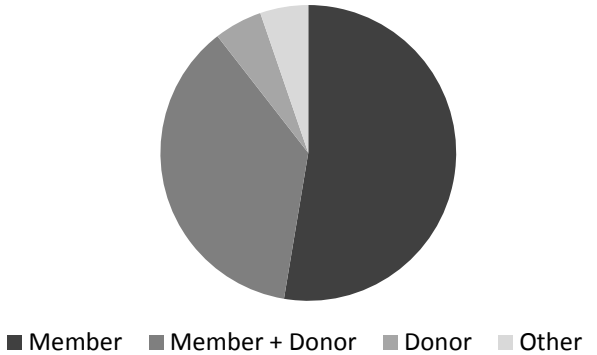
Other functions of RBO Secretariats are also closely related to the RBO's river basin governance mechanisms – namely the acquisition, analysis and dissemination of data, research and information, monitoring functions, the management of external relations and public participation (see sections below). The Secretariat of the ICPDR, for instance, maintains DANUBIS (Danube River Basin

Information System), that is, responsible for data collection and dissemination. Similarly, the ZAMCOM Secretariat develops research and training programs on sustainable use and protection of watercourse (Art. 11 ZAMCOM Agreement).

Financing RBOs

In order to fulfill their mandate and govern their respective watercourse, RBOs require sufficient financial resources. Empirical evidence from a number of basins has shown that the lack of financial resources can considerably impede and RBO's work. The LVFO, for instance, came under considerable pressure after the Global Environment Facility (GEF)'s funding ended in 2002, leaving the RBO with insufficient financial means for implementing activities it had committed to, especially in the field of environmental health (LVFO 2005: 36). Similarly, several OKACOM projects got delayed in the mid-2000 due to financial constraints and could only be revived when external funding was provided by Swedish International Development Cooperation Agency (SIDA) (OKACOM 2009: 15). The financing mechanisms are therefore another important component of an RBO's organizational set-up as well. However, not all RBOs have clearly defined their financing mechanisms. Within the RBO Design Database dataset, only for 77 institutions financing mechanisms could clearly be identified.

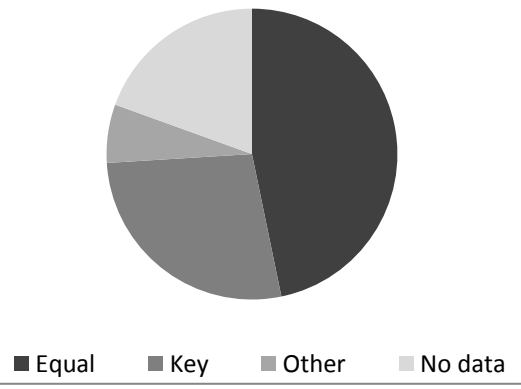
Figure 8: Sources of RBO Funding



Among the institutions for which funding is known, most are funded by member contributions (40 out of 77, see figure 8 – for 1 of the 77 institutions, data was insufficient to identify the funding source), followed by RBOs funded through a combination of member and donor funding (28 out of 77). Examples for the latter are obviously most common in RBOs in the developing world where financial contributions from member countries only would be insufficient to pay for the activities the RBO has been mandated to execute in order to manage the basin's water resources. Other funding sources include sole donor funding (4 out of 77) or other mechanisms, such as the ZRA's funding through water tariffs, fees and charges it collects for the provision of its services.

Furthermore, we can classify RBO financing mechanisms on the basis of cost-sharing, distinguishing between equal and key-based cost-sharing mechanisms. The majority of RBOs relies on equal cost-sharing with member states contributing equally to the RBO's budget (36 out of the 77 for which funding mechanisms could be determined; see figure 9). Other RBOs (21) apply key-based cost-sharing mechanisms. In these cases, each member state's contributions to the RBO's budget are defined on the basis of a certain key. Such key refers, for instance, to

Figure 9: Cost-Sharing Mechanisms



each member state's share of the basin's territory as done in the ICPE with Germany covering 66.25% of the organization's budget and the Czech Republic covering 33.75%[6]. In other cases, several indicators are taken into consideration when defining budget contributions. In the VBA, for instance, each state's share of the basin's territory, its share of the basin's population and its economic capacity – determined on the basis of the GDP – are taken into account, leaving Benin with 10%, Burkina Faso with 29%, Côte d'Ivoire with 9%, Ghana with 29%, Mali with 8% and Togo with 14% of the budget. In the OMVS, cost-sharing is based on the assumed benefits for each member state from jointly developed projects. RBOs that have a strong implementation focus and work on the development and management of joint infrastructures also use fees as sources for financing. The ZRA, for instance, generates income on the basis of fees being paid for electricity generated in hydropower schemes owned by the ZRA.

In addition, external funding provided by bi- and multilateral donors is of great importance for many RBOs in the developing world. Especially in the early stages of an RBO's development, donor funding has often been critical for establishing the RBO's infrastructure and initiating its first river basin governance activities. The institutionalization of the OKACOM Agreement throughout the 2000s, for instance, benefited considerably from funding from SIDA, the United States Agency for International Development (USAID) and GEF/UN Development Programme (UNDP) without which most of the RBO's activities would not have been established. Similarly, the NBI would not have been able to start its work without significant funding from the World Bank and other donors through the Nile Basin Trust Fund (NBTF).

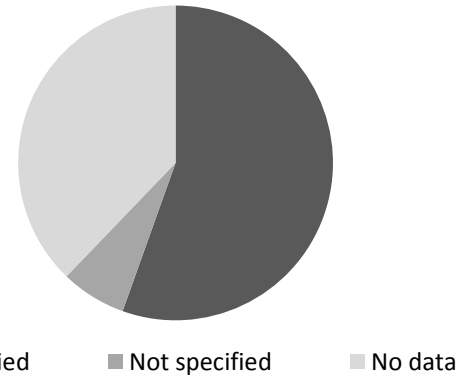
5 Observations II: The River Basin Governance Mechanisms of RBOs

This second part of the findings gathered from the database presents results from the analysis of the mechanisms RBOs provide for governing a river basin, namely mechanisms for coming to joint decisions, acquiring, analyzing and exchanging data and information, monitoring the basin, mitigating or solving disputes among the RBO's members and including external actors such as NGOs, epistemic communities and other institutions relevant for the basin.

