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The Guarani Aquifer System, highly present but not high profile: A hydropolitical analysis of transboundary groundwater governance

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ABSTRACT

This article explores the governance of the Guarani Aquifer System (GAS) through the lens of critical hydropolitics and specifically through the framework of hydro-hegemony. This study is important as the GAS, which is one of the first examples of transboundary groundwater cooperation, has been studied through hydrological, geological and legal disciplinary approaches, but hydropolitical analyses of the issues raised in cooperation of this resource is still lacking. While a hydrological analysis of the GAS is important, it is not enough to comprehend and make sense of the governance and political agreements among the countries. For this reason, this article complements the existing studies on the hydrological, geological, and legal analyses published on this aquifer. By taking the case study of the GAS, this article makes important empirical contributions to the study of transboundary groundwater cooperation. This article argues that through critical hydropolitics, and in particular by consideration of the power asymmetries between states and their exploitation potential of groundwater, it is possible to more accurately understand the current water governance's arrangements around the GAS. It also argues that critical hydropolitics fails to explain informal cooperation arrangements in the case of the GAS.

1. Introduction

This article explores the governance of the Guarani Aquifer System (GAS) through the lens of critical hydropolitics and specifically through the framework of hydro-hegemony. This study is important as the GAS, which is one of the first examples of transboundary groundwater cooperation, has been studied through hydrological and geological disciplinary approaches (e.g. OAS, 2009; Hirata et al., 2011; Rabelo and Edson, 2009; Gómez et al., 2010), and recently by international lawyers (Green, 2012; Villar and Ribeiro, 2011; Sindico, 2011; Sindico and Hawkins, 2015; Eckstein and Sindico, 2014; Sindico and Manganelli, 2016), but hydropolitical analysis around the GAS is still lacking. While a hydrological analysis of the GAS is important, it does not explain the governance and political agreements among the countries. A hydropolitical analysis is important because it allows explanation of cooperation and conflict over shared water resources, including the governance and political agreements among the countries, explaining the power asymmetries between these states. In addition, it allows understanding of the current political context behind the arrangements governing the GAS, and why the 2010 agreement has been signed but it has not been ratified by all parties. In other words, this article is important because it explains the governance of the GAS, unpacking power relations among the countries sharing it. For this reason, this article makes an empirical contribution to the study of transboundary groundwater cooperation, complementing the existing hydrological, geological, and legal studies published on this aquifer.

First, this article presents the literature on groundwater governance and the framework of hydro-hegemony (FHH), which is adopted here as the theoretical framework for analysis of this case. Second, it provides a background of the GAS, discussing the geographical, institutional, historical, context and the importance of Brazil in the region. Then, it uses the GAS as a case study to examine the extent to which a hydropolitical analysis can explain the circumstances guiding cooperation over transboundary groundwater resources. For this purpose, this article analyses the 2010 agreement[1] and the politics surrounding it. Finally, it examines the current governance through the lens of the theoretical framework before summarising the main findings.

This article argues that through critical hydropolitics, and in

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[1] Acuerdo Sobre el Acuífero Guarani – the 'Guarani Aquifer Agreement' – was signed in San Juan on 2 August 2010 by Argentina, Brazil, Paraguay and Uruguay, but is not yet in force. This agreement aims to regulate the governance of the GAS and is discussed in detail in the section below.

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particular by consideration of the power asymmetries between states and their exploitation potential of groundwater, it is possible to understand the current political context behind the arrangements governing the GAS. However, it also argues that critical hydropolitics fails to explain informal cooperation arrangements, as demonstrated in this article for the case of the GAS.

2. Groundwater governance and critical hydropolitics

2.1. Groundwater governance

Groundwater governance has been defined as "the overarching framework of groundwater use laws, regulations, and customs, as well as the processes of engaging the public sector, the private sector, and civil society" that "shapes how groundwater resources are managed and how aquifers are used" (Megdal et al., 2014: 2). As noted by Varady et al. (2013), in the case of transboundary groundwater governance, and in addition to legal and cultural limitations, there are also challenges due to the institutional and financial resources required for effective governance of the shared resources. For Rogers and Hall (2003) there is effective governance when institutions are responsive, efficient, and accountable. Linton and Brooks (2011) emphasise that transboundary groundwater governance requires the involvement of both governmental and non-governmental actors, while Mukherji and Shah (2005) and Puri (2001) underline that it is necessary to have transparent and reliable information in order to facilitate wider stakeholder participation. In the case of the GAS, good and effective governance also needs to include informal rules, practices, and institutions (e.g. Blatter and Ingram, 2001; Sehring, 2009) within an interplay between formal and informal actors and institutions on different scales (Lebel et al., 2005; Young, 2002). Nevertheless, governance – especially at the transboundary level – is strongly shaped by the most powerful countries and actors involved, as they can exercise their influence to support joint institutions, regulations, and processes, as well as delaying or stopping their creation. For instance, while international water law (IWL) provides objective guiding principles for the governance of transboundary groundwater resources, there is a need to contextualize them within the reality of power asymmetries. Legal norms and provisions in treaty agreements can be used as leverage in political arguments, and thus powerful states with greater resources can usually more effectively shape hydropolitical dynamics in their favour through the use of legal tools (Farnum et al., 2017; Stephan, 2011, 2017). As the legal literature on transboundary aquifers and groundwater largely lacks consideration of power asymmetries, gaps remain in understanding the role of power dynamics in decisions regarding water allocation and use among states sharing transboundary aquifers. Hence, elements from theories on critical hydropolitics need to be considered to complement the literature on transboundary groundwater governance.

