

Institutional Architecture and the Good Governance of International Transboundary Waters

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Abstract

This paper critically reviews institutional architecture as an important aspect of good governance of international transboundary waters. International transboundary waters are international waters that are shared by two or more sovereign states, and include international freshwater, international groundwater and international Large Marine Ecosystems. At the core of good governance and institutional architecture is a clear understanding of the objectives driving the creation of an international transboundary waters governance institution. International transboundary waters face a multiplicity of governance challenges and there can be no “one-size-fits-all” approach to institutional architecture. Differences in approach to institutional architecture in an international transboundary waters context are dependent on a wide range of political, social, economic and ecological drivers and these drivers provide the context within which institutional architecture must function. Effective international transboundary waters governance institutions are those that address a functional necessity. Put another way, form should follow function. This paper discusses the role of institutional architecture in developing efficacious and coherent mechanisms for the governance of international transboundary waters. This paper outlines the problem context in reaching working arrangements over international transboundary water areas, identifies key means objectives in institutional regimes, and discusses specific institutional architecture concepts that stakeholders can utilize to achieve more effective institutional design. Concepts that can be used to achieve more effective institutional designs are presented and critically reviewed including balancing incentives, reducing uncertainty, increasing confidence and reducing costs. These concepts are illustrated using case studies including from Lake Tanganyika, the Mekong River, the Columbia River, and the Volta River Basin. More research and analysis is clearly needed to identify the specific institutional features that are most likely to lead to collaborative solutions to common problems in international transboundary waters management. However, this paper presents some preliminary observations and conclusions.

I. Introduction

International transboundary waters [“transboundary waters”] are waters that are shared by two or more sovereign states and include international freshwater, international groundwater and international Large Marine Ecosystems (LMEs).¹ Competing roles in transboundary waters, as both engines of regional

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¹ LMEs are regions of ocean space of 200,000 km² or greater that encompass coastal areas from river basins to estuaries to the outer margins of a continental shelf or the seaward extent of a predominant coastal current. LMEs are defined by ecological criteria, including bathymetric, hydrographic, productivity and trophically linked populations: as described in Kenneth Sherman, *Large Marine Ecosystem of the World*, Elsevier Editions, In UNESCO Intergovernmental Oceanographic Commission technical series (2008), a leading text on the subject. See also: Kenneth Sherman, Marie Christine Aquarone and Sara Adams, (Eds) *Sustaining the World's Large Marine Ecosystems*, available at http://www.lme.noaa.gov/lmeweb/downloads/book_sustain.pdf. See also: Kenneth Sherman and Gotthilf Hempel, (Eds), *The GEF UNEP Large Marine Ecosystem Report: A Perspective on Changing Conditions in LMEs of the World's Regional Seas*. UNEP Regional Seas Report and Studies No. 182. United Nations Environment Programme. Nairobi, Kenya. (2008).

development and as critical sites of biodiversity conservation, make transboundary waters governance issues enormously challenging.²

Designing and implementing appropriate institutional architecture is a critical step in the sustainable conservation and management of transboundary waters.³ The governance institution that is established and maintained will ultimately define not only which uses are “sustainable”, but also which uses are deemed “appropriate” and “equitable” in all of the circumstances.

Regrettably, development of sustainable governance institutions in a transboundary waters context has historically been the exception as opposed to the norm. According to Eckstein:

Institutional mechanisms have been installed in numerous transboundary river basins around the world for the purpose of managing and allocating shared waters, coordinating development and conservation activities, and protecting aquatic environments for human and environmental health. Yet, in comparison with the number of transboundary surface and ground water resources found on the planet, coordinated management of shared waters is still an uncommon occurrence. The result has been significant inefficiencies in the management and conservation of shared waters, as well as occasional conflicts, which, in turn, has detrimentally impacted economic development, the environment, human health, and international relations.⁴

At the core of sustainable institutional architecture in a transboundary waters context is the development of an understanding of the needs, issues and objectives driving the creation of a governance institution. Since transboundary waters face a multiplicity of challenges there can be no "one-size-fits-all" approach to transboundary waters governance (Schreiner et al, 2011; Eaux Partagees, 2002). Differences in approach are necessarily dependent on various political, social, economic and ecological drivers.⁵

Effective transboundary governance institutions are those that address a functional necessity. In other words, form best follows function. The overall goal of a governance arrangement may be the sustainable use of resources. However, the objective may be equitably allocating a resource, building trust between parties, and/or developing an institutional framework that will minimize the costs of administration and implementation. The elements influencing the effectiveness of the governance institution will depend upon how well those objectives have been met. For example, if there is a great deal of uncertainty related to the size of a fish stock, then clearly one of the key objectives may be to reduce uncertainty. Thus, a stock assessment component should probably be incorporated into the institutional architecture.⁶

² In this context it has been observed that, despite predictions of conflict, quite a number of international river basins have seen the establishment of international agreements and also the setting up of river basin organizations. Agreements regarding governance of international waters serve not only to protect and promote sustainable development, but also affect security throughout an entire area. These international agreements tend to stabilize and enhance security at the regional level, and the security return generated is independent of the concrete ecological and economic benefits produced by such agreements. Severe deforestation, soil erosion, salinization, toxic contamination, resource exploitation, habitat destruction, drought, flooding, air pollution and water pollution are just some of the environmental calamities that can increase international tension and lead to war over international waters. Conversely, the very process of reaching accommodation while developing bilateral resources and environmental and other mechanisms for cooperation in an international waters context creates a stabilizing and more transparent atmosphere. The mere fact of negotiation usually widens political participation, builds stability and spreads confidence between sovereign states.

³ See Ruth Vollmer, Reza Ardakanian, Matt Hare, Jan Leentvaar, Charlotte van der Schaaf & Lars Wirkus, *Institutional Capacity Development in Transboundary Water Management*, The United Nations World Water Assessment Programme (2009) available at <http://unesdoc.unesco.org/images/0018/001817/181792e.pdf>, who say “Sound and sustainable approaches to manage and allocate freshwater resources are of tremendous significance for human health, survival, nutrition and development. The interconnectedness of border-crossing freshwater systems inevitably results in the interdependence of all its users and stakeholders, who share a river, lake or aquifer notwithstanding their potential diversity in many other respects. Water-related activities in one state are likely to impact the water situation in another one and water-related problems such as pollution can often only be solved through transboundary cooperation. Therefore, the need to cooperate on water issues beyond the borders of states has been broadly accepted for many years.” See also Hala Qaddumi, *Practical Approaches to Transboundary Water Benefit Sharing*, Working Paper (2008) available at <http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/2576.pdf>

⁴ Gabriel Eckstein, *Water Scarcity, Conflict and Security in a Climate Change World: Challenges and Opportunities for International Law and Policy*, 27 Wisconsin. Intl. Law J. 409 (2009).

⁵ There are economic/demographic drivers; trade/food security drivers; climate/energy drivers; physical/environmental drivers; and trans-basin regional cooperation drivers. See WWF/DFID, 2008.

⁶ An example of this is the multinational technical committee, under the Bering Sea Pollock agreement, which assesses the annual pollock stocks in order to calculate the allowable catch for any given year for the signatories (United States, China, Russia, Korea and Poland). See the

This paper discusses the role of institutional architecture in developing an efficacious and coherent means to better govern transboundary waters. It outlines the problem context in reaching working arrangements over transboundary water areas, identifies key means objectives in institutional regimes, and presents specific institutional architecture concepts that stakeholders can utilize to achieve more effective institutional design. These concepts are illustrated using the transboundary waters governance regimes for Lake Tanganyika, the Mekong River, the Columbia River, and the Volta River Basin, as case studies. More research and analysis is needed to identify the specific institutional features that are most likely to lead to collaborative solutions to common problems in transboundary waters management. However, to this end, the paper presents some preliminary observations and conclusions.

2. Factors Determining Effectiveness of Governance Regimes in Transboundary Waters

The path to developing an effective governance regime (identifying the context, key means objectives and institutional architecture) is summarized in Figure 1 below.

Figure 1 – The Main Factors Determining Regime Formation and Effectiveness of Regimes in a International Waters Governance Context⁷

agreement, *Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea*, Washington 16 June, 1994 retrieved 29 March 2011. (find at[©]).

⁷ This table is based on Samuel Barkin & George Shambaugh, *Hypotheses on the International Politics of Common Pool Resources* (1999), In Samuel Barkin and George Shambaugh (Eds.) *Anarchy and the Environment*, New York: State University of New York; Joachim Blatter, *Lessons from Lake Constance: Ideas, Institutions and Advocacy Coalitions*, In Joachim Blatter and Helen Ingram (Eds.) *Reflections on Water: New Approach to Transboundary Conflict and Cooperation* (2001) 89-123, Boston MIT Press; Frank Marty, *International River Management: Problems Politics and Institutions* (2001) Bern: Peter Lang; Eric Mostert, *Conflict and Cooperation in International Freshwater Management: A Global Review*, 1:3 *International Journal of River Basin Management* 1 (2003); F. Jaspers, *Institutional Arrangements for Integrated River Basin Management*, 5 *Water Policy* 77 (2003); and Richard K. Paisley & Glen Hearn, *Some Observations From Recent Experiences With the Governance of International Drainage Basins*, in *Proceedings of the Symposium—Precious, Worthless, or Incalculable: The Value and Ethic of Water*, 2, Center for Water Law & Policy and International Center for Arid and Semi-Arid Land Studies, Texas Tech University. Corrêa A., and Eckstein G., eds. (2006).

Context	Institutional Means Objectives	Institutional Architecture
<p><i>Problem definition:</i></p> <p>Collective</p> <ul style="list-style-type: none"> ➤ Homogeneous interests <p>External</p> <ul style="list-style-type: none"> ➤ Heterogeneous interests <p>Maintenance</p> <ul style="list-style-type: none"> ➤ Quality issues <p>Appropriation</p> <ul style="list-style-type: none"> ➤ Quantity issues <p><i>Situation:</i></p> <p>Existing institutional arrangements</p> <p>Interests of the various parties</p>	<p>Balance Incentives</p> <ul style="list-style-type: none"> ➤ Removal of the cause of the problem ➤ Ensure Equity ➤ Addition of new incentives (direct and indirect) ➤ Welfare preservation ➤ Distributive equity <p>Reduce Uncertainty</p> <ul style="list-style-type: none"> ➤ Substantive issues – includes adaptability. ➤ Behaviour of other parties and stakeholders to the issue <p>Increase Confidence between Parties</p> <ul style="list-style-type: none"> ➤ Education and learning <p>Reduce Costs</p> <ul style="list-style-type: none"> ➤ Develop sustainable financing ➤ Minimize transactional costs of implementation. 	<p>Specificity in the focus of cooperation.</p> <ul style="list-style-type: none"> ➤ Appropriate scope <p>Information</p> <ul style="list-style-type: none"> ➤ Sufficient information (includes exchange) ➤ Inclusion of various interests. <p>Rules and norms</p> <ul style="list-style-type: none"> ➤ Clear and harmonious rules and norms of procedure ➤ Dispute resolution ➤ Enforcement and monitoring. <p>Feasibility</p> <ul style="list-style-type: none"> ➤ Capacity to run regime ➤ Resources to run regime <p>Adaptability</p> <ul style="list-style-type: none"> ➤ Learning and adaptive management ➤ Effective decision-making <p>Effective Organization</p> <ul style="list-style-type: none"> ➤ Appropriate organization size ➤ Centralized or decentralized <p>Openness</p> <ul style="list-style-type: none"> ➤ Providing interaction with interested actors ➤ Provides for learning between parties

2.1. Context

2.1.a. Problem Definition

Context relates to the degree of homogeneity of interests between parties, and the nature of the problem, being either appropriation or maintenance (Figure 2). In broad terms, human interest in many natural resources is in the form of maintenance, such as water quality or air quality, aesthetics; or appropriation, such as water for irrigation, trees for lumber, and fish for food.⁸ There are nuances between appropriation and maintenance, and often a degree of overlap. For example, the Bering Sea Pollock agreement is ostensibly about the quantity of fish for each nation and is thus an appropriation model. However, there is concern regarding the ‘quality’ of the resource, albeit with the goal of maintaining a high sustainable yield. The size of the fish, their age and distribution need to be considered when assessing a healthy population. Thus, maintenance issues are integrated into the process. Consequently, net mesh size, timing of fishing, and location are part of the management of the shared resource. From a negotiation and institutional arrangement standpoint, to allow certain quotas of stocks to be taken annually regardless of location, timing or quality of fish would be much simpler.

