

# HYDRO-POLITICAL TENSION RISKS IN SHARED WATERS OF SEPARATIST REGIONS

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## ABSTRACT

This study identifies potential hydro political tension risks of the water resources shared between Abkhazia, Kosovo, Northern Cyprus, Palestine, South Ossetia, Western Sahara, separatist regions seeking independence, and their neighboring countries. Before the study was conducted, it was anticipated that these waters would be managed unilaterally regardless of the need for joint actions since various difficulties in most of these regions exist such as interparty conflicts, territorial disputes, and international representation limitations. Therefore, it was anticipated that these waters would have high hydro political tension risks. In fact, management of them are disturbed by the political impasse. However, surprisingly, in most of the cases, there was more cooperation than conflict over the management of the shared waters. There were lower hydro political tension risks than expected in most of the cases. This was due to numerous drivers, most importantly: political incentives offered by external parties with condition of cooperation, necessity to work together for improving individual benefits obtained from shared water resources, third parties mediating co-management, cultural and spiritual approaches improving water cooperation, and technical-level management. **Keywords:** conflict and cooperation; hydro political tension risks; transboundary water management

## Disclosure Statement

Language used in this study assumed that all the regions mentioned were independent countries. This was due to convenience of writing not with the intention of expressing opinion in territorial integrity of any of the regions examined. The author intends to remain politically neutral, and is not aware of any biases that might be considered harmful to the objectivity of this study.

## INTRODUCTION

Stress on water resources is increasing at an alarming rate around the world, primarily due to human-induced factors.<sup>2</sup> Studies project catastrophic consequences for humans and the environment if water management issues are not addressed. Given that 40 percent of the world's population relies on transboundary waters,<sup>3</sup> cooperative transboundary water management (TWM) is indispensable for managing global water resources for a number of reasons. First, cooperative TWM enables countries to use their cumulative technical and financial resources to ensure sustainable access to adequate quantities of quality water. Second, TWM can be leveraged to

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<sup>2</sup> Sarah J. Popelka and Laurence C. Smith. "Rivers as Political Borders: A New Subnational Geospatial Dataset," *Water Policy* 22, no. 3 (2020): 293-312; Shlomi Dinar, "The Geographical Dimensions of Hydro-politics: International Freshwater in the Middle East, North Africa, and Central Asia," *Eurasian Geography and Economics* 53, no. 1 (2012): 115-42.

<sup>3</sup> Aaron T. Wolf, "Shared Waters: Conflict and Cooperation," *Annual Review of Environment and Resources* 32, no. 1 (2007): 241-69.

obtain technical and financial support from international organizations, such as the European Union (EU), the United Nations (UN), and the World Bank that demand cooperation among riparian governments.<sup>4</sup> In addition, cooperative TWM can play a key role in improving international relations, a process often referred to as environmental peacebuilding, and improved international relations play a significant role in ensuring a sustainable environment and regional political stability.<sup>5</sup>

Cooperative TWM is quite common among countries that have friendly relations. Unfortunately, such collaboration is usually lacking when countries are in conflict with one another, although it is vital that they cooperate over TWM as well.<sup>6</sup> First, countries pursuing unilateral agendas regarding TWM often problematize sustainability, while cooperative management usually improves sustainability. Furthermore, on the one hand, cooperation over TWM can improve relations, which is much needed in cases where there are severe inter-party conflicts. On the other hand, conflicts over TWM can worsen already strained affairs, which could even lead to or exacerbate violence. Many studies encourage cooperation over TWM among riparian states in severe conflict with each other.<sup>7</sup>

The literature has considered numerous cases, of not only sovereign countries but also separatist regions and revealed reasons as to why cooperation is occurring in some basins despite inter-party conflicts.<sup>8</sup> For example, research on the Jordan Basin has underlined the importance of how vital a transboundary water source can be, while the case of the Indus River has shown the importance of proper timing or a window of opportunity.<sup>9</sup> Other studies have noted the relevance of the scale of management (e.g. ministerial, municipal, local), e.g. the Arpacay Dam,<sup>10</sup> while others have highlighted the importance of mediating third parties, e.g. Gazivoda Lake.<sup>11</sup>

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<sup>4</sup> United Nations-Water, *Water Security and the Global Water Agenda: A UN-Water Analytical Brief* (Hamilton, Canada: United Nations University, 2013).

<sup>5</sup> Saleem H. Ali, *Peace Parks: Conservation and Conflict Resolution* (Cambridge, MA: MIT Press, 2007); Ken Conca, "Decoupling Water and Violent Conflict," *Issues in Science and Technology* 29 no. 1 (2012): 39-48; Ken Conca and Geoffrey D. Dabelko, eds., *Environmental Peacemaking* (Washington, DC: Woodrow Wilson Center Press, 2002); UN-Water, *Water Security and the Global Water Agenda*; Wolf, "Shared Waters."

<sup>6</sup> Aaron T. Wolf et al., "Managing Water Conflict and Cooperation," in *State of the World: Redefining Global Security*, eds. Erik Assadourian et al. (Washington, DC: Worldwatch Institute, 2005), 80-95.

<sup>7</sup> For example, Ali, *Peace Parks*; Wolf, et al., "Managing Water Conflict and Cooperation."

<sup>8</sup> For a comprehensive literature review, see Susanne Schmeier, "Governing International Watercourses – Perspectives from Different Disciplines: A Comprehensive Literature Review," *Hertie School of Governance Working Paper*, no. 53 (Berlin: Berlin Graduate School for Transnational Studies, 2010). <<https://core.ac.uk/download/pdf/71738984.pdf>> (accessed March 28, 2021).

