Against the current: transboundary water management in small states on two continents

Harlan Koff\textsuperscript{a,*} and Carmen Maganda\textsuperscript{b}

\textsuperscript{a}IPSE Research Unit, University of Luxembourg and RISC Consortium, Luxembourg; \textsuperscript{b}Environment and Sustainability Network, Instituto de Ecología A.C., Xalapa, Mexico and RISC Consortium

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In general, studies on regional integration and transboundary water management (TWM) focus on the relationships between large states. Instead, this paper analyses TWM in relation to two cross-border cases involving small states: Germany–Luxembourg and Mexico–Belize. Small states are significant due to their presumed adherence to regional governance and vulnerability to external shocks, especially those of climate change and environmental threats. Specifically, the article asks: How well do small states implement regional water governance models, especially in cross-border contexts? It concludes that the interpersonal bargaining and consensus-building that characterizes small state governance limits effective TWM.

**Keywords:** Belize; European Water Framework Directive (WFD); Luxembourg; Luxembourg–Germany border; Belize–Mexico border; small states; transboundary water management (TWM)

**Introduction and research question**

Since the Global Water Partnership defined ‘integrated water resources management’ (IWRM) at the World Summit on Sustainable Development in Johannesburg 2002, social scientists and political stakeholders have noted increased global emphasis on the promotion of broader, basin-based water management under the principles of good governance and public participation (Rahaman & Varis, 2005). Transboundary water management (TWM) has been promoted as a governance tool relevant to the principles of basin-wide socio-political interaction which impacts international relations and levels of cross-border cooperation and development. Cross-border water management is a policy arena where domestic politics and international relations intersect.

Most of the governance initiatives focusing on border regions – i.e. UNESCO’s ISARM programme\textsuperscript{1} or the European Union (EU) Water Framework Directive (WFD) – examine water management in terms of cross-border pollution, water and agriculture, water and economic development, etc., without making a distinction between typologies of states. There is little differentiation between federal or centralized states or between large and small ones. These specificities certainly merit consideration (Easterly & Kraay, 2000), especially in studies related to governance. There is a dearth of studies focusing specifically on cross-border water resource management and interactions between small and large states. One originality of this article in interdisciplinary discussions on water

*Corresponding author. Email: harlan.koff@uni.lu

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management is its focus on the role of small states in the management of transboundary waters.

A second contribution of this article to global water management debates is its comparison of cases between continents. It analyses the implementation of TWM in two research cases involving small states: Luxembourg’s Greater Region and the Mexico–Belize border area. By comparing an American case with a European one, the article will address a central weakness of the TWM literature: the dearth of cross-regional research on trans-border water management due to an overemphasis on the specificities of regional institutional and regulative frameworks. Through this cross-regional comparison, it attempts to answer the following interrelated questions: What factors influence TWM between large and small states? How does small state behaviour affect the governance of transboundary water resources?

**Literature review**

The management of transboundary water resources is a multifaceted challenge, not only because these resources represent about 60% of global freshwater, but also because they have specific and complex settings related to national, regional and international governance. Zeitoun, Goulden, and Tickner (2013) recently identified four interesting and specific challenges facing transboundary river basin management: (1) the expanding pressure on governance from competing water uses and users; (2) the different stages of management methods and policy that have not kept pace with evolving governance systems; (3) the direct and indirect influence of climate change; and (4) the politics of reconciling international political borders and basin boundaries.

Facing such a multifaceted scenario, it is easy to understand why many different approaches to the application of TWM exist. Numerous scholars have analysed the role of water in cross-border regions as a source of dispute/conflict or cooperation (Allan & Nicol, 1998; Bennett & Herzog, 2000; Blatter & Ingram, 2001; Just & Netanyahu, 1998; Turton, Patrick, & Julien, 2006). Others focus on legal frameworks and the intersection of governance, rights and economic interests (Daibes-Murad, 2005; Ghiotti, 2011) or governance institutions, transboundary water cooperation and the particular dynamics of state relations (Mumme, Ibañez, & Till, 2012; Norman, Cohen, & Bakker, 2013; Zeitoun & Warner, 2006). Special attention has been given by some authors to the water security dimension in TWM (e.g. Lankford, Bakker, Zeitoun, & Conway, 2013), including the analysis of the security discourses used by powerful countries to achieve their individual goals, such as project compliance (Mirmachi, 2013). A subgroup of this literature more specifically focuses on local transboundary power relationships and neighbouring concepts (Cortéz-Lara, 2012; Maganda, 2005; Norman & Bakker, 2015; Walsh, 2012). In response, other works have analysed the challenges related to the establishment of a participatory process that fosters stakeholder participation (Kranz & Mostert, 2010; Turton & Earle, 2005; Wester, Merrey, & de Lange, 2003).

TWM is indeed related to river basin planning and it promotes sustainable development of water resources. Particularly, the concept of TWM focuses on fostering international and/or regional cooperation on transboundary waters through the establishment or reinforcement of governance mechanisms. Therefore, numerous studies discuss regional institutional frameworks of water distribution in shared river basins (e.g. Conca, 2006; Ingram, Laney, & Gillilan, 1995; Mumme, 2003; among others).
This literature is extensive and rich, but, as Wescoat (2014) declares, detailed international comparisons on water management seem infrequent. In particular, the literature does not yet differentiate between large and small states. This article opens this black box by studying TWM around Luxembourg and Belize. The study is based on considerations on governance mechanisms deriving from the literature on small states in global affairs.