Figure 2 – Classification of Context.

	Homogeneous Interests	Heterogeneous Interests
Maintenance	Flooding in upstream and downstream state	Pollution release from an upstream state
Appropriation	Maintaining sustainable fisheries in joint area	Water extraction in an upstream state

In managing shared resources such as transboundary waters there are usually different interests at play.⁹ When interests are heterogeneous, issues are more difficult to agree on than when interests are homogeneous. The situation described in the upper left-hand box of Figure 2 is an example where flooding of a river negatively affects two nations. This was the case in both the Upper Rhine agreement

⁸ Samuel Barkin & George Shambaugh, *Hypotheses on the International Politics of Common Pool Resources* (1999), In Samuel Barkin and George Shambaugh (Eds.) *Anarchy and the Environment*, New York: State University of New York.

⁹ See Nicole Kranz, Antje Vorwerk, Rodrigo Vidaurre, *Towards Adaptive Water Governance Observations from the Two Transboundary River Basins Ecologic – Institute for International and European Environmental Policy*, available at: http://www.newater.uni-osnabrueck.de/caiwa/data/papers%20session/F3/Kranz_Ecologic_CAIWA_transboundary_governance.pdf pp.1” Transboundary river basins constitute a particularly complex example of multilevel governance. Not only do they comprise a multitude of administrative level – the international, national, regional and local levels – but several sets of these, according to the number of riparian countries in a transboundary river basin. In addition, the number of actor groups is automatically compounded as well. In addition to numerous state authorities from the different riparian, oftentimes other stakeholder groups play a role in transboundary water management, including non-governmental organizations, donors or academia.”

between Austria and Switzerland¹⁰ to control flooding; and in the flood control provisions of the Columbia River Treaty between the US and Canada.¹¹ In both situations, the benefits of cooperation were obvious. In the Bering Sea Pollock agreement, for example, there are homogeneous interests in maintaining a secure fish stock for allocation purposes. For such systems to function requires the possibility to exclude other users. In fisheries, this can only occur when fishing is done under areas of jurisdictional control with resources to exclude those not abiding by the rule. However, more common in many fisheries is the case of resource appropriation combined with heterogeneous interests (such as individual gain) that have been described as Hardin's *Tragedy of the Commons*.¹² That the majority of fish stocks worldwide are decreasing should come as no surprise.¹³ Similarly, an upstream user of water, wishing to construct a dam and take water for irrigation or hold water back for hydropower, may have interests that are in complete opposition to those of downstream users. This is the current situation in the Syr Darya basin where the four central Asian republics of Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan have been striving unsuccessfully for decades to develop a sustainable understanding regarding water and power generation in the region.¹⁴

Another generally difficult context is where there is an upstream polluter and a downstream end user of water suffering from the effects of pollution. This was the case in the Rhine, where 24 French potassium mines had been discharging waste salts into the river, negatively affecting Dutch drinking water and horticultural interests. This practice ultimately led to the Rhine Chlorides Convention between France and the Netherlands. The institutional arrangement arrived at took into account a variety of interests of the two nations, and developed a scheme whereby the Netherlands would financially support the reduction of pollutants from France.¹⁵

2.1.b. Situation

In assisting the evolution of an institution, it is important to realize that seldom is it possible to start from a completely clean slate. Existing institutions and levels of cooperation are likely to have been in place prior to the development of a specific international arrangement. For example, in the case of the Benguela Current LME, existing scientific agencies initiated dialogue, and later became an advisory body.¹⁶ In the Guinea Current LME, existing centres of excellence, such as the Marine Unit at Lagos University, were used as focal points for information and data for the entire region. This facilitated the development of

¹⁰ Treaty for the Regulation of the Rhine (1892). UN LEG. SER. 489.

¹¹ See Columbia River Treaty Review, BC Ministry of Energy, Mines and Petroleum Resources: online at [http://www.empr.gov.bc.ca/EAED/EPB/Documents/ColumbiaRiverTreatyReviewNov13\(web\).pdf](http://www.empr.gov.bc.ca/EAED/EPB/Documents/ColumbiaRiverTreatyReviewNov13(web).pdf)

¹² Garrett Hardin, *The Tragedy of the Commons*, 162 Science 1243 (1968). See Douglas Stinnett & Jaroslav Tir, *The Institutionalization of River Treaties*, 14:2 International Negotiation 229 (2009). "The result of over-using water resources is a classic tragedy of the commons (Hardin 1968) where each riparian state is tempted to maximize its use of the river, to the point at which the collective use exceeds what is sustainable (Benvenisti 1996). Because the costs are shared by all the riparian states, the result of unilateral consumption decisions creates an inferior outcome for all. In some cases, of course, certain states bear a greater proportion of these costs, as with the costs borne by downstream states for the actions of upstream states".

¹³ Richard Grainger, *Global Trends in Fisheries and Aquaculture*, In *National Ocean Service*, NOAA, Center for the Study of Marine Policy Policy at the University of Delaware, *The Ocean Governance Group. Trends and future challenges for US National Ocean and Coastal Policy: Workshop materials*. Washington, DC, (1999) pp. 21–25; R Froese & K Kesner-Reyes, *Impact of Fishing on the Abundance of Marine Species*, 12 ICES Council Meeting Report CM 12/L:12, International Council for the Exploration of the Sea (ICES), Copenhagen, Denmark, pp. 1–15 (2002); Daniel Pauly, Reg Watson and Jackie Alder, *Global Trends in World Fisheries: Impacts on Marine Ecosystems and Food Security*, 360 Philosophical Transactions of Royal Society 5 (2005); U. Thara Srinivasan, William Cheung, Reg Watson & U. Rasid Sumaila, *Food Security Implications of Global Marine Catch Losses Due to Overfishing*, 12 *Journal of Bioeconomics* 183 (2010).

¹⁴ See Bo Libert, Erkin Orolbaev & Yuri Steklov, *Water and Energy Crisis in Central Asia*, 6:3 China and Eurasia Forum Quarterly 9 (2008); See Christine Bichsel, *Liquid Challenges: Contested Water in Central Asia*, 12:1 Sustainable Development Law & Policy 24 (2011).

¹⁵ See Carel Dieperink, *International Water Negotiations Under Asymmetry, Lessons from the Rhine Chlorides Dispute Settlement*, 11 Intl. Environ Agreements 139 (2011). This paper gives a historical overview of the settlement of the Rhine Chlorides dispute "in order to draw some lessons for negotiators who have to work under comparable conditions of asymmetrical international water pollution. The case not only shows the complexities in reaching acceptable solutions for asymmetrical transboundary pollution, but also the importance of sound argumentation, institutions, side payments, issue framing, issue linking and arbitration."

¹⁶ See Global Environment Facility (GEF) Good Practices and Portfolio Learning in GEF Transboundary Freshwater and Marine Legal and Institutional Frameworks Project International Waters Governance project. "In-Depth Case Analysis of the Benguela Current Large Marine Ecosystem" Available online at: http://governance-iwlearn.org/wfp-content/uploads/2011/10/BCLME_Case_Study.pdf

agreements, as it reduced competition between parties for facilities.¹⁷ However, in some cases existing institutional relationships may be dysfunctional or inefficient, and thus, there is a need to create new mechanisms to achieve institutional goals.

Ultimately, no agreement will be successful if the fundamental interests of the parties are not addressed. Understanding interests will help determine the relative importance of various institutional objectives that drive architectural development. This is commonly called ‘interest-based bargaining’ where emphasis is placed on examining objectives as opposed to positions.¹⁸ This type of bargaining¹⁹ has been used in a variety of negotiations dealing with natural resource settings.²⁰

2.2. Institutional Means Objectives

Once the problem context and interests of the various parties are clarified, the process of determining the objectives of the institution begins. Objectives arguably fall into four broad categories: wanting to have incentives met; reducing uncertainty for the future; building trust between parties; and reducing costs (or maximizing financial gains). When there is greater clarity around the relative importance of these means objectives greater attention needs to be paid to appropriate architecture.

2.1.a. Balance Incentives

Parties usually enter into arrangements to meet their incentives. These can include developing an ‘equitable’ arrangement for benefit sharing,²¹ or reducing the ‘costs’ of not cooperating (such as pollution downstream).

¹⁷ See *Global Environment Facility (GEF) Good Practices and Portfolio Learning in GEF Transboundary Freshwater and Marine Legal and Institutional Frameworks Project International Waters Governance project. "In-Depth Case Analysis on the Guinea Current LME. Available online at <http://governance-iwlearn.org/wp-content/uploads/2010/09/GCLME-FORMATTED.pdf>*

¹⁸ R. Fisher, *Beyond Yes*, 1:1 *Negotiation Journal* 67 (1982); See Kathleen O'Connor, *Motives and Cognitions in Negotiation: A Theoretical Integration and an Empirical Test*, 8:2 *International Journal of Conflict Management* 114 (1997).

¹⁹ Interest-based bargaining is "a negotiation strategy that focuses on satisfying as many interests or needs as possible for all negotiators. It is a problem-solving process used to reach an integrative solution rather than disturbing rewards in a win/lose manner. It is not a process of compromise. It is typically used when the interests of the negotiators are interdependent; when it is not clear whether the issue being negotiated is fixed-sum; when future relationships are a high priority; when negotiators want to establish cooperative problem-solving rather than competitive procedures to resolve their differences; when negotiators want to tailor a solution to specific needs or interests; and when a compromise of principles is unacceptable." Taken from GEF UNDP Good Practices and Portfolio Learning in GEF Transboundary Freshwater and Marine Legal and Institutional Frameworks (2011) Reference and Training Manual: Lessons Learned and Experiences with International Waters and Governance including Experiential Learning Exercises at pp. 62.

²⁰ L.S. Jackson, *Consensus Processes in Land Use Planning in British Columbia: The Nature of Success*, 57:1 *Progress in Planning* 1 (2002); See Anthony Dorsey, L. Doney H. Rueggeberg, *Public Involvement in Government Decision-Making: Choosing the Right Model* (1994) B.C. Table on the Environment and the Economy, Victoria; See Daniel Druckman, *Dimensions of International Negotiations: Structures, Processes and Outcomes*, 6:5 *Group Decision and Negotiation* 395 (1997).