<sup>9</sup> Miriam R. Lowi, *Water and Power: The Politics of a Scarce Resource in the Jordan River Basin* (Cambridge: Cambridge University Press, 1993); Asit K. Biswas, "Cooperation or Conflict in Transboundary Water Management: Case Study of South Asia," *Hydrological Sciences Journal* 56, no. 4 (2011): 662-770.

<sup>10</sup> Mehmet Altingoz et al., *Promoting Development in Shared River Basins: Case Studies from International Experience* (Washington, DC: World Bank, 2018); Mehmet Altingoz and Saleem H. Ali, "Environmental Cooperation in Conflict Zones: Riparian Infrastructure at the Armenian-Turkish Border," *The Journal of Environment & Development* 28, no. 3 (2019): 309-35.

<sup>11</sup> Florian Krampe, "Building Sustainable Peace: Understanding the Linkages between Social, Political, and Ecological Processes in Post-War Countries," Ph.D. dissertation (Uppsala, Sweden: Uppsala University, 2016).

This study adds to the existing literature by researching the risks of hydro-political tension in transboundary waters involving separatist regions, a topic that has not been closely studied to date.<sup>12</sup> This topic also requires attention due to the border complexities in those regions. The borders between the separatist regions and their neighboring countries are invisible on maps yet very real and visible in real life (barbed wires, limited access, etc.), causing many challenges in the border regions for management of water resources (i.e. limited mobility and access to the water). By their nature, separatist regions already involve international territorial disputes and limited opportunities for diplomatic representation, which present further challenges for managing waters shared with sovereign countries. All these greatly complicate joint management efforts and signify alternative approaches. Researching the risk of hydro-political tensions regarding those waters provides useful insights that could encourage timely interventions and collaborative management facilitating environmental peacebuilding, as well as generate alternative perspectives for the relevant parties.

### METHODOLOGY

There are plenty of separatist regions (de facto states) striving for independence and international recognition. To limit the number of cases, this chapter will focus on separatist regions that are recognized by at least one UN member, but not afforded full recognition by the UN. There are seven regions that meet this requirement: Abkhazia, Kosovo, Northern Cyprus, Palestine, South Ossetia, Taiwan, and Western Sahara. Taiwan is an island nation and does not share any surface water (e.g. rivers, lakes) or offshore aquifers with neighboring countries and was therefore excluded from this study.<sup>13</sup>

In their seminal study, titled “Climate Change and the Institutional Resilience of International River Basins,” De Stefano et al. created 747 basin country units (BCUs), where each unit is described as the portion of a riparian country’s land area that is within a certain transboundary river basin, and suggested that the presence of river basin organizations (RBOs), as well as the presence of international river treaties and their provisions concerning water allocation, conflict resolution, and water variability, determine resilience of international river basins to hydrologic variability caused by climate change. They used those five parameters (existence values 1 while absence values 0) to calculate a numerical value between 0 and 5 for each of the 747 BCUs. They combined these numbers with values between 0 and 3.5 (determined via present water variability and future scenarios for 2030 and 2050) and calculated the potential hydro-political tension risk for each BCU. They considered the BCUs scored 0 and 1 at high risk, 2 and 3 at medium risk, and 4 and 5 at low risk of future hydro political tensions.

The De Stefano framework first appeared as a World Bank report and was subsequently revised through several studies by the same group of researchers.<sup>14</sup> The framework is the result of

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<sup>12</sup> Language used in this study assumed that all the regions mentioned were independent countries. This was due to convenience of writing and not intended to express opinions regarding the territorial disposition of any of the regions examined. The author intends to remain politically neutral and is not aware of any biases that might limit this study’s objectivity.

<sup>13</sup> Vincent E. A. Post et al., “Offshore Fresh Groundwater Reserves as a Global Phenomenon,” *Nature* 504 (2013): 72.

<sup>14</sup> Lucia De Stefano et al., *Mapping the Resilience of International River Basins to Future Climate Change-Induced Water Variability*, Water Sector Board Discussion Paper Series, no. 15 (Washington, DC: World Bank, 2010); Lucia De Stefano et al., “Climate Change and the Institutional Resilience of International River Basins,” *Journal of Peace Research* 49 no. 1 (2012): 193-209; Lucia De Stefano et al.,

rigorous study of numerous transboundary water resources around the world, and it has been used by many researchers to calculate the potential risks of hydro-political tensions.<sup>15</sup> As such, this framework offers a proven and comprehensive tool for assessing the likelihood of hydro-political tensions.

This study modifies the BCU component of the De Stefano framework to transboundary basin unit (TBU), where each unit is described as the total portion of a transboundary river basin in a separatist region and its neighboring country rather than their respective portions of the basin. Therefore, TBUs cover two BCUs as defined by the De Stefano framework. This modification is intended to put more emphasis on cooperative efforts rather than individual initiatives, as what follows is more focused on joint management. The number of the cases in this study is relatively small to allow for more detailed examination. Because De Stefano et al. emphasized that additional stipulations may add to the accuracy of the analysis, this study added three additional parameters to the framework and some of the existing parameters were revised.

In doing so, “internal factors,” “external factors,” and “past water conflicts” are also considered in the analysis, and the RBO and water treaty components of the De Stefano framework are referred to below as “joint practices.” These adjustments reflect the fundamental importance of internal and external politics for separatist regions, the increasing impacts of internal and external factors, and the legacy of historical interparty grievances, which signify past water conflicts. In addition, since separatist regions lack international representation making water treaties and RBOs unlikely, “joint practices” better reflect the role of water treaties and RBOs. Finally, rather than only the absence or presence of the parameters, their impact on cooperative management practices (negative, neutral, positive) is also included in the analysis. Due to lack of data and time constraints, this study elides the modelling aspect of the framework.<sup>16</sup> Table 1 outlines the modified analytical framework.