A conceptual approach: small states in world markets

This article questions whether the literature on small states in international affairs can be applied to TWM. For the purposes of this article, small states are defined as those countries possessing a population less than or equal to 1.5 million people and small territorial size, without making reference to levels of economic development, regional location or influence in global affairs.

Scholars in this field, such as Keohane (1969), Panke (2010), Maes and Verdun (2005), Arter (2000) and Galbreath (2006), have explored how small states have transcribed non-alignment and consensus-building abilities into leadership roles in regional and international organizations. This is relevant to international debates over TWM because cross-border water management is increasingly being affected by regional governance (especially in the EU since the implementation of the WFD) (Maganda, 2013). The other major strand of this literature examines the performance of small states in international affairs. While some works, such as those contributing to debates in political economy (Campbell & Hall, 2009; Katzenstein, 1985, 2003; Ken, 2007; Remmer, 2010; Siddiqui, 2010; Verdun, 2013) have concentrated on the governance characteristics of small states which facilitate their successful performance in global markets, others (Bishop, 2012; Katzenstein, 1985) have addressed the vulnerability of small states to external shocks, especially in terms of climate change and other environmental threats (Briguglio, Cordina, Vella, & Vigilance, 2010). These two characteristics – the recognized importance of small states in regional governance systems and small state vulnerability to environmental threats – highlight the relevance of small states for TWM debates. There are two important gaps in this literature that must be noted. First, comparative cross-regional perspectives are conspicuously missing. This is highly problematic in terms of theory-building because authors’ abilities to generalize are seemingly limited at regional borders. Second, this literature does not engage in comparative discussions of environmental governance (Ingebritsen, 2010). This, of course, is the focus of this article which examines how small states can elucidate the impact of regional governance mechanisms on TWM.

Research design and methodology

Research design

This article is based on a ‘most different’ case selection within the framework of small states (Table 1). It addresses the two aforementioned gaps in the small states literature by examining small state border water governance in Luxembourg and Belize, both of which qualify as ‘small states’ according to the definition provided above. These countries have populations of around 500,000 people and both are characterized by small geographic size (22,966 km² for Belize and 2586 km² for Luxembourg). Both countries also share borders with powerful political neighbours (Figures 1 and 2); they participate in regional
integration processes; are characterized by heterogeneous, multilingual communities; and both states share cross-border environmental resources.

There are also important differences between these countries, notably their diverging levels of economic development since the 1980s. During this period, Luxembourg successfully transformed itself from a small industrial state into a global banking capital. This transformation was attempted in Belize, but it remains incomplete.

It seems that we can apply the aforementioned literature on small states to explain the important economic disparities between Luxembourg and Belize. On the one hand, Luxembourg has an economy that is based on consensus-building governance (Clément, 2013); its leadership has effectively established a niche economy in banking and finance (Sohn & Walther, 2008; Walther, Schulz, & Dorry, 2011); Luxembourg has played a leading role in the EU as one of the organization’s capital cities; and the country has

| Table 1. Small states and their micro–macro-regions: Luxembourg and Belize. |
|--------------------------------------------------|
| **Belize** | **Luxembourg** |
| Population | 340,844 | 550,000 |
| Geographic size (km$^2$) | 22,966 | 2586 |
| Social composition | Recognized racial and ethnic hierarchies. Multilingualism (Creole, English and Spanish) | 45% of the population does not have Luxembourg’s nationality. Multilingualism (German, French and Luxemburgish) |
| Government | Bicameral parliament. Constitutional monarchy | Unicameral parliament. Constitutional monarchy |
| Economy | Tourism (services), agriculture (the United States and the UK are most important trade partners; the United States and Canada represent the most important sources of tourism) | Financial/banking services, steel industry, tourism, information technology, communication and logistics, 80% of products produced in Luxembourg are exported and 85% of them go to European Union member states |
| Gross domestic product (GDP) per capita (US$) | 8172 | 90,062 |
| Macro-region | CARICOM, SICA, CAFTA$^b$ | European Union (EU), Council of Europe |
| Micro-region | Corozal Free Trade Zone, Mexico–Belize border (10,000–12,000 Mexican consumers per day), territorial dispute with Guatemala | Greater Region (open border where 120,000 cross-border workers commute daily) |
| Total renewable water resources | 18.55 km$^3$ transboundary waters: The Rio Hondo Basin, 13,465 km$^2$ between Mexico (57%), Belize (22%) and Guatemala (21%)$^a$ | 3.1 km$^3$ transboundary waters: The Moselle River Basin (28,286 km$^2$) between Luxembourg, France and Germany |

Note: See http://www.conagua.gob.mx. Retrieved on 31 October 2013. $^b$CAFTA, Central American Free Trade Agreement.