²¹ See Hala Qaddumi, *Practical Approaches to Transboundary Water Benefit Sharing*, Working Paper (2008) available at <http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/2576.pdf>. Overseas Development Institute at pp. 1 - " 'benefit sharing' has been proposed as one approach to bypass the contentious issue of property rights. The idea is that if the focus is switched from physical volumes of water to the various values derived from water use - in multiple spheres, including economic, social, political, and environmental - riparians will correctly view the problem as one of positive-sum outcomes associated with optimizing benefits rather than the zero-sum outcomes associated with dividing water. The case for sharing benefits is a compelling one. A river basin is a common pool resource, meaning that use of it by one riparian (or indeed individual) will necessarily diminish the benefits available to others. In other words, water use in one part of the basin creates external effects in other parts. If these externalities are not 'internalised', the overall benefits are reduced and the outcome is sub-optimal. Thus, both hydrology and economics concur that a river basin should be treated as a single unit to maintain the physical integrity of the system and to internalize externalities. See for example Article III of the Bucharest Convention (Black Sea). It provides that all of the Contracting Parties are to take part in the Bucharest Convention "on the basis of full equality of rights and duties...." See infra note 34. See also The Southern African Development Community (SADC) Revised Protocol on Shared Watercourses ("Watercourses Protocol"), arts. 3(7)(a), 7 Aug. 2000, available at <http://www.sadc.int/index/browse/page/159>. Among the general principles of the Watercourses Protocol is the expectation that: "Watercourse States shall in their respective territories utilize a shared watercourse in an equitable and reasonable manner. In particular, a shared watercourse shall be used and developed by Watercourse States with a view to attain optimal and sustainable utilization thereof and benefits therefrom, taking into account the interests of the Watercourse States concerned, consistent with adequate protection of the watercourse for the benefit of current and future generations."

One of the principal incentives for cooperation is usually the removal, or mitigation, of a specific problem. There are numerous conventions for protection of areas, such as the Caspian Sea,²² Lake Tanganyika,²³ and the Black Sea,²⁴ which focus on problem mitigation. Problem mitigation will influence all aspects of institutional architecture, including defining the scope of the institution, the information needed to facilitate decision-making, and the rules and norms. The scope of the arrangement will have a large impact on determining institutional feasibility in terms of both the capacity (technical and socio-economical know-how) and resources (financial, infrastructural) to run the regime. Institutional development must consider scope in terms of incentives to avoid building systems that cannot be sustained by those parties charged with the task.²⁵ Waterbury gives the example of the Nile as a basin where the scope could be overwhelming, and thus there is a need to break the basin into sub-basins with sub-activities.²⁶ Linked to problem mitigation is ensuring equity, either in terms of allocation of benefits (i.e., water for irrigation or fish) or in terms of costs (i.e., infrastructure, research, pollution control).

In some situations, merely looking at the benefits of cooperation will not suffice, and thus increasing the scope of the arrangement may be needed.²⁷ The importance of developing a greater ‘basket of benefits’ allows actors to accept certain terms of an overall agreement that, individually, may not appear encouraging enough to them to form an accord.²⁸ An example is the US agreement to provide hydropower transmission and allow power sales in the US of the ‘Canadian share of increased energy produced’, under the Protocol to the Columbia River Treaty.²⁹ This practice is key to ensuring that equity among parties is established.

²² Framework Convention for the Protection of the Marine Environment of the Caspian Sea (“Tehran Convention”), 4 Nov. 2003, *available at* <http://www.caspianenvironment.org/newsite/Convention-FrameworkConventiontext.htm>. The preamble states: "Noting of the deterioration of the marine environment of the Caspian Sea due to its pollution arising from various sources as a result of human activities, including the discharge, emission and disposal of harmful and hazardous substances, wastes and other pollutants, both in the sea and from land-based sources; Firmly resolved to preserve living resources of the Caspian Sea for present and future generations; Acknowledging the need to ensure that land-based activities do not make harm for the marine environment of the Caspian Sea; Mindful of the danger for the marine environment of the Caspian Sea and to its unique hydrographic and ecological characteristics related to the problem of sea-level fluctuation; Reaffirming the importance of protection of the marine environment of the Caspian Sea; Recognizing the importance of co-operation among the Contracting Parties and with relevant international organizations with the aim to protect and conserve the marine environment of the Caspian Sea".

²³ Convention on the Sustainable Management of Lake Tanganyika (“Tanganyika Convention”), 12 June 2003, *available at* <http://www.lta-alt.org/tanganyika-eng/view>. The Convention addresses several aspects of the lake's management, including sustainable fisheries management (Art. 7); Prevention and control of pollution (Art. 8); Prevention of sedimentation (Art.9); Conservation of biological diversity (Art. 10); and Protection and utilization of genetic and biochemical resources (Art. 11).

²⁴ Convention on the Protection of the Black Sea Against Pollution (“Bucharest Convention”), 21 Apr. 1992, *available at* http://www.blacksea-commission.org/_convention-fulltext.asp. This agreement is aimed to prevent pollution by hazardous substances or matter (Annex to the Convention); to prevent, reduce and control the pollution from land-based sources (Protocol to the Convention); to prevent, reduce and control the pollution of the marine environment from vessels in accordance with the generally accepted rules and standards; to prevent, reduce and control the pollution of the marine environment resulting from emergency situations (Protocol to the Convention); to prevent, reduce and control the pollution by dumping (Protocol to the Convention); to prevent, reduce and control the pollution caused by or connected with activities on the continental shelf, including exploration and exploitation of natural resources; to prevent, reduce and control the pollution from or through the atmosphere; to protect the biodiversity and the marine living resources (Draft Protocol on the biodiversity); to prevent the pollution from hazardous wastes in transboundary movement and the illegal traffic thereof (Draft Protocol to the Convention); and to provide framework for scientific and technical co-operation and monitoring activities.

²⁵ John Waterbury, *Between Unilateralism and Comprehensive Accords: Modest Steps Toward Cooperation in International River Basins*, 13:3 *Water Resources Development* 279 (1997).

²⁶ *Ibid.*

²⁷ Daniel Druckman, *Dimensions of International Negotiations: Structures, Processes and Outcomes*, 6:5 *Group Decision and Negotiation* 395 (1997).

²⁸ J Stein, *Getting to the Table*, (1989) Baltimore: Johns Hopkins University Press; See I. William Zartman, *Ripe for Resolution*, 2nd ed. (1989) New York: Oxford Press; See Eric Mostert, *Conflict and Cooperation in International Freshwater Management: A Global Review*, 1:3 *International Journal of River Basin Management* 1 (2003); See Richard K. Paisley & Glen Hearn, *Some Observations From Recent Experiences With the Governance of International Drainage Basins*, in *Proceedings of the Symposium—Precious, Worthless, or Incalculable: The Value and Ethic of Water*, 2, Center for Water Law & Policy and International Center for Arid and Semi-Arid Land Studies, Texas Tech University. Corrêa A., and Eckstein G., eds. (2006); See Richard K. Paisley, *Adversaries Into Partners: International Water law and the Equitable Sharing of Downstream Benefits*, 3 *Melbourne Journal of International Law* 280 (2002).

²⁹ The Columbia River Treaty Protocol and Related Documents (1964) available online at http://www.empr.gov.bc.ca/EAED/EPB/Documents/1964_treaty_and_protocol.pdf

2.2.b. Reduce Uncertainty

According to the Oxford Dictionary when something is uncertain it is "not able to be relied on; not known or definite".³⁰ Uncertainty is often one of the major obstacles to achieving successful agreements or decision-making processes.³¹ This includes the biophysical uncertainties related to the resource as well as the costs of implementation, behaviour and commitment of other actors, development needs and growth.

In situations where there is uncertainty around the resource, due to climate change or other factors, it will be essential to build high levels of information gathering and exchange into the institutional architecture. The multi-national scientific panel in the Bering Sea to assess annual catch³² illustrates this process.

An increasingly important aspect of dealing with uncertainty is developing an institutional arrangement that can deal with change, either due to climate alterations or social factors. Adaptability is an essential component of any design to ensure that institutions can change. The key to changing effectively is having sufficient information to make appropriate management decisions around the resource and associated users.

Effective decision-making involves developing a process for evaluation, which should be as non-biased as possible in a process where scientific information and facts are used to help develop and identify clear trade-offs for decision-making. The trade-offs are then viewed in terms of preferences and values between parties. Trade-off analysis can sometimes then be used to help effective and transparent decision-making.³³

Information sharing beyond the resource to include socio-economic issues can help increase equity through greater understanding of interests, values, and incentives. The European Water Framework Directive,³⁴ with the intention of bringing a variety of values to the table,³⁵ has already established such levels of information exchange in European Union law. In another example, the inclusion of data on social aspects of development in the Mekong region was suggested as complimentary to technical data as far back as 1961.³⁶

2.2.c. Increase Confidence Between Parties

In his study of 35 international waters basins, Mosert (2003) concluded that the most effective force to reach agreement between riparian states has been the desire to develop and maintain good relationships between parties.³⁷ Building trust is not generally an explicit factor in developing an institutional arrangement, although in many cases it is incorporated into the final architecture, as cooperation over a resource can bring parties together.³⁸

³⁰ <http://oxforddictionaries.com/definition/english/uncertain>

³¹ R.T. Clemen & T. Reilly, *Making Hard Decisions* (2000) Pacific Grove: Duxbury Press.

³² See "An Independent, Scientific Review of the Biological Opinion (2010) of the Fisheries Management Plan for the Bering Sea/Aleutian Islands Management Areas." (2011) Available online at:

http://wdfw.wa.gov/conservation/steller_sealions/final_fmp_biop_ind_sci_rev_08oct2011.pdf.

³³ Ralph Keeney, *Value Focused Thinking*, (1992) Harvard University Press, Cambridge, MA.

³⁴ On 23 October 2000, the "Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy" or, in short, the EU Water Framework Directive.

³⁵ Jos G. Timmerman & Sindre Langaas, *Water Information -- What is it Good For? The Use of Information in Transboundary Water Management*, 5 Reg. Environ Change 177 (2005).

³⁶ Greg Browder & Leonard Ortolano *The Evolution of International Water Resources Management Regime in the Mekong River Basin*, 40 Natural Resources Journal 499 (2000).

³⁷ Erik Mostert, *Conflict and Cooperation in International Freshwater Management: A Global Review*, 1:3 International Journal of River Basin Management 1 (2003).

³⁸ D. Phillips, M. Daudy, S McCaffrey, J. Ojendal and A. Turton, *Transboundary Water Cooperation as a Tool for Conflict Prevention and for Broader Benefit Sharing*, Ministry of Foreign Affairs, Stockholm, (2006).

Trust can also be reflected in the substantive details of how resources are to be shared. Under the Indus River Treaty, for example, Pakistan and India share water resources. Pakistan has exclusive use of the three western rivers, one of them being the Chenab, while India has exclusive use of the three eastern rivers.³⁹ Trust can also be a key component in the design of the organizational structure (i.e., altering the chairs of key groups), or how information is gathered (i.e., joint scientific fact-finding).