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“Assessment of Transboundary River Basins for Potential Hydro-Political Tensions,” *Global Environmental Change* 45 (2017): 35-46; Shlomi Dinar et al., *Climate Change, Conflict, and Cooperation: Global Analysis of the Resilience of International River Treaties to Increased Water Variability* (Washington, DC: World Bank, 2014); Shlomi Dinar et al., “Climate Change, Conflict, and Cooperation: Global Analysis of the Effectiveness of International River Treaties in Addressing Water Variability,” *Political Geography* 45 (2015): 55-66; Shlomi Dinar et al., *Climate Change and Water Variability: Do Water Treaties Contribute to River Basin Resilience?* World Bank Policy Research Working Paper, no. 7855 (Washington, DC: World Bank, 2016); Shlomi Dinar et al., “Do Treaties Matter? Climate Change, Water Variability, and Cooperation along Transboundary River Basins,” *Political Geography* 69 (2019): 162-72.

<sup>15</sup> Marloes H. N. Bakker and James Duncan, “Future Bottlenecks in International River Basins: Where Transboundary Institutions, Population Growth and Hydrological Variability Intersect,” *Water International* 42, no. 4 (2017): 400-24; Jacob D. Petersen-Perlman, “Projecting River Basin Resilience in the Zambezi River Basin through Global Analyses and Basin Realities,” *Water Resources Management* 30, no. 6 (2016): 1987-2003.

<sup>16</sup> All the seven analytical framework components utilized in this study were considered to have the same level of impact in the calculation of hydro-political tension risks of the TBUs. In fact, in reality, the level of the impacts of the components would be different. This study does not claim to calculate the tension risks with a very high accuracy; rather it provides a general overview.

TBU Parameters	Existence		Impact on TBU		
	Yes	No	Negative	Neutral	Positive
Conflict resolution mechanisms					
Water allocation practices					
Water variability					
Joint practices					
Internal factors					
External factors					
Past water conflicts					

Table 1. Analytical Framework Components used to rank the TBUs

In addition to academic and media sources and interviews, this study also uses the water conflict chronology table created by Peter H. Gleick, a renowned expert on water resources and climate change, to analyze “past water conflicts.”<sup>17</sup> The number of negative impacts for each TBU are then summed. TBUs that contain 0, 1, or 2 negative impacts are considered to be at low risk, 3 or 4 negative impacts are considered at moderate risk, and 5, 6, or 7 negative impacts are at high risk of hydro-political tensions.

The subsequent sections of this chapter explore shared water management among separatist regions and their neighboring countries in the context of invisible borders. It also assesses risk of hydro-political tensions in those regions and offers recommendations for relevant parties to make timely interventions. In addition, findings of this study also reveal insights regarding subnational assertions of hydro-territoriality in specific regions.

## ANALYSIS

There are hundreds of regions seeking to separate from the sovereign countries within borders of which they are considered in the international arena. Many of those regions wish to have their own independent countries while some of them aspire to unite with another country, often with another neighbor. Abkhazia, Kosovo, Palestine, Northern Cyprus, South Ossetia, and Western Sahara are de facto states seeking independence or unification with other regions and countries. They all are recognized by at least one UN member as a sovereign country. While some of them are recognized by over one hundred countries and others by only a few, this does not appear to have a direct impact on the level of sovereignty. While the longevity and sovereignty level of the de facto states influence their level of international recognition, much of the recognition or lack thereof seems to be coming from political motives, as well as alliances and sympathy (cultural, religious, ethnic, linguistic ties, etc.).

Borders between those separatist regions and their neighboring countries are not visible on standard maps yet very apparent in real life (barbed wires, limited access, etc.). Crossing those invisible borders is often much more limited and complicated than crossing sovereign countries’ borders (i.e. no flights, entering through a friendlier neighboring country, detailed security checks, etc.). By their nature, separatist regions already involve international territorial disputes and limited opportunities for diplomatic representation. This along with borders’ invisibility, in addition to causing a world of issues for everyday life for the residents in those regions (i.e., citizenship, international travel, phone code, etc.), very much complicates efforts in the border

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<sup>17</sup> P. H. Gleick, *The World’s Water: The Biennial Report on Freshwater Resources* (Washington, DC: Island Press, 2012).

regions for the management of water resources as well (i.e., limited mobility and access to the water). By its nature, shared water management is an issue that requires collaboration from all the stakeholders as favorable management of those resources benefits all the stakeholders while mismanagement harms everyone. However, on one hand, in many cases, sovereign countries do not even agree to sit at the same table and treat the separatist region as an authority with which diplomatic arrangements can be conducted. On the other hand, unregulated shared water management remains an issue that harms all the shareholders. This analysis aims to provide useful insights that could encourage timely interventions and collaborative management facilitating shared water management in the context of invisible borders.

### **Abkhazia**

Abkhazia is located in the Caucasus region between Georgia and Russia. During the Soviet period, Abkhazia was part of the Georgian Soviet Socialist Republic (SSR) and therefore became part of Georgia when the Soviet Union dissolved in 1991 and its constituent SSRs became independent countries. As a distinct ethno-linguistic group, some Abkhazian elites had agitated for independence, or at least greater autonomy, since the 1980s. Through a series of violent conflicts beginning in the 1990s, Abkhazia gained de facto independence with the consistent support of Russia. Despite its de facto autonomy, Abkhazian independence is only recognized by Russia and a handful of other countries, while most other countries consider Abkhazia to be part of Georgia's sovereign territory. As a result, the border between Abkhazian and Georgian controlled territories is often invisible on standard maps.

