

The Role of Energy in Transboundary Water Governance

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To say the management of water resources in the 21st century is a complex task is putting it mildly. Balancing anthropogenic and non-anthropogenic water needs while accounting for variables such as local hydrology, meteorology, and geology, is no easy task. Throw in the added topological complexity of multiple countries with competing interests tasked with managing a single transboundary water resource and all of a sudden, the odds of winning the lottery start to look promising. Nevertheless, the task of managing the world's freshwater resources cannot be ignored or left to chance, especially given the linkages to energy development. The stakes are simply far too high.

When solving any type of problem, one should start by breaking it into manageable pieces. Complex or overwhelming problems in particular, are more manageable with fewer or better understood variables. When it comes to water management issues, such as Transboundary Water Management (TWM), dealing with each basin individually and understanding the situation's underlying causes, is critical. There are at least as many solutions to the management of transboundary waters as there are transboundary river, lake, or aquifer basins. Approximately 276 river basins cross the political boundaries of two or more countries¹, and are home to approximately 40 percent of the world's population. Globally about 30-50% of the world's population depend on groundwater sourced from 608 transboundary aquifer systems.²

¹ "Product of the Transboundary Freshwater Dispute Database, College of Earth, Ocean, and Atmospheric Sciences, Oregon State University. Additional information about the TFDD can be found at: <<http://www.transboundarywaters.orst.edu>>."

² http://webworld.unesco.org/water/wwap/wwdr/wwdr3/pdf/WWDR3_Water_in_a_Changing_World.pdf

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While there are observable similarities between variables such as hydrology, or the social or political economies of different basins, no two basins are identical. Any attempt to understand TWM decision-making processes must therefore follow the contours of a broad range of individual characteristics - found both inside, and outside of the basin.

Too frequently, the starting point for understanding TWM has been on the basin itself – in particular, the water interactions therein. For more than two decades, the accepted view within water management circles has been that “the basin” should form the unit of management (Earle, Jägerskog, & Öjendal, 2010). Key drivers in a basin include political relations between basin states, power asymmetries between the states, development of infrastructure (joint or unilateral), and hydropower and irrigation schemes. While these are important they are far from the only perspectives that need to be understood in order to better comprehend management decisions in different regions.

In many regions, efforts to better understand “beyond the basin” benefits – such as those that can be derived from large-scale hydropower development – are increasingly in focus. This special issue aims to analyze the linkages between TWM and energy, with perspectives from both inside and outside the basin.

The relationship between TWM and energy development is not well understood at present. A broader perspective that includes issues such as energy demand and potential, power generation and interconnections, electricity generation, regional integration and regional power pools, is required. It is our hope that this special issue will improve global understanding of this aspect, and identify new avenues for research.

1. Transboundary Water Management: Evolution of the Research Agenda

Transboundary water management research and practice has largely focused on conflict and cooperation between states sharing a river or groundwater source.³ In the late 1990s, researchers and practitioners identified the challenge of sourcing adequate amounts of freshwater for agriculture, particularly in regards to the Middle East and North Africa (MENA) region. They concluded that water scarcity threatened agricultural production to the extent that millions were vulnerable to famine.

At the time, there seemed to be no viable way to reconcile the demand for freshwater resources with the available supply (Allan, 2001). Rhetoric from some of the rulers of MENA region countries implying that they would be willing to go to war to protect their precious water resources only made the situation worse. It therefore came as no surprise that researchers and analysts concluded that water could lead to increased conflict and even war.

³ For a thorough review of this debate and the wider development of the discourse on water security see: Jägerskog, A. Swain, A. and Öjendal, J. (2014) "Water Security – International Conflict and Cooperation, Volume II" in Jägerskog, A. Swain, A. and Öjendal, J. (eds) *Water Security*, A Four Volume Set of SAGE Major Works. SAGE Publications. London. (October 2014).

The research did not however take into account the global commodities market. Water scarce countries began to compensate for their lack of freshwater resources by importing food through the global food market. Subsequent research suggested countries such as Egypt improved its water balance by importing ‘virtual water’, that is, food. Allan famously calculated this hidden flow as roughly equivalent to that of the Nile at Aswan, at the end of the 20th century.

The importation of food released some of the pressure on the Nile but the population within the basin continues to experience rapid growth. Agriculture also still accounts for a high percentage of both GDP and employment- raising doubts that this equilibrium is actually sustainable (Cascão, 2009).

Virtual water trading is a clear example of an outside-the-basin driver of TWM. The infrequency of conflicts over transboundary water resources is clearly linked, at least in part, to the *decrease* in competition over a dwindling water supply – a decrease largely fuelled by virtual water trading.