Sources: Data were compiled by the authors with information derived from the following sources: http://www.luxembourg.public.lu/fr/societe/population/index.html; http://www.luxembourg.public.lu/fr/economie/index.html; http://www.statistiques.public.lu/fr/espace-edu/indicateurs-phares/index.html; http://www.eau.public.lu/cours_eau/ressources_hydrographiques/index.html; http://www.oecd-ilibrary.org/economics/country-statistical-profile-luxembourg_20732888-table-lux; http://www.cia.gov/library/publications/the-world-factbook/geos/lu.html; https://www.cia.gov/library/publications/the-world-factbook/geos/bh.html; http://www.tradingeconomics.com/belize/gdp-per-capita-ppp; and Ken (2007).
created an economy of scale in ‘The Greater Region’ (Schulz et al., 2013). This cross-border polity includes the sub-national regions of Lorraine (France), Wallonie (Belgium), the German-speaking Community of Belgium, Rhineland-Palatinate (Germany) and Saarland (Germany). The area covers 65.401 km², with a population of approximately 11.2 million inhabitants. Most importantly, over 120,000 commuters cross the borders into Luxembourg on a daily basis as the Greater Region provides the country with an important source of labour, especially in the service sector (Thill & Thomas, 2011). The
Greater Region is politically recognized by the EU and has been funded through INTERREG programmes since the year 2000. Similarly, the cities of Luxembourg, Metz, Trier and Saarbrucken have formed a political community called ‘Quattropole’ in order to facilitate cross-border exchanges related to urban governance.

Conversely, Belize does not generally display the main characteristics of ‘small states’ presented in the above-cited literature. First, it does not have a natural ‘region’ because it was a British colony in Central America. Hence, Belize was part of the Caribbean Community (CARICOM) well before it joined the Sistema de Integración Centroamericana (SICA). Politically, formal stability has reigned, but the country has been characterized by high degrees of corruption (Belsky, 1999; Duffy, 2000). Economically, the country has not necessarily established economic development strategies that are linked to regionalism as the United States remains the country of reference for economic development. In terms of trade, more than 35% of Belize’s exports go to the United States (Great Britain is second at 21%), while 49% of imports come from the United States.2

Belizean history has been characterized by tense relationships with neighbouring countries. Belize and Guatemala have an ongoing territorial dispute, which led to armed conflict in the year 2000. The dispute is presently being treated by the Organization of American States and the International Court of Justice. Also, an ‘Adjacency Zone’ spanning 1 km each side of the internationally recognized border has been established in order to prevent further armed conflict. This zone has been the site of significant deforestation which has affected ethnic groups living in this area.

Belize’s cross-border relationships with Mexico have been more peaceful than those with Guatemala, but they have not been fluid due to language barriers and cultural
differences (Arnaiz Burne, 1993; Castillo, Toussaint, & Vázquez, 2006; Gargallo & Santana, 1993). Presently, trade between Mexico and Belize has increased slightly due to the establishment of the Corozal Free Trade Zone. While cross-border exchanges in the Greater Region focus on movement of labour, the Belize–Mexico border is characterized by flows of consumers (Romero & Benítez, 2010). The Corozal Free Trade Zone provides inexpensive retail products to shoppers coming from Mexico. Also, the zone’s casinos attract people from Mexico because casinos are illegal there. Conversely, the devaluation of the Mexican peso (combined with access restrictions to the Free Trade Zone for Belizeans) has opened a market for Belizean consumers in the Mexican border state of Quintana Roo. Ken (2007), however, notes that economic impacts in the region have their limits. She points to the existence of complaints of labour exploitation, low wages and informal trade given the salary cap of US$50 per person in the retail trade area between Belize and Mexico.

The area where cross-border collaboration seems to be strongest is the tourism sector. Belizean and Mexican authorities have recently promoted the ‘Mayan Route’ which is publicized as a form of sustainable tourism that combines elements of environmental preservation with Mayan archaeology and culture. In 10 interviews with representatives of the city government of Chetumal and the state government of Quintana Roo, respondents identified sustainable tourism as the only field in which regular cross-border cooperation occurred. Paradoxically, while the Adjacency Zone has been established between Belize and Guatemala and it is a site of deforestation, both national governments have cooperated to also convert this area into a space for sustainable tourism as part of the tri-national ‘Mayan Route’ development strategy (Latin American and Caribbean Economic System, 2013).

These differences are important to the comparative examination of small states’ TWM strategies within the framework of regional governance systems. On one hand, Luxembourg’s border with Germany is an internal EU border. Thus, water management is governed by the European WFD which presents a comprehensive institutional framework for TWM. Belize, on the other hand, is located at the southern border of Mexico, which is an external border of the North American Free Trade Agreement (NAFTA). Because of the weakness of NAFTA’s environmental governance mechanisms and because regional agreements do not apply to Belize, no common regional environmental governance framework exists.

Economic differences also exist between the two countries. As stated above, Luxembourg is fully embedded in the Greater Region, which promotes cross-border economic exchanges. Conversely, the Belizean economy is oriented more toward attracting tourism from the United States than fostering cross-border exchanges with Mexico.

Finally, differences in cross-border cooperation amongst local authorities also exist. The Greater Region is a polity that has been recognized by the EU, which includes institutional settings in which local leaders discuss common problems and plan development strategies. Conversely, no such forums exist at the Mexico–Belize border.