The Enguri River (TBU 1) originates in northwestern Georgia before forming the border between Abkhazia and Georgia and finally discharging into the Black Sea (figure 1). The main transboundary management issue pertaining to the Enguri River concerns a cross-border power generation system consisting of the Enguri Hydropower Plant and the Enguri Dam, originally built by the Soviet Union. The dam is on the Georgian side, while the power plant is on the Abkhazian side. Abkhazia manages electricity production while Georgia, as the upstream country, controls the dam and the flow of the river. They share the electricity generated through an informal agreement, which gives 60 percent of the electricity produced to Georgia and 40 percent to Abkhazia.<sup>18</sup> Abkhazia and Georgia export electricity when production exceeds their demand. Despite the informal agreement, both parties dispute ownership of the system, as well as the distribution of electricity. However, the cross-border nature of the installation requires joint management, even though Abkhazia and Georgia have problematic relations and avoid inter-party cooperation in many other fields. In addition, Georgia intends to join the EU, which requires its members and potential members to comply with the United Nations Economic Commission for Europe's (UNECE) Water Convention and the Water Framework Directive (WFD), which mandate and encourage cooperative TWM.

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<sup>18</sup> "Tbilisi Denies Talks with Sokhumi over Enguri HPP," *Civil.ge*, January 16, 2015. <<https://bit.ly/2XsjPW5>>; "They Still Aim to Get Their Hands on the Enguri Hydroelectric Plant," *Interpress News*, 2015. <<https://bit.ly/3a5RpDP>>; "Electricity Supply to Abkhazia May Be Cut off in Two Weeks," *Democracy and Freedom Watch*, February 14, 2016. <<https://bit.ly/2VkzK6j>> (all accessed March 28, 2021).



Figure 1. Map of Abkhazia and its TBUs

Abkhazia has a second transboundary water feature, the Psou River (TBU 2) which originates on Aigba Mountain in Russia. From there, the river forms the Abkhazian-Russian border until it discharges into the Black Sea. The main crossing points between Abkhazia and Russia span the Psou River when Russia recognized Abkhazia and South Ossetia.<sup>19</sup> In contrast to its relations with Georgia, Abkhazia has favorable relations and continuous dialogue with Russia. In 2010, for example, Abkhazia and Russia created a jointly managed transboundary wildlife reserve.<sup>20</sup> Abkhazia and Russia also installed video surveillance for joint border control in 2015.<sup>21</sup> Also unlike the Enguri River, the Psou River lacks any major infrastructures that withdraw water. In fact, the basin contains very little water and is not used significantly by either side. As a result, both Abkhazia and Russia generally ignore the Psou. The Enguri River commonly appears as a purely internal river in Georgia and unlikely a source of dispute, but the de facto border with Abkhazia makes Enguri a de facto transboundary feature. Conversely, the Psou is a transboundary waterway but not a source of dispute partially because of the close relations between Russia and Abkhazia.

### Kosovo

Kosovo is located in the Balkans region between Albania, Montenegro, North Macedonia, and Serbia. The Balkans was under the Ottoman rule between fifteenth and twentieth centuries, during which time a significant number of Balkan people, predominantly Albanians, converted to Islam. During the Ottoman Era, the portion of Kosovo mainly inhabited by Albanians was an autonomous region. After World War I, Yugoslavia was founded and annexed Kosovo. During the Yugoslav period, Kosovo was an autonomous province in the Republic of Serbia and became part of Serbia

<sup>19</sup> Vladimir Kolossov and John O’Loughlin, “After the Wars in the South Caucasus State of Georgia: Economic Insecurities and Migration in the ‘de Facto’ States of Abkhazia and South Ossetia,” *Eurasian Geography and Economics* 52, no. 5 (2011): 631-54.

<sup>20</sup> *Agreement between the Government of the Russian Federation and the Government of the Republic of Abkhazia About Creation of the Cross-Border Wildlife Reserve*, 2010.

<sup>21</sup> “On the Border of the Republic of Abkhazia, on Psou River Will Be Installed Video Surveillance in Real Time,” *State Information Agency of Republic of Abkhazia* (2015). <<https://bit.ly/2V1OBDA>> (accessed March 28, 2021).

when Yugoslavia dissolved in 1991 and its constituent republics became independent countries. As a distinct religious and ethnic group, many Kosovars have agitated for independence since the 1990s. After a series of violent conflicts during the 1990s and 2000s, Kosovo gained de facto independence with the consistent support of NATO. Kosovo's independence is recognized by more than half of UN members, while many other countries consider Kosovo to be a part of Serbia's sovereign territory. As a result, the border between Kosovo and its neighboring territories is often invisible on standard maps.

In the Southwestern Danube basin (TBU 3), Kosovo and Serbia share Gazivoda Lake, the Iber River, and the Southern Morava River (figure 2). Gazivoda Lake is located in Mitrovica, a Serb dominated region that has remained loyal to Serbia even after Kosovo declared independence in 2008.<sup>22</sup> On this lake, there is a dam and a power plant that are the main source for water and electricity in Kosovo.<sup>23</sup> Both Kosovo and Serbia assume administration of Mitrovica while Gazivoda Lake is operated by Kosovar Serbs and financed by Serbia.<sup>24</sup> Kosovars not having any control over the water and electricity from Gazivoda Lake while they are entirely dependent on them is central to this case. The EU is also a very important external factor for the transboundary water management between Kosovo and Serbia since Serbia wishes to join the EU that requires cooperation over TWM resources. One of the main reasons why Serbia has signed various agreements with Kosovo is the fact that the agreements would move Serbia forward in EU negotiations. The main significance of the Iber River, originating in Serbia, is that it feeds Gazivoda Lake. The Southern Morava River originates in North Macedonia. Then, it flows through Kosovo and Serbia. Then, it connects to the Danube River that discharges to the Black Sea. There are not any major installations on the river that withdraw water. There is not much water in the basin, and the riparians do not rely on it. This resource is generally ignored by both riparians. Kosovo and Serbia have problematic relations and avoid inter-party cooperation in many fields. Overall, despite all the efforts, the management of the basin has been unilateral and problematic.