Decision-Making Mechanisms

The decision to join forces when governing an international watercourse is only the first in a row of many decisions that need to be taken by the members of an RBO when jointly governing a watercourse. Decision-making mechanisms are therefore an important part of an RBO's river basin governance mechanisms. However, for a considerable number of RBOs (45 out of 119), decision-making mechanisms are not clearly specified in the

Figure 10: Specification of Decision-Making Mechanisms

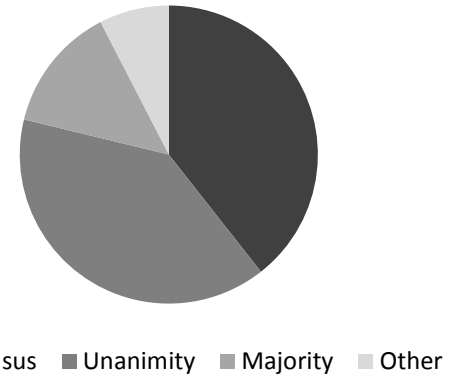


[6] Austria and Poland, each covering less than 1% of the basin, are neither member of the ICPE nor contribute to the RBO's budget. The cost-sharing key therefore relies on the assumption that the Czech and German territory of the basin constitute 100%.

institution's underlying agreements (see figure 10). RBOs lacking the definition of decision-making mechanisms completely are often RBOs of very limited institutionalization level (such as the NBI that still lacks formal institutionalization) or an institutionalization attached to another and often bigger international institution (such as the GMS, an institutionalized project of the ADB for economically developing the Mekong River Basin through economic integration).

66 RBOS, on the other hand, have clearly defined whether they base their decision-making on unanimity, consensus or majority principles. Most RBOs rely on consensus- or unanimity-based decision-making mechanisms (26 RBOs for consensus and majority respectively; see figure 11). Majority principles, deemed particularly helpful by many authors studying international institutions more generally (Wettestad, 1999; Underdal, 2002a; Breitmeier et al., 2006), are, however, found with an extremely limited number of RBOs only (9 in total[7]). In some cases, even RBOs enabled to apply majority-based decision-making mechanisms often refrain from using them. The ICPDR, for instance, relies on the preparation of decisions by the technical level (through its Expert Groups, EGs). Based on EG members' judgments and advice on the available technical solutions to a certain water resources governance problem, decisions are taken by the political level on the basis of an implicit technical consensus that does not require any majority voting.

Figure 11: Decision-Making Mechanisms of RBOs



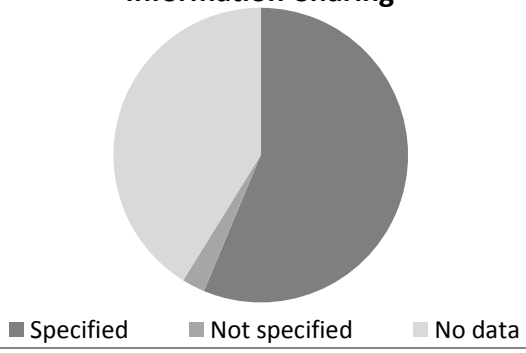
While the RBO Institutional Design Database can provide important insights into how RBOs come to decisions, further research is required to better understand the underlying dynamics of decision-making within RBOs. In some cases, for instance, decisions tend to take a very long time or keep being postponed due to a lack of common understanding among the riparian states involved, thus slowing down important or urgently needed water resources management activities. Better understanding the reasons for such delayed processes can also help to improve the effectiveness of water resources governance in the respective basins.

Data and Information Management

Governing shared watercourses necessarily requires data and information on the watercourse, the use of its water as well as on the different water-related sectors. RBOs therefore often engage in data acquisition, analysis and dissemination – although at very different levels and with very different scopes.

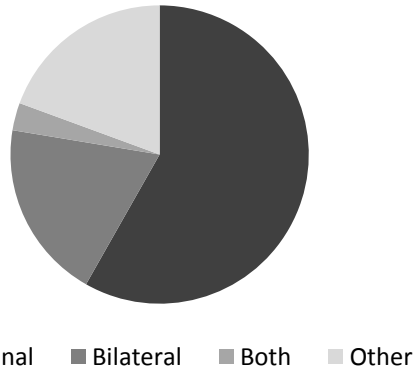
[7] These are Central Commission for the Navigation of the Rhine (CCNR), Commission Internationale du Bassins Congo-Oubangui-Sangha (CICOS), Comision Technica de Mixta de Salto Grande (CTMS), Danube Commission (DC), Great Lakes Commission (GLC), International Commission for the Protection of the Danube River (ICPDR), International Joint Commission (IJC), Lake Victoria Fisheries Organization (LVFO) and Finish-Norwegian Transboundary Waters Commission (TWC).

Figure 12: Specification of Data and Information-Sharing



In light of the importance of data and information-sharing for successful river basin management, it is surprising that only a limited number of RBOs (67 out of 119; see figure 12) has actually defined the modes for data and information-sharing in any of their legal or policy documents. For a large number of RBOs (49 out of 119), data is insufficient for identifying whether and how they share data and information among their member states. This lack of data calls for additional research. Only understanding whether and how riparian states to a shared basin share data and information on the hydrological, environmental and socioeconomic characteristics can ensure that river basin management decisions are taken, implemented and monitored for their effectiveness.