These differences provide the opportunity to examine governance mechanisms that affect TWM in regional water management contexts. Should regional contexts drive cross-border water management implementation, then Luxembourg should participate in TWM more than Belize in top-down cross-border water management institutions because the EU has a more developed institutional framework thanks to the WFD amongst other initiatives. Should local economic integration promote cross-border cooperation in water management, then Luxembourg should participate more than Belize in bottom-up, cross-border, market-based water management because the Greater Region is a consolidated economy. Finally, it is important to recognize that local authorities often participate in institutionalized cross-border cooperation in small states because their political and environmental problems are usually cross-border in nature. Because of existing political
cooperation in the Greater Region, Luxembourg should participate more than Belize in bottom-up, institutionalized water management.

**Methodology**

The following section presents empirical research based on this comparative ‘most different cases’ research design. This study was part of the larger University of Luxembourg-funded BRIDGE (Border Regions in Different Geographic Espaces) project on power relations in Luxembourg and Belize and the University of Luxembourg-funded HUMENITY (Human and Environmental Security in Border Regions: Cross-Regional Perspectives) research project on human and environmental security in cross-border regions. It is based on archival research, policy documents and interviews with about 20 local actors in cross-border water politics in Luxembourg’s Greater Region, Mexico and Belize. Interviews were carried out with water officials, representatives of local, state and national governments, representatives of non-governmental organizations (NGOs), and members of economic organizations such as Chambers of Commerce and labour unions.

**Transboundary water governance in two small states**

This section presents empirical considerations on transboundary water governance in Luxembourg and Belize. TWM is an issue of vital importance to small states due to their limited geographic size. This article evaluates TWM through the implementation of cross-border water regulations. For Luxembourg, this implies the implementation of the European WFD. For Belize, this would entail the implementation of bi-national water agreements with Mexico.

**TWM along the Belize–Mexico border**

Mexico and Belize share the basins of the Rio Hondo and Arroyo Azul rivers, the latter of which, while it varies in depth according to precipitation levels, has virtually disappeared (Magnon, 2005; cited in Kauffer, 2005). Little bi-national governance of these basins has occurred. In 1897 a Complementary Convention to the 1893 Treaty on the free navigation of merchant vessels in the territorial waters of British Honduras in the Bay of Chetumal was signed. However, a direct dialogue on the bilateral relationship in the field of cross-border waters did not begin until Belize became independent from the UK in 1981. Even then, 10 years passed before the Mexico–Belize International Commission on Limits and Border Cooperation was established. This organ became the International Boundary and Water Commission (IBWC) between Mexico and Belize in 1993 (Kauffer & García, 2011). It is important to note that there are no records indicating social participation, public consultation or citizen forums on the creation/transformation of this bi-national commission. Apparently the decision to establish it was taken vertically and exclusively by the governments of Mexico and Belize. Moreover, because the Rio Hondo Basin also includes Guatemalan territory, Kauffer and García (2011) have argued that the Mexico–Belize IBWC should be trilateral and include Guatemala, but that this tri-nationalism in TWM is difficult to achieve given the territorial dispute between Belize and Guatemala.

The activities of the Mexico–Belize IBWC have focused on the operation and maintenance of international hydro-stations and monitoring water quality in the Rio Hondo and Arroyo Azul rivers. Unlike its sister institution in the north (the United States–Mexico IBWC), the Mexico–Belize IBWC lacks treaties on the distribution of international
waters, nor does it make recommendations or hold regular proceedings. In short, it is not legally or politically active in either participating country. One of the commission’s most recent activities was a proposal (in 2003) to conduct a diagnostic study of sustainable water management in the basin of the Rio Hondo until 2025. It was to be coordinated by Mexico and Belize and funded by the Government of Mexico through the National Water Commission (Conagua), in coordination with the National Weather Service of Belize. No mechanisms for social participation or public consultation for the preparation of this study have been revealed. Also, the project faced many delays apparently due to a lack of institutional monitoring by Conagua, resulting in numerous Belizean complaints toward Mexico (Kauffer & García, 2011).

Table 2 summarizes the activity in bilateral TWM between Mexico and Belize. It is important to note that cross-border environmental issues related to shared waters in this case focus on the lack of continuous communication, and therefore cooperation on the development of bi-national planning in the management of the Rio Hondo international river basin; as well as the lack of social participation in the cited management process. Three reasons why this is important can be identified. First, TWM cannot move forward while there is an evident gap between politics of reconciling international political borders and basin boundaries. Recent analysis (Olvera Alarcón, Kauffer Michel, Inge Schmook, & Huicochea, 2011) of the lack of bi-national cooperation on water management between Mexico and Belize identifies five factors of potential conflict in the Rio Hondo River Basin:

- Unilateral decisions, due to the exclusion of countries which contribute to the basin.
- Asymmetries between states threatening or hindering the implementation of agreements.
- Lack of clarity of responsibilities in the instances that ensure cooperation.
- Revision of programmes and substitution of cooperation project managers according to election cycles.
- Legal vacuum for trilateral cooperation.

Moreover, in 2009, the Mexican Superior Auditing Agency (ASF, a Spanish acronym), rightfully stated that Mexico had not complied with the Treaty of Limits with British Honduras (Belize) from the exchange of notes/letters that gave rise to the International Boundary and Water Commission (IBWC) between Mexico and Belize. The ASF signalled that the IBWC does not include important references to a treaty signed by the two countries in January 1998 because it had expired before 2007 and therefore the work programme set out after the 1998 act ‘was not in effect (for the completion of the diagnosis) in 2007’.  