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<sup>22</sup> Krampe, "Building Sustainable Peace."

<sup>23</sup> "Big Deal – Split Asunder: Civic Oversight of the Kosovo-Serbia Agreement," *Balkan Investigating Reporting Network*, 2015. <<https://bit.ly/3b3rdLF>> (accessed March 28, 2021).

<sup>24</sup> Ibid.



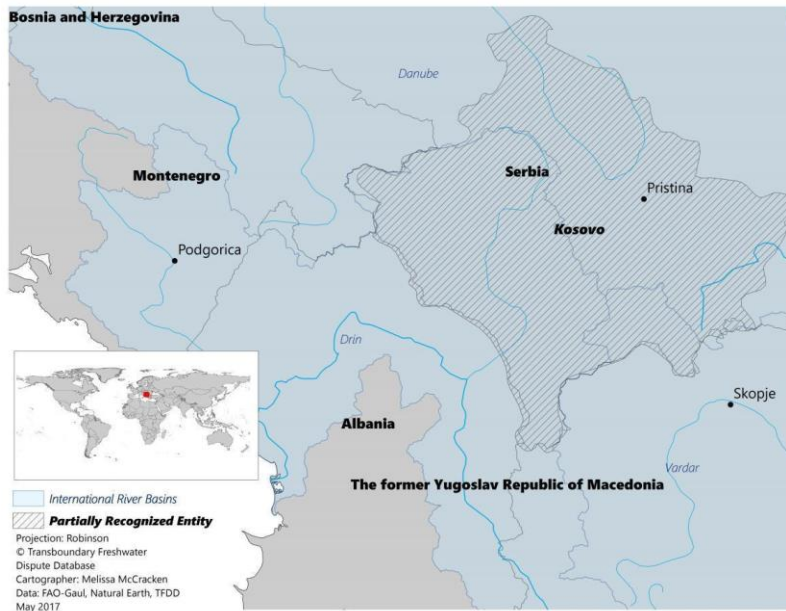


Figure 2. Map of Kosovo and its TBUs

The Drin basin is a very large basin shared between Albania, Greece, Kosovo, Montenegro, and North Macedonia. Approximately 1.5 million people rely on it for drinking water, agriculture, fisheries, industry, and hydropower.<sup>25</sup> Kosovo and its neighbors share three TBUs in the Drin basin: TBU 4 – Eastern Drin basin (Kosovo and Albania), TBU 5 – Northern Drin basin (Kosovo and Montenegro), and TBU 6 – Southern Drin basin (Kosovo and North Macedonia). In 2011, the riparians signed the Drin Basin Memorandum as an outcome of the Drin Dialogue process supported by the Swedish Environmental Protection Agency (SEPA) and coordinated by the UNECE and the Global Water Partnership Mediterranean (GWP-Med).<sup>26</sup> In the scope of this process, the Drin Project was initiated in December 2015. This project had a budget of US\$5.5 million to promote joint management of the transboundary Drin basin, which included joint practice mechanisms among the various sub-basin joint commissions and committees in Albania, Kosovo, Montenegro, and North Macedonia.<sup>27</sup> Kosovo has very favorable relations with its Drin neighbors. In addition, all the riparians aspire to join the EU, which requires cooperation over TWM resources. Overall, the basin has been managed peacefully and cooperatively.

In the Northwestern Vardar basin (TBU 7), the Lepenec River is the main shared water body between Kosovo and North Macedonia. In 2013, Kosovo and North Macedonia signed the Lepenec Memorandum that committed them to cooperate over the river.<sup>28</sup> Then, for the implementation of the agreement, they formed a joint committee, constituted by four members from each riparian country. They also created a book of rules to identify the scope and functions of the committee. The Government of Finland funds the process, and the Organization for Security

<sup>25</sup> “Drin River Basin,” *Drin Corda*, 2020. <<https://bit.ly/2JXQWsW>> (accessed March 28, 2021).

<sup>26</sup> “Drin Memorandum of Understanding,” Global Water Partnership, 2016. <<https://bit.ly/2VgcXsc>> (accessed March 28, 2021).

<sup>27</sup> “Raising Awareness among Local Communities on the Importance of Sustainable Management for the Drin River Basin,” *Drin Corda*, 2016. <<https://bit.ly/2yW9bwN>> (accessed March 28, 2021).

<sup>28</sup> K. Georgievska, “Lepenec River Protection via Introduction of Integrated Water Management,” *Regional Environmental Center*, March 9, 2015. <<https://bit.ly/2XqXd8s>> (accessed March 28, 2021).

and Co-operation in Europe (OSCE) implements it.<sup>29</sup> In addition to joint management, both Kosovo and North Macedonia passed laws and decrees favoring cooperation over their transboundary basins and have favorable relations. As a result, the basin has been managed in a peaceful and cooperative way.