2.2. Framework of hydro-hegemony

Hydropolitics has been defined by Elhance (1999: 3) as "the systematic study of conflict and cooperation between states over water resources that transcend international borders". This definition of hydropolitics is characterised by the study of conflict and cooperation – which is seen as a dichotomy – over transboundary water resources. Instead, critical hydropolitics, a sub-branch of hydropolitics, is a recent body of literature that has been developed within the last decade. It is critical, in the sense that it differs from mainstream hydropolitics. Specifically, this is through the consideration of cooperation and conflict over water as co-existing, and by focusing on the role of power asymmetries by riparian states in order to explain current allocations and institutional arrangements over transboundary water resources. In particular, Zeitoun and Warner (2006) developed the Framework of Hydro-Hegemony (FHH) to explain how control over shared water resources is achieved and maintained. The FHH is based on Lukes' definition of power, which he divides into three dimensions. The framework is based on three pillars: geographical position, exploitation potential, and Lukes' three dimensions of power – hard, bargaining, and ideational power (Zeitoun and Warner, 2006). The authors conclude that consideration of power asymmetries help to explain the allocation of the shared water resources among the riparian countries of a basin. The main weakness of this framework is its focus on states, overlooking the role of non-state actors. The FHH has been also criticised for its conceptualisation of hegemony, which fails to capture the impact of foreign interference and of the international hegemonic discourses like the role of neoliberalism (Davidson-Harden et al., 2007; Kehl, 2015). In addition, the concept of hegemony is not rigorously defined in line with classical international relations tradition (Selby, 2007). Finally, the focus is on nation states and their interactions, overlooking the domestic sphere (Conker, 2014; Selby, 2007).

Building on the FHH, Conker (2014) shows how non-state actors are able to use discursive power to reach their interests and challenge hydro-hegemonic settings (Conker, 2014). Warner and Zawahri (2012) call for moving beyond a state-centric approach, considering tools that non-state-actors deploy to shape the behaviour of the hydro-hegemon riparian states. Cascão (2009) shows that hydro-hegemony is not incontestable, and develops a model for counter-hegemonic processes, analysing how non hydro-hegemonic countries can challenge the status quo and contest hegemonic settings (Cascão, 2009). Daoudy (2009) applies Putnam's theory to show how issue linkages can be utilize to increase bargaining power during negotiations, while Kehl (2015) shows the importance of external actors and alliances to supporting in particular the weaker riparian states (Daoudy, 2009; Kehl, 2015). Daoudy (2008) also contributed to this literature by highlighting the role of IWL in providing more legitimacy and bargaining power to non-hegemonic countries (Daoudy, 2008), while Woodhouse and Zeitoun (2008) call for IWL to include covert hegemonic practices in its principles (Woodhouse and Zeitoun, 2008). Hussein (2016) emphasises the necessity of considering the broader socio-political-economic context to explain outcomes of transboundary water governance. In fact, as summarised by Mirumachi (2015), "the management and governance of shared basins need to contend with factors outside of the 'water box'" (Mirumachi, 2015: 33).

The critical hydropolitics literature has also focused on cooperation and conflict over shared water resources. Zeitoun and Mirumachi (2008) critically examine the role of treaties, which are often seen as a positive example of cooperation. They argue that cooperation is not always good, as treaties can codify an existing asymmetrical status quo, and treaties can also become the subject of the conflict. Zeitoun and Mirumachi (2008) develop the Transboundary Water Interaction Nexus (TWINS) matrix to analyse the nature of conflict and cooperation between riparian states over shared water (Zeitoun and Mirumachi, 2008). In this way, they go beyond the idea of a continuum of conflict or cooperation, emphasising the co-existence of conflict and cooperation. Nevertheless, their attempt to go beyond the continuum leads the authors to rely heavily on the FHH, which is seen by Chokkakula (2017:187) as "limiting, especially for engaging with the 'power-laden' political ecologies and the spatiality of power in transboundary water sharing [..]. Similarly, the spatial nature of power can be complex in its ways of working, and cannot be simply attributed to riparian positions of nations, as is provided by the FHH".

Zeitoun et al. (2016) build on the FHH and integrate theories about change and counter-hegemony. They found that both compliance and contest elements lie within transboundary water interactions (Zeitoun et al., 2016). They emphasise the effects of a non-hegemon's consent to an arrangement, and underlines that the seeds for change might lie there. The framework also stresses the necessity to contextualise transboundary water interactions within the broader socio-political processes. Finally, Menga (2016) presents the Circle of Hydro-Hegemony, an analytical framework that places the concept of hegemony at the centre of its structure, illustrating how various forms of power are