The audit shows that the SRE (Secretaría de relaciones exteriores) has not made a boundary treaty with Belize as an independent state, and, of course, this is important for any current and future TWM plans between these two countries.

Second, a main conclusion from the Diagnosis for Sustainable Water Management in the International Basin of the Rio Hondo, Mexico–Belize 2025, is that one of the main problems in the Hondo River Basin is the lack of input – in quality and quantity – from the sub-basins towards the Rio Hondo, as well as the lack of information about the production activities taking place in the whole basin (online report Conagua–Yucatán). There are general perceptions expressed in media/newspaper declarations on both sides of the border that such activities could be causing negative impacts on the quality and quantity of water and other natural border resources. Moreover, since 2011 Belize has abandoned its commitments towards the sustainability of the river basin apparently for lack of financial resources (Table 2). For example, it has recently been reported that
Table 2. Transboundary water management (TWM) cooperation agreements and current bi-national projects related to the Rio Hondo river basin between Belize and Mexico.

| Cooperation agreements | Countries | Date         |
|------------------------|-----------|--------------|
| Agreement between Mexico and Belize on the protection and improvement of the environment and natural resource conservation in their border area | Belize–Mexico | 1991 |
| Exchange of diplomatic notes for the establishment of the Mexico–Belize International Boundary and Water Commission | Belize–Mexico | 1993 |
| Agreement to establish the correct programme for the technical description of the international boundary between Belize and Mexico (IBWC) | Belize–Mexico | 1998 |
| Agreement to define the terms of reference needed to for the Diagnosis for Sustainable Water Management in the International Basin of the Rio Hondo, Mexico–Belize, 2025 | Belize–Mexico | June 2003 |
| Diagnosis for Sustainable Water Management in the International Basin of the Rio Hondo, Mexico–Belize, 2025 | CILA Mexico–Belize (this diagnosis was published by CONAGUA). The results were apparently incomplete and there was no clear follow-up of bi-national commitments | 2007 |
| Mesoamerican Environmental Sustainability Strategy (EMSA). The subject of integrated watershed management is generally addressed without defining operational structures | Belize–Mexico, other member countries of the Mesoamerican Project (previously the Plan Puebla Panamá) | June 2008 |
| Establishment of the Commission of the Rio Hondo River Basin. Basin Management Program (*Programa de Gestión de la Cuenca*). Public plans to develop a new – and most complete – diagnosis of the Rio Hondo River Basin | Only the Mexican side | 2009 |
| Sustainability plans for the international basin of the Rio Hondo. Follow up actions from the diagnosis Mexico–Belize, 2025 | The Mexican side complains that Belize stopped its collaboration on this subject apparently for lack of funding | 2011 |

Note: CILA, Comisión Internacional de Límites y Aguas.

Sources: For the first agreement, see Benítez (2010); for the second agreement, see the official website of the México–Belize IBWC (http://www.sre.gob.mx/cilasur/); for the third and fourth agreements, see Olvera Alarcón et al. (2011); for the fifth agreement, see http://www.conagua.gob.mx/; and for the sixth agreement, see the official website of the Mesoamerican Project (see http://www.proyectomesoamerica.org/). For the last two rows, see Chetumal’s local media/newspapers and Benítez (2010).
Mexican authorities are seeking international assistance to address the run off of dangerous chemicals and pesticide from agricultural farms into the Rio Hondo because Belize did not send a delegation to the 12th session of the Rio Hondo Basin Commission.\(^7\)

According to applied interviews with local Conagua officials, these are the reasons why Conagua Mexico has decided to advance almost alone in the implementation of recommended actions for sanitation and control of pollution arising from the disposal of solid waste and wastewater. Another reason why Mexican officials decided to move forward alone is that this specific Mexican border faces an increasing demand for water resources due to population pressures related to the 115 towns and villages located adjacent to this basin. It is particularly relevant to mention the urban growth of Chetumal where governmental projections claim an average rate of 2.5%.\(^8\) The whole region of the Rio Hondo Basin, specifically on the Mexican side of the border, is the subject of national and private investments to develop a larger tourist corridor. Proof of that is the Chetumal Maritime Terminal presently being constructed in order to promote and increase the arrival of grand-scale tourism travelling by sea,\(^9\) and the inherent and correlated projects of infrastructure, hotels, restaurants, housing and services.\(^10\) This is already a different situation from the Belizean side which has not made such large public investment projects and also counts on only 78 villages with an average of six inhabitants per km\(^2\) in its part of the Rio Hondo Basin (Kauffer, 2013).

Nevertheless, these three socioeconomic aspects are mostly hidden from official binational agendas. A report of the IBWC’s 2010 meeting stated that the commission’s binational priorities are the protection of the quality of water from the Rio Hondo Basin and the establishment of an early warning system in case of flooding (Latin American and Caribbean Economic System, 2013, p. 11). Through field visits and interviews with institutional actors, it was observed that in Mexico and Belize daily political/administrative programmes at the local and national levels focus on increasing the supply of drinking water to growing population centres in their respective territories without further cross-border interactions related to planning. Although some institutional actors interviewed on the Mexican side of the border (especially regional representatives of Conagua) expressed interest in working more closely with their counterparts in Belize and stressed the need to develop a shared vision of the basin, the bilateral relationship on TWM does not seem to generate any effective operating structures that can foster institutional collaboration. Moreover, the separation of the IBWM’s (Mexico–Belize and Mexico–Guatemala) in the Rio Hondo Basin shows not only the lack of a coordinated policy amongst the three countries, but also the lack of a comprehensive approach to watershed management (Kauffer, 2005).