### **Northern Cyprus**

Cyprus is an island in the Eastern Mediterranean Sea. It is mainly populated by Orthodox Greeks and Muslim Turks. During World War I, after three centuries of Ottoman rule, the British Empire annexed Cyprus and declared it a British colony. Over the years, nationalism among Cypriots gained traction and, with support from Greece and Turkey, led to independence in 1960.<sup>30</sup> From 1960 until a Greek coup d'état in 1974, Britain, Greece, and Turkey co-administered Cyprus. The Greek coup d'état was followed by a 25-day long armed conflict between Turks and Greeks from Cyprus, Greece, and Turkey. As a result of the armed conflict, Greek Cypriots agglomerated in the south, Turk Cypriots moved to the north, and a buffer zone, controlled by the United Kingdom and the UN, was established in the middle. Since then, Cyprus has been divided into three sections. In 1983, Northern Cyprus declared independence. Despite its de facto autonomy, Northern Cyprus' independence is only recognized by Turkey, while all the other countries consider it to be a part of the Republic of Cyprus' sovereign territory. In 2004, the Republic of Cyprus was admitted to the EU, while the status of Northern Cyprus remains unclear. As a result, the border between Northern Cyprus and Republic of Cyprus controlled territories is often invisible on standard maps.

Northern Cyprus and the Republic of Cyprus share two major aquifers, which are the Center and Western Mesaoria aquifer (TBU 8) and the Kokkinochoria aquifer (TBU 9), as well with small streams that feed them (figure 3).<sup>31</sup> The Center and Western Mesaoria aquifer is classified as in poor quantity and poor quality.<sup>32</sup> It is over-pumped and managed unsustainably.<sup>33</sup> The most significant component influencing transboundary water management between Northern Cyprus and the Republic of Cyprus is the water supply project that brings water from southern Turkey. With this project, water sent from Turkey is distributed throughout Northern Cyprus, giving Northern Cyprus a lot of water availability. This project is greatly reducing the tensions that might arise through the management of the shared aquifers.<sup>34</sup> In addition, the Republic of Cyprus is an EU member and is therefore mandated to comply with the UNECE water convention and WFD, which urge cooperative management of transboundary water resources. Overall, the TBUs are managed somewhat cooperatively. However, the inter-party relations are poor, and water is over politicized in the region due to Greece and Turkey being heavily involved in the regional politics and TWM is being managed by higher-level institutions (ministries, etc.).

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<sup>29</sup> Georgievskia, "Lepenec River Protection via Introduction of Integrated Water Management."

<sup>30</sup> Dimitrios Zikos and Matteo Roggero, "The Patronage of Thirst: Exploring Institutional Fit on a Divided Cyprus," *Ecology and Society* 18, no. 2 (2013): 25-37.

<sup>31</sup> Dimitrios Zikos and K. Hagedorn, "Competition for Water Resources from the European Perspective," in *Competition for Water Resources: Experiences and Management Approaches in the US and Europe*, eds. Jadwiga R. Ziolkowska and Jeffrey M. Peterson (Elsevier, 2016), 19-35.

<sup>32</sup> Zikos and Roggero, "The Patronage of Thirst."

<sup>33</sup> Charalambos Demetriou and Adonis Georgiou, "Management of Groundwater Resources in Cyprus - Harmonisation with the EU Water Framework Directive," paper presented at the BALWOIS (Ohrid, FY Republic of Macedonia, 2004), 25-29.

<sup>34</sup> DSI, "KKTC'ye Su Temin Projesi," State Hydraulic Works of the Ministry of Environment and Forestry of Turkey, 2014. <<https://bit.ly/34uZfpA>> (accessed March 28, 2021).

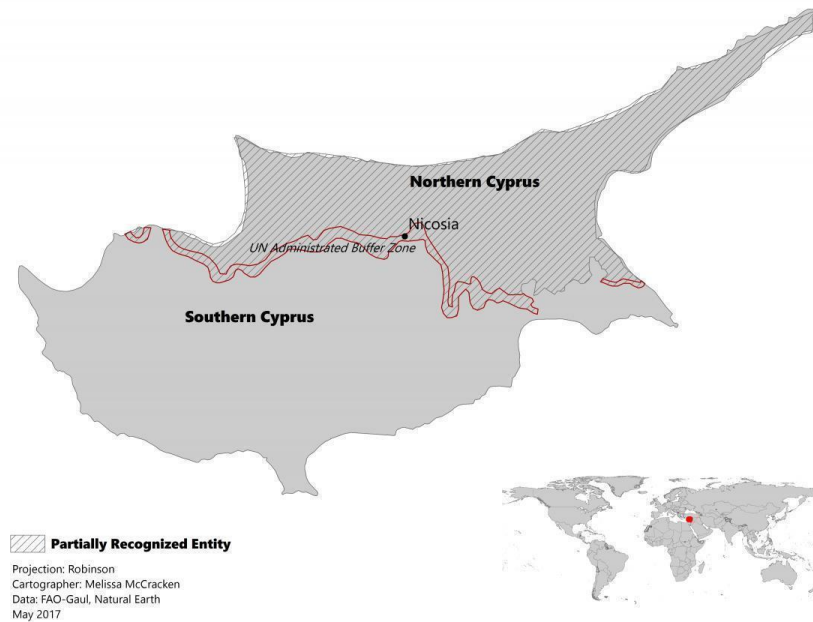


Figure 3. Map of Northern Cyprus and its TBUs

## Palestine

Palestine (West Bank and Gaza) is located in the Middle East between Egypt, Israel, and Jordan. Since the late 1800s, when Jews began emigrating to Ottoman Palestine where Israel and Palestine are located today, there has been an ongoing conflict between Arabs and Jews, which escalated in 1948 with the establishment of Israel.<sup>35</sup> After decades of severe conflict that resulted in three wars along with numerous armed conflicts, Palestine declared its independence in 1988. Palestine has been recognized as a sovereign country by over a hundred UN members while many other countries consider it a part of Israel. As a result, the border between Palestine and Israel is often invisible on standard maps yet very much apparent in real life.