In diplomacy, the term Confidence Building Measures (CBM)⁴⁰ is applied to mechanisms employed to build trust and promote dialogue between parties where trust must be developed before entering into a more substantive agreement. These can range from unilateral actions, such as self-declared moratoriums on resource extraction or reduction of development, to more interactive mechanisms, such as exchanging information, hosting 'informal' dialogue meetings to test policy options, and initiating exploratory talks.⁴¹

Another possible consideration for addressing confidence building is designing an institution that can evolve to take on additional aspects of transboundary waters governance as they develop, and not attempt to be everything to everyone.⁴² While there is merit in inclusivity, there is also a risk of being overly stretched. For example, despite no overall framework for the Nile Basin, the Nile Basin Initiative has successfully supported different programs in different sub-regions.⁴³

Negotiation theory also supports incremental cooperation for building trust between actors.⁴⁴ Negotiations should always 'start with what you can agree on' to provide a point of success.⁴⁵ This can often be the conclusion of a single issue such as the process for negotiation,⁴⁶ or on what information is needed.⁴⁷ A stepwise process is viewed as key in achieving goals and maintaining momentum in international resource negotiations, as illustrated in such regions as the Danube⁴⁸ and Palestine Aquifers.⁴⁹

In terms of institutional architecture, an emphasis on building confidence can be expressed in the organizational structures and locations of secretariats; the transparency and openness of dialogue; levels of information exchange; clear norms and rules; dispute resolution; and realistic monitoring and enforcement.

Dispute resolution is also seen as a very important measure to build confidence between parties. Systematic and effective dispute resolution mechanisms in international waters agreements fulfil a number of key objectives including the fact that they can: 1) Reinforce proactive problem solving and dispute prevention; 2) Deliver a remedy based on the facts; 3) Resolve disputes and utilize the human and financial resources of basin states as efficiently as possible; 4) Reduce the risks associated with cooperative management and investment and expand the potential for mutual gain.

³⁹ Under Article 2 of the Indus Water Treaty, India has virtually complete control of the three Eastern Rivers, Sutbji, Beas and Ravi; while Article 3 gives control to Pakistan of the Western Rivers, Indus, Chenab and Jhelum.

⁴⁰ See Sophie Harman, Confidence Building Measure, Encyclopedia of Governance. Ed. Thousand Oaks, CA: SAGE, 2006. 138-39. SAGE Reference Online (2012).

⁴¹ Haslim Djalal & Ian Townsend-Gault, Preventive Diplomacy: Managing Potential Conflicts in the South China Sea, (1999) (In Crocker, Hampson and Aall (Eds.) Herding Cats: Multiparty Mediation in a Complex World (p 107-133) Washington DC: United States Institute of Peace Press.

⁴² John Waterbury, Between Unilateralism and Comprehensive Accords: Modest Steps Toward Cooperation in International River Basins, 13:3 Water Resources Development 279 (1997).

⁴³ The NBI supports the implementation of the Social Values Program, as well as sub-basin investment programs in the Eastern Nile Subsidiary Action Program and the Nile Equatorial Lakes Subsidiary Action Program.

⁴⁴ W. Ross & J. LaCroix, Multiple Meanings of Trust in Negotiation Theory and Research: A Literature Review and Integrative Model, 7:4 International Journal of Conflict Management 314 (1996).

⁴⁵ Erik Mostert, *Conflict and Cooperation in International Freshwater Management: A Global Review*, 1:3 International Journal of River Basin Management 1 (2003).

⁴⁶ A. Dorcey & C.I. Riek, Negotiation Based Approaches to the Settlement of Environmental Disputes in Canada, In *The Place of Negotiation in EIA Processes: Institutional Considerations* (1987).

⁴⁷ Leigh Thompson, Information Exchange in Negotiation, 27:2 Journal of Experimental Social Psychology 161 (1991).

⁴⁸ J. Linnerooth, The Danube River Basin: Negotiating Settlements to Transboundary Environmental Issues, 30 Natural Resources Journal 629 (1990).

⁴⁹ Eran Feitelson & Marwan Haddad, A Stepwise Open-Ended Approach to the Identification of Joint Management Structures for Shared Aquifers, 23:4 Water International 227 (1998).

Monitoring and enforcement is often cited as one of the most difficult aspects to deal with in transboundary waters governance.⁵⁰ Ideally, joint surveys and monitoring can be conducted, though this is not always possible due to funding and logistics. New technologies can often offer assistance in terms of monitoring, such as the use of transceivers, data loggers and satellite mapping.⁵¹

Enforcement is another key issue.⁵² Lessons learned from fisheries indicate that sanctions are often used as a threat for those not abiding by the agreed rules and norms.⁵³ Trust and cooperative norms or rules, are more easily built and complied with between homogeneous groups rather than heterogeneous ones.⁵⁴ However, most international waters are often shared among heterogeneous parties, including fisheries in Southern Africa, transboundary river water in southern Asia and groundwater in Latin America. Because the parties may be heterogeneous simply suggests that more effort may be required to build trust and confidence.

2.2.d. Reduce Costs

Reducing costs associated with cooperating or developing and implementing an institutional governance arrangement will be a concern for all parties involved, including those funding development. In an analysis of river basin organizations, parties are often drawn into arrangements that are beyond their financial and technical capacity to implement.⁵⁵ This stems from a variety of factors, including from a desire to address a broad number of issues that may be related to the development of, and cooperation over, a shared resource.

Ensuring focus and appropriate scope when developing cooperative regimes and institutional arrangements is essential.⁵⁶ This needs to be weighed against expanding the 'basket of benefits' to enhance the balancing of incentives to garner political will and possibly foster innovative financing mechanisms.

Often costs associated with infrastructure development or large capital costs are difficult to reduce if they are really needed. However, the transactional costs of cooperating can often be substantive and can more easily be reduced through thoughtful institutional design. The number of meetings held, the decision-making process, the way information is compiled and assessed, the secretariat, and the use of existing institutions all affect the transactional costs of implementing the agreement.

2.3. Institutional Architecture

Once key means objectives are recognized, attention shifts to the overall institutional governance framework. This phase requires careful consideration of specific governance structures that provide for effective, efficient planning and management, and allow administrators and technical staff to operate efficiently.

⁵⁰ T. Dietz, E. Ostrom and P. Stern, *Struggle to Govern the Common*, 302 *Science* 1907 (2003).

⁵¹ See United Nations Economic Commission for Europe (2006) "Strategies for Monitoring and Assessment of Transboundary Rivers, Lakes and Groundwaters" Available online at: <http://www.unece.org/fileadmin/DAM/env/water/publications/documents/StrategiesM&A.pdf>.

⁵² The outcomes of negotiation, mediation and binding dispute resolution need to be implemented if the parties are to have any confidence in the dispute resolution mechanism. What assures implementation? This varies depending on the means used to resolve the dispute. The underlying guarantees of implementation are the prospect of binding dispute resolution and withdrawal of the benefits associated with the cooperation.

⁵³ Z. Tyler, *Saving Fisheries on the High Seas: the Use of Trade Sanctions to Force Compliance with Multilateral Fisheries Agreements*, 20:45 *Tulane Environmental Law Journal* 96 (1989); D. Craon, *International Sanctions, Ocean Management, and the Law of the Sea: A Study of Denial of Access to Fisheries*, 23 *Ecology Quarterly* 311 (1989).

⁵⁴ Robert D. Putnam, *Bowling Alone: The Collapse and Revival of American Community* (2000) Simon and Schuster: London.

⁵⁵ Frank Marty, *International River Management: Problems Politics and Institutions* (2001) Bern: Peter Lang.

⁵⁶ John Waterbury, *Between Unilateralism and Comprehensive Accords: Modest Steps Toward Cooperation in International River Basins*, 13:3 *Water Resources Development* 279 (1997).

2.3.a Specificity in the Focus of Cooperation

A clear mandate outlining cooperation between the different national and transboundary organizations that make up the institution is an important prerequisite for the formation of strong governing bodies (UN-Water, 2008). A World Bank paper on integrated river basin management that considers cooperation intensity (Millington et al, 2006), suggests river basins can be grouped into three categories:

- A *River Basin Commission* is adequate when ‘significant development options are still to be considered in the river basin’, ‘conflicting uses [are] significant’, ‘information and policies still need further development’, and ‘water resource planning and management practices are not well detailed’. A commission is formally constituted and comprised of a management board or group of commissioners who ‘set objectives, goals, policy and strategic direction’, are supported by technical staff, and possibly complemented by a presiding Ministerial Council. A Commission does not interfere with general water management functions but sets ‘the bulk of water shares that each state/province it entitled to divert and ... monitor(s) water use’. It is characterized by equal partnerships among member governments and may include other stakeholders as well.
- A *River Basin Authority* can either be a ‘large multi-disciplinary organization with specific development tasks’ (e.g. hydropower development) or ‘an organization that absorbs virtually all the water resources functions of other agencies in the basin’. While in some countries authorities are being transformed into commissions or coordinating committees/councils (see below), this model is adequate, for example, in some African basins because of their relatively low degree of water resources development, such as the Niger. However, it is not suitable for ‘historically, geographically, and politically very complex’ basins such as the Nile.
- A *River Basin Coordinating Committee or Council* is based on the assumption that ‘existing agencies ... are operating effectively’, ‘most of the important data networks are in place’, ‘most of the high priority water projects have been constructed’ and ‘competition for resource use ... has been resolved’. This comprises ministers or senior representatives of main water-related agencies, meeting regularly; it has no executive power and is legally based on letters of agreement from the participating agencies. This category, however, is more common in the national context and serves to complement joint bodies on a higher level.

2.3.b. Information

To effectively govern the world's global transboundary international waters, basin states and institutions must have 'access to credible and reliable data and information regarding the state of the resource and, among other things, how it is affected by resource use and development, land use practices and climate change' (Gerlak, Lautze and Giordano 2011; see also Paisley and Henshaw 2013 (in preparation); Grossman 2006; Wolf 2007; UNESCO 2009; Bernauer and Kalbhenn 2010). Establishing data and information exchange agreements and networks among common basin states and institutions helps maximize securitization in riparian regions by facilitating trust and building a shared vision for the resource (UN-Water 2008). Absent such exchange, it becomes extremely difficult for basin states and institutions to manage water uses, formulate basin-wide policies, or take steps to minimize floods,

droughts and pollution (Eckstein 2010). Data and information sharing is a precondition for data integration, joint modeling and common monitoring protocols—key characteristics of successful institutional arrangements for unified and adaptive water governance (Karkkainen 2006; Raadgever et al. 2008). Data and information exchange is not only accepted as being useful for effective international water management, the practice is also widely seen as a basis or starting point for more comprehensive cooperation regarding the shared resource (Chenoweth and Feitelson, 2001).

2.3.c. Rules and Norms

An effective institutional design should have clear rules that include rules for the membership of the decision-making body, the levels of decision-making and the voting rules.⁵⁷

Membership in the governance institution should be carefully defined. Normally, the rules will appoint specific representatives of the signatories who may interpret and modify the rules of the institution. The rules should also describe voting procedures, such as when unanimity, consensus and majority voting is required. According to Draper, “rules that require unanimity effectively give one party a veto in any decisions, but unanimous voting may be the only politically feasible option for certain decisions. Decisions requiring non-unanimous votes can be extremely effective for nonpolitically sensitive decisions or those involving technical matters. The rules of decision can call for a simple majority or some higher percentage” (Draper, 2007).