This case illustrates the lack of coordination between Mexican and Belizean institutions to develop, plan and implement public policy on shared basins. It also confirms claims by Dourojeanni and Jouravlev (2002) and Kauffer (2005) that Latin American and Caribbean cooperation agreements on water are scarce and water management is not a political priority on regional public agendas. In addition to the weak water management institutions in the states in this world region, one also finds institutional actors with superimposed functions, poorly defined roles and insufficiently defined responsibilities. This is reflected in debates and delays in the formulation and updating of water laws, as well as institutional disorientation regarding what kind of water management organizations should be adopted in each country (Olvera Alarcón et al., 2011).

The Belizean government has readily admitted institutional shortcomings in water management and attempted to address them (Belizean Ministry of Natural Resources and Agriculture, 2009). The country’s 2008 national water law and 2009 study of climate change impacts in the water sector have reinforced calls for national integrated water
management strategies. Also, they call for increased collaboration with Mexican and Guatemalan water authorities, citing the deteriorating quality of cross-border water resources (including the Rio Hondo Basin) due to agriculture and sewage and the need for collaborative efforts to address climate change.

The empirical research on TWM along the Belize–Mexico border supports the expected outcome that integrated water management is lacking in this region. The following subsection examines the other case examined in this research project, which is the Greater Region of Luxembourg.

**TWM in Luxembourg’s greater region**

Luxembourg was described above as a small state in a region that is highly integrated and officially recognized (the Greater Region as part of the EU). Consequently, the whole country is impacted by daily cross-border flows, including four transboundary rivers (Moselle, Sure, Our and Alzette). Access to water is essential to support the increase in population and economic growth mentioned above, and like Belize, the availability and supply of water does not seem to be a problem for Luxembourg. According to the Luxembourg Water Management Agency (Administration de la Gestion de l’Eau – Luxembourg), national drinking water consumption is about 120,000 m$^3$ per day, and about two-thirds of this amount is provided by groundwater while one-third comes from the treatment of surface water. Surface waters of the international rivers mentioned above also play an important role in irrigation, commercial shipping and tourism.

Prior to the establishment of the EU WFD in 2000, which includes the commitment of all member states to develop integrated management plans for shared basins, Luxembourg had no history of this type of environmental management (Maganda, 2013). Like Belize, water management responsibilities were distributed/shared amongst several ministries, each of which had its own water authorities. This separation included technical services for agriculture, environment, forests, roads and bridges. According to local water specialists, transboundary cooperation was restricted to the construction of shared water infrastructure, the protection of rivers against imminent pollution threats, and the management of shared fisheries. In 1993, a national law was passed to regulate pollution and coordinate the protection of surface and groundwater. This act provided the basis for the national transposition of WFD regulations, giving rise to the creation of the 2004 law, which formed the national water management agency (Administration de la Gestion de l’Eau). This new body brought together the different ministerial administrations mentioned above under the leadership of the Ministry of Interior. However, despite the fact that this governmental reorganization occurred in a democratic and industrialized EU country where processes are assumed to be transparent and participative, the government officials interviewed for this project who participated in this process stated that there was no social participation prior to or during the creation of this new administration (Maganda, 2013).

What makes Luxembourg a unique case in Europe, is the fact that no water management agency existed before the implementation of the WFD. The country had a shared water management approach through participation in international river commissions (Rhine, Meuse, Moselle–Saar) of which Luxembourg has been a member since the 1950s. While Luxembourg has signed multiple inter-state agreements for the protection and management of international waters (Table 3), it did not have a singular authority participating in these various bodies as officials from different ministries took turns attending intergovernmental meetings. Because Luxembourg is a small country, both formal and informal consultation took place between the competent authorities of the
Table 3. Selected transboundary water management (TWM) cooperation agreements for the greater region.

| Cooperation agreement                                                                 | Countries                      | Date       |
|--------------------------------------------------------------------------------------|--------------------------------|------------|
| State treaty between the Grand Duchy of Luxembourg and the Land Rhineland-Palatinate | Luxembourg–West Germany        | April 1950 |
| in the Federal Republic of Germany concerning the construction of a hydroelectric  |                                 |            |
| power-plant on the Sauer (Sûre) at Rosport/Ralingen, signed at Trier                 |                                 |            |
| Convention between the Federal Republic of Germany, the French Republic and the Grand-| Luxembourg–West Germany–France  | October 1956|
| Duchy of Luxembourg on the subject of Moselle canalization                           |                                 |            |
| State treaty between Luxembourg and West Germany concerning the construction of     | Luxembourg–West Germany        | July 1958  |
| hydroelectric power installations on the Our (with annexes)                         |                                 |            |
| Protocol between the government of the Federal Republic of Germany, the French       | Luxembourg–West Germany–France  | December 1961|
| Republic and the Grand Duchy of Luxembourg concerning the establishment of an        |                                 |            |
| international commission to protect the Moselle against pollution                   |                                 |            |
| Agreement on the International Commission for the protection of the Rhine against    | Luxembourg–West Germany–France–| November 1963|
| pollution                                                                           | Netherlands–Switzerland         |            |
| Agreement between the government of the Federal Republic of Germany and the          | Luxembourg–West Germany        | September 1976|
| government of the Grand Duchy of Luxembourg concerning the maintenance,             |                                 |            |
| restoration and operation of the section of the Moselle common to the two states    |                                 |            |
| Convention on the protection of the Rhine against chemical pollution (with annexes   | Luxembourg–West Germany–France–| December 1976|
| and exchanges of letters dated 1983), concluded at Bonn                            | Netherlands–Switzerland with    |            |
| Agreement between the government of the French Republic, the government of the      | Luxembourg–West Germany–France  | October 1987|
| Grand Duchy of Luxembourg and the government of the Grand Duchy of Luxembourg       |                                 |            |
| warning for the catchment basin of the Moselle                                     |                                 |            |
| Additional protocol to the convention on the protection of the Rhine against         | Luxembourg–Germany–Netherlands–| September 1991|
| pollution from chlorides                                                            | Switzerland–France              |            |
| Convention concerning the collection, storage, and discharge of waste from ships    | Luxembourg–Germany–Belgium–     | September 1996|
| navigating along the Rhine and other inland waters                                  | Netherlands–Switzerland         |            |
| Convention on the protection of the Rhine                                          | Luxembourg–Germany–France–      | January 1998|
| Enactment of the European Union Water Framework Directive (WFD). Pressure for the   | Netherlands–Switzerland         |            |
| establishment of shared basin district plans                                         |                                 |            |
| Establishment of the Luxembourg national water management agency                    | Luxembourg                      | 2005       |

Source: Compiled by the authors from the International Freshwater Treaties Database from Oregon University (see http://transboundarywater.geo.orst.edu/database/), as well as from information collected as part of the BRIDGE Research Project (funded by the University of Luxembourg).
various ministries before and after the meetings of each river management committee. Therefore, the country was late to formalize the institutionalization of the WFD because of the character of inter-ministerial relationships that are associated with consensus-building governance and because the country had elite participation in international commissions.

As a result, the WFD involved unprecedented challenges for Luxembourg. According to the EU Ecological Institute, the plan of action for the WFD was intended to support the development of national management plans by analysing the costs and effectiveness of measures to reduce stress on water bodies. However, the newly established water management agency in Luxembourg lacked appropriate methods to develop an analysis and calculation of the measures to be undertaken.\(^ {11} \) The WFD sets binding targets and a global framework for integrated and adaptive water management. Under this Directive, the EU member states not only have the right to set environmental objectives and ecological targets for surface waters in basin district plans, but also they are financially responsible for all environmental and resource costs for water services, and the establishment of national water prices (European Commission, 2007). With these overall objectives that go beyond water quality, this directive is considered the central instrument of water reform in Europe. However, many EU member states have shown inconsistencies related to the different stages of the implementation of the WFD (European Commission, 2012). Luxembourg has been one of the countries that have lagged in the implementation of WFD goals since its early stages. Specifically, it has had structural problems concerning the transition from a ‘water sovereignty’ approach to management to the new approach based on regional policy, especially in terms of legal and operational transposition. Despite the good bilateral relationship between Luxembourg and Germany in the Moselle Commission, both countries, among others, were called before the European Court of Justice (ECJ) which forced Luxembourg to redesign its national agency and reassign responsibilities for implementation of the WFD and instructed Germany to complete its river basin management plans. In Luxembourg there are still ongoing discussions related to the establishment of national prices for water as directed by the WFD. This illustrates continuing problems governmental officials have in understanding the potential benefits associated with the new regulatory regime.

**Summary comparison**

Table 4 summarizes the characteristics of international cooperation related to TWM in the two case studies. It raises an important question: Why have we witnessed the convergence of water management models between the ‘most different’ cases selected for this study? This is the central theme of the conclusions presented below.

**Conclusions**

This article compares TWM in two small states from different world regions. The empirical research presented above provides interesting perspectives on integrated border water management. This paradigm, which has become so prominent in both the academic literature and policy debates, focuses on the need for cross-border institutional cooperation in water management, public participation and strengthening connections between regional approaches to water management and local public debates. Until now, most studies in this field have focused on cases of TWM in large states or regions, such as the EU (e.g. Kaika & Page, 2003, among others). Therefore, the first important finding of this article is that small states can, and should, be examined comparatively in the context
of integrated border water management due to the inherent cross-border nature of national debates on water resources and their economic and political links to regional integration.

Second, this article comparatively examines border water management in Luxembourg and Belize through the lens of a research design that facilitates examination of governance mechanisms that are prominent in the integrated border water management literature. Because the research design is based on a 'most different cases' approach, the convergence in border water management characteristics of the cases is significant because it provides an unexpected result. The empirical evidence presented has shown that even though Luxembourg’s Greater Region is characterized by more fully developed legal and institutional frameworks for water management at both the local and regional levels, TWM implementation has only been moderately better than that found along the Belize–Mexico border.

What explains these similarities? This article argues that the answer to this puzzle is highlighted in the literature on small states in global affairs. According to Katzenstein (2003) the common characteristics that define small state governance in the literature are the following: (1) small states have relatively homogeneous populations; (2) small states are open to international economies; (3) small states create niches in global economies; (4) small states promote social solidarity due to perceived notions of vulnerability to external shocks; (5) small states amplify their influence through regions; and (6) small states possess efficient and effective governments because of their propensity for interpersonal relations.

Luxembourg demonstrates all these qualities, while Belize does not. Despite this fact, their water management systems are similar. One explanation for this puzzle could be linked to the fact that these two countries only share one of these governance

Table 4. Comparison of transboundary water management (TWM) characteristics between Belize–Mexico and Luxembourg’s Greater Region.

| TWM characteristics                  | Belize–Mexico | Luxembourg’s Greater Region |
|--------------------------------------|---------------|-----------------------------|
| Boundary definitions by cross-border waters | Rio Hondo (border). Divides a small state (Belize) from a large one (Mexico) | Moselle River (border). Divides a small state (Luxembourg) from large ones (Germany and France) |
| Uses of transboundary waters          | Navigation, tourism, fishing, irrigation and approximately 1% is used for drinking water | Navigation (the principal use), recreation, irrigation and wine industry |
| TWM                                  | Mexico Belize IBWC. Mesoamerican Strategy for Sustainable Development approved by the region’s Ministers of the Environment, 10 June 2008 (SICA and CARICOM have no concrete TWM regulations) | Moselle River Commission linked with the Rhine River (98% of Luxembourg’s territory is located in this hydrographic district). Meuse River Commission (2%). European WFD |
| Institutional frameworks             | Incomplete legal and institutional framework | Institutionally developed regulatory frameworks |
| Present environmental problems        | Contamination of surface waters, deforestation | Contamination of waters by chemicals used in the wine industry and problems with urban water treatment (Remich) |

Sources: See http://www.eau.public.lu/cours_eau/reseau_hydrographique/index.html; and http://www.iksr.org/index.php?id=58; http://www.cipm-icbm.be/page.asp?id=14/.
characteristics: the propensity for interpersonal relations amongst political elites. Normally, this is highlighted in the small states literature as an explanation for efficient and effective governance and consensus building. The empirical study presented above, however, has shown that this quality should not be considered inherently positive in all policy arenas. In terms of border water management in changing regional settings, this governance characteristic has impeded the implementation of integrated border water management norms, especially social participation.

Border water governance remains dominated by national elites and technicians in centralized administrations and there is a shortage of public information on border water issues, especially in terms of regional initiatives. Second, the corporatist traditions that facilitate planning in the economic sphere actually restrict institutionalized forums for public water debates in small states as bi-national or multilateral (regional) policy discussions often take place behind closed doors. Finally, the interpersonal connections in small states combined with the bargaining linked to consensus-building politics have given local leaders power in water discussions and these figures have utilized these platforms to challenge national and regional authorities in water policy-making arenas. This has impeded the implementation of the European WFD in Luxembourg and hindered the activation of bi-national border water management between Belize and Mexico.

In both cases, the establishment of a national water agency has occurred only recently as different ministries and local authorities have traditionally shared responsibilities in this field. Due to governance traditions associated with small states, most notably the facility of informal inter-ministerial and inter-governmental communication, the establishment of a single authority in water management was not deemed to be necessary. This situation, however, has contributed to inter-ministerial and multilevel conflicts in the field of TWM. Consequently, this article contends that small states, those which should be defined by the most significant propensity for integrated border water management due to their small geographic size, their vulnerability to external shocks and their heightened levels of integration in regional governance systems, have not properly implemented this approach because it contradicts the national governance models that have been utilized to maintain economic and political stability. Moreover, the interpersonal (and often informal) connections that define these models actually undermine integrated border water management because they limit democratic debate and social participation.

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Notes
1. Internationally Shared Aquifer Resources Management (ISARM).
2. See http://atlas.media.mit.edu/country/blz/.
3. The authors thank Mr Fabian Gal and Ms Jessica Giro for their assistance with empirical research carried out within the framework of the BRIDGE and HUMENITY research projects.
4. There is also a Mexico–Guatemala IBWC, but its work is not at all coordinated with that of the Mexico–Belize IBWC.
5. Since 1940 Guatemala has been claiming about 12,000 km² of Belize’s territory (Gargallo & Santana, 1993).
6. See http://contralinea.info/archivo-revista/index.php/2009/04/19/mexico-incumple-a-guatemala-y-belice-asf/.
7. See http://www.sanpedrosun.com/community-and-society/2014/03/31/belize-fails-attend-twelfth-session-rio-hondo-basin-commission/.
8. The average rate was calculated by following the Population Department of State of Quintaroo projections from 2010 to 2017 (see http://coespo.qroo.gob.mx/portal/datos_estadisticos_cartograficos/PROYECCIONESPORLOCALIDAD2011_2017.pdf/).
9. Official message from the spokesman’s unit of the State of Quintana Roo (see http://vocero.qroo.gob.mx/uv/index.php?option=com_content&view=article&id=13550:avanza-nueva-terminal-maritima-de-chetumal&catid=49:noticias-del-dia/).
10. Ibid. (see http://vocero.qroo.gob.mx/uv/index.php?option=com_content&view=section&layout=blog&id=32&Itemid=134/).
11. See http://ecologic.eu/.

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