Palestine and Israel share the Coastal Aquifer (TBU 10) and the Western Jordan basin (TBU 11), while Palestine and Jordan share the Eastern Jordan basin (TBU 12) (figure 4).<sup>36</sup> All three of these TBUs have severe quality and quantity problems.<sup>37</sup> Israel signed US-facilitated bilateral agreements with Jordan and Palestine regarding the management of the Jordan basin.<sup>38</sup> However, Jordan and Palestine have not signed any agreements with each other, and no trilateral water agreement has been signed to date.<sup>39</sup> In 2013, Jordan, Israel, and Palestine signed a memorandum to implement the Red-Dead Sea Water Project that would desalinate seawater and

<sup>35</sup> Joel Beinin and Lisa Hajjar. “Palestine, Israel and the Arab-Israeli Conflict: A Primer” (Chicago: Middle East Research and Information Project, 2014).

<sup>36</sup> Anders Jägerskog, “Are There Limits to Environmental Peacebuilding? A Critical Reflection on Water Cooperation in the Jordan Basin,” in *Routledge Handbook of Environmental Conflict and Peacebuilding*, eds. Ashok Swain and Joakim Öjendal (London: Routledge, 2018).

<sup>37</sup> Charlotte Silver, “Israel’s Water Miracle That Wasn’t,” *Al Jazeera*, March 30, 2014. <<https://bit.ly/2XrW3tp>> (accessed March 28, 2021).

<sup>38</sup> Silver, “Israel’s Water Miracle That Wasn’t.”

<sup>39</sup> *Ibid.*

allocate it among the signatories.<sup>40</sup> This project is tremendously crucial for this case. However, even though it has been several years, the project has not begun yet. Israel and Palestine have problematic relations and are an interesting example for a very apparent coexistence of cooperation and conflict. Palestine and Jordan, on the other hand, have favorable relations. Even though they do not have many management mechanisms, they generally cooperate over their shared waters.

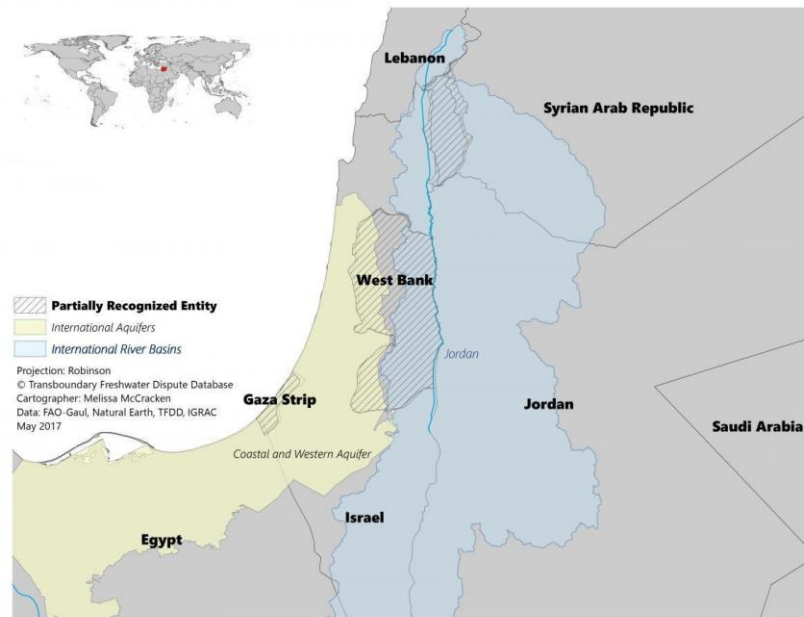


Figure 4. Map of Palestine and its TBUs

### Western Sahara

Western Sahara is located on the Atlantic coast of West Africa neighboring Algeria, Mauritania, and Morocco. Upon Spain’s decolonization of Western Sahara in 1976, Morocco, Mauritania, and the Polisario Front, a movement seeking independence, claimed the region. In 1979, Mauritania withdrew and abandoned its claims over the region, and a guerrilla war between Morocco and the Polisario Front began. In 1991, the UN facilitated a ceasefire and adopted a peacekeeping mission in Western Sahara. Since then, Morocco has controlled the “Southern Provinces” – the western portion of the region encompassing about 80 percent of total area – while Polisario Front has controlled the “Free Zone” – the eastern portion of the region covering the other 20 percent. While nearly one hundred countries recognize Western Sahara as an independent country, most other countries consider it a part of Morocco. The invisible border in this case is very much alive.