Figure 13: Data and Information-Sharing Level



For those RBOs that have clearly defined mechanisms for sharing data and information, one variable refers to the level of data and information-sharing. Here, it can be distinguished between institutionalized data and information-sharing in which the RBO is mandated to acquire, manage and disseminate data, and bilateral data and information-sharing in which data is exchanged directly between the members of the RBOs with a consequently limited role of the RBO. Out of the institutions that have clearly defined their data and information-sharing mechanisms, 39 refer to the RBO for data and information sharing whereas 13 rely on bilateral exchange (see figure 13). Another 2 RBOs combine institutional and bilateral data and information-sharing whereas 13 RBOs apply other means for ensuring that all riparian states involved in the joint management effort are provided with the required data and information, often through ad hoc mechanisms and issue-specific information requests.

While a considerable amount of understanding of data and information-sharing in shared river basins and under the framework of RBOs has already been gathered by a number of scholars (e.g. Chenoweth/Feitelson 2001; Burton/Molden 2005), further research on the basis of data provided by the RBO Design Database can help further strengthen data and information-sharing.

Monitoring

Generally, it can be distinguished between two very different types of monitoring – however often lumped together under the same notion: compliance monitoring and environmental monitoring. Compliance monitoring refers to the monitoring of actors' behavior in order to assess whether these actors comply with the principles, norms and rules according to which water resources should be used and/or protected. Environmental monitoring, on the other hand, refers to activities that aim at capturing the state of the river basin and its environment at a certain point in time and over time, often related to the influence of actions of member states and thus interlinked to compliance

monitoring as well. Both types of monitoring can be expected to be important for RBOs in their efforts to sustainably govern a shared basin.

In practice, however, only very few RBOs have clearly defined monitoring mechanisms. In terms of compliance monitoring, the Finish Russian Commission on the Utilization of Frontier Waters (CUFW) requires member states to regularly report on the measures they implement for improving the water quality of shared rivers in order to achieve jointly agreed upon pollution reduction targets. Similarly, the LTA requires its member states to report on the implementation and the effectiveness of measures related to its Strategic Action Program.

In terms of environmental monitoring, the MRC's State of the Basin Report presents an attempt to comprehensively capture the state of the river basin and to describe its development over time. More such efforts have been undertaken for specific issues of relevance to the Mekong River Basin, namely hydropower and fisheries, implemented by the MRC's hydropower and fisheries programs respectively. They focus on assessing changes in the basin's fish populations and related riparian benefits or on analyzing the effects of hydropower developments on the basin's environment. Similarly, the OMVS' Environmental Observatory aims to capture environmental change in the basin and present comprehensive results of environmental assessment to the basin's decision-makers.

The ICPDR provides an example for combined compliance and environmental monitoring: The ICPDR requires member states to regularly report on the measures they implement for achieving jointly agreed upon goals in the areas of pollution prevention/reduction, water quality improvement and flood management. At the same time, a joint environmental monitoring system (the Trans-National Monitoring Network, TNMN) has been established to monitor environmental change in these issue-areas as well, hence assessing whether behavior change among participating actors actually leads to an improvement in the basins environment.

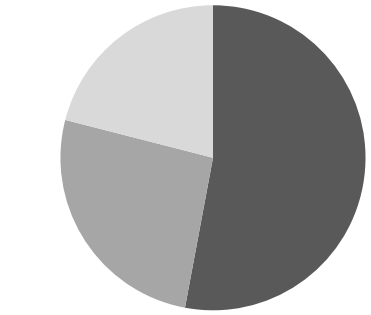
Both for environmental and for compliance monitoring, the role of RBOs and the influence of an RBO's monitoring mechanisms on river basin governance outcomes are still insufficiently understood. Compliance monitoring research largely relies on monitoring research done by more general institutionalist scholars (such as Peterson 1997; Wettestad 1999; Raustiala 2005) whereas environmental monitoring research – if occurring at all – is largely influenced by water resources management practitioners. Preliminary data on how RBOs use these two mechanisms for monitoring their member's behavior and related changes in the basin's environment hopes to initiate further research on this important yet insufficiently understood issue in transboundary water resources governance.

Dispute-Resolution

Even with RBOs established for promoting cooperation among states sharing a transboundary watercourse, disputes can still emerge among riparians. Empirical evidence for the emergence of specific disputes along the cooperation process are manifold: In the Mekong River Basin, for instance, the unilateral pursuit of the Xayaburi hydropower project by Laos has led to considerable disagreement with downstream neighbors Cambodia and Vietnam, putting the MRC in a dispute mode for more than 2 years. Similarly, the IPCR experienced a dispute among its members with the Netherlands, on the one side, unilaterally closing sluice gates close to the mouth of the Rhine River in order to prevent salinity intrusion and damages to Dutch agriculture, and upstream riparians such as Germany and France objecting these measures because the gates provided obstructions to salmon migration and thus threatened the achievement of joint goals defined under the ICPR's Salmon 2020

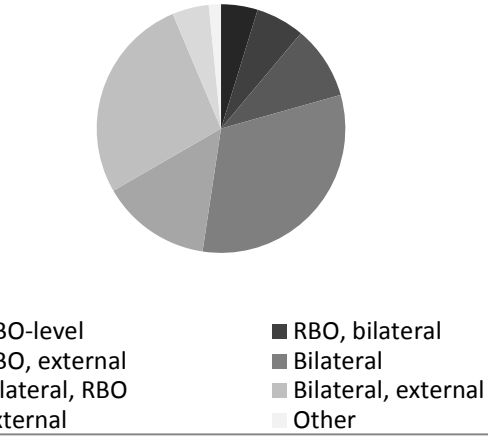
Program (ICPR 2004). In order to address this challenge, a number of RBOs have established dispute-resolution mechanisms.

Figure 14: Specification of Dispute-Resolution Mechanisms



This need to overcome eventually emerging disputes has been acknowledged in a number of river basins and for a considerable number of these basins, dispute-resolution mechanisms have been defined (63 out of 119; see figure 14). For some river basins (31 out of 119, for the remaining 25 institutions within the sample of 119 institutions data availability is insufficient to analyze their dispute-resolution mechanisms), however, no clear dispute-resolution mechanisms have been defined. Such absence of pre-defined means for solving and mitigating disputes among member states can even further increase dispute intensity since in the case of an emerging disputes the mechanisms of addressing it need to be defined ad-hoc, providing disputing parties with even more reasons to disagree. This is particularly problematic in river basins with a high likelihood of disputes emerging among the different parties – such as the Congo or the Jordan River Basin, both not possessing any transboundary dispute-resolution mechanism for addressing water-related disagreements.