Basins can continue to experience disputes even after a treaty is established and an institution is created.⁵⁸ Therefore, incorporating clear mechanisms for resolving conflicts is usually a prerequisite for effective, long-term management (Wolf, 2007). The disputes may involve differences in interpretation of the agreement’s provisions or noncompliance with the agreement itself. “The disputes may also arise because of changing conditions that alter the effectiveness of the agreement for one or more of the parties. Therefore, the institutional provisions should provide for a process to resolve disputes quickly, effectively, and permanently” (ASCE, 2013). The mechanism should emphasize “a streamlined process of dispute resolution that minimizes costly, time-consuming litigation” (Draper, 2007). While mechanisms to settle disputes can be varied, the most common are “direct negotiations, non-binding mediation, or binding arbitration or adjudication by an international institution” (Berardo and Gerlak, 2012).

Institutions that are set up with monitoring capability can improve compliance with river treaties. Formal mechanisms for monitoring a transboundary basin “can provide early warning of violations, which will prompt quicker enforcement actions” (Benvenisti, 1996). Even when monitoring mechanisms do not track the actions of individual signatories, the range of information collected can raise the visibility of environmental problems and draw the attention of domestic actors to the consequences of non-compliance (Dai, 2005). According to Haas et al, 1993, this information will provide leverage to domestic interest groups favouring cooperation when they pressure their governments to resume compliance. Public pressure may be especially important for implementing environmental agreements.

Once a treaty is signed, successful implementation is dependent not only on the actual terms of the agreement but also on an ability to enforce those terms. Appointing oversight bodies with decision-making and enforcement authority is one important step towards maintaining cooperative management

⁵⁷ This section is adapted from Stephen E. Draper, *Administration and Institutional Provisions of Water Sharing Agreements*, 133 *Journal of Water Resources Planning and Management* 446 (2007).

⁵⁸ Paisley, Richard Kyle and Alex Grzybowski. Lessons Learned from Recent Experience with Governance of International Freshwater, International Groundwater and International Large Marine Ecosystems: Dispute Resolution. Proceedings of Water Law: Through the Lens of Conflict: Colloquium of the University of New England and the Australian Centre for Agriculture and Law. *International Journal of Rural Law and Policy* (2011)

institutions (Wolf, 2007). In other words, the institution must have “the clout to enforce its mandates” (Dellapenna, 1997).

Formally specified procedures for enforcement can improve compliance in several different ways. First, they can reduce the transaction costs of punishing cheaters, thereby increasing the costs of non-compliance and deterring violations. In this manner, they help support the decentralized self-enforcement of an agreement by the parties. They will also enhance the political acceptability of sanctioning. Sanctioning done according to the rules laid out in an international agreement will be seen as more legitimate than direct, unilateral retaliation by an aggrieved state. In this way, institutions can lend “collective legitimization” (Claude, 1966) to sanctioning efforts. When punishment is seen as legitimate, it will help prevent relations from collapsing in a spiral of retaliatory and counter-retaliatory measures. Even in the absence of strong punitive sanctions, institutionalized enforcement procedures can increase the reputational consequences of non-compliance. Depending on the treaty enforcement provisions, the parties can disseminate information about defectors themselves, through a joint monitoring body, or enlist the help of an intergovernmental organization. Possessing a reputation for being unreliable can make it difficult for states to negotiate new agreements across various policy areas (Henkin, 1979). Institutions can magnify these consequences and deter violations by raising the visibility of non-compliance (Keohane 1984).

2.3.d. Feasibility

Regardless of the authority granted to an institution, the absence of financial and other mechanisms to support and sustain the institution’s activities can render the institution ineffective and irrelevant.⁵⁹ To ensure that a joint water management mechanism can produce the expected benefits and promises, it should have the appropriate resources to carry out its mandate (Eckstein, 2010). This includes both financial and human resources as well as the political capital necessary to carry out policies and implement projects that may be unpopular but necessary. Governmental support by all of the basin riparians must be secured and assured in order to allow the institution to formulate and implement effectively its responsibilities. Moreover, adequate funding for effective institutional management will help to establish more cohesion between parties and develop better resource management strategies which in turn will help secure investment for large scale infrastructure or development projects.⁶⁰

2.3.e. Adaptability⁶¹

Wolf, 2007, states that the most effective institutional management structures incorporate a certain level of flexibility, allowing for public input, changing basin priorities, and new information and monitoring technologies.⁶² The adaptability of management structures must also extend to non-signatory riparians, by

⁵⁹ This section is adapted from Gabriel Eckstein, *Water Scarcity, Conflict and Security in a Climate Change World: Challenges and Opportunities for International Law and Policy*, 27 *Wisconsin. Intl. Law J.* 409 (2009).

⁶⁰ David Le Marquand, *International Rivers: the Politics of Cooperation*, (1977) Vancouver: Westwater Research Centre, University of British Columbia). See United Nations-Water, *Transboundary Waters. Sharing Benefits, Sharing Responsibilities* (2008) UN Thematic Paper at 1, available at http://www.unwater.org/downloads/UNW_TRANSBOUNDARY.pdf, “For joint bodies to be effective, their institutional and human capacities are crucial. Staffs of joint bodies should have a broad competence and skills that bridge disciplines. The capacities of managers, especially at the national and local levels, should be strengthened not only to raise understanding of the complexities of managing shared water resources but also to derive the benefits made possible through cooperation. Negotiation, diplomacy and conflict resolution skills need to be developed and improved. The capacity to develop and implement policies and laws as well as the relevant enforcement mechanisms is vital, and should be developed accordingly, as is setting up funding arrangements, both internal and external.”

⁶¹ Adaptive Management (AM) is an important governance mechanism that should be utilized in governance of transboundary international waters. AM is a structured, iterative process of robust decision making in the face of uncertainty, with an aim to reducing uncertainty over time via system monitoring. In this way, decision making simultaneously meets one or more resource management objectives and, either passively or actively, accrues information needed to improve future management.

⁶² This section is adapted from Aaron T. Wolf, *Shared Waters: Conflict and Cooperation*, 32 *Annual Rev. of Environment and*

incorporating provisions addressing their needs, rights, and potential accession. An agreement or institution may be thought of as a sociopolitical analogue to a vibrant ecosystem, and thus vulnerable to the same categories of stresses, which threaten ecosystem sustainability. Will the agreement and institutions which were crafted in the exercise sustain themselves through:

- . Biophysical stresses? Are there mechanisms for droughts and floods? Shifts in the climate or river-course? Threats to ecosystem health?
- . Geopolitical stresses? Will the agreement survive elections or dramatic changes in government? Political stresses, both internal and international?
- . Socioeconomic stresses? Is there public support for the agreement? Does it have a stable funding mechanism? Will it survive changing societal values and norms?

2.3.f. Effective Organization

Subsidiarity is an important organizing principle of institutional architecture for the good governance of transboundary waters. A matter ought to be handled by the smallest, lowest, or least centralized authority capable of addressing that matter effectively.

Kliot and Shmueli, 2001⁶³ say that, “small countries can effectively manage all aspects of water resources by a single centralized agency, but large countries need a more decentralized structure”. Basin-wide planning, namely that planning and management will cover the whole river basin and thus the institution should cover the whole basin. According to Vollmer et al, 2009,

Constraints to concerted action have been identified as including institutional arrangements established in an overly top-down manner and without recognition of the context, and ‘rigid allocations’ of ‘organizational responsibilities’ reinforcing ‘existing boundaries’ and undermining collaborative activities (UN Water Assessment Program). Unilateral decision-making and overly bureaucratic procedures reduce cooperation potentials by discouraging participation and creative solutions. Failure of the more formal institutions to deal with current challenges and changing situations and to fulfill their core functions might lead relevant stakeholders to turn away from them and act unilaterally. The same is true for the fragmentation of institutional responsibilities. This is not only inefficient, because of the overlaps as well as different interests, responsibilities and experiences of the organizations involved; it also does not lend itself to advancing the implementation of agreements and conventions

2.3.g. Openness

Experience with participation as a governance objective in a transboundary international waters governance context varies across a wide spectrum, ranging from simply providing information without expectation of involvement to consultation, to accommodation, to co-management, to collaboration, to actual joint decision-making and accountability. The level of participation that appears to be necessary or desirable as a governance objective in any particular international waters governance situation is a function of a number of factors, ranging from how much the affected parties are necessary or desirable to ensure viability, to whether, and to what extent, the affected parties can be really identified and appropriately engaged. Changes in governance objectives may well require changes in participation.

Resources, 241 (2007).

⁶³ Nurit Kliot & Deborah Shmueli, *Development of Institutional Frameworks for the Management of Transboundary Water Resources*, 1:3 Int. J. Global Environment Issues 306 (2001).

According to Draper, 2007, “the (transboundary waters governance) agreement should provide for accountability and responsiveness, including accountability to decision makers, water resource users, and the general public. Except in rare cases, internal meetings should be open to the public and the agreement should establish full disclosure provisions and require publishing of all institutional records. Participation is fundamental to maximize agreement, enhance transparency and decision-making, create ownership and facilitate the acceptance and enforcement of decisions and policies. It is also a mechanism for gaining a better or common understanding between the various stakeholders on the nature of a given problem and the desirability of specific outcomes. Stakeholder participation strengthens integration, thereby contributing to conflict prevention, and risk reduction – all highly important in large infrastructure development projects.”

3. Detailed Case Studies

One key challenge for transboundary international waters governance is to develop appropriate institutional architecture that fits ecological and social (and political) processes, operating at appropriate spatial and temporal scales.⁶⁴ The following transboundary waters governance case studies are presented: Lake Tanganyika, the Mekong River, the Columbia River and the Volta Basin.

3.1. Lake Tanganyika

The Lake Tanganyika Convention⁶⁵ set up the Lake Tanganyika Authority (LTA)⁶⁶ to address the sustainable management of the Lake Tanganyika.⁶⁷ The LTA comprises the Conference of Ministers (the “Conference”), the Management Committee, and the Secretariat (Figure 3).⁶⁸

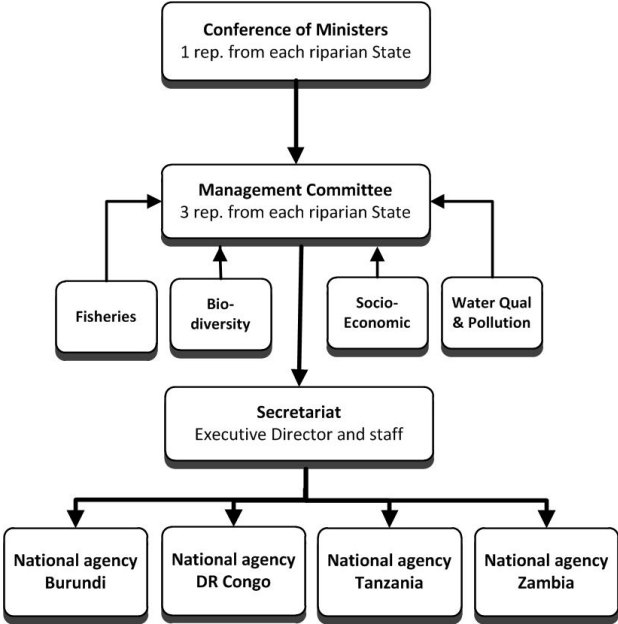
⁶⁴ Carl Folke, Lowell Pritchard, Fikret Berkes, Johan Colding & Uno Svedin, *The Problem of Fit Between Ecosystem and Institutions* (1998) In *International Human Dimensions Programme Working Paper No. 2*, available at www.uni-bonn.de/IHDP/public.htm.