It has also helped to shift the focus of TWM research from conflict- to cooperation-focused research, highlighting the more frequent tendency for countries to find ways to cooperate over managing shared water resources (Swain, 2001; Wolf, 1998). This line of research has also shown that interactions between states sharing a watercourse often result in cooperation (Jägerskog, Swain, & Öjendal, 2014; Wolf, Kramer, Carius, & Dabelko, 2005).

It was subsequently noted however, that both the nature of cooperation and the outcomes of interactions between states were rarely well defined. Cooperation was in fact, often reached according to the terms of the stronger party. This was regardless of whether strength was measured in economic, military or expert terms. In fact, power asymmetry tended to be ignored by the research and development practitioners who supported increased cooperation (Zeitoun & Warner, 2006).

It is now argued that in order to better understand the nature of cooperation, a thorough power and political economy analysis is necessary - one that identifies both explicit and implicit interests. Also, that there is generally a multi-level game being played out in transboundary watercourses, where to some extent, cooperation can co-exist alongside conflict. It is therefore not a question of conflict *or* cooperation but rather how they co-exist and how the interests of the hegemonic state in the basin or region influence TWM (Zeitoun & Mirumachi, 2008).

Parallel to the debate around water as a source of conflict or cooperation, emerged a debate around the relationship between water cooperation and non-water actors, namely actors “beyond the basin” (or river). Sadoff and Grey (2002) outlined the opportunities and benefits of cooperation over international rivers. This opened up for drivers outside of the basin that could connect TWM with the wider region and beyond. Essentially, they viewed the interactions between states on transboundary watercourses to lie along a spectrum, from conflictual to cooperative. By building institutions and trust, and conducting joint activities such as data sharing, countries would shift towards the cooperation end of the spectrum. By expanding the range of benefits to include, for example, electricity production, navigation,

tourism and health-benefits, they argue it becomes more likely for states to enter into multilateral cooperative agreements. For this approach to be implemented however, it is necessary to better understand the interests and objectives beyond the water sector.

In addition to states engaging in both cooperative and conflictive behavior on basins at any point in time, the interests of non-water actors may also be at odds with those of TWM institutions in a basin. This leads states, which have vested sovereign interests, to adopt different positions, on different watercourses, and on different issues, resulting in differing degrees of cooperation between sectors. This shift from a “cooperation continuum” to “continuous negotiation” illustrates the dynamic nature of TWM processes, that is, a change in one variable leading to changed interests and actions amongst certain stakeholders (Earle, Jägerskog, & Öjendal, 2010).

Sustained high energy prices that change the cost-benefit ratio of hydro-power development in a basin is a tangible example. Factors such as climatic change, urbanization, demographic shifts and economic development are all likely to add to the flux. The types of institutions needed to manage such a multi-objective development process, such as rules or agreements, organizations, and norms, need to be sophisticated yet robust, sensitive to changes in stakeholder preferences and have clear, long-term mandates and functions.

The effective management of our world’s transboundary water resources will help to sustain, or even improve, the quality of millions of lives and crucial ecosystems. As climate variability threatens supply of freshwater, and growing populations increase their demand for it, this task becomes all the more vital. While our understanding of TWM drivers has undoubtedly evolved, we must continue to deconstruct the barriers in order to further advance our understanding.

As a cross-cutting driver, both inside and outside the basin, hydropower production remains a primary concern for governments all around the world. The articles summarised here seek to broaden the understanding of the potential, and varying impacts of energy development on TWM. Through the work of these researchers and practitioners we hope to refine existing, and develop new, approaches to cooperatively managing transboundary waters.

2. Articles

When considering the drivers and decision making processes in transboundary water basins, the motivations for interactions at the basin or regional level are often described from the perspective of the state. While the hydro hegemony within a basin, framed by nation and sovereignty-inspired perspectives on management and development, influence regional dynamics to a large extent, it doesn’t capture less obvious and nuanced contexts of other tensions that motivate cooperation or conflict. Hanasz uses the pursuit of Himalayan hydropower development between India, Nepal, and Bhutan to illustrate how these actors interact within a multi-level environment, as opposed to a two dimensional one. Here, the underlying interests and formal positions of the three nations are not easily reconciled.

A range of external factors also shape their negotiations. While there are opportunities to unlock the potential of Himalayan ‘Blue Gold’, it is suggested that political will to cooperate has not yet been achieved and mutually agreeable terms for developing hydropower remain a moving target.