Figure 15: Dispute-Resolution Mechanisms



For those basins equipped with dispute-resolution mechanisms, it can be distinguished between three mechanisms of dispute-resolution: 1) dispute-resolution directly by the RBO, 2) dispute-resolution in a bilateral manner among disputing member states of the RBO, and 3) dispute-resolution by third parties (e.g. international donors, international courts or arbitration panels). In most cases, two of the aforementioned mechanisms are combined. In some cases (9 out of the 63 institutions for which dispute-resolution mechanisms have been defined, see figure 15[8]), bilateral negotiation among the disputing members of the RBO is often followed by reference to the RBO. This is, for instance, the case in the DC where issues that disputing parties cannot solve among them are referred to a DC-internal arbitration mechanisms, consisting of representatives of the disputing parties and a third party that is appointed by the president of the DC (Art. 45, Convention Concerning the Regime of

[8] This figure displays the dispute-resolution mechanisms applied by RBOs, including combinations thereof – given that in many cases more than one dispute-resolution mechanism can applied, offering conflicting parties second instances for dispute-resolution. "RBO, bilateral" thus indicates that the first instance of dispute-resolution is the RBO itself but if disputes remain unresolved, they would be referred to the conflicting parties for bilateral negotiation. Similarly, "bilateral, external" captures instances in which disputes are first negotiated bilaterally but can be referred to external dispute-resolution or arbitration bodies in case bilateral negotiation fails.

Navigation on the Danube). Similarly, in the Niger Basin, issues that cannot be resolved bilaterally by the members of the NBA are referred to the RBO's Summit of Heads of State and Government for arbitration (Art. 15, Niger Basin Convention). Even more common is the reference of the dispute to an external arbitration panel or court in case bilateral efforts to solve the issue fail (17 out of 63). This is, among others, the case in the Danube River Basin where disputes that cannot be resolved directly between the disputing members of the ICPDR via negotiation can be referred to the International Court of Justice (ICJ) or any specifically established external arbitration panel (Art. 24, Danube River Protection Convention). Similarly, in the case of the Lake Victoria Basin Commission (LVBC), disputes remaining unresolved after negotiation among the involved parties can be referred to the East African Court of Justice (Art. 46, Protocol for Sustainable Development of the Lake Victoria Basin). As figure 15 indicates, a number of other combinations of dispute-resolution mechanisms exist.

Data on the different dispute-resolution mechanisms at play in different RBOs hopes to help future research in better understanding which dispute-resolution mechanisms have been chosen in which basins and to what extent they are successful in solving or mitigating disputes, hence contributing to better governing shared water resources.

External Actor Involvement

In addition to the members of an RBO and potential other riparian states that are not members of the RBO, various other actors might be present in a basin and exert influence on water resources governance. Such external actors can be distinguished into three groups: 1) civil society and NGOs, 2) epistemic communities, and 3) other international or regional institutions.

With regard to stakeholders from the civil society and non-governmental actors, the extent to which RBOs involve external actors in their work varies considerably. Overall, however, official involvement mechanisms for external actors, defined in the RBO's underlying legal or policy documents, are rather rare. Only 44 out of the 119 institutions mention stakeholder involvement explicitly and define specific mechanisms for ensuring such involvement. Among these 44 institutions, the mechanisms vary as well – ranging from information-sharing, consultation or granting observer status to the RBO's meetings to the involvement into decision-making processes.

Some RBOs commit themselves to information-sharing with the public. The BALT, for instance, holds workshops for local populations in order to increase awareness on water resources management issues in the Lake Titicaca, most often in cooperation with local municipalities. The NBI ensures the dissemination of Nile-specific knowledge and the infroamtion of stakeholder through the Nile Basin Discourse, a civil society organization committed to awareness raising and information-sharing concerning water resources management issues in the Nile River Basin.

Other RBOs go further and involve non-governmental stakeholders in decision-making processes: Some grant NGOs observer status to the RBO's governance meetings. In the ICBC, for instance, NGOs can participate as observers in the ICBC's governance meetings. Similar observer roles are also granted in ICPDR, ICPE and ICPO. In other cases, stakeholder groups are consulted before or during decision-making processes. In the CCNR, for instance, NGOs are granted the opportunity to submit proposals for consideration in the CCNR's governance meetings.

Overall, however, data in the RBO Institutional Design Database indicates that our understanding of whether and to what extent RBOs involve the basin's public in water resources management is still

very limited. In addition to existing research generally emphasizing the need for more public participation on the governance of shared watercourses (e.g. Delli Priscolli 2004; Curton 2005; Kranz/Vorwerk 2007), research on the different mechanisms at hand and their respective effectiveness in making the basin's population's voices heard – ideally from a comparative perspective – is therefore required.

With regard to epistemic communities, information is even more limited. While it is common knowledge that norms and ideas established by scientific groups and knowledge hubs influence the way water resources are managed, explicit provisions for incorporating such knowledge as well as the groups that produce it are very rare. Most often, such collaboration comes in the form of commissioned research, the joint development and implementation of water-specific training and capacity building programs or the provision of technical advice.

The MRC, for instance, has closely collaborated with a large number of research institutions and groups over the last years, working on a number of water-related issues. The Asian Disaster Preparedness Center (ADPC), for instance, has provided advice on flood management, the International Network for Water and Ecosystems in Paddy Fields (INWEPF) as provided knowledge on irrigated agriculture and World Fish Center has issued expertise on fisheries issues, especially in the context of hydropower development in the Mekong River Basin. The OMVS has equally benefitted from the knowledge of external research institutions, most notably in the definition of the OMVS' cost- and benefit-sharing mechanisms which were developed on the basis of a model provided by the Utah State University (USU) and are currently being updated by a researcher team from the same institution. And in the Interstate Commission for Water Coordination in Central Asia (ICWC), a specific organizational body of the RBO, the Scientific Information Centre, has been establish to strengthen cooperation with epistemic communities by coordinating the ICWC's work with bodies such as the Global Water Partnership (GWP) or the World Water Council.

In addition to basin stakeholders and epistemic community groups, RBOs also occasionally engage with other international or regional institutions such as international organizations, regional organizations, international financing institutions or regional environmental institutions. The following examples illustrate some of the different institutions RBOs collaborate with and some of the mechanisms used for doing so.

In some cases, the activities of an RBO affect the activities of other regional institutions – as it is, most obviously, the case with institutions governing regional seas and working on the improvement of their environmental status. Examples include the International Commission for the Protection of the Black Sea (ICPBS) governing the Black Sea into which the Danube River flows or the Council of the Baltic Sea States (CBSS) in charge of the Baltic Sea into which the Oder River discharges. In these cases, close collaboration between the RBO and the institution governing the sea into which the river discharges is crucial for Integrated Water Resources Management (IWRM). Therefore, a close collaboration has, for example, been established between the ICPDR and the ICPBS, based on a Memorandum of Understanding signed in 2001 (ICPDR-Black Sea MoU). It defines common strategic goals and joint activities aiming at the recovery of the Black Sea ecosystem through a reduction of nutrient inflows form and an improvement of pollution levels of the Danube River.

In other cases, collaboration between different RBOs governing different though interrelated basins has been established in order to ensure IWRM across the entire river basin. The International Sava River Basin Commission (ISBC), for instance, has signed a Memorandum of Understanding with the

ICPDR in order to align governance of the Sava River Basin, a tributary to the Danube, with the governance of the entire Danube River Basin. This aims at providing "a framework for enhancing cooperation and coordination between the ISBC and the ICPDR and avoiding duplication of their activities" (Art. 3, ICPDR-ISBC MoU).

Overall, knowledge about the interdependencies between different actors in shared river and lake basins remains extremely limited. The RBO Institutional Design Database therefore hopes to provide a starting point for further research addressing overlapping and interdependent governance approaches over shared watercourses and their impact on the sustainable development of the respective basin.

6 Conclusion

Overall, this paper has shown that RBOs vary considerably in their institutional design. While some RBOs bring together a large number of member states in order to govern a broad variety of water resources issues, others remain very narrow in both size and scope. And while some RBOs possesses a number of highly sophisticated water resources governance mechanisms, allowing member states to take decisions, monitor the basin's development and solved disputes, others lack such mechanisms and restrain themselves to providing member states with a negotiation forum to coordinate rather unilateral water resources development.

One of the main aims of this paper and the RBO Design Database is to inform and inspire future research. By providing a first overview of the design of RBOs, the database hopes to provide a basis for various important questions about the design of RBOs and its influence on water resources governance that so far remain unanswered. Among them, the following three areas can particularly benefit from a better understanding of the institutional design of RBOs – 1) the question of RBO effectiveness, 2) the challenge of taking into consideration additional and newly emerging actors in a river basin, and 3) the challenges related to environmental change and the capacities of an RBO to cope with them.

Firstly, the question whether and to what extent RBOs actually make a difference in governing shared watercourses still remains insufficiently answered. While hydropolitics research has increasingly turned to the question whether and under which exogenous and endogenous conditions RBOs contribute to better governing shared water resources, the reasons for why some RBOs have managed to make important contributions to improving the state of a river while others have largely failed are still largely unknown. This is largely due to the fact that in the case of most studies the black box of RBOs remains closed. Better understanding which institutional design mechanisms RBOs actually possess (or theoretically could possess) can therefore help understanding their effects on water resources governance effectiveness.

Secondly, water resources governance is becoming increasingly complex in terms of actors involved. In addition to riparian states' governments, a variety of actors – ranging from local civil society organizations or large institutionalized RBOs to representatives of the academic community and from the private sector to international organizations – needs to be included in the governance of shared water resources. Understanding the institutional design of RBOs (and particularly their membership structure, their mechanisms for data and information sharing as well as for third party engagement) can thereby help to develop mechanisms to include such new actors into river basin governance activities.

And thirdly, environmental change poses increasing challenges to the governance of internationally shared watercourses. RBOs are therefore increasingly faced with the task to identify and measure change and to develop the appropriate responses. Understanding the current set-up of RBOs and the mechanisms they possess for addressing change (e.g. on the basis of their data and information management systems or their dispute-resolution mechanisms) is crucial for improving their adaptive capacity towards environmental change – for the benefit of the RBOs themselves as well as the river basins they are supposed to sustainably govern.

Overall, better understanding the institutional design of RBOs can hence move water resources governance research further and – on the basis of better knowledge – help developing policy advice that can ensure the long-term sustainable governance of shared water resources for the benefits of the river's ecosystem as well as its riparian people.

Abbreviations

ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Center
ALG	Autorité de Développement Integré de la Région du Liptako-Gourma
ARBC	Amur River Basin Coordination Committee
ASEAN	Association of Southeast Asian Nations
BALT	Binational Autonomous Authority of the Lake Titicaca for the TDPS
CBSS	Council of the Baltic Sea States
CCNR	Central Commission for the Navigation of the Rhine
CICOS	Commission Internationale du Bassins Congo-Oubangui-Sangha
CIPM	Commission International pour la Protection de la Moselle
CIPS	Commissions International pour la Protection de la Sarre
COMO	Commission de la Moselle
DC	Danube Commission
EG	Expert Group
ENSAP	Eastern Nile Subsidiary Action Program
GEF	Global Environment Facility
GLC	Great Lakes Commission
GLFC	Great Lakes Fisheries Commission
GMS	Greater Mekong Sub-Region
GWP	Global Water Partnership
IBWC	International Water and Boundary Commission
ICBC	International Scheldt Commission
ICBL	International Commission for Boating on the Lake Constance
ICJ	International Court of Justice
ICPBS	International Commission for the Protection of the Black Sea
ICPDR	International Commission for the Protection of the Danube River
ICPE	International Commission for the Protection of the Elbe
ICPO	International Commission for the Protection of the Oder
ICPR	International Commission for the Protection of the Rhine
IDBC	International Dnieper Basin Council
ICRB	International St. Croix River Board
ICWC	Interstate Commission for Water Coordination in Central Asia
IJC	International Joint Commission
INWEPF	International Network for Water and Ecosystems in Paddy Fields
ISBC	International Sava River Basin Commission
IWRM	Integrated Water Resources Management
IWT	International Water Treaty
LCBC	Lake Chad Basin Commission
LTA	Lake Tanganyika Authority
LVBC	Lake Victoria Basin Commission
LVFO	Lake Victoria Fisheries Organization
MARC	Mahakali River Commission
MDBC	ASEAN's Mekong Basin Development Cooperation
MRC	Mekong River Commission

MRU	Mano River Union
NBA	Niger Basin Authority
NBI	Nile Basin Initiative
NBTF	Nile Basin Trust Fund
NELSAP	Nile Equatorial Lakes Subsidiary Action Program
OCTA	Organization of the Amazon Cooperation Treaty
OKACOM	Okavango River Basin Water Commission
OMVS	Organisation pour la Mise en Valeur du Fleuve Sénégal
ORASECOM	Orange Senqu River Commission
RBO	River Basin Organization
SIDA	Swedish International Development Cooperation Agency
TFDD	Transboundary Freshwater Dispute Database
TNMN	Trans-National Monitoring Network
UN	United Nations
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
USAid	United States Agency for International Development
USU	Utah State University
VBA	Volta Basin Authority
ZAMCOM	Zambezi Watercourse Commission
ZRA	Zambezi River Authority

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Convention on Cooperation for the Protection and Sustainable use of the Danube River (Danube River Protection Convention), signed 29 June 1994 in Sofia, Bulgaria

Convention regarding the Regime of Navigation on the Danube (Danube Navigation Convention), signed 18 August 1948 in Belgrade, Serbia

Convention on the Sustainable Management of Lake Tanganyika (LTA Convention), signed 12 June 2003, Dar es Salaam, Tanzania

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Annex I – List of all Institutions analyzed concerning their Institutional Design[9]

Name of the Institution	Code[10]	Name of the River(s)	Year establ.	Member Countries
Administrative Commission for the Rio de la Plata	CARP	La Plata/Parana	1973	Uruguay, Argentina
Amur River Basin Coordination Committee	ARBC	Amur	2004	China, Mongolia, Russia
Angola Namibian Joint Commission of Cooperation	JCOC	Kunene	1996	Angola, Namibia
Aral Sea Basin Programme	ASBP	Aral Sea	1994	Kazakhstan, Kyrgyztan, Tatjikistan, Turkmenistan, Uzbekistan
ASEAN Mekong Basin Development Cooperation (ASEAN-MBDC)	MBDC	Mekong	1996	Cambodia, China, Laos, Myanmar, Thailand, Vietnam
Autorité de Développement Integré de la Région du Liptako-Gourma	ALGX	Volta; Niger	1970	Burkina Faso, Mali, Niger
Binational Autonomous Authority of the Lake Titicaca for the TDPS	BALT	Lake Titicaca	1992	Bolivia, Peru
Binational Commission of Economical Cooperation and Physical Integration	BCEC	Cullen; Lake Fagano; St. Martin; Zapaleri	.	Chile, Argentina, Bolivia
Central Commission for the Navigation of the Rhine	CCNR	Rhine	1816/1922	Belgium, France, Germany, Netherlands, Switzerland
Comision Administradora del Rio Uruguay (River Uruguay Executive Commission)	CARU	Uruguay	1975	Argentina, Uruguay
Comision Binational des Rio Paz	CBRP	Rio Paz	.	Guatemala, El Salvador
Comision Binational Puente Buenos Aires Colonia (COBACIO)	CBPB	La Plata/Parana	.	Argentina, Uruguay
Comision Technica de Mixta de Salto Grande	CTMS	La Plata/Parana	1958	Argentina, Uruguay
Comité de la Cuenca des Rio Sixaola	CCRS	Sixaola	.	Costa Riva, Panama
Commission for the Development of the Mirim Lagoon Basin	CDML	Lagoon Mirim	1977	Brazil, Uruguray
Commission Internationale du Bassins Congo-Oubangui-Sangha (CICOS)	CICO	Congo	1999	Cameroon, Central African Republic, Republic of Congo, Democratic Republic of Congo
Commission of the Republic of Kazakhstan and the Kyrgyz Republic on the Use of Water Management Facilities of Intergovernmental Status on the Rivers Chu and Talas	CTCX	Chu & Talas	2006	Kyrgyztan, Kazakhstan
Commissions International pour la Protection de la Moselle	CIPM	Mosel	1961	France, Germany, Luxemburg

[9] Some of the institutions listed here do not qualify as RBOs in the narrow sense; for a discussion of the RBO-character of these institutions, refer to Schmeier et al. 2013.

[10] The RBO code consists of a four letter code to match the TFDD coding schemes. Some RBOs are, however, commonly known under different acronyms (e.g. the Orange Senqu River Commission as ORASECOM). In such cases, the commonly used acronym is provided in brackets after them full name of the RBO.

Commissions International pour la Protection de la Sarre	CIPS	Sarre	1961	France, Germany
Council of the Lake Léman	CLLX	Lake Geneva (Leman)	1987	France, Switzerland
Danube Commission	DCXX	Danube	1948	Austria, Bulgaria, Croatia, Germany, Hungary, Moldova, Russia, Romania, Serbia, Slovakia, Ukraine
Dostluk Commission	DOCO	Harirud	2007	Iran, Turkmenistan
Estonian Russian Joint Transboundary Waters Commission	ERWC	Narva	1997	Estonia, Russia
Finish Russian Commission on the Utilization of Frontier Waters	CUFW	Olanga; Oulu; Vuoksa	1964	Finland, Russia
Finish-Norwegian Transboundary Waters Commission	TWCX	Kemi; Naatamo; Paswik; Tana; Tourne	1980	Finland, Norway
Fly River Provincial Boundaries Commission	FRBC	Fly	1978	Indonesia, Papua New Guinea
Franco-Swiss Consultative Commission on Fishing in the Lake Geneva	FSCC	Lake Geneva (Leman)	1982	France, Switzerland
German Czech Boundary Waters Commission	GCWC	Elbe	1995	Czech Republic, Germany
Great Lakes Commission	GLCX	St. Lawrence	1955	Canada, US
Great Lakes Fisheries Commission	GLFC	St. Lawrence	1955	Canada, US
Greater Mekong Sub-Region	GMSX	Mekong	1992	Cambodia, China, Laos, Myanmar, Thailand, Vietnam
Greater Tumen Initiative	GTIX	Tumen	1995	China, Mongolia, Russia, Korea
Guatemala Mexico International Boundary Water Commission	GMWC	Candelaria; Grijalva	1987	Guatemala, Mexico
Helmand River Delta Commission	HRDC	Helmand	1950	Afghanistan, Iran
Indo-Bangladesh Joint Rivers Commission	IBJC	Fenney; Ganges; Karnapuli	1972	Bangladesh, India
International Commission for Boating on the Lake Constance	ICBL	Lake Constance	1973	Austria, Germany, Switzerland
International Commission for the Management of the Irtysch	ICMI	Ob-Irtysch	1992	Russia, Kazakstan
International Commission for the Protection of Lake Geneva	ICPG	Lake Geneva (Leman)	1962	France, Switzerland
International Commission for the Protection of the Danube River	ICPD	Danube	1994	Austria, Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia, Ukraine, EC
International Commission for the Protection of the Elbe River	ICPE	Elbe	1990	Czech Republic, Germany
International Commission for the Protection of the Oder River against Pollution	ICPO	Oder	1996	Czech Republic; Germany; Poland
International Commission for the Protection of the Rhine	ICPR	Rhine	1999	France; Germany; Luxemburg; Netherlands; Switzerland; EC
International Commission of International Rivers	ICIR	Duero; Guadiana; Lima; Mino; Tago/Tagus	1964	Portugal, Spain
International Commission on Limits and Water between	ICLW	Candelaria; Coatam Achute;	1961	Mexico, Guatemala

Mexico and Guatemala		Grijalva; Hondo; Suchiate		
International Dnieper Basin Council	IDBC	Dnieper	2003	Belarus, Russian Federation, Ukraine
International Fund for Saving the Aral Sea	IFAS	Aral	1998	Uzbekistan, Kasakhstan, Kyrgyztan, Tatjikistan, Turkmenistan
International Joint Commission	IJCX	Alsek; Chilkat; Columbia; Nelso-Sakatchewan; St. Croix; St. John; St. Lawrence; Stikine; Taku; Whiting; Yukon	1909	US, Canada
International Meuse Commission	IMCX	Meuse	2006	Belgium, France, Germany, Luxemburg, Netherlands
International Sava River Basin Commission	ISBC	Sava	2002	Croatia; Bosnia Herzegovina; Serbia; Slovenia
International Scheldt Commission	ICBC	Schelde	1994	Belgium, France, Netherlands
International St. Croix River Board	ICRB	St. Croix	1915	Canada, US
International Water and Boundary Commission	IBWC	Colorado; Mississippi; Rio Grande; Tijuana; Yaqui	1889	US, Mexico
Internationale Bodenseekonferenz	IBKX	Lake Constance	1994	Austria, Germany, Switzerland
Internationale Gewässerschutzkommission für den Bodensee (International Commission for the Protection of Lake Constance)	IGKB	Lake Constance	1960	Austria, Germany, Switzerland
Interstate Commission for Water Coordination in Central Asia	ICWC	Aral	1992	Uzbekistan, Kasakhstan, Kyrgyztan, Tatjikistan, Turkmenistan
Joint Boundary Water Commission	JBWC	Coruh	1973	Georgia, Turkey
Joint commission for the protection of Italian- Swiss waters against pollution	CIPA	Lage Maggiore, Lago di Lugano	1972	Italy, Switzerland
Joint Commission of the Parana River (COMIP)	JCPR	La Plata/Parana	1971	Argentina, Brazil, Paraguay
Joint Commission on the Dniester	JCDX	Dniester	1994	Moldova, Ukraine
Joint Commission on the Garonne	GRJC	Garonne	1963	France, Spain
Joint Commission on the Tisza Basin	JCTB	Tisza	1994	Slovakia, Ukraine
Joint Commission on the Vistula	JCVX	Vistula	1964	Poland, Soviet Union
Joint Irrigation Authority	JIAX	Orange	1992	Namibia, South Africa
Joint Operating Authority on the Kunene	JOAX	Kunene	.	Angola, Namibia
Joint Permanent Technical Committee	JPTC	Limpopo	1983	Botswana, Mozambique, South Africa, Zimbabwe
Joint Permanent Water Commission for the Chobe-Linyanti Sub-Basin	JPWC	Okavango	1990	Botswana, Namibia, Lesotho, South Africa
Joint Russian Kazakhstan Commission for Utilization and Protection of Transboundary Waters	RKCW	Ob-Irtysch; Volga	1992	Kazakhstan, Russia
Joint Subcommittee for the Development of the Lake Titicaca	SDLT	Lake Titicaca	1987	Bolivia, Peru

Integration Zone (SUBCOMILAGO)				
Joint Syrio-Jordanian Commission	JSJC	Jordan	1953	Syria, Jordan
Joint Technical Committee on Regional Waters	JTCW	Tigris-Euphrates	1980	Turkey, Iraq, Syria
Joint Water Commission between Mozambique and Zimbabwe	JWC7	Bzi; Pungwe; Save/Sabi	2002	Mozambique, Zimbabwe
Joint Water Commission between South Africa and Swaziland	JWC1	Incomati; Maputo	1992	South Africa, Swaziland
Joint Water Commission between Swaziland and Mozambique	JWC2	Incomati	.	Mozambique, Swaziland
Joint Water Commission on the Limpopo	JWC5	Limpopo	1996	Mozambique, South Africa
Joint Water Commission on the Ruvuma	JWC6	Ruvuma	2006	Mozambique, Tanzania
Joint Water Committee between Israel and Palestine	JWC4	Jordan	1995	Israel, Palestine
Joint Water Committee between Jordan and Israel	JWC3	Jordan	1994	Jordan, Israel
Komati Basin Water Authority	KBWA	Incomati	1992	South Africa, Swaziland
Kura Araks Joint Commission	KAJC	Kura-Araks	2004	Georgia, Turkey
Lake Chad Basin Commission	LCBC	Lake Chad	1964	Cameroon, Central African Republic, Chad, Niger, Nigeria, Libya
Lake Tanganyika Authority	LTAX	Lake Tanganyika	2003	Burundi, DR Congo, Tanzania, Zambia
Lake Victoria Basin Commission	LVBC	Lake Victoria	2003	Kenia, Tanzania, Uganda
Lake Victoria Fisheries Organization	LVFO	Lake Victoria	1994	Kenia, Tanzania, Uganda
Lesotho Highlands Water Commission	LHWC	Orange	1986	Lesotho, South Africa
Limpopo Basin Permanent Technical Committee	LPTC	Limpopo	1986	Botswana, Mozambique, South Africa, Zimbabwe
Limpopo Watercourse Commission (LIMCOM)	LWCX	Limpopo	2003	Botswana, Mozambique, South Africa, Zimbabwe
Mahakali River Commission	MARC	Mahakali	1996	India, Nepal
Mano River Union	MRUX	Mano-Morro	1973	Liberia, Sierra Leone
Mekong River Commission (MRC)	MRCX	Mekong	1995	Cambodia, Laos, Thailand, Vietnam
Mixed Commission for the Protection of Italo-Swiss Waters against Pollution	MCPP	Po	1972	Italy, Switzerland
Moselkommission (Commission de la Moselle)	COMO	Mosel	1956	France, Germany, Luxemburg
Niger Basin Authority	NBAX	Niger	1980	Algeria, Benin, Burkina Faso, Cameroon, Chad, Guinea, Ivory Coast, Mali, Niger, Nigeria, Sierra Leone
Nigeria-Niger Joint Commission for Cooperation Cooperation	NNJC	Niger	1990	Niger, Nigeria
Nile Basin Initiative	NBIX	Nile	2002	Burundi, Central African Republic, DR Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Uganda
Okavango River Basin Water Commission (OKACOM)	OKAC	Okavango	1994	Angola, Botswana, Namibia

Orange Senqu River Commission (ORASECOM)	ORAS	Orange	2000	Botswana, Namibia, Lesotho, South Africa
Organisation pour la Mise en Valeur du Fleuve Gambie	OMVG	Corubal; Gambia; Geba	1978	Gambia, Guinea, Senegal
Organisation pour la Mise en Valeur du Fleuve Senegal	OMVS	Senegal	1972	Guinea, Mauritania, Mali, Senegal
Organization for the Management of the Development of the Kagera River Basin	ORKB	Kagera	1977	Burundi, Rwanda, Tanzania, Uganda
Organization of the Amazon Cooperation Treaty	OCTA	Amazon	1978	Bolivia, Colombia, Brazil, Equador, Guyana, Peru, Surinam, Venezuela
Pacific Salmon Commission	PSCX	Alsek; Chilkat; Firth; Stikine; Taku	1985	Canada, US
Permanent Greek Albanian Commission on Transboundary Freshwater Issues	PGAC	Lake Prespa	2005	Greece, Albania
Permanent Indus Water Commission	PICX	Indus	1960	India, Pakistan
Permanent Intergovernmental Co-Ordination Committee	CICX	La Plata/Parana	1969	Argentina, Bolivia, Brazil, Paraquay, Uruquay
Permanent Joint Technical Commission	PJTC	Kunene	1996	Angola, Namibia
Permanent Joint Technical Commission on the Nile	NJTC	Nile	1959	Egypt, Sudan
Permanent Water Commission for the Lower Orange Sub-Basin	PWCO	Orange	1992	Namibia, South Africa
Permanent Yugoslav-Greek Hydroeconomic Commission	PHYC	Struma	1959	Greece, Yuoslavia
Rio Grande Rio Bravo Basin Coalition	GBBC	Rio Grande	.	Argentina, Chile
Russian- Byelorussian- Latvian Commission	RBLC	Daugava	2003	Russia, Byelarus, Latvia
Slovenian Austrian Commission on the Drava River	SADR	Drava	1954	Slovenia, Austria
Trilateral Commission for the Development of the Riverbed of the Pilcomayo (Comision Trinacional para el Desarrollo en la Cuence del Rio Pilcomayo)	TCRP	Rio Pilcomayo	1995	Argentina, Bolivia, Paraguay
Trinational Commission of the Trifino Plan	TCPT	Lempa	1998	El Salvador, Guatemala, Honduras
Tripartite Permanent Technical Committee	TPTC	Incomati; Maputo; Umbeluzi	1983	Mozambique, South Africa, Swaziland
Tumen River Area Consultative Commission	TACC	Tumen	1995	China, North Korea, South Korea, Mongolia, Russia
Tumen River Area Development Coordination Committee	TRCC	Tumen	1995	China, North Korea, Russia
Volta Basin Authority	VBAX	Volta	2006	Burkina Faso, Mali, Togo, Ghana, Benin
Zambezi River Authority	ZRAX	Zambezi	1987	Zambia, Zimbabwe
Zambezi Watercouse Commission (ZAMCOM)	ZAMC	Zambezi	2004	Angola, Botswana, Malawi, Mozambique, Namibia, Tanzania, Zambia, Zimbabwe