⁶⁵ Convention on the Sustainable Management of Lake Tanganyika (“Lake Tanganyika Convention”), 12 June 2003. See UNDP-GEF International Waters Project: Good Practices and Portfolio Learning in GEF Transboundary Freshwater and Marine Legal and Institutional Frameworks, “International Waters: Review of Legal and Institutional Frameworks” April 2011. at p. 163-171. Lake Tanganyika is located in Africa’s Western Great Rift Valley. The lake is divided between the four Contracting States, with the DRC and Tanzania possessing the majority of the lake’s area. Lake Tanganyika is the world’s longest lake, the second largest freshwater lake by volume (18,940 km³), and the second deepest (1,470 m), discussed in Kelly West, *Lake Tanganyika: Results and Experiences of the UNDP/GEF Conservation Initiative (RAF/92/G32) in Burundi, D.R. Congo, Tanzania, and Zambia*, 28 Feb. 2001. For background reading see also FAO, *Lake Tanganyika Research*, available at www.fao.org/fi/oldsite/ltr/index.htm; S. E. Jorgensen, G. Ntakimazi, S. Kayombo, *Lake Tanganyika: Experience and Lessons Learned Brief*, in *Managing Lakes and their Basins for Sustainable Use: A Report for Lake Basin Managers and Stakeholders* (M. Nakamura ed. 2005, ILEC).

⁶⁶ The Lake Tanganyika Authority, available at <http://lta.iwlearn.org>. The Convention was finalized between 2000 and 2003 through regional and national planning executed under the GEF (PDF – B) funded Lake Tanganyika Management Planning Project. During this time the GEF funding enabled the Interim Lake Tanganyika Authority to be designed and established, so that coordinated management of Lake Tanganyika could commence before the formal ratification of the Convention. The Convention was formally signed by all four riparian states on June 12, 2003. The Convention has the primary objective of “ensur[ing] the protection and conservation of the biological diversity and the sustainable use of the natural resources of Lake Tanganyika and its Basin by the Contracting States on the basis of integrated and co-operative management. To that end, the Convention aims to facilitate the “development and implementation of harmonized laws and standards concerning the management of Lake Tanganyika and its Basin” (Convention, art. 2(1)). The Convention addresses several aspects of the lake’s management, including: sustainable fisheries management; prevention and control of pollution; prevention of sedimentation; conservation of biological diversity; and protection and utilization of genetic and biochemical resources.

⁶⁸ Tanganyika Convention, Art. 23(2).

Figure 3: Structure of the Lake Tanganyika Authority



The Conference is the highest body of the Lake Tanganyika Authority,⁶⁹ and maintains ultimate decision-making authority. It meets annually (or as needed) to adopt financial rules and determine the financial obligations of the Contracting States under the Convention. It is responsible for evaluating the implementation of the Convention and may adopt protocols or amendments to do so. The Conference has one member from each riparian country, each with one vote. The Conference develops its own procedural rules. The Management Committee is responsible for supporting, coordinating, and monitoring the implementation of the Convention. This includes implementing the policies and decisions of the Conference; providing scientific and technical advice to the Conference; preparing a strategic action program for Lake Tanganyika for approval by the Conference; supervising the implementation of the strategic action program and proposing necessary revisions; proposing protocols, annexes, or amendments to the Convention for approval by the Conference; negotiating with donors; monitoring the implementation of the Convention; supervising the Secretariat; and undertaking any other tasks identified by the Conference.⁷⁰ Four technical sub-committees, addressing socio-economic conditions, water quality and pollution, biological diversity, and fisheries management, support it.⁷¹ The Management Committee consists of three members appointed by each Contracting State. Decisions are made on a consensus basis, or by a two-thirds majority vote at the next meeting, if a consensus has not been reached on the issue. The Executive Director serves as the secretary of the Management Committee but has no right to vote. The Secretariat is the executive organ of the Lake Tanganyika Authority.⁷² It consists of an Executive Director and a Deputy Executive Director, both of whom are appointed by the Conference,⁷³ and any other staff required for its operation.⁷⁴ The Executive Director is the chief executive officer of the Authority, answerable to the Management Committee, and represents the Lake Tanganyika Authority in the exercise of its legal personality. The Secretariat’s functions include: carrying out the tasks assigned to it by the Management Committee or by any protocol; providing technical and scientific services and advice; performing necessary financial and administrative services; formulating annual work programs and budgets for the Lake Tanganyika Authority; preparing plans, projects, assessments, reports and the

⁶⁹ See Tanganyika Convention, Art. 24 for functions relating to the Conference of Ministers.
⁷⁰ See Tanganyika Convention, Art. 25 for the functions relating the Management Committee.
⁷¹ Tanganyika Convention, Article 27, note 1
⁷² See Tanganyika Convention, Art. 26 for the functions relating to the Secretariat.
⁷³ Tanganyika Convention, Art. 26(4)-(5).
⁷⁴ Tanganyika Convention, Art. 26(1).

like as required by the Management Committee; obtaining and disseminating information relevant to the implementation of the Convention to the Contracting States; maintaining databases of information; arranging and supporting meetings of the Conference of Ministers and of the Management Committee; reporting on the execution of its functions to the Management Committee; and performing any other functions determined by the Conference.

3.2. Mekong River Treaty⁷⁵

Under the Mekong River Treaty⁷⁶ the Mekong River Commission (MRC)⁷⁷ is charged with managing the allocation and utilization of the Mekong River waters between Cambodia, Lao PDR, Thailand, Vietnam.⁷⁸ It is made up of a high level Council, a Joint Management Committee and a Secretariat (Figure 4).

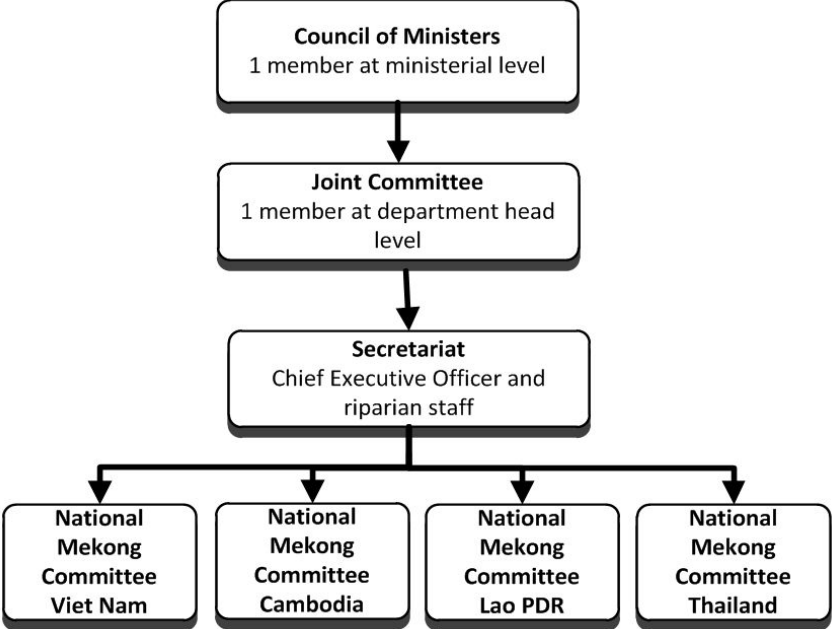


Figure 4: Structure of the Mekong River Commission

The Council is composed of one member from each Member State at the ministerial or cabinet level.⁷⁹ It shall convene at least one regular session a year and may convene special sessions whenever the Council

⁷⁵ See UNDP-GEF International Waters Project: Good Practices and Portfolio Learning in GEF Transboundary Freshwater and Marine Legal and Institutional Frameworks, "International Waters: Review of Legal and Institutional Frameworks" April 2011. at p. 262-272. See also In-Depth Analysis for the Mekong River Basin: Observations on the 1995 Agreement on the Cooperation for Sustainable Development of the Mekong River Basin System, available online at: <http://governance-iwlearn.org/wp-content/uploads/2010/09/MEKONG-FORMATTED.pdf>. The Mekong River is the twelfth longest river in the world (4,173 km), and ranks tenth in terms of total volume (475 BCM/year). The Mekong River Basin covers 795,000 km² and encompasses six riparian countries. The Mekong River Basin consists of all the land area drained by all of tributaries that flow into the mainstream of the Mekong River.

⁷⁶ Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin ("1995 Agreement"), 5 Apr. 1995, 34 I.L.M. 864. See Greg Browder and Leonard Ortolano, *The Evolution of an International Water Resources Management Regime in the Mekong River Basin*, 40 NAT. RESOURCES J. 499, 505 (2000).

⁷⁷ The Mekong River Commission, available at <http://www.mrcmekong.org/>.

⁷⁸ See Ellen Bruzelius Backer, *Paper Tiger Meets White Elephant?: An Analysis of the Effectiveness of the Mekong River Regime*, Aug. 2006, available at http://www.isn.ethz.ch/isn/Digital_Library/Publications/Detail/?ots591=0C54E3B3-1E9C-BE1E-2C24-A6A8C7060233&lng=en&id=47649; Pech Sokhem, Cooperation in the Mekong Basin in Implementing Integrated River Basin Management (IRBM): From Negotiation Stage to a More Concrete Joint Planning and Implementation (2004) available at http://www.adb.org/Documents/Events/2004/NARBO/1_5_Pech_paper.pdf.

⁷⁹ See Mekong 1995 Agreement, arts. 15-19 for the structure and function of the Council.

considers it necessary or at the request of a Member State. The chairmanship of the Council is for a one-year term and rotates alphabetically amongst the Member States. The Council adopts its own Rules of Procedure. The Council makes policy decisions “on behalf of member governments”⁸⁰ necessary to the successful implementation of the Agreement. Accordingly, the Council approves the Joint Committee’s Rules of Procedure, rules of water utilization and inter-basin diversions to be proposed by the Joint Committee, the basin development plan, and major component projects and programs. The Council also settles disputes referred to it by any Council member, the Joint Committee, or the any Member State on matters arising under the 1995 Agreement.⁸¹ The Joint Committee is composed of one member from each Member State at no less than the department-head level.⁸² It shall convene at least two regular sessions a year and may convene more frequently when necessary. The chairmanship of the Joint Committee is for a one-year term and rotates reverse-alphabetically amongst the Member States. The Joint Committee adopts its own Rules of Procedure, subject to Council approval. The Joint Committee is the main operational body of the MRC and implements the policies and decisions of the Council. In particular, the Joint Committee formulates a basin development plan and joint development projects and programs; updates and exchanges information and data necessary to implement the Agreement; conducts environmental studies and assessments to maintain the ecological balance of the Mekong River Basin; supervises the Secretariat; and seeks to resolve disputes that may arise between regular sessions of the Council, referred to it by any Joint Committee member or Member State on matters arising under the Agreement, and when necessary refers matters to the Council. The Secretariat is led by a Chief Executive Officer (“CEO”) who is appointed by the Council from a short-list of “qualified candidates” forwarded by the Joint Committee.⁸³ The deputy to the CEO, the Assistant Chief Executive Officer, is nominated by the CEO and approved by the Chairman of the Joint Committee. Riparian technical staff also assists the CEO. The number of riparian staff posts is assigned on an equal basis among the Member States. The Secretariat is the “central coordinating and logistical body to the [MRC] under the direct supervision of the [Joint] Committee.”⁸⁴ The Secretariat renders technical and administrative support to the Council and the Joint Committee.⁸⁵ The secretariat coordinates and oversees the work four National Mekong Committees in each of the signatories. The National committees are responsible for coordinating activities within the various riparian states and are associated with line ministries.