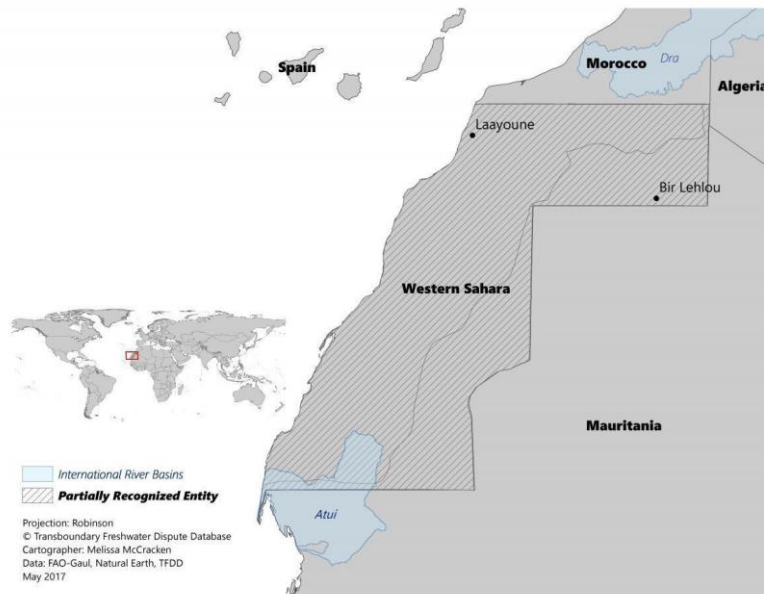
The only TBU of Western Sahara is the hyper-arid Atui Basin (TBU 13), shared with Mauritania (figure 5).<sup>41</sup> The most significant component of the management of the Atui basin is that it is managed with the Bedouin philosophy, which has a very favorable and efficient approach towards shared water management.<sup>42</sup> Both sides are members of the same Bedouin tribe, and they

<sup>40</sup> H. Namrouqa, “Winning Bid in Red-Dead Project to Be Announced Soon,” *Jordan Times*, 2016. <<https://bit.ly/3b04vUI>> (accessed March 28, 2021).

<sup>41</sup> Food and Agriculture Organization of the United Nations, “Average Annual Precipitation (mm/year),” 2016. <<https://bit.ly/2VhkkzA>> (accessed March 28, 2021).

<sup>42</sup> Aaron T. Wolf, “Indigenous Approaches to Water Conflict Negotiations and Implications,” *International Negotiations* 5 (2000): 357-73.

greatly respect the customs. According to the Bedouin philosophy, water is “sacred,” and selling it or not sharing it is forbidden.<sup>43</sup> In addition, all humans and animals have the right to drinking water at all times under any circumstances. The Bedouin customs ensure that shared water management is conducted peacefully and cooperatively. The relations between Mauritania and Western Sahara are good, and there is cooperation over the Atui basin.



### South Ossetia

During the Soviet period, South Ossetia was part of the Georgian SSR and therefore became part of Georgia when the Soviet Union dissolved in 1991 and its constituent SSRs became independent countries. As a distinct ethno-linguistic group, some South Ossetians had agitated for independence and/or unification with North Ossetia, or at least greater autonomy, since the 1980s. Through a series of violent conflicts beginning in the 1990s, South Ossetia gained de facto independence with the consistent support of Russia. Despite its de facto autonomy, South Ossetian independence is only recognized by Russia and a handful of countries, while most other countries consider South Ossetia to be a part of Georgia’s sovereign territory. As a result, the border between South Ossetia and Georgian controlled territories is often invisible on standard maps.

The Northwestern Kura Araks basin (TBU 14) includes numerous rivers, tributaries, reservoirs, and irrigation canals (figure 6). The Trifoni canal, which crosses the border multiple times making the riparians both upstream and downstream, is the main water supply for the Georgian and South Ossetian villages in the border region.<sup>44</sup> South Ossetia controls the headwaters of the Trifoni canal, while Georgia controls the gas supply to South Ossetia.<sup>45</sup> The Trifoni canal has experienced accidental and intentional stoppages by South Ossetia that caused the canal to

<sup>43</sup> Ibid.

<sup>44</sup> Goga Aptsiauri, “Georgia and South Ossetia in Rare Accord,” *Institute for War and Peace Reporting*, August 13, 2015. <<https://bit.ly/2XuBGMi>> (accessed March 28, 2021).

<sup>45</sup> Ibid.

become clogged with silt.<sup>46</sup> Russia facilitated restoration of the canal, as one of the most influential players in the post-Soviet border regions. In addition, Georgia cut gas supplies to South Ossetia from time to time, perhaps greatly impacting inter-party water management.<sup>47</sup> Both sides wish to ensure the continuous flow of water and gas supplies.<sup>48</sup> In an EU Monitoring Mission in Georgia (EUMM) sponsored meeting in 2015, South Ossetia and Georgia reached an agreement, with which South Ossetia promised to clear the waterway and provide a sufficient flow of water to the Georgian villages, while Georgia promised to renovate their side of the Trifoni canal and guaranteed water flow to reach to ten South Ossetian villages located downstream from the Georgian villages.<sup>49</sup> In addition, the parties agreed to exchange information through a hotline provided by the EUMM that monitors and facilitates the process.<sup>50</sup> Georgia and South Ossetia have poor relations. However, extensive cooperation at the technical level is taking place between them to ensure the continuing flow of water in the region.<sup>51</sup>



Figure 6. Map of Abkhazia and its TBUs

## RESULTS

The application of the modified De Stefano framework to these case studies produces the following results in table 2.

<sup>46</sup> Ibid.

<sup>47</sup> Ibid.

<sup>48</sup> “South Ossetia: The Burden of Recognition,” *International Crisis Group*, Crisis Group Europe Report, no. 205, June 7, 2010. <<https://bit.ly/3e8Neut>> (accessed March 28, 2021).

<sup>49</sup> K. Jankauskas, “Georgian-South Ossetian Water Deal,” *Institute for War and Peace Reporting*, 2015. <<https://bit.ly/2Xtrpj6>> (accessed March 28, 2021); Aptsiauri, “Georgia and South Ossetia in Rare Accord.”

<sup>50</sup> Jankauskas, “Georgian-South Ossetian Water Deal;” Aptsiauri, “Georgia and South Ossetia in Rare Accord.”

<sup>51</sup> Aptsiauri, “Georgia and South Ossetia in Rare