With a renewed interest in the development of hydropower on transboundary watercourses, there has been a noticeable increase in the development of legal frameworks for the management and development of these resources. Rieu-Clarke analyses how these TWM legal frameworks interact with three other key areas of international law - human rights, foreign investments and environmental protection. These linkages are not well understood, but given the large sums of money likely to be invested in hydropower projects combined with the likelihood of negative impacts on local communities and ecosystems, it is likely that this field will become increasingly important in the coming years.

The paper provides an overview of the implications of the substantive, as well as procedural provisions contained under these three areas of international law, each with critical intersections in relation to hydropower developments on identified transboundary watercourses. The theoretical analysis is complemented by solid examples, an initial institutional framework for field integration is proposed, and areas in need of further research in order to inform the policy-development process, are identified.

From the perspective of Georgia and Turkey’s Coruh/Chorokhi transboundary river, Scheumann and Tigrek tackle common trade-offs between water for hydropower production, social preferences and managing ecosystem services.

Despite obvious challenges, the authors have successfully built a case study around interviews, a field visit and an extensive literature review to help provide context. The paper presents a strong technical context for a complex problem and highlights the practical challenges of building a level of scientific consensus across borders. It brings the broader political and strategic relationships between two countries into focus, specifically the issue of who absorbs the cost of mitigation. While these are interesting dimensions, the authors highlight the important role of linking to other ministerial efforts, namely in the energy sector, and how these alliances and agreements can be used to further cooperate in the water domain.

Milner, Mehyar, Bromberg, Waxman, and Khateb take the Middle East and the Jordan Basin as a point of departure. They outline a scenario by which water and energy could serve a similar purpose in the conflict ridden Middle East region, drawing parallels to the contribution the European Union and coal and steel unions have made to development, integration and the cooperation we see today. Taking a clearly functionalist or environmental peacemaking perspective – a perspective less common in the MENA region these days, the paper explores the opportunity for establishing a water-renewable energy community, drawing on the interdependence of water and energy between Israel, Jordan and Palestine.

One of the most water scarce regions in the world, and combined with the presumption that it needs to increasingly rely on desalinated water, it proposes using the vast

deserts in Jordan to produce solar energy on a large scale. The interdependence of water and energy clearly shows how drivers outside the basin - in this case, the need for energy, can draw upon and potentially affect the water situation - including cooperation.

While this vision is idealistic, it still provides solid, rational reasons why it makes sense to use the abundance of sunshine in the region to improve the water situation. It also outlines the challenges that jeopardize regional relations and simultaneously affect the sustainability of energy and water supply. The high prevalence of conflict was identified as the key challenge.

The contribution from Middleton and Dore discusses plans for hydropower development and regional power trade in Southeast Asia. The paper outlines both regional water and regional energy governance in the region, and the linkages between them. With the significant hydropower development plans in the region the paper discusses some key development drivers, such as demographic changes, food and energy demands, climate change and human development aspirations.

It also discusses the limitations of those linkages however. The authors argue there is a disconnect between the two. The Mekong River Commission (MRC) operates at the regional level (China and Myanmar are observers only however) with a mandate on TWM. When hydropower is being developed, the MRC is tasked with completing Strategic Environmental Assessments (SEAs). These are not always given due consideration within the energy ministries however, despite being where hydropower development decision-making takes place.

The potential for further integration at the institutional level, between the energy and water sectors, is therefore apparent in this case. Indeed a key driver of the TWM in the Mekong region is the energy sector. It also appears to at least politically, have the upper hand.

Söderbaum contends that the “problem-solving” discourse around TWM serves to entrench vested interests in accordance with the views and objectives of the most powerful actors in a basin or region. In the case of the Zambezi River, this has led to managing the basin as a state-centric enterprise. Despite making a contribution to the development of some of the basin states, this has led to environmental degradation, resource waste and unrealized potential. The state-centric problem-solving approach has made establishing a basin-wide management regime a challenge, as any shift in the status-quo is perceived as a threat to state sovereignty.

A shift to what he terms an “ecological approach” would see the basin managed with due consideration for its natural ecosystems, and for the benefit of the communities living in proximity to the basin. A shift in the management of any basin is dependent on successfully addressing the respective national incentives for cooperation. Environmentally sound policies will be extremely difficult to achieve if they compete with the national interest or national sovereignty. This means that in parts of the world where water is viewed as a strategic national issue (such as southern Africa) a functionalist approach is unlikely to succeed. More emphasis needs to be given to the political economy at play, and appropriate institutional responses need to be developed.

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