3.3. Columbia River⁸⁶

The Columbia River Treaty⁸⁷ is implemented by the "Entities", which are BC Hydro in Canada, and (jointly) the Bonneville Power Administration and the US Army Corps of Engineers in the US. In addition there are several other bodies, including the Permanent Engineering Board (PEB), which make up the institutional structure of the CRT (Figure 5). It is important to note that there was no authority or

⁸⁰ Greg Browder and Leonard Ortolano, *The Evolution of an International Water Resources Management Regime in the Mekong River Basin*, 40 NAT. RESOURCES J. 499, 505 (2000) at 524.

⁸¹ Mekong 1995 Agreement, art. 18.

⁸² See Mekong 1995 Agreement, art. 21-24 for functions of the Joint Committee.

⁸³ See Mekong 1995 Agreement, art. 31-33 for the functioning of the secretariat.

⁸⁴ George E. Radosevich, *Draft Commentary and History of the Making of the Mekong* (1993) [unpublished manuscript on file with White & Case LLP].

⁸⁵ Mekong 1995 Agreement, arts. 28, 30

⁸⁶ See UNDP-GEF International Waters Project: Good Practices and Portfolio Learning in GEF Transboundary Freshwater and Marine Legal and Institutional Frameworks, "International Waters: Review of Legal and Institutional Frameworks" April 2011, at p. 262-272. See also Noah D. Hall, *The Centennial of the Boundary Waters Treaty: A Century of United States-Canadian Transboundary Water Management*, 54 WAYNE L. REV. 1417 (2008). See also In-Depth Case Analysis for Columbia River Basin, available online at: <http://governance-iwlearn.org/wp-content/uploads/2010/09/Columbia-River-Case-Study-Sept-2010.pdf>

⁸⁷ Treaty between the United States of America and Canada relating to cooperative development of the water resources of the Columbia River Basin (“Columbia River Treaty”), 17 Jan. 1961, and exchanges of notes at Washington, 22 Jan. 1964 and at Ottawa, 16 Sep. 1964, 542 U.N.T.S. 244.

commission that was set up to administer or implement the Treaty. Treaty implementation was conducted with existing institutions for the most part. However, the PEB needed to be established.

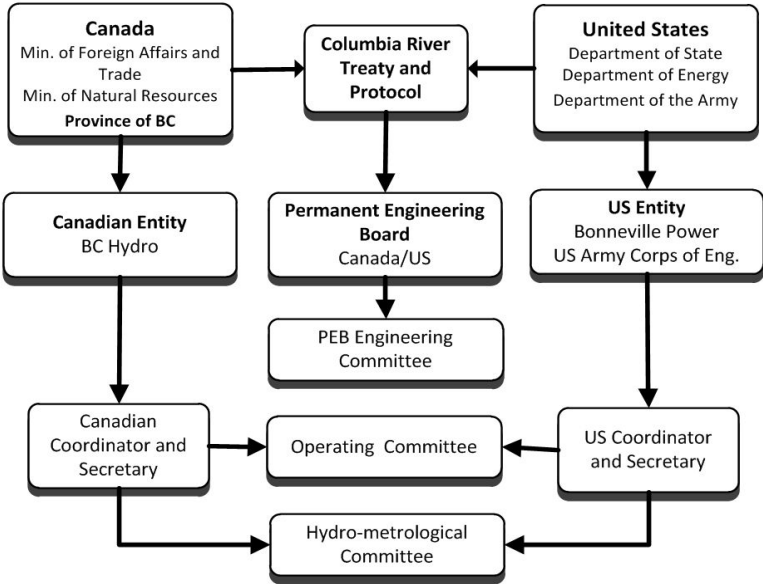


Figure 5: Structure of the Institutional Arrangement for the CRT

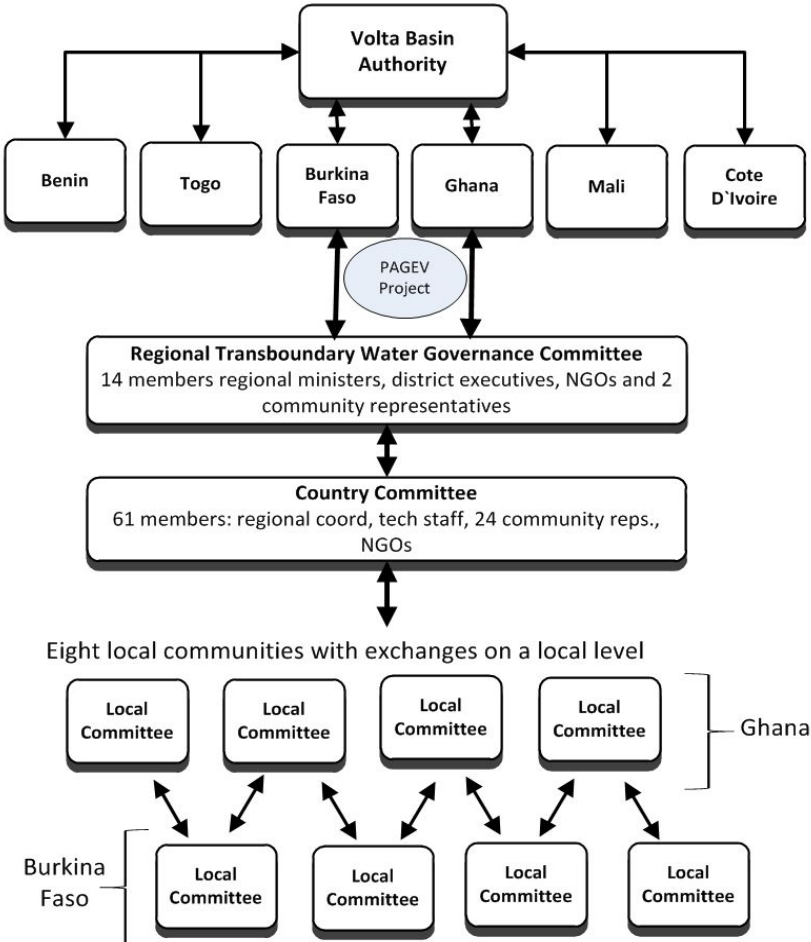
The Entities are responsible for coordination of plans and exchanges of information relating to the facilities to be used in producing and obtaining the benefits contemplated by the Treaty; calculation of, and arrangements for, delivery of hydroelectric power to which Canada is entitled for providing flood control; calculations of benefits; consultation on requests for variations in operation or use of water; the establishment and operation of a hydro-meteorological system; assisting and cooperating with the Permanent Engineering Board in the discharge of its functions; and maintenance and operations of their respective facilities, amongst others. Central to the structure of the institutional structure of the CRT was the establishment of the Permanent Engineering Board to provide an independent review of Treaty implementation.⁸⁸ It collects statistics, ensures that the objectives of the Treaty are met, and reports to the Canadian and U.S. federal governments. It consists of two persons from Canada (one Federal and one Provincial) and two from the US. The PEB is not an arbitration board but can ‘fact find’ with operations, meaning that they can determine a view on how operations are being conducted. That ‘fact’ may be accepted in any further tribunal or ruling. Moreover, the PEB can also assist with resolving any contentious issues through dialogue and facilitation. The PEB reports to each of the parties (Canada and United States) annually. The Board does not decide or make rules, but its recommendations are powerful and are generally respected by the governments. The PEB created the PEB Engineering Committee to assess technical elements of the Treaty operations.

3.4. Volta Basin.⁸⁹

The Volta Basin Authority (VBA) was established in January 2007 with the signing of the Convention on the status of the Volta River and the Establishment of the Volta Basin Authority.⁹⁰ The Convention is

⁸⁸ See Columbia River Treaty Art. 15.
⁸⁹ See UNEP-GEF Volta Project, 2008. *Addressing Transboundary Concerns in the Volta River Basin and its Downstream Coastal Area. Inception Report UNEP/GEF/Volta/IR.1/2008.*

between Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali and Togo. The convention came into force on the 14 August 2009. Its primary goal is to promote consultation tools among the parties for the development of the basin employing IWRM and equitable utilization of the benefits. The VBA collaborates with a number of other institutions and projects, one of which has been spearheaded by the IUCN to promote stakeholder engagement at the local level in transboundary water management. The Improving Water Governance in the Volta Basin Project (PAGEV)⁹¹ is an interesting example of establishing an institutional mechanisms for incorporating local community interests and people at the decision making level for transboundary waters.⁹² While PAGEV has not established a legal entity, the structure is of interest nonetheless interesting to review. PAGEV was initiated in 2004⁹³ to help deal with issues related to climate change and water management in the White Volta River between Ghana and Burkina Faso. It was focused on a participatory approach to transboundary issues and building local community capacity to deal with alterations associated with climate change. The institutional arrangement consists of a Transboundary Committee for water management, a Country Committee, and eight local community committees (Figure 6).



⁹⁰ The Volta River Basin is the ninth largest in Africa, encompassing approximately 417,000 km² in area and generating more than 35,000 million cubic metres in mean annual runoff (FAO, 2001; Challenge Program for Water & Food, 2003). The basin contains people from more than 50 ethnic groups and parts of six African nation-states, each of which endured different colonial experiences and adapted different post-independence trajectories of development (Buah, 1998; Oxfam, 2000).

⁹¹ Projet d'Amélioration de la Gouvernance de l'Eau dans le bassin de la Volta, Annual Report 2005. available at: http://cmsdata.iucn.org/downloads/pagev_annual_report_05_fr.pdf

⁹² See VBA information at <http://www.abv-volta.org/about/depeches/>

⁹³ Funding was from the Swedish International Development Agency.

Figure 6: Structure of the PAGEV project under the VBA⁹⁴

The Transboundary Committee (TC) for water resource management in the White Volta Basin is a 14-member committee, with equal representation from each country, comprised of regional ministers, district chief executives, civil servants from forestry, agriculture and water ministries, NGOs, and two community representatives. Led by the respective regional ministers, the Upper East Regional Minister and the Governor of the Central East Region, it provides a mechanism for better coordination of water sharing as well as managing water conflicts between Burkina Faso and Ghana.⁹⁵ It also has the ultimate authority on determining adaptation activities that are to be undertaken by local communities.⁹⁶ A large country committee was set up with 30 members from Ghana and 31 from Burkina Faso (eight regional coordinators, six district coordinators, 15 technical service staff for water, agriculture and forestry, eight NGOs and 24 members chosen from participating communities (8 women and 16 men)). This committee provides recommendations and advised the TC (but has no decision making power).⁹⁷ To improve the communication between local communities in Ghana and Burkina Faso, workshops, training, and site visits were organised. Community representatives met at least twice a year. They shared both the successes and frustrations in implementing adaptation activities in their own communities. Ghanaians developed skills in mango tree pruning from representatives of Burkina Faso while community members from Burkina Faso learned how to resolve conflicts between farmers and animal owners from their Ghanaian partners. The NGOs stressed that local participation in the project was crucial to tackling climate change. Villagers needed to develop a sense of project ownership and a deeper understanding of the interdependence of communities in water resource management.⁹⁸ This approach of having local committees feed into decision-making at the international level has had some success. Following a series of negotiations in 2007 and 2008, Burkina Faso agreed to make an early warning announcement to the Upper North Region of Ghana before opening the dam gates to release floodwater. There have been some drawbacks and concerns, however; in particular while attempting to set up a space for voicing local concerns, this space was often dominated by local elite. Moreover, while a process of knowledge transmission from local to national and international was intended, local knowledge was not incorporated into adaptation strategies, and local communities were expected to adopt policies that were directed by the TC committee.^{99 100}

⁹⁴ Based on governance scheme at

http://www.iucn.org/fr/propos/union/secretariat/bureaux/paco/programmes/peauzh/pagevhome_paco/schema_pagev/ (accessed Dec 12, 2010); and Wong, S. 2009, Lessons from a participatory transboundary water governance project in West Africa in *Participatory Learning and Action* 60, IIED, December 2009, Chapter 7, 99:106

⁹⁵ <http://www.abv-volta.org/about/depeches/projet-pagev-lobservatoire-de-la-volta-presente-1> (accessed Jan 3, 2011).

