WHO GOVERNS INTERNATIONALLY SHARED WATERCOURSES?

Clearing the Muddy Waters of International River Basin Organizations

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ABSTRACT

Institutions that have been set up by riparian states to internationally govern shared water resources – international River Basin Organizations (RBOs) – play a key role in river basin governance. Increasingly, RBOs are on the agenda of policy-makers who accord them a key role in promoting cooperation over shared water resources. Despite the increased attention paid to RBOs in international relations and water scholarship, there has been little focus on definitions and conceptualization of RBOs. This has challenged research around RBOs in both methodological and theoretical ways. This paper aims to bridge this gap by offering a theoretically-grounded definition of a River Basin Organization. We do so deductively, building from the larger institutionalist research and international water resources governance literature. Our definition identifies three broad categories of constitutive elements: internationalization, institutionalization and governance. We apply this definition to potential cases to better identify the extent of RBOs around the world today. We outline which cases qualify as RBOs and which cases fail to meet our constitutive criteria and why. We conclude by crafting an agenda for future research around RBOs that can considerably benefit from a more theoretically-grounded understanding of RBOs.

SERIES FOREWORD

This working paper was written as part of the Earth System Governance Project, a ten-year research initiative launched in October 2008 by the International Human Dimensions Programme on Global Environmental Change under the overall auspices of the Earth System Science Partnership.

Earth system governance is defined in this Project as the system of formal and informal rules, rule-making mechanisms and actor-networks at all levels of human society (from local to global) that are set up to prevent, mitigate and adapt to environmental change and earth system transformation. The science plan of the Project focusses on five analytical problems: the problems of the overall *architecture* of earth system governance, of *agency* of and beyond the state, of the *adaptiveness* of governance mechanisms and processes, of their *accountability* and legitimacy, and of modes of *allocation and access* in earth system governance. In addition, the Project emphasizes four crosscutting research themes that are crucial for the study of each analytical problem: the role of power, of knowledge, of norms, and of scale. Finally, the Earth System Governance Project advances the integrated analysis of case study domains in which researchers combine analysis of the analytical problems and crosscutting themes. The main case study domains are at present the global water system, global food systems, the global climate system, and the global economic system.

The Earth System Governance Project is designed as the nodal point within the global change research programmes to guide, organize and evaluate research on these questions. The Project is implemented through a Global Alliance of Earth System Governance Research Centres, a network of lead faculty members and research fellows, a global conference series, and various research projects undertaken at multiple levels (see www.earthsystemgovernance.org).

Earth System Governance Working Papers are peer-reviewed online publications that broadly address questions raised by the Project's Science and Implementation Plan. The series is open to all colleagues who seek to contribute to this research agenda, and submissions are welcome at any time at workingpapers@earthsystemgovernance.org. While most members of our network publish their research in the English language, we accept also submissions in other major languages. The Earth System Governance Project does not assume the copyright for working papers, and we expect that most working papers will eventually find their way into scientific journals or become chapters in edited volumes compiled by the Project and its members.

Comments on this working paper, as well as on the other activities of the Earth System Governance Project, are highly welcome. We believe that understanding earth system governance is only feasible through joint effort of colleagues from various backgrounds and from all regions of the world. We look forward to your response.

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1. INTRODUCTION

Institutions that have been set up by riparian states to govern internationally shared water resources – international River Basin Organizations (RBOs) – play a key role in international river basin governance. Designed to overcome the problems unilateral behavior creates in shared systems, RBOs provide mechanisms to respond to issues such as conflicts emanating from the interactions between surface water and groundwater, water quantity and quality, as well as the use of water for human and environmental needs (MOLLE AND WESTER 2009).

One of the first RBOs, the Central Commission for the Navigation of the Rhine (CCNR), for example, was created in 1815 to help facilitate free navigation on the Rhine River. More recently, RBOs like the Permanent Okavango River Basin Commission (OKACOM) and the International Commission for the Protection of the Danube River (ICPDR) have been set up by their riparian states to develop water resources more sustainably and help to protect the ecosystem by coordinating national water resources management activities across borders. Others, including for example the Zambezi River Authority (ZRA) or the Lesotho Highlands Water Commission (LHWC), manage shared infrastructure projects for the generation of hydropower or water transfer schemes.

Increasingly, RBOs are also on the agenda of policy-makers who accord them a key role in promoting cooperation over shared water resources. They are promoted by a host of international organizations and NGOs, including the Global Environment Facility (GEF), the World Water Council (WWC), the Organisation for Economic Co-operation and Development (OECD), the World Wildlife Fund (WWF), and Green Cross International (COSGROVE AND RJSBERMAN 2000; GREEN CROSS 2000; UITTO AND DUDA 2002; WWF 2003; GERLAK 2004; OECD 2011). Both the 1997 UN Convention on the Law of the Non-navigational Uses of International Watercourses and the 2004 Berlin Rules, two major international water agreements, encourage states to establish joint mechanisms or commissions to facilitate transboundary cooperation.).

Despite this heightened attention and relative growth in RBOs around the world in the past few decades (GERLAK AND GRANT 2009), there lacks a theoretically-grounded definition on what constitutes an international RBO. This hampers case selection and comparability, and muddies our larger understanding of the role of RBOs in water governance. This paper aims to help clarify and define what is meant by an international RBO, providing a basis for further scholarly discussion and research as well as the development of policy approaches. We proceed deductively, building from the larger institutionalist and water governance research in international relations to propose a theoretically-guided definition of RBOs and outline its key constitutive elements. We apply this definition to potential cases to better identify RBOs around the world today. We outline which cases qualify as RBOs and which cases fail to meet our constitutive criteria and why. We conclude by crafting an agenda for future research around RBOs that can considerably benefit from a more theoretically-grounded understanding of RBOs.

2. THE NEED FOR A THEORETICALLY-GROUNDED RBO DEFINITION

At the same time that RBOs are becoming of greater interest to international organizations and decision-makers, scholars of hydropolitics, who study conflict and cooperation between states over international water resources, (ELHANCE 1999: 3), are also directing their attention to international water basins and RBOs. [1] One stream of this research examines the conflict and cooperation potentials of international waters, either arguing that transboundary waters, and particularly water scarcity within such basins, triggers conflict potential between riparian states (e.g. STARR 1991; BULLOCH AND DARWISH 1993; GLEICK 1993; HOMER-DIXON 1999; GLEDITSCH ET AL. 2006) or provides opportunities for cooperation and the establishment of joint institutions (e.g. WOLF ET AL. 1999; ELHANCE 2000; LOWI 2000). Another body of research examines the conditions for institutionalized cooperation and the creation of international water treaties (e.g. LE MARQUAND 1977; DURTH 1996; HAFTENDORN 2000; SPECTOR 2000; DINAR 2009; STINNET AND TIR 2009; TIR AND ACKERMAN 2009). A smaller set of researchers have focused their attention on the formation of RBOs (MOSTERT 2003; KLAPHAKE AND SCHEUMANN 2006; LINDEMANN 2008; GERLAK AND GRANT 2009) and the variation in types of basin organizations that have come to exist (HOOPER 2006, LAUTZE ET AL. 2012; GWP 2012: 39). In recent years, the study of RBOs has also extended to questions of performance and effective river basin governance (BERNAUER 1997; MARTY 2001; LINDEMANN 2004; RIECKERMANN ET AL. 2006; BACKER 2007; ZAWAHRI 2008; DOMBROWSKY 2008; BERARDO AND GERLAK 2012; SCHMEIER 2013).

Despite the seemingly heightened attention paid to RBOs in both academic literature and in the broader international water community, scholars often use the term "River Basin Organization" with little attention to its definitional or conceptual nature. It is common, for example, for researchers to subsume RBOs under the broader umbrella of water institutions. For example, in her study on Conflict, Cooperation, and Institutions in International Water Management Ines Dombrowsky (2007: 2) subsumes RBOs under the broader concept of institutions defined as rules that constrain human interaction. Yet, she does not clearly differentiate the specifics of RBOs as opposed to institutions and international water treaties. Gerlak and Grant (2009: 117) see RBOs as cooperative institutional arrangements, "defined as a permanent organizational structure established by riparian states with the intended purpose of promoting cooperation and dialogue around an international river". While they acknowledge different depths of cooperation, they fail to distinguish between the different types of institutions, treating more informal institutions such as international water treaties in the same way as formalized organizations.

In addition, we observe that many researchers, International Organizations and NGOs, independently of which school of thought or background they stem from, sidestep or avoid explicit definitions of RBOs in favor of focusing on aspects of RBO objectives or functions. These may include the collection of data and information

[1] For a more detailed review of the hydropolitics literature refer to Bernauer and Kalbhenn (2010) and Schmeier (2010).

(RANGELEY ET AL. 1994: 25; CHENOWETH AND FEITELSON 2001), enforcement (UN-WATER 2008), cooperative development (SOLANES AND JOURAVLEV 2006; NEPAD 2004: 45; RANGELEY ET AL. 1994: 25), environmental monitoring (HOOPER 2006), participatory decision-making (UNESCO 2003; WWC 2006) or the promotion of IWRM (INBO 2013; AGUILLAR AND IZA 2011; WORLD BANK 2006; WWF 2003; GREEN CROSS INTERNATIONAL 2000). Particularly, it is common for hydropolitics scholars to assume RBOs have some form of conflict alleviating character because they promote cooperation, mitigate uncertainty and, consequently, increase water security (JÄGERSKOG 2003; WOLF ET AL. 2003; YOFFE ET AL. 2003; DELLI PRISCOLI AND WOLF 2009). Although RBOs, like all social institutions, generally aim to fulfill certain functions as outlined by hydropolitics researchers, they are unlikely to always realize the fulfillment of their original purposes. It is therefore insufficient to use objectives or functions as the primary basis for an RBO definition.

One the one hand it could be argued that the lack of theoretically-grounded definition of RBOs has allowed the international waters governance research to progress more organically, building incrementally from case studies and reflecting narrower research pursuits. However, we argue that the substantial ambiguity that exists around RBOs poses several challenges to international waters governance research. First, we argue that it hinders transparency in case study selection and comparability of research results conducted by different scholars. How do questions of design or effectiveness make sense if we are comparing apples to oranges? Second, the lack of a theoretically-grounded definition challenges the testing of international relations and governance theories in the context of RBOs. How can we assess the role of particular institutional design elements if we lack good comparative organizational data? Finally, we argue that the absence of a theoretically-driven RBO definition limits a broader scholarly discussion about the significance of RBOs in the greater political arena. How can we understand the scope and extent of governance on the ground if we lack clarity in our concepts?

3. DEFINING RIVER BASIN ORGANIZATIONS – KEY CONSTITUTIVE ELEMENTS

To construct a theoretically-grounded definition of an RBO, we proceed deductively from the institutionalist research and international water resources governance literature.

Institutionalist research offers broad conceptual understandings of institutions, regimes and organizations. To better understand what is meant by an RBO, it is helpful to consult this literature. In the broadest sense, international institutions are understood as "enduring sets of rules, norms and decision-making procedures that shape the expectations, interests, and behavior of actors" (GOLDSTEIN ET AL. 2000: 387). The notion of international institutions is thus often related to social practices and the principles that guide state behavior in the international system – and less to the entities through which such cooperation is taking place. The bodies of international cooperation, on the other hand, are most commonly captured by the concept of international organizations, described as entities that "possess legal personality in the sense that they are authorized to enter into contracts, own property, sue and be sued" (YOUNG 1989: 32). The reduction to entities with specifically defined legal personality, however, leads to the neglect of a large number of institutionalized cooperation efforts and is therefore unsuitable in the context of water resources governance.

Yet, neither the notion of international institutions nor the notion of international organizations is adequate to capture the reality of international politics today evidenced by the increase in various different forms of issue-specific cooperation among a range of nation states. The concept of international regimes captures institutionalized cooperation between these two extremes of broad international institutions and narrow, formalized international organizations. Regimes can be seen as "a set of implicit and explicit principles, norms, rules and decision-making procedures around which actors' expectations converge in a given area of international relations" (KRASNER 1983: 2). Although this definition has received a considerable amount of criticism (KRATOCHWIL AND RUGGIE 1986, YOUNG AND OSHERENKO 1993, HASENCLEVER ET AL. 1996), it is still valuable for the analysis of institutionalized cooperation because it allows capturing cooperation that goes beyond informal norms guiding the behavior of actors in the international system and thus constituting rules of the game (as, for instance, defined by YOUNG 1994: 3 or GOLDSTEIN ET AL. 2000: 387) but also captures cooperation attempts that fall short of full-fledged international organizations. This is particularly valuable in the field of water resources governance that is characterized by a high variance of governance forms.

Many scholars analyzing international environmental politics and international waters management therefore both implicitly and explicitly used the concept of international regimes when defining the objects of their analysis (e.g. BERNAUER 1995; GREENE 1996; UNDERDAL 2002; BIERMANN AND BAUER 2004; BREITMEIER ET AL. 2006; LINDEMANN 2008). The regime concept can be helpful in defining institutionalized cooperation in

its variety while avoiding both the pitfalls of a too broad and vague concept of institutions and a too narrow understanding of international organizations. It is therefore particularly helpful for defining institutionalized cooperation over shared watercourses as well. Building on this tradition, research on earth system governance, and specifically its focus on architecture (BIERMANN ET AL. 2010: 4-6), has recently also contributed considerably to better understanding what international institutions are, which functions they perform and how they interact, thus comprehensively grasping the governance of specific environmental issue-areas.

While this legacy of defining institutionalized cooperation helps inform our efforts to define RBOs as one type of institutionalized cooperation, it is also necessary to turn our attention to international water resources governance research for insights into in this specific issue-area. Such literature provides insights into the specific issue-area of transboundary water resources governance that cannot be captured by more general concepts of international environmental politics. Most relevant for the question of what RBOs are and what elements constitute an RBO is are the following branches of research: Research on river basins as management units (TECLAFF 1996; MOLLE 2009); on international water treaties and the mechanisms they provide for governing internationally shared resources (BERNAUER 1997; STINNET AND TIR 2009); on the institutionalization of cooperation in international river basins and the different reasons for why RBOs emerge (MOSTERT 2003; KLAPHAKE AND SCHEUMANN 2006; DOMBROWSKY 2007; LINDEMANN 2008; GERLAK AND GRANT 2009); on IWRM and the different approaches for ensuring that IWRM principles are taken into consideration when governing shared watercourses (MOSTERT 2003; SAVENIJE AND VAN DER ZAAG 2008; GWP 2009; GWP 2012; MERREY AND COOK 2012); or on specific governance mechanisms treaties or institutions provide in international river basins (KLIOT ET AL. 2001; MILICH AND VARADY 1999; CHENOWETH AND FEITELSON 2001; MARTY 2001; MOSTERT 2003; BRUCH ET AL. 2005; WOLF 2007; BERARDO AND GERLAK 2012; SCHMEIER 2013).

Following Goertz's (2006) concept building approach and drawing on a rich tradition that exists in global environmental politics research to tackle complex concepts in need of clarity (e.g. MITCHELL 2003 on international environmental agreements; DELLAS ET AL. 2011 on agency; LAUTZE ET AL. 2011 on water governance), we propose a three-level definition of RBOs. We recognize that to properly conceptualize RBOs and to initiate a comprehensive and fruitful discussion about the nature of RBOs, we must engage in operationalization and identify key constitutive elements of an RBO. Through integrating and building from both institutionalist and international water resources governance literatures, we identify nine constitutive elements under three broad categories: internationalization, institutionalization, and governance. Accordingly, we propose a definition of River Basin Organizations 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**.

This definition includes nine constitutive elements that together form a three-level concept of an RBO (see Figure 1 below).

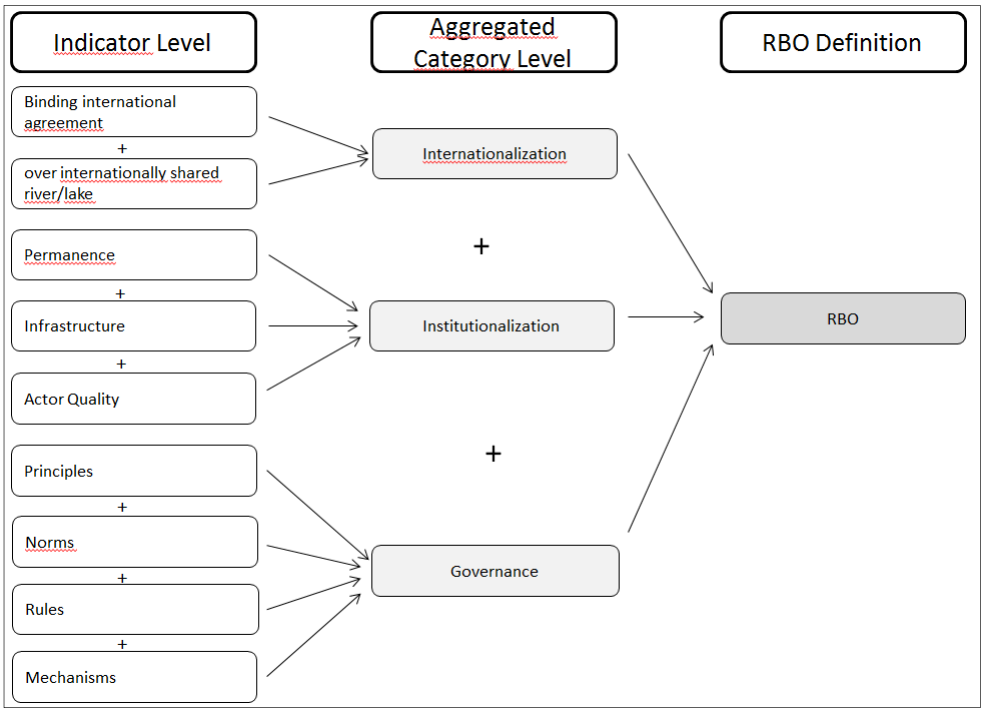

Figure 1: Three-Level Definition of RBOs

INTERNATIONALIZATION

The first category of our RBO definition addresses internationalization. It consists of two indicators – whether an international agreement has been made and whether it covers and internationally shared river or lake basin. Firstly, cooperation under the framework of an RBO relies on binding international agreements. This suggests some degree of implicit or explicit bindingness of the international agreement establishing an RBO. Such implicit or explicit legal or political bindingness is included in many understandings of institutionalized governance, including Bernauer's (1995: 352) definition of international environmental institutions that emphasizes "legally or politically binding international agreements" as a key constituting factor. For the case of RBOs, we consider bindingness to be either legal or political (or a combination of both). Hence, an institution can be an RBO although it does not rely on a legally binding treaty according to international law but is equipped with sufficient political bindingness provided by its member states. This is particularly crucial in order to capture the specific characteristics of water resources governance, not always treated as critically as high-politics issues such as security and therefore often exhibiting slightly looser cooperation mechanisms.

In addition, an agreement that provides the basis for the respective international institution covers a certain geographic area, an internationally shared river or lake

basin and its water resources[2]. An international river or lake basin is understood as "a system of surface waters […] constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus" (as defined in Art. 2 of the 1997 UN Convention) that is shared by two or more riparian states. The international dimension is crucial for our definition of RBOs as institutionalized means for international water resources governance. Our definition thus excludes institutions that manage river basins at the national level only – even if they address an international river as does the German Commission for the Protection of the Rhine, consisting of six German states and the federal level.

INSTITUTIONALIZATION

The second category of our RBO definition captures the institutionalization of RBOs. Institutionalization distinguishes RBOs from international water treaties that do not lead to institutionalized cooperation efforts between signatory states as well as from more ad-hoc and short-term cooperation efforts such as cooperation on flood relief during times of disasters. Institutionalization is thereby captured through three characteristics: 1), permanence, 2) RBO infrastructure and 3) actor quality. We consider all elements as crucial and necessary for a case to be deemed an RBO.

Permanence refers to the more long-term nature of institutionalized cooperation within RBOs, capturing what International Relations scholars have described as "some degree of permanence" (BIERMANN AND BAUER 2004: 190) or "some persistence, durability and resilience" (DUFFIELD 2007: 8) as a key element of institutions. This is similar to what German regime scholars have referred to as robustness (EFINGER ET AL. 1988; HASENCLEVER ET AL. 1997; MAYER 2006) or the "staying power" of regimes (HASENCLEVER ET AL. 1997: 2). Obviously, this cannot refer to the length of the period of time an RBO existed given the high variation in establishment dates across RBOs. Instead, it captures whether an RBO has continuously existed since its establishment – independently of when this might have been. For RBOs that have been established not long ago, this necessarily implies weaker testing grounds than for RBOs that have been established decades ago. Nonetheless, we do consider this constitutive element as crucial for RBOs given their mandate in long-term water resources governance across their member states.

The notion of RBO infrastructure refers – similar to what Zürn described as "the infrastructure of regimes" (ZÜRN 2010: 81) – to the organizational bodies of an RBO, that is, the organizational differentiation of an RBO into different bodies in charge of different types of water resources governance tasks. This can, for example, include regular meetings at the ministerial level (RBO commission or council meeting), task forces assigned with specific task or the presence of a permanent secretariat assigned

[2] This paper focuses on internationally shared surface waters, i.e. rivers and lakes only. However, the definition of RBOs developed in this paper provides some interesting insights for the analysis of international institutions managing shared groundwater bodies as well – especially given the so far limited research on such institutions (refer, for some exceptions, to Scheumann and Herrfahrt-Pähle 2008; Puri and Aureli 2009).

with administrative tasks. This implicitly includes the technical and financial resources required for maintaining the organizational structure of the organization which has been emphasized by other scholars as an integral part of international organizations (Young 1986: 108) and transboundary water institutions in particular (KLIOT ET AL. 2001: 308-309).

Actor quality suggests the ability of the organization to act relatively independently in the respective river basin and vis-à-vis other stakeholders, especially when initiating, coordinating and implementing water resources governance activities. Often, actor quality is expressed through the legal personality of an international institution and thus its capacity to act independently in the international system. This has been emphasized by a number of institutionalist scholars as well as proponents of international water law as a key requirement for institutionalized (water) governance (KOREMENOS ET AL. 2001; BROWNLIE 2008; KOREMENOS 2008; UNECE 2009). For example, this can include conducting scientific studies or the implementation of water infrastructure developments as well as the entering into agreements or other forms of cooperation with other international institutions or non-member states as well as other national or international actors. Actor quality thus differentiates RBOs from international institutions in the broader sense (e.g. KEOHANE 1988: 384; DUFFIELD 2007: 12-13).

GOVERNANCE

The third category captures the governance function of RBOs. We understand governance as the rules and water policies formulated by RBOs that create the framework for the management of water resources within the respective basin (PAHL-WOSTL ET AL 2012: 25). Relying on Krasner's (KRASNER 1983: 2) understanding of institutionalized governance, we distinguish between four governance elements as our constitutive elements for this category – principles, norms, rules and water governance mechanisms.

Principles are understood as underlying consent on how to govern and share water resources in a shared basin. This can, for instance, include general beliefs on how the basin's natural resources should be used or the belief that socioeconomic development takes precedence over environmental protection. In many cases, governance principles reflect general principles of international water law, such as the principle of equitable and sustainable use, the obligation not to cause significant harm, or the polluter pays principles in case water quality is the key collective action problem in a basin. The existence of such principles is most often reflected in the agreement or convention through which the RBO was established, generally in its Preamble.

Norms describe specific standards of behavior that set the framework for riparian states' rights and obligations with a specific focus on the respective river basin. Krasner (1983: 2) defines norms as "standards of behavior defined in terms of rights and obligations". Recognizing the potential overlap between principles and norms in some more general neo-institutionalist literature (e.g. KRATOCHWIL AND RUGGIE 1986), we differentiate between them. While principles set the general normative

framework for cooperative behavior on a meta-level and thus beyond the river basin with more general international water law principles as mentioned above, norms relate much more specifically to the respective basin's context and riparian states' normative commitments to jointly governing the specific watercourse. By norms, we suggest specific governance objective concerning the specific basin's resource protection, navigation or water development for the specific basin. This could, for instance, be a joint commitment to protect a river basin and minimize environmental change or even reverse change that already occurred. Or it could be a commitment to develop the basin's resources jointly for economic purposes, thus focusing more on economic development than on environmental protection. Norms are often outlined in the founding agreements of an RBO but are also reflected in other policy or strategy papers.

Rules operationalize principles and norms guiding the governance of a shared basin. They set clear prescriptions and proscriptions, goals, targets and behaviors and are – in most cases – spelled out explicitly and in a formalized way in the agreement or treaty establishing the RBO. These may include, for example, water allocation provisions, often set in certain quantities of run-off to be guaranteed by riparians, target thresholds for the intrusion of pollutants, or particular requirements for notification to co-riparians over specifically defined projects.

Finally, water resources governance mechanisms describe the various mechanisms, instruments and tools an RBO provides to its member states (as well as other actors) for solving water-related conflicts, governing water resources and achieving the goals and objectives of cooperative behavior as defined in the RBO's underlying agreements as well as the strategies it develops. Importantly, the mechanisms to govern and manage must be targeted at the subject area of water – defined as the governance of water and water-related resources that are closely tied to water (such as fish, other aquatic species, the management of floods and droughts, water allocation, or the use of water for the generation of hydropower or irrigation schemes). Our attention to governance mechanisms is an explicit recognition of the need to move beyond the regime approach and its aforementioned criticism and its limited focus on joint decision-making (KRASNER 1983: 2). Institutionalist research as well as international water resources governance research highlight various (water) governance mechanisms including information-sharing mechanisms, dispute-resolution mechanisms, instruments for monitoring and enforcing compliance with the RBO's rules and decisions, as well as means for including stakeholders, civil society representatives of NGOs into decision-making and management processes (GREENE 1996; WETTESTAD 1999; CHENOWETH AND FEITELSON 2001; KLIOT ET AL. 2001; KOREMENOS ET AL. 2001; BENVENISTI 2002; BERNAUER 2002; UNDERDAL 2002; MOSTERT 2003; ROGERS AND HALL 2003; BRUCH ET AL. 2005; CONCA 2006, WOLF 2007; BERARDO AND GERLAK 2012).

4. IDENTIFYING RBOS AROUND THE WORLD

To identify RBOs around the world, we apply our theoretically-grounded RBO definition to a list of potential cases. To construct this list, we relied on a number of sources. First, we turned to Oregon State University's Transboundary Freshwater Dispute Database (TFDD)'s Treaty Database and the University of Oregon's International Environmental Agreements Database to access international waters treaties potentially mentioning the establishment of an RBO[3]. Next, we engaged in a comprehensive review of secondary literature on conflict and cooperation over shared water resources, international water treaties and water governance for reference to RBOs. This included a comprehensive review of secondary literature focusing specifically on RBOs, most often in the form of single or comparative case studies. Finally, we consulted earlier RBO lists constructed by water scholars (DOMBROWSKY 2007; BAKKER 2007; GERLAK AND GRANT 2009). In particular, we rely heavily upon Schmeier's (2013) earlier work in which a first comprehensive list of potential RBOs around the world was compiled.

Upon crafting a list of all potential cases, we then examined each case to systematically determine if they meet the constitutive elements of our RBO definition.[4] We first consulted the treaty and, where available, the organizational website as well as additional official documents of the institutions such as Strategic Plans, Annual Reports or policy and strategy documents. We then also relied on secondary sources to address gaps in information.

By applying our definition to potential RBO cases we encountered a few methodological problems: In some cases it was impossible to access founding agreements. In other cases organizations did not have organizational websites or policy papers were not available to us which can be seems as a sign of limited permanence or actor quality, and therefore, limited institutionalization. In a few cases we encountered contradictions in the secondary literature when scholars presented RBO information that seemed to contradict our empirical findings.

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[3] We have turned to TFDD Treaties Database as a main starting point for our research because it provides the only collection of a broad set of international water treaties – the main starting point for institutionalized cooperation over shared waters.

[4] A standardized coding form and coding instructions were used to code the cases. The coding form is based on the nine constitutive elements that make up the theoretically-guided RBO definition. Three individuals, trained in the coding instructions, conducted the coding. Coders always started with the treaty and relied on the organizational website and secondary papers and reports to address any remaining gaps in coding. Five cases were coded with the initial coding form by two coders and then the coding instructions were revised in cases where inter-coder reliability was low. After coding with the final coding form, approximately 25 percent of the coded cases were selected randomly and coded by a second coder to check for inter-coder reliability. Inter-coder reliability was approximately 85% based on the number of constitutive elements coded the same. In cases where we encountered contradictions in the secondary literature, we relied on our empirical findings from the treaties and website analysis.

Annex 1 provides a complete list of the cases identified, including the name of the potential RBO, the river's name that is governed by the RBO, the date of its establishment, the continent in which the river basin is located and the member states of the RBO. It also includes those institutions for which data was too limited to actually classify them as RBOs or non-RBOs. Below, we outline how the population of cases met our definitional criteria to be identified as an RBO and also discuss which cases we exclude for failing to meet our constitutive criteria.

CASES FULFILLING THE CONSTITUTIVE ELEMENTS

Of the 124 potential cases we identified in Annex 1, we find that 81 cases fulfilled all of the constitutive criteria for an RBO. We list these RBOs which meet our definitional criteria in Table 1 below.

Table 1: Institutions fulfilling all Constitutive Elements to qualify as an RBO

Name of the Institution	River	Year establ.[5]	Member States
Binational Autonomous Authority of the Lake Titicaca for the TDPS	Lake Titicaca	1992	Bolivia, Peru
Administrative Commission for the Rio de la Plata (CARP)	La Plata/Parana	1973	Argentina, Uruguay
Comisión Administradora del Río Uruguay (CARU) (River Uruguay Executive Commission)	Uruguay	1975	Argentina, Uruguay
Central Commission for the Navigation of the Rhine (CCNR)	Rhine	1816/ 1922	Belgium, France, Germany, Netherlands, Switzerland
Commission for the Development of the Mirim Lagoon Basin	Lagoon Mirim	1977/ 2002	Brazil, Uruguay
Permanent Intergovernmental Co-Ordination Committee	La Plata/Parana	1969	Argentina, Bolivia, Brazil, Paraquay, Uruquay
Commission Internationale du Bassins Congo-Oubangui-Sangha (CICOS)	Congo	1999	Cameroon, Central African Republic, Republic of Congo, Democratic Republic of Congo
Joint Commission for the Protection of Italian- Swiss Waters against Pollution (CIPAIS)	Lage Maggiore; Lago di Lugano	1972	Italy, Switzerland
Commissions International pour la Protection de la Moselle (International Commission for the Protection of the Mosel) (CIPM)	Mosel	1961	France, Germany, Luxemburg
Commissions International pour la Protection de la Sarre (International	Sarre	1961	France, Germany

[5] In some cases, RBOs have been established by an original treaty but were later reformed through an additional agreement among their member states. In these cases, two establishment dates are provided.

Commission for the Protection of the Sarre) (CIPS)			
Council of the Lake Léman	Lake Léman	1987	France, Switzerland
Binational Commission for the Development of the upper Bermejo River and Grande de Tarija River Basins (COBINABE)	Bermejo/Tarija	1995	Argentina, Bolivia
Moselkommission/Commission de la Moselle (Mosel Commission)	Mosel	1956	France, Germany, Luxemburg
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 (CTC)	Chu & Talas	2006	Kazakhstan, Kyrgyztan
Comision Tecnica de Mixta de Salto Grande	La Plata/Parana	1946/ 1958	Argentina, Uruguay
Finnish Russian Commission on the Utilization of Frontier Waters	Olanga; Oulu; Vuoksa	1964	Finland, Russia
Donaukommission (Danube Commission)	Danube	1948	Austria, Bulgaria, Croatia, Germany, Hungary, Moldova, Russia, Romania, Serbia, Slovakia, Ukraine
German Czech Boundary Waters Commission	Elbe	1995	Czech Republic, Germany
Great Lakes Commission	Saint Lawrence	1955	Canada, USA
Great Lakes Fisheries Commission	Saint Lawrence	1955	Canada, USA
Joint Commission on the Garonne	Garonne	1963	France, Spain
Indo-Bangladesh Joint Rivers Commission	Ganges; Fenney; Karnapuli	1972	Bangladesh, India
International Water and Boundary Commission	Colorado, Mississipi; Rio Grande; Tijuana; Yaqui	1989	Mexico, USA
International Scheldt Commission	Scheldt	1994/ 2002	Belgium, France, Netherlands
International Commission for Boating on the Lake Constance (ICBL)	Lake Constance	1973	Austria, Germany, Switzerland
International Commission of International Rivers	Duero; Guadiana; Lima; Mino; Tajo	1964	Portugal, Spain
International Commission for the Management of the Irtysh	Ob-Irtysh	1992	Kazakhstan, Russia
International Commission for the Protection of the Danube River (ICPDR)	Danube	1994	Austria, Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia, Ukraine, EU
International Commission for the Protection of the Elbe River (ICPE)	Elbe	1990	Czech Republic, Germany
International Commission for the Protection of Lake Geneva	Lake Geneva	1962	France, Switzerland

International Commission for the Protection of the Oder River against Pollution (ICPO)	Oder	1996	Czech Republic, Germany, Poland, EU
International Commission for the Protection of the Rhine (ICPR)	Rhine	1963/ 1999	France, Germany, Luxemburg, Netherlands, Switzerland
Interstate Commission for Water Coordination in Central Asia	Aral	1992	Uzbekistan, Kasakhstan, Kyrgyztan, Tatjikistan, Turkmenistan
International Dnieper Basin Council	Dnieper	2003	Belarus, Russia, Ukraine
International Fund for Saving the Aral Sea (IFAS)	Aral	1998	Uzbekistan, Kasakhstan, Kyrgyztan, Tatjikistan, Turkmenistan
Internationale Gewässerschutzkommission für den Bodensee (International Commission for the Protection of Lake Constance)	Lake Constance	1960	Austria, Germany, Switzerland
International Joint Commission (IJC)	Alsek; Chilkat; Columbia; Nelso-Saskatchewan; St. Croix; St. John; St. Lawrence; Stikine; Taku; Whiting; Yukon	1909	Canada, USA
International Meuse Commission (IMC)	Meuse	2006	Belgium, France, Germany, Luxemburg, Netherlands
International Sava River Basin Commission (ISBC)	Sava	2002	Croatia, Bosnia Herzegovina, Serbia, Slovenia
Joint Boundary Water Commission	Coruh	1973	Georgia, Turkey
Joint Commission on the Dniester	Dniester	1994	Moldova, Ukraine
Joint Commission on the Vistula	Vistula	1964	Poland, Russia
Joint Irrigation Authority	Orange	1992	Namibia, South Africa
Joint Syrio-Jordanian Commission	Jordan	1953	Jordan, Syria
Joint Water Commission between South Africa and Swaziland	Incomati; Maputo	1992	South Africa, Swaziland
Joint Water Committee between Jordan and Israel	Jordan	1994	Israel, Jordan
Joint Water Committee between Israel and Palestine	Jordan	1995	Israel, Palestine
Komati Basin Water Authority (KOBWA)	Incomati	1992	South Africa, Swaziland
Lake Chad Basin Commission	Lake Chad	1964	Cameroon, Central African Republic, Chad, Niger, Nigeria, Libya
Lesotho Highlands Water Commission (LHWC)	Orange	1986/ 1999	Lesotho, South Africa
Lake Tanganyika Authority (LTA)	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
Limpopo Watercourse Commission	Limpopo	2003	Botswana, Mozambique,

(LIMCOM)			South Africa, Zimbabwe
Mahakali River Commission (MARC)	Mahakali	1996	India, Nepal
Mixed Commission for the Protection of Italo-Swiss Waters against Pollution	Po	1972	Italy, Switzerland
Mekong River Commission (MRC)	Mekong	1995	Cambodia, Laos, Thailand, Vietnam
Niger Basin Authority (NBA)	Niger	1980	Algeria, Benin, Burkina Faso, Cameroon, Chad, Guinea, Ivory Coast, Mali, Niger, Nigeria, Sierra Leone
Nile Basin Initiative (NBI)	Nile	2002	Burundi, Central African Republic, DR Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Uganda
Nigeria-Niger Joint Commission for Cooperation Cooperation	Niger	1990	Niger, Nigeria
Organization of the Amazon Cooperation Treaty (OCTA)	Amazon	1978	Bolivia, Colombia, Brazil, Equador, Guyana, Peru, Surinam, Venezuela
Okavango River Basin Water Commission (OKACOM)	Okavango	1994	Angola, Botswana, Namibia
Organisation pour la Mise en Valeur du Fleuve Gambie (OMVG)	Gambia; Corubal; Geba	1978	Gambia, Guinea, Senegal
Organisation pour la Mise en Valeur du Fleuve Sénégal (OMVS)	Senegal	1972	Guinea, Mauritania, Mali, Senegal
Orange Senqu River Commission (ORASECOM)	Orange	2000	Botswana, Namibia, Lesotho, South Africa
Permanent Greek Albanian Commission on Transboundary Freshwater Issues	Lake Prespa	2005	Greece, Albania
Permanent Yugoslav-Greek Hydroeconomic Commission	Struma	1959	Greece, Yuoslavia
Permanent Indus Water Commission	Indus	1960	India, Pakistan
Permanent Joint Technical Commission	Kunene	1969	Angola, Namibia
Pacific Salmon Commission	Alsek; Chilkat; Stikine; Firth; Taku	1985	Canada, USA
Permanent Water Commission for the Lower Orange Sub-Basin	Orange	1992	Namibia, South Africa
River Cuareim/Quarai Commission	Cuareim/Quaraim	1997	Brazil, Uruguay
Joint Russian Kazakhstan Commission for Utilization and Protection of Transboundary Waters	Volga; Ob-Irtysh	1992	Kazakhstan, Russia
Binational Autonomous Authority of Lake Titicaca (SUBCOMILAGO)	Lake Titicaca	1987	Bolivia, Peru
Trinational Commission of the Trifino Plan (TCPT)	Lempa	1998	El Salvador, Guatemala, Honduras
Comisión Trinacional para el Desarrollo en la Cuence de la Rio Pilcomayo (Trilateral Commission for the Development of the Riverbed of the Pilcomayo)	Rio Pilcomayo	1995	Argentina, Bolivia, Paraguay
Tripartite Permanent Technical	Incomati; Maputo;	1983	Mozambique, South

Committee	Umbeluzi		Africa, Swaziland
Finnish-Norwegian Transboundary Waters Commission	Kemi; Naatamo; Pasvik; Tana; Tourne	1980	Finland, Norway
Volta Basin Authority (VBA)	Volta	2006	Burkina Faso, Mali, Togo, Ghana, Benin
Zambezi Watercouse Commission (ZAMCOM)	Zambezi	2004	Angola, Botswana, Malawi, Mozambique, Namibia, Tanzania, Zimbabwe
Zambezi River Authority (ZRA)	Zambezi	1987	Zambia, Zimbabwe

HIGHLIGHTING RBO CASES

We highlight a few cases which possess all nine constitutive elements of an RBO across the three categories as defined above to provide a more comprehensive illustration of what constitutes an RBO. These are the Mekong River Commission (MRC), the ICPDR and the Orange-Senqu River Basin Commission (ORASECOM).

The MRC clearly is an **international** institution: It was established through the signature of the legally binding Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin (Mekong Agreement) by Thailand, Laos, Cambodia and Vietnam in 1995. This agreement spells out signatory states' commitment to cooperation in "all fields of sustainable development, utilization, management and conservation of the water and related resources of the Mekong River Basin" (Article 1) and thus the geographical focus of cooperation on a clearly defined international watercourse.

The MRC possesses a considerable level of **institutionalization**. Firstly, it has continuously performed its works since its establishment in 1995 and, moreover, relies on the work of its two predecessors (Mekong Committee and Interim Mekong Committee), thus possessing considerable permanence since 1957. The MRC consists of three key organizational bodies (the Council, the Joint Committee and the Secretariat[6]), together providing the RBO with sufficient infrastructure to fulfill its mandate and perform its activities. This, in turn, ensures its actor quality. This actor quality is, most obviously, determined by the fact that the MRC is officially mandated to have legal personality (Art. 11 1995 Mekong Agreement). Moreover, it is reflected by the fact that the MRC has – as an independent actor – developed and implemented a number of activities such as the drafting of a Basin Development Plan (MRC 2011: 1-10), the development of various databases capturing and analyzing hydrological, geographic, environmental and socioeconomic data on the Lower Mekong River Basin (refer to the MRC Data Portal), or the implementation of fisheries research and monitoring projects (MRC 2010).

[6] In addition, the MRC relies on two additional organizational bodies – the Donor Consultative Group, bringing together MRC's donors, and the National Mekong Committees, ensuring the link between regional RBO-level river basin governance and the MRC's member states and their respective water-relevant agencies.

When governing the Mekong River Basin, the MRC relies on all four constitutive elements within the **governance** category. The underlying principles are defined in the Mekong Agreement as cooperation "on the basis of sovereign equality and territorial integrity in the utilization and protection of the water resources of the Mekong River Basin" (Article 4). The agreement also emphasizes the equitable and sustainable utilization of the water course, the obligation not to cause significant harm and the prior notification of co-riparians (captured in Art. 5-8) as additional major principles cooperation should be based on. MRC's underlying norms of water resources governance concern the sustainable development of the basin (Art. 2) and thus member states' commitment to the development of the river's resources in a sustainable manner. Rules of cooperation under the MRC concern, in particular, the use of the Mekong River's water resources. They are equally outlined in Art. 5-8 of the Mekong Agreement, defining explicitly to what extent water of the river (and its tributary) can be used and whether and how co-riparian states have to be consulted before making any alterations to the river system (further spelled out in MRC's Procedures which are agreed upon and thus binding to MRC's member countries). Finally, the MRC, based on provisions of the Mekong Agreement, provides a number of river basin governance mechanisms to its member states: Decision-making processes are clearly spelled out (Art. 20 and 27), dispute-resolution mechanisms are pre-defined (Art. 18), environmental monitoring mechanisms have been established under the MRC Secretariat and its various programs and stakeholder participation instruments have been identified and implemented.

The ICPDR can also be seen as a somewhat typical RBO based on our constitutive elements across the three categories. The ICPDR is based on the 1994 Convention on Cooperation for the Protection and Sustainable Use of the Danube River (Danube Convention) to which today 14 out of the Danube's 19 riparian states, together with the European Union, are members – providing the legally binding basis for institutionalized cooperation on the Danube as a geographically confined basin. The ICPDR is hence an **international** institution.

Cooperation on the "sustainable and equitable water management, including the preservation, improvement and the rational use of surface waters and groundwaters" (Art. 2), to which signatory states commit, is **institutionalized** through the ICPDR. The ICPDR – continuously operational since its establishment and thus fulfilling the permanence criteria – possesses two key organizational bodies: the Commission as the Meeting of Parties and the Secretariat. [7] The ICPDR thus possesses a reliable RBO infrastructure. The ICPDR is, moreover, characterized by a comprehensive actor quality. Not only does it possess legal personality, it also acts independently in the Danube River Basin by developing objectives for pollution control and prevention, flood risk reduction and environmental health and helping member states to implement measures for achieving these objectives (including monitoring progress).

[7] In addition, the ICPDR can rely on a Ministerial Meeting, a Standing Working Group for policy and strategy formulation below the Commission level, and a number of Expert Groups working on specific water-related topics.

ICPDR's work relies on the four aforementioned **governance** elements. Its water resources governance principles are defined in the Danube Convention and, more specifically, in the 1992 United Nations Economic Commission for Europe (UNECE) Convention on the Protection and Use of Transboundary Watercourses and International Lakes to which the Preamble of the Danube Convention explicitly refers and commits. They include, most importantly, the need for "the protection and use of transboundary watercourses […] through enhanced cooperation" (Preamble of the UNECE Convention) and the principle of equitable and sustainable utilization of the river and its resources. More specifically, norms define specific objectives to be reached by member countries through the ICPDR. They focus mainly – driven by the requirements defined in the European Water Framework Directive (EUWFD) – on the environmental status of the river, comprising the river's chemical and biological quality as well as issues related to hydromorphological alterations. Based on these objectives, the ICPDR and its member states have defined clear rules and obligations for how to achieve the objectives (e.g. through the definition of certain pollutants' intrusion levels which states committed to comply with). The achievement of the ICPDR's objectives in line with its principles, norms and rules is ensured through the provision of various river basin governance mechanisms: For example, the ICPDR provides clearly defined decision-making mechanisms to its members (based on Art. 22 of the Danube Convention), offers means for exchanging data and information under the framework of the Danube Information System DANUBIS and a GIS-based information-sharing platform hosted by the Secretariat, and helps members with environmental monitoring of the river basin under the framework of the TransNational Monitoring Network (TNMN) (ICPDR 2008). It also ensures public participation under specific ICPDR guidelines (ICPDR 2005) through means such as stakeholder conferences, the granting of observer status to NGOs or the involvement of riparian populations into environmental monitoring activities.

In Southern Africa, the ORASECOM can also be considered a typical RBO fulfilling all nine constitutive elements. The organization is first of all based on a binding international agreement, the Agreement on the Establishment of the Orange-Senqu River Commission which was signed by the four riparian states of the Orange-Senqu basin Lesotho, South Africa, Namibia and Botswana in 2000. The agreement focuses on the international watercourse of the Orange-Senqu Basin recognizing that collaboration between riparians over "water source of common interest could significantly contribute towards mutual benefit, peace, security, welfare and prosperity of their people" (Preamble). ORASECOM thus fulfills all criteria of an **international** institution.

The agreement furthermore **institutionalizes** cooperation by establishing an organizational body, ORASECOM, as a permanent organization operating since its establishment, consists of an organizational body which includes a Council, a permanent Secretariat based in South Africa as well as several Task Teams (Art. 1). ORASECOM thus possesses a permanent infrastructure. The organization furthermore possesses legal personality (Art. 1). This legal personality together with its organizational body allows ORASECOM to fulfill the role of a regional water governance actor which has, for example, produced a number of scientific basin studies and promoted several capacity building programs for water experts.

ORASECOM moreover relies on all four **governance** elements defined in the previous section. This includes specific governance principles such as the principle of equitable and reasonable utilization of the river resources and the principle to prevent of significant harm to other riparians (Art. 7). Furthermore the agreement spells out norms such as the requirement to take all measure to protect and preserve the ecology of the river's estuary and rules which include the obligation of prior notification of projects that may have significant adverse effects on other riparians as outlined in the Agreement (Art. 7).

Finally, the agreement also provides specific governance mechanisms, such as a mechanism for dispute resolution, referring conflict cases to the Southern African Development Community (SADC) Tribunal (Art. 8) as well as a decision-making mechanism of the Council which is based on consensus (Art. 3).

MULTI-BASIN RBOS

The vast majority of RBOs listed in Table 1 cover just one river or lake basin (70 out of the 81 institutions we identified as RBOs). However, in 11 out of 81 instances (14%), we find that an RBO covers more than one river basin. Such institutionalized cooperation attempts do, nonetheless, qualify as RBOs but with the additional characteristic that the constitutive element "basin coverage" applies to more than one watercourse (see Table 2 below).

Table 2: Multi-Basin RBOs

Name of the Institution	River	Year establ.	Member States
Finnish Russian Commission on the Utilization of Frontier Waters	Olanga; Oulu; Vuoksa	1964	Finland, Russia
Indo-Bangladesh Joint Rivers Commission	Ganges; Fenney; Karnapuli	1972	Bangladesh, India
International Water and Boundary Commission	Colorado, Mississippi; Rio Grande; Tijuana; Yaqui	1989	Mexico, USA
International Commission of International Rivers	Duero; Guadiana; Lima; Mino; Tajo	1964	Portugal, Spain
International Joint Commission (IJC)	Alsek; Chilkat; Columbia; Nelso-Saskatchewan; St. Croix; St. John; St. Lawrence; Stikine; Taku; Whiting; Yukon	1909	Canada, USA
Joint Water Commission between South Africa and Swaziland	Incomati; Maputo	1992	South Africa, Swaziland
Organisation pour la Mise en Valeur du Fleuve Gambie (OMVG)	Gambia; Corubal; Geba	1978	Gambia, Guinea, Senegal
Pacific Salmon Commission	Alsek; Chilkat; Stikine; Firth; Taku	1985	Canada, USA

Joint Russian Kazakhstan Commission for Utilization and Protection of Transboundary Waters	Volga; Ob-Irtysh	1992	Kazakhstan, Russia
Tripartite Permanent Technical Committee	Incomati; Maputo; Umbeluzi	1983	Mozambique, South Africa, Swaziland
Finnish-Norwegian Transboundary Waters Commission	Kemi; Naatamo; Pasvik; Tana; Tourne	1980	Finland, Norway

For example, the Indo-Bangladesh Joint Rivers Commission (IBJC) fulfills the constitutive criteria for an RBO but its geographic scope reaches beyond one basin to include the Ganges, the Fenney and the Karnapuli River Basins under one institutionalized cooperation framework. Similarly, the International Joint Commission (IJC) between Canada and the United States fulfills the constitutive criteria, but also reaches beyond one basin to include some ten rivers shared between the two states, as well as the Great Lakes.

Multi-River RBOs exhibit some specific characteristics that make them worth distinguishing them from the more common form of RBOs that covers one basin only. First, RBOs covering multiple basins often rely on more general water resources cooperation agreements, covering all transboundary waters between the riparians. Examples include the Boundary Waters Treaty between Canada and the US, including all transboundary watercourses between these two countries, or the Agreement between Finland and Norway on a Finnish-Norwegian Transboundary Water Commission (TWC), covering all rivers shared between Finland and Norway. Consequently, most multi-basin RBOs are bilateral in their membership (out of the 11 multi-river RBOs, 9 have two members only[8]; SCHMEIER, 2013). Furthermore, dealing with more than one river also requires slightly different governance approaches – concerning both the rules according to which the rivers are governed and the mechanisms that are applied to doing so.

CASES FAILING TO MEET THE CONSTITUTIVE ELEMENTS

But just as it is important to identify the cases that meet our criteria, it is also important to examine the "negative pole" and the non-RBO cases (GOERTZ 2006: 31). We find that some forms of institutionalized cooperation over shared watercourses fail to fulfill our constitutive criteria (see Table 3 below). [9] While sometimes treated as RBOs in research, we argue that these cases should not be classified as RBOs. Instead, they should be discussed as other means of institutionalized governance – a field meriting further research in the future.

[8] Exceptions are the Organisation pour la Mise en Valeur du Fleuve Gambie (OMVG) with its members Gambia, Guinea and Senegal, and the Tripartite Permanent Technical Committee (TPTC), bringing together Mozambique, South Africa and Swaziland.

[9] Annex 2 includes a list of cases that can neither be confirmed nor rejected as RBOs based on our definition due to missing data.

Table 3: Cases failing to meet the Constitutive Elements to qualify as an RBO

Name of the Institution	River	Year establ.	Member States
Autorité de Développement Integré de la Région du Liptako-Gourma (Authority for the Integrated Development of the Liptako-Gourma Region)	Volta; Niger	1970	Burkina Faso, Mali, Niger
Amur River Basin Coordination Committee	Amur	2004	China, Mongolia, Russia
Aral Sea Basin Programme	Aral	1994	Kazakhstan, Kyrgyztan, Tatjikistan, Turkmenistan, Uzbekistan
Binational Commission of Economic Cooperation and Physical Integration	Zapaleri; Cullen; Lake Fagano; St. Martin	1984	Argentina, Bolivia, Chile
Comisión Binacional del Puente Buenos Aires Colonia (COBACIO)	La Plata/Parana	.	Argentina, Uruguay
Comisión Binacional del Río Paz (CBRP)	Rio Paz	.	El Salvador, Guatemala
Comité de la Cuenca del Río Sixaola	Sixaola	.	Costa Rica, Panama
Dostluk Commission	Harirud	2007	Iran, Turkmenistan
Rio Grande Rio Bravo Basin Coalition	Rio Grande	.	Argentina, Chile
Greater Mekong Sub-Region (GMS)	Mekong	1992	Cambodia, China, Laos, Myanmar, Thailand, Vietnam
Greater Tumen Initiative (GTI)	Tumen	1995	China, Mongolia, Russia, Korea
Helmand River Delta Commission	Helmand	1950	Afghanistan, Iran
Internationale Bodenseekonferenz (International Conference for the Lake Constance)	Lake Constance	1994	Austria, Germany, Switzerland
International St. Croix River Board	St. Croix	1915/2000	Canada, USA
International Columbia River Board of Control	Columbia	1941	Canada, USA
Angola Namibian Joint Commission of Cooperation	Kunene	1996	Angola, Namibia
Joint Operating Authority on the Kunene	Kunene	1969/1990	Angola, Namibia
Joint Permanent Technical Committee	Limpopo	1986	Botswana, Mozambique, South Africa, Zimbabwe
Joint Permanent Water Commission for the Chobe-Linyanti Sub-Basin	Okavango	1990	Botswana, Namibia
Joint Technical Committee on Regional Waters	Tigris-Euphrates	1980	Iraq, Syria, Turkey
Joint Transboundary Technical Committee	Alsek; Chilkat	1999	Canada, USA
Kura Araks Joint Commission	Kura-Araks	2004	Georgia, Turkey
Limpopo Basin Permanent Technical Committee	Limpopo	1986	Botswana, Mozambique, South Africa, Zimbabwe
ASEAN Mekong Basin Development Cooperation (ASEAN-MBDC)	Mekong	1996	Cambodia, China, Laos, Myanmar, Thailand, Vietnam
Mano River Union (MRU)	Mano-Morro	1973/2004	Liberia, Sierra Leone
Permanent Joint Technical	Nile	1959	Egypt, Sudan

Commission on the Nile			
Organization for the Management of the Development of the Kagera River Basin (OKRBO)	Kagera	1977	Burundi, Rwanda, Tanzania, Uganda
Peruvian-Bolivian Commission	Lake Titicaca	1957	Bolivia, Peru
Tumen River Area Consultative Commission (TACC)	Tumen	1995	China, North Korea, South Korea, Mongolia, Russia
Tumen River Area Development Coordination Committee	Tumen	1995	China, North Korea, Russia

With regard to the different categories of RBO characteristics and the respective constitutive elements at the indicator level, we find the **internationalization** component absent in some cases. Firstly, some institutionalized forms of cooperation analyzed do not rely on a binding agreement – neither in a legally nor in a politically binding way. For example, the Amur River Basin Coordination Committee (ARBCC) is not based on an intergovernmental agreement between its member states. Instead, it is a rather loose forum for riparian states of the Amur River Basin to coordinate and cooperate on various governance levels on the preservation of the Amur River Basin, though not implying any legal or political obligations for its members. In other cases, we find some institutionalized forms of cooperation fail to cover an internationally designated river or lake. For example, the Autorité de Développement Integré de la Région du Liptako-Gourma (ALG), established by Burkina Faso, Mali, and Niger in 1970, institutionalizes cooperation through the establishment of a joint organization with a permanent organizational structure. It is, however, not bound to the geographical area of a river basin but to the Liptako-Gourma area which covers a number of administrative areas of the three countries, some of which are situated in parts of the Volta and Niger Basin.

Other institutions fall short on constitutive elements related **institutionalization**. Some RBOs lack permanence as an important constitutive element of RBOs. While established in 1950 between Afghanistan and Iran, the Helmand River Delta Commission (HRDC) failed to implement any river basin governance activities and slowly seized to exist. Similarly, the Joint Permanent Technical Committee (JPTC) on the Limpopo, set up in 1986 between the four riparians Botswana, Mozambique, South Africa, Zimbabwe, was officially replaced by the agreement on the Limpopo Watercourse Commission (LIMCOM) in 2003. Others, although not being officially dissolved, have stopped operating over time. For example, the Joint Permanent Water Commission (JPWC) between Namibia and Botswana that that focused on advising both countries on matters of joint waters, particularly on the Chobe-Linyanti Sub-Basin of the Okavango, has practically ceased to operate since the establishment of OKACOM.

Other cases lack infrastructure, or the organizational bodies to fulfill the RBO's river basin governance mandate and implement the respective activities. For example, the Greater Mekong Sub-Region (GMS) does not possess any organizational bodies on its own. Rather, it is administered by the Asian Development Bank. Similarly, the Mano River Union (MRU), for instance, only possesses a Secretariat that coordinates

economic integration projects. It is, however, lacking any intergovernmental or transboundary decision-making body characteristic of RBOs.

Finally, some cases fail to possess actor quality. The GMS, for instance, does not act as independent actor but implements and coordinates economic integration projects that are developed by and decided upon by the Asian Development Bank (ADB). A similar example can be found in the same region – mainland Southeast Asia – where the Association of Southeast Asian Nation (ASEAN)'s Mekong Basin Development Cooperation (MBDC) only coordinates ASEAN's integration work that specifically targets the Mekong River Basin. MBDC therefore does not possess any means for acting proactively or developing and implementing activities by itself. Very often, a lack of actor quality is linked to a lack of RBO infrastructure, indicating that institutions that do not possess sufficient infrastructure to develop and implement projects also have a very limited scope for acting independently – and vice versa.

Thirdly, a number of institutions fail to meet the third category of constitutive elements – **governance**. Most institutions possess some form of either principles or norms or rules (or any combination of those). However, we find that some institutions lack water resources governance mechanisms due to the fact that they do not focus on water resources governance in the first place. For example, the GMS is often considered as an RBO due to its geographical coverage of the entire Mekong River Basin (with China, Myanmar, Thailand, Laos, Cambodia and Vietnam). Yet, it has the objective to stimulate growth through trade, investment and infrastructure development covers issue-areas other than water resources management and includes other aspects than the Mekong River. Hence, we do not classify the GMS as an RBO. Similarly, the Greater Tumen Initiative (GTI), which relies on the Tumen River Basin as its geographical determinant works on the identification of regional cooperation and integration activities in the sectors of energy, transport and tourism development, aiming at fostering growth and socioeconomic development. Because it covers issues other than water, it fails to meet our constitutive criteria. The MRU is a similar case – geographically identifying itself with the Mano-Morro River Basin but actually dealing with issues other than water resources governance.

5. DISCUSSION AND CONCLUSIONS

In this paper, we propose a theoretically-grounded RBO definition that builds on the broader theoretical work of neo-institutionalist literature and integrates empirical findings from water governance research. We then assess institutionalized forms of cooperation against this definition to better understand the landscape of RBOs around the world today. Our analysis makes an important contribution toward understanding what RBOs actually are and what not: Overall, we find a substantial presence of RBOs around the world. Of the 124 potential cases explored, we find that 81 – or 65% – meet our criteria and thus can be considered RBOs (as presented in Table 1). At the same time, we also find that not all institutions generally considered as RBOs actually live up to the theoretically-grounded definition of RBOs. We find that some 30 cases cannot be classified as RBOs because they fail to meet our constitutive elements (as presented

in Table 2). In another 13 cases included in Annex 2 missing data limits our ability to determine if these cases qualify as RBOs. These institutions therefore merit further research – not only for determining whether they can actually be considered as RBOs but also because the current lack of data indicates that our understanding of these institutions and their roles in governing their respective watercourses is still very limited.

In our research, we have found that our application of a theoretically-grounded concept of RBOs to a list of empiric cases faces some operational obstacles. In some cases, we struggled with clearly differentiating between a couple of the sub-categories of the constitutive elements, including the principles and norms on which RBOs are based. Further research on this issue could not only shed light on this particular operational challenge but might also be able to broaden our understanding of the role of principles and norms in international water resources governance more generally. In addition, for the constitutive element of institutionalization we found that for some RBOs it was challenging to show whether they showed permanence, either because the institution was still rather young like in the case of the International Meuse Commission (IMC) or Zambezi Watercourse Commission (ZAMCOM), or because we found only little evidence of their operation over time (as for example for the Permanent Water Commission for the Lower Orange Sub-Basin (PWCO)). Despite these challenges, we argue that it is important to make a distinction between ad-hoc institutionalized cooperation on a specific issue over a short time period only versus long-time cooperation. Further in-depth comparative case research can shed greater light on these distinctions and the relative benefit of either of these sub-categories.

Indeed a better understanding the RBO landscape is valuable for water governance research more broadly. While a theoretically-guided RBO definition does not suggest better governance or necessarily offer insights into power or political dynamics in transboundary water governance, it does provide a more macro-based view of the institutional arrangements in international rivers and lakes. Questions related to better governance or issues of power can and should be explored with a better understanding of the nature of the institutional setting and its relative place in larger water governance via-a-via other transboundary institutions. Studies of varying shapes and sizes, including large-N, more medium-N comparative studies and contextually rich single case studies are all important in water governance research.

We outline three ways that future research on the institutionalized governance of shared water resources can benefit from our research: 1) with regard to the scope of research, 2) from a methodological perspective, and 3) when focusing on newly emerging topics and developing policy advice. Firstly, understanding of the complete universe of RBOs may draw greater attention to the less examined RBO cases as it is common for many of the same well-known cases to receive far greater academic attention than other cases (BERNAUER 2002: 17; SCHMEIER 2013: 16-17) as well as issues that have so far only received limited scholarly interest. Generally, there are intensively studied basins such as the Aral Sea, the Indus, the Mekong or the Rhine River Basin as well as basins that have remained outside of the scope of most researchers (such as Latin American RBOs, or newly emerging RBOs in Eastern Europe).

A comprehensive scoping of RBOs also allows for moving research questions forward that have so far been answered insufficiently, such as questions of how RBOs form, how they change and evolve (e.g. MOLLE AND WESTER 2008) as well as research on whether and to what extent RBOs actually live up to the expectations that come with their establishment and effectively govern joint watercourses. Although some case study research highlights changes in institutional design and organizational practices of RBOs (e.g. KIBAROGLU 2008), we know little about how RBOs change over time. More systematic, large-N research studies could uncover if RBOs become more transparent or participatory over time in response to changing values and pressure from stakeholders and external actors. A full population of RBOs also allows us to test approaches to effectiveness from the case study research that focus on causal effects and problem solving of RBOs (SIEGFRIED AND BERNAUER 2007). It may help us to explore the relationship of effectiveness to levels of institutionalization and functional scope of RBOs (SCHMEIER 2013). At the same time, a more concise definition of RBOs can also considerably improve the quality of small-n comparative research – ensuring that comparative case studies compare RBOs to RBOs and not apples to oranges.

Secondly, a more theoretically-guided RBO definition and comprehensive picture of the entire population of RBOs can expand our methodological approaches to river basin governance. For instance, such knowledge can help with case selection. Only a sufficient knowledge of the entire population can avoid selection biases in terms of accidentally selecting non-RBOs or cases that are most similar or most diverse (e.g. KING ET AL. 1994: 128-135; COLLIER AND MAHONEY 1996: 59-63; GEDDES 2003: 91-95; MITCHELL AND BERNAUER 2004: 89-90; GEORGE AND BENNETT 2005: 23). This is particularly important for the comparative study of RBOs – an approach increasingly popular among water governance scholars.

In this context, the full population of RBOs can allow for more comparative studies into what types of institutional design features or water governance mechanisms are more likely to support the capacity of international communities to promote cooperation and shared management, address and resolve conflicts in situations where resource availability changes over time, and manage the resource sustainably (FISCHHENDLER 2004; WOLF 2007; DRIESCHOVA ET AL. 2008; TIR AND STINNETT 2012; HEIKKILA ET AL. 2013). Further research into institutional design may also better inform growing research on the adaptive capacity of institutions to respond to changing resource conditions, global environmental change, and future systems shocks (DIETZ ET AL. 2003; WALKER ET AL. 2004; BIERMANN AND DINGWERTH 2004; FOLKE AT AL. 2005; GIORDANO ET AL. 2005; RAADGEVER ET AL. 2008; ENGLE AND LEMOS 2010).

Finally, these paths for future research have the potential to play important roles in informing policy recommendations. Today, all around the world foreign ministers, NGOs, engineers, and hydrologists are operating within the parameters of RBOs. New RBOs are still being established as existing RBOs evolve and change over time. Our efforts to determine a theoretically-grounded RBO definition can contribute to this more global view of RBOs and potentially help shed greater light on the nature of RBOs and their role in terms of broader global water governance.

ACRONYMS

ADB	Asian Development Bank
ALG	Autorité de Développement Integré de la Région du Liptako-Gourma
ARBCC	Amur River Basin Coordination Committee
ASEAN	Association of Southeast Asian Nations
CCNR	Central Commission for the Navigation of the Rhine
EUWFD	European Water Framework Directive
GEF	Global Environment Facility
GMS	Greater Mekong Sub-Region
GTI	Greater Tumen Initiative
HRDC	Helmand River Delta Commission
IBJC	Indo-Bangladesh Joint Rivers Commission
ICPDR	International Commission for the Protection of the Danube River
IJC	International Joint Commission
IMC	International Meuse Commission
JPTC	Joint Permanent Technical Commission
JPWC	Joint Permanent Water Commission
LHWC	Lesotho Highlands Water Commission
LIMCOM	Limpopo Watercourse Commission
MDBC	ASEAN Mekong Basin Development Cooperation
MRC	Mekong River Commission
MRU	Mano River Union
OECD	Organization for Economic Cooperation and Development
OKACOM	Permanent Okavango River Basin Water Commission
OMVG	Organisation pour la Mise en Valeur du Fleuve Gambie
ORASECOM	Orange-Senqu River Commission
PWCO	Permanent Water Commission for the Lower Orange Sub-Basin
RBO	River Basin Organization
SADC	Southern African Development Community
TFDD	Transboundary Freshwater Dispute Database
TNMN	Trans-National Monitoring Network
TPTC	Tripartite Permanent Technical Committee
TWC	Transboundary Waters Commission

UN	United Nations
UNECE	United Nations Economic Commission for Europe
WWC	World Water Council
WWF	World Wide Fund for Nature
ZAMCOM	Zambezi Watercourse Commission
ZRA	Zambezi River Authority

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ANNEX 1: LIST OF ALL INSTITUTIONS INCLUDED IN THE ANALYSIS

Name of the Institution	River	Year establ.	Member States
Autorité de Développement Integré de la Région du Liptako-Gourma (Authority for the Integrated Development of the Liptako-Gourma Region)	Volta; Niger	1970	Burkina Faso, Mali, Niger
Amur River Basin Coordination Committee	Amur	2004	China, Mongolia, Russia
Aral Sea Basin Programme	Aral	1994	Kazakhastan, Kyrgyztan, Tatjikistan, Turkmenistan, Uzbekistan
Binational Autonomous Authority of the Lake Titicaca for the TDPS	Lake Titicaca	1992	Bolivia, Peru
Binational Commission of Economic Cooperation and Physical Integration	Zapaleri; Cullen; Lake Fagano; St. Martin	1984	Argentina, Bolivia, Chile
Administrative Commission for the Rio de la Plata (CARP)	La Plata/Parana	1973	Argentina, Uruguay
Comisión Administradora del Río Uruguay (CARU) (River Uruguay Executive Commission)	Uruguay	1975	Argentina, Uruguay
Comisión Binacional del Puente Buenos Aires Colonia (COBACIO)	La Plata/Parana	…	Argentina, Uruguay
Comisión Binacional del Rio Paz (CBRP)	Rio Paz	…	El Salvador, Guatemala
Central Commission for the Navigation of the Rhine (CCNR)	Rhine	1816/1922	Belgium, France, Germany, Netherlands, Switzerland
Comité de la Cuenca del Río Sixaola	Sixaola	…	Costa Rica, Panama
Commission for the Development of the Mirim Lagoon Basin	Lagoon Mirim	1977/2002	Brazil, Uruguay
Commission Internationale du Bassins Congo-Oubangui-Sangha (CICOS)	Congo	1999	Cameroon, Central African Republic, Republic of Congo, Democratic Republic of Congo
Permanent Intergovernmental Co-Ordination Committee	La Plata/Parana	1969	Argentina, Bolivia, Brazil, Paraquay, Uruquay
Joint Commission for the Protection of Italian- Swiss Waters Against Pollution (CIPAIS)	Lage Maggiore; Lago di Lugano	1972	Italy, Switzerland
Commissions International pour la Protection de la Moselle (International Commission for the Protection of the Mosel) (CIPM)	Mosel	1961	France, Germany, Luxemburg
Commissions International pour la Protection de la Sarre (International Commission for the Protection of the Sarre) (CIPS)	Sarre	1961	France, Germany
Council of the Lake Léman	Lake Léman	1987	France, Switzerland

Binational Commission for the Development of the upper Bermejo River and Grande de Tarija River Basins (COBINABE)	Bermejo/Tarija	1995	Argentina, Bolivia
Moselkommission/Commission de la Moselle (Mosel Commission)	Mosel	1956	France, Germany, Luxemburg
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 (CTC)	Chu;Talas	2006	Kazakhstan, Kyrgyztan
Comision Tecnica de Mixta de Salto Grande	La Plata/Parana	1946/1958	Argentina, Uruguay
Finnish Russian Commission on the Utilization of Frontier Waters	Olanga; Oulu; Vuoksa	1964	Finland, Russia
Donaukommission (Danube Commission)	Danube	1948	Austria, Bulgaria, Croatia, Germany, Hungary, Moldova, Russia, Romania, Serbia, Slovakia, Ukraine
Dostluk Commission	Harirud	2007	Iran, Turkmenistan
Estonian Russian Joint Transboundary Waters Commission	Narva	1997	Estonia, Russia
Fly River Provincial Boundaries Commission	Fly	1978	Indonesia, Papua New Guinea
Franco-Swiss Consultative Commission on Fishing in the Lake Geneva	Lake Geneva	1982	France, Switzerland
Rio Grande Rio Bravo Basin Coalition	Rio Grande	…	Argentina, Chile
German Czech Boundary Waters Commission	Elbe	1995	Czech Republic, Germany
Great Lakes Commission	Saint Lawrence	1955	Canada, USA
Great Lakes Fisheries Commission	Saint Lawrence	1955	Canada, USA
Greater Mekong Sub-Region (GMS)	Mekong	1992	Cambodia, China, Laos, Myanmar, Thailand, Vietnam
Guatemala Mexico International Boundary Water Commission	Candelaria; Grijalva	1987	Guatemala, Mexico
Joint Commission on the Garonne	Garonne	1963	France, Spain
Greater Tumen Initiative (GTI)	Tumen	1995	China, Mongolia, Russia, Korea
Helmand River Delta Commission	Helmand	1950	Afghanistan, Iran
Indo-Bangladesh Joint Rivers Commission	Ganges; Fenney; Karnapuli	1972	Bangladesh, India
Internationale Bodenseekonferenz (International Conference for the Lake Constance)	Lake Constance	1994	Austria, Germany, Switzerland
International Water and Boundary Commission	Colorado; Mississippi; Rio Grande; Tijuana; Yaqui	1989	Mexico, USA
International Scheldt Commission	Scheldt	1994/2002	Belgium, France, Netherlands
International Commission for Boating on the Lake Constance (ICBL)	Lake Constance	1973	Austria, Germany, Switzerland

International Commission of International Rivers	Duero; Guadiana; Lima; Mino; Tajo	1964	Portugal, Spain
International Commission on Limits and Water between Mexico and Guatemala	Candelaria; Coatam Achute; Grijalva; Hondo; Suchiate	1961	Guatemala, Mexico
International Commission for the Management of the Irtysch	Ob-Irtysh	1992	Kazakhstan, Russia
International Commission for the Protection of the Danube River (ICPDR)	Danube	1994	Austria, Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia, Ukraine, EU
International Commission for the Protection of the Elbe River (ICPE)	Elbe	1990	Czech Republic, Germany
International Commission for the Protection of Lake Geneva	Lake Geneva	1962	France, Switzerland
International Commission for the Protection of the Oder River against Pollution (ICPO)	Oder	1996	Czech Republic, Germany, Poland, EU
International Commission for the Protection of the Rhine (ICPR)	Rhine	1963/1999	France, Germany, Luxemburg, Netherlands, Switzerland
International St. Croix River Board	St. Croix	1915/2000	Canada, USA
Interstate Commission for Water Coordination in Central Asia	Aral	1992	Uzbekistan, Kasakhstan, Kyrgyztan, Tatjikistan, Turkmenistan
International Dnieper Basin Council	Dnieper	2003	Belarus, Russia, Ukraine
International Fund for Saving the Aral Sea (IFAS)	Aral	1998	Uzbekistan, Kasakhstan, Kyrgyztan, Tatjikistan, Turkmenistan
Internationale Gewässerschutzkommission für den Bodensee (International Commission for the Protection of Lake Constance)	Lake Constance	1960	Austria, Germany, Switzerland
International Columbia River Board of Control	Columbia	1941	Canada, USA
International Joint Commission (IJC)	Alsek; Chilkat; Columbia; Nelso-Saskatchewan; St. Croix; St. John; St. Lawrence; Stikine; Taku; Whiting; Yukon	1909	Canada, USA
International Meuse Commission (IMC)	Meuse	2006	Belgium, France, Germany, Luxemburg, Netherlands
International Sava River Basin Commission (ISBC)	Sava	2002	Croatia, Bosnia Herzegovina, Serbia,

			Slovenia
Joint Boundary Water Commission	Coruh	1973	Georgia, Turkey
Joint Commission on the Dniester	Dniester	1994	Moldova, Ukraine
Angola Namibian Joint Commission of Cooperation	Kunene	1996	Angola, Namibia
Comision Mixta del Rio Parana (COMIP) (Joint Commission of the Parana River	La Plata/Parana	1971	Argentina, Brazil, Paraguay
Joint Commission on the Tisza Basin	Tisza	1994	Slovakia, Ukraine
Joint Commission on the Vistula	Vistula	1964	Poland, Russia
Joint Irrigation Authority	Orange	1992	Namibia, South Africa
Joint Operating Authority on the Kunene	Kunene	1969/1990	Angola, Namibia
Joint Permanent Technical Committee	Limpopo	1986	Botswana, Mozambique, South Africa, Zimbabwe
Joint Permanent Water Commission for the Chobe-Linyanti Sub-Basin	Okavango	1990	Botswana, Namibia
Joint Syrio-Jordanian Commission	Jordan	1953	Jordan, Syria
Joint Technical Committee on Regional Waters	Tigris-Euphrates	1980	Iraq, Syria, Turkey
Joint Transboundary Technical Committee	Alsek; Chilkat	1999	Canada, USA
Joint Water Commission between South Africa and Swaziland	Incomati; Maputo	1992	South Africa, Swaziland
Joint Water Commission between Swaziland and Mozambique	Incomati	1999	Mozambique, Swaziland
Joint Water Committee between Jordan and Israel	Jordan	1994	Israel, Jordan
Joint Water Committee between Israel and Palestine	Jordan	1995	Israel, Palestine
Joint Water Commission on the Limpopo	Limpopo	1996	Mozambique, South Africa
Joint Water Commission on the Ruvuma	Ruvuma	2006	Mozambique, Tanzania
Joint Water Commission between Mozambique and Zimbabwe	Pungwe; Buzi; Save	2002	Mozambique, Zimbabwe
Kura Araks Joint Commission	Kura-Araks	2004	Georgia, Turkey
Komati Basin Water Authority (KOBWA)	Incomati	1992	South Africa, Swaziland
Lake Chad Basin Commission	Lake Chad	1964	Cameroon, Central African Republic, Chad, Niger, Nigeria, Libya
Lesotho Highlands Water Commission (LHWC)	Orange	1986/1999	Lesotho, South Africa
Limpopo Basin Permanent Technical Committee	Limpopo	1986	Botswana, Mozambique, South Africa, Zimbabwe
Lake Tanganyika Authority (LTA)	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
Limpopo Watercourse Commission (LIMCOM)	Limpopo	2003	Botswana, Mozambique, South Africa, Zimbabwe
Mahakali River Commission (MARC)	Mahakali	1996	India, Nepal
ASEAN Mekong Basin Development Cooperation (ASEAN-MBDC)	Mekong	1996	Cambodia, China, Laos, Myanmar, Thailand, Vietnam
Mixed Commission for the Protection of Italo-Swiss Waters against Pollution	Po	1972	Italy, Switzerland

Mekong River Commission (MRC)	Mekong	1995	Cambodia, Laos, Thailand, Vietnam
Mano River Union (MRU)	Mano-Morro	1973/2004	Liberia, Sierra Leone
Niger Basin Authority (NBA)	Niger	1980	Algeria, Benin, Burkina Faso, Cameroon, Chad, Guinea, Ivory Coast, Mali, Niger, Nigeria, Sierra Leone
Nile Basin Initiative (NBI)	Nile	2002	Burundi, Central African Republic, DR Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Uganda
Permanent Joint Technical Commission on the Nile	Nile	1959	Egypt, Sudan
Nigeria-Niger Joint Commission for Cooperation Cooperation (NNJC)	Niger	1990	Niger, Nigeria
Organization of the Amazon Cooperation Treaty (OCTA)	Amazon	1978	Bolivia, Colombia, Brazil, Equador, Guyana, Peru, Surinam, Venezuela
Okavango River Basin Water Commission (OKACOM)	Okavango	1994	Angola, Botswana, Namibia
Organisation pour la Mise en Valeur du Fleuve Gambie (OMVG)	Gambia; Corubal; Geba	1978	Gambia, Guinea, Senegal
Organisation pour la Mise en Valeur du Fleuve Sénégal (OMVS)	Senegal	1972	Guinea, Mauritania, Mali, Senegal
Orange Senqu River Commission (ORASECOM)	Orange	2000	Botswana, Namibia, Lesotho, South Africa
Organization for the Management of the Development of the Kagera River Basin (OKRBO)	Kagera	1977	Burundi, Rwanda, Tanzania, Uganda
Peruvian-Bolivian Commission	Lake Titicaca	1957	Bolivia, Peru
Permanent Greek Albanian Commission on Transboundary Freshwater Issues	Lake Prespa	2005	Greece, Albania
Permanent Yugoslav-Greek Hydroeconomic Commission	Struma	1959	Greece, Yuoslavia
Permanent Indus Water Commission	Indus	1960	India, Pakistan
Permanent Joint Technical Commission	Kunene	1969	Angola, Namibia
Pacific Salmon Commission	Alsek; Chilkat; Stikine; Firth; Taku	1985	Canada, USA
Permanent Water Commission for the Lower Orange Sub-Basin	Orange	1992	Namibia, South Africa
Russian- Byelorussian- Latvian Commission	Daugava	2003	Russia, Byelarus, Latvia
River Cuareim/Quarai Commission	Cuareim/Quarai	1997	Brazil, Uruguay
Joint Russian Kazakhstan Commission for Utilization and Protection of Transboundary Waters	Volga; Ob-Irtysh	1992	Kazakhstan, Russia
Slovenian Austrian Commission on the Drava River	Drava	1954	Slovenia, Austria
Binational Autonomous Authority of Lake Titicaca (SUBCOMILAGO)	Lake Titicaca	1987	Bolivia, Peru
Tumen River Area Consultative	Tumen	1995	China, North Korea, South

Commission (TACC)			Korea, Mongolia, Russia
Trinational Commission of the Trifino Plan (TCPT)	Lempa	1998	El Salvador, Guatemala, Honduras
Comisión Trinacional para el Desarrollo de la Cuenca del Rio Pilcomayo (Trilateral Commission for the Development of the Riverbed of the Pilcomayo) (TCRP)	Rio Pilcomayo	1995	Argentina, Bolivia, Paraguay
Tripartite Permanent Technical Committee	Incomati; Maputo; Umbeluzi	1983	Mozambique, South Africa, Swaziland
Tumen River Area Development Coordination Committee	Tumen	1995	China, North Korea, Russia
Finnish-Norwegian Transboundary Waters Commission	Kemi; Naatamo; Pasvik; Tana; Tourne	1980	Finland, Norway
Volta Basin Authority (VBA)	Volta	2006	Burkina Faso, Mali, Togo, Ghana, Benin
Zambezi Watercouse Commission (ZAMCOM)	Zambezi	2004	Angola, Botswana, Malawi, Mozambique, Namibia, Tanzania, Zambia, Zimbabwe
Zambezi River Authority (ZRA)	Zambezi	1987	Zambia, Zimbabwe

ANNEX 2: LIST OF INSTITUTIONS WITH INSUFFICIENT DATA TO CLASSIFY THEM ACCORDING TO THE DEFINITION

Name of the Institution	River	Year establ.	Member States
Estonian Russian Joint Transboundary Waters Commission	Narva	1997	Estonia, Russia
Fly River Provincial Boundaries Commission	Fly	1978	Indonesia, Papua New Guinea
Franco-Swiss Consultative Commission on Fishing in the Lake Geneva	Lake Geneva	1982	France, Switzerland
Guatemala Mexico International Boundary Water Commission	Candelaria; Grijalva	1987	Guatemala, Mexico
International Commission on Limits and Water between Mexico and Guatemala	Candelaria; Coatam Achute; Grijalva; Hondo; Suchiate	1961	Guatemala, Mexico
Joint Commission of the Parana River (COMIP)	La Plata/Parana	1971	Argentina, Brazil, Paraguay
Joint Commission on the Tisza Basin	Tisza	1994	Slovakia, Ukraine
Joint Water Commission between Swaziland and Mozambique	Incomati	1999	Mozambique, Swaziland
Joint Water Commission on the Limpopo	Limpopo	1996	Mozambique, South Africa
Joint Water Commission on the Ruvuma	Ruvuma	2006	Mozambique, Tanzania
Joint Water Commission between Mozambique and Zimbabwe	Pungwe; Buzi; Save	2002	Mozambique, Zimbabwe
Russian- Byelorussian- Latvian Commission	Daugava	2003	Russia, Byelarus, Latvia
Slovenian Austrian Commission on the Drava River	Drava	1954	Slovenia, Austria

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