⁹⁶ S. Wong, Lessons from a Participatory Transboundary Water Governance Project in West Africa in *Participatory Learning and Action* (2009) 60, IIED, December 2009, Chapter 7, 99:106

⁹⁷ *Ibid.*

⁹⁸ *Ibid.*

⁹⁹ *Ibid.*

¹⁰⁰ In the North-Western Sahara Aquifer System (NWSAS), the Sahara and Sahel Observatory, OSS, as the Executive Agency, presides over a Steering Committee that is responsible for the execution of projects. The OSS is in charge of managing funds, recruiting experts and consultants, obtaining equipment, providing logistical assistance, and auditing scientific reports. The Steering Committee is tasked with reviewing the validity and quality of the scientific research; approving or modifying the proposals and plans submitted by regional coordinators and the OSS; and resolving problems that arise during the execution of the program. The Steering Committee is composed of the General Directors of the national institutions responsible for water resources in the Member States (the Algerian Agence Nationale des Ressources Hydrauliques (“ANRH”); the Libyan General Water Authority (“GWA”); and the Tunisian Direction Générale des Ressources en Eau (“DGRE”)); international scientific partners (such as the United Nations Educational, Scientific and Cultural Organization (“UNESCO”); the Arab Center for the Studies of Arid Zones and Dry Lands (“ACSAD”); and Germany’s Federal Institute for Geosciences and Natural Resources (“BGR”)); and cooperation partners (including the FAO; the United Nation’s International Fund for Agricultural Development (“IFAD”); and Switzerland’s Direction du Développement et de la Coopération (“DDC-Suisse”). The Steering Committee meets for one ordinary session each year, and extraordinary sessions may be convened at the request of one of the Member States. The sessions are held on a rotating basis in each of the three Member States, and the Steering Committee’s chairmanship is held by the representative of the host country. In addition to the Steering Committee, the NWSAS Project’s organizational structure includes a Coordination Unit, led by a coordinator designated by the OSS in consultation with the Steering Committee, and an ad hoc scientific committee that provides technical advice and knowledge as needed. The Member States have agreed on an evolutionary approach towards the development of an institutional structure for the NWSAS, starting with a simple structure and then moving towards a more complex and autonomous structure with responsibility for specific functions.

4. Observations and Conclusions

Good institutional architecture is not a panacea for all that ails good governance of transboundary waters. Even in basins where governance regimes are in place, fundamental management components may be noticeably absent (Girodano and Wolf, 2003). Knowledge about how governance institutions should be designed for the conservation and management of transboundary waters remains more art than science (Bakker, 2009; Dombrowsky, 2008; Bernauer, 1997). More research and analysis is needed to identify the specific institutional features that are most likely to lead to collaborative solutions to common problems in transboundary waters governance (Gerlak and Berardo, 2012; UN-Water 2008).

However, some preliminary observations and conclusions as to what might facilitate good governance from an institutional architecture perspective are:

1. Form best follows function in the design of institutional architecture for the good governance of transboundary international waters.¹⁰¹
2. Subsidiarity is also an important organizing principle of institutional architecture for good governance of transboundary waters. A matter ought to be handled by the smallest, lowest, or least centralized authority capable of addressing that matter effectively.
3. Adaptive Management is an important organizing principle especially when grappling with future uncertainties like climate change. Adaptive Management is a structured, iterative process of robust decision making in the face of uncertainty, with an aim to reducing uncertainty over time via system monitoring. In this way, decision making simultaneously meets one or more resource management objectives and, either passively or actively, accrues information needed to improve future management.
4. There are a wide range of institutional architectures that have been attempted to address transboundary waters governance. As each situation will have unique characteristics, there is no single ‘model’ or recipe for success in developing effective regimes.¹⁰² Physical, social, and political geography will determine constraints and opportunities available to determine institutional architecture. While the means objectives of regime building, such as balancing incentives, and building trust will be present in all situations, their relative importance will differ in different contexts. Consequently, the effort placed in designing institutional architecture will need to address those needs while being as adaptive as reasonably possible.
5. Though each situation is unique, there are some common threads when bringing multiple states together to govern transboundary international waters. Most institutional structures that deal with international waters will have some higher-level authority for final decision-making, a mid-level group for more technical and scientific analysis (i.e., a joint management committee), and a secretariat for implementation. However there may be significant differences in how this broad tri-body structure is applied.

¹⁰² Arun Elhance, *Hydropolitics: Grounds for Despair, Reason for Hope*. 5:20 International Negotiation 201 (2000).

6. One of the major trade-offs in developing institutional architecture is balancing the operational needs and desire for minimum bureaucracy with the need for building trust and equity. This is illustrated by looking at the different models of how and where a "secretariat" is run and physically located. For the Lake Tanganyika Authority, the secretariat is in Bujumbura, Burundi, and meetings of the Council of Ministers are held in different states, with the Chair being from the host country. In the case of the Mekong River Commission, not only is there a clear tri-body hierarchy, but the secretariat is split between two locations: Vientiane (Lao PDR) and Phnom Penh (Cambodia). Having a split secretariat incurs greater costs, as some functions will be duplicated, and is relatively more bureaucratic, lending itself to increasing time in dealing with logistics, as well as decision-making. The choice of having a split secretariat was a conscious trade-off between a more efficient organizational structure and other needs, such as increased political equity. Another model for addressing political equity is the secretariat for the Caspian Sea Environmental Program, which is currently in Astana, Kazakhstan. However, this will only be for a three to four-year period before moving to another location. The secretariat is rotated through the littoral states on the basis of alphabetical order.¹⁰³ The choice to have a rotating secretariat, with all the additional work associated with relocation¹⁰⁴ was deemed necessary to ensure equity and build trust within and between the states of the Caspian Sea. This is hardly surprising when one considers that they were newly created states from the former Soviet Union, and the international boundaries of the sea have not yet been conclusively established.¹⁰⁵

7. In the case of the Columbia River, a physical secretariat is not needed as the system is run with a virtual secretariat, and a Permanent Engineering Board that meets annually, and as needed, to review implementation. There is no ministerial council or political body to make final decisions *per se*. The incremental costs of managing transboundary resources are thus minimal. The institutional architecture in this situation stems from the solid historical relationship between Canada and the United States. However, trust and equity were key issues when negotiating the Treaty, as both countries requested the assistance of the International Joint Commission to help determine possible locations for facilities, as well as the principles behind the agreement.

8. Built-in flexibility in the organizational structure can serve political as well as scientific interests, and encourage confidence building. The ability to invite observers to the Council and Joint Committee of the Mekong River Committee¹⁰⁶ is to accommodate the participation of China and Myanmar to have them be included in the discussions of the development of the Mekong. By attending the various meetings, China and Myanmar may become more comfortable with the goals and objectives of the Mekong River Committee. This assists the exchange of data and information, as well as possibly aligning the interests of the nations.

9. Other trade-offs need to be considered in institutional architecture, particularly with respect to data and information exchange. In most circumstances, data is gathered at the national level and forwarded by each country to one another or through a central secretariat. In other circumstances, joint fact-finding may be conducted, as is the case of the Joint Technical Committee of the Bering Sea Pollock agreement. Not only how information is gathered, but how it is used, and how decisions are made, should ultimately be determined based on the importance of the means objectives of the institution. Trade-off and multi-attribute analysis, adaptive decision-making, and ecosystem-based management are all potentially important elements of institutional architecture and require thoughtful consideration in their design.

¹⁰³ Art 22 (5) Convention for the Protection of the Marine Environment of the Caspian Sea. Tehran, 4 November, 2003 (Caspian Convention).

¹⁰⁴ This includes staff, dealing with new authorities, work permits, hiring new local staff, buildings and logistics etc

¹⁰⁵ Note this is reflected in a key article of the Caspian Convention, Art. 37 which states "Nothing in this Convention shall be interpreted as to prejudge the outcome of the negotiations on the final legal status of the Caspian Sea".

¹⁰⁶ 1995 Agreement, art. 23.

10. In the case of the PAGEV project in Burkina Faso and Ghana, information exchange occurred at local as well as national levels, and it was a clear attempt to develop a new architecture to incorporate local values in decision-making. However, there was a sentiment that the decisions made by the Transboundary Commission were simply to be enacted at the local level without adequate input or control from the communities.¹⁰⁷ The importance of incorporating local values at the international level is key for success in many circumstances. However, equally important is the design of decision-making at the appropriate level. This sense of decentralization is aimed at effective management through a fine-tuning of information. More relevant details can be observed at a lower level, closer to the end-user. Further, direct stakeholder participation can be facilitated better in a system of decentralised decision-making that impact the local community.¹⁰⁸ For example, instead of being directed from the Transboundary Commission that planting should take place in riverbanks to avoid erosion, incentives could have been developed through nudging communities in that direction. Language and communication barriers can also present problems but are generally not a key reason for slow progress. Instead, factors hampering effectiveness often lie in the limited ability of commission members to influence complex domestic policy processes.
11. While there is no single model to apply to the development of institutional architecture for transboundary waters governance, various key means objectives need to be addressed to develop effective governance regimes. More often than not it is political constraints, not technical constraints that hinder cooperation over international waters governance.¹⁰⁹ In the case of the *Danube River Protection Convention*, progress was hampered by the limited ability of the commission members to influence the policy makers of the need to and benefits of cooperation.¹¹⁰ Paramount to all efforts will be garnering political will to the goals of the institutions. Elhance concludes that “nothing will be done if there is not the political will to pursue transboundary cooperation”¹¹¹ and Sadoff and Grey suggest, “The choice between conflict and cooperation will in large part be determined by [political] perceptions of their relative benefits”.¹¹²

¹⁰⁷ S. Wong, Lessons from a Participatory Transboundary Water Governance Project in West Africa in *Participatory Learning and Action* (2009) 60, IIED, December 2009, Chapter 7, 99:106

¹⁰⁸ F. Jaspers, *Institutional Arrangements for Integrated River Basin Management*, 5 *Water Policy* 77 (2003)

¹⁰⁹ Thomas Bernauer, Explaining Success and Failure in International River Management, 64:1 *Aquatic Sciences* 19 (2002).

¹¹⁰ Ines Dombrowsky, *Institutional Design and Regime Effectiveness in Transboundary River Management – the Elbe Water Quality Regime*, 12 *Hydrol. Earth Syst.* 223 (2008)

¹¹¹ Arun Elhance, *Hydropolitics: Grounds for Despair, Reason for Hope*. 5:20 *International Negotiation* 201 (2000).

¹¹² Claudia Sadoff & David Grey, *Beyond the River: The Benefits of Cooperation on International Rivers*, 4:5 *Water Policy* 389 (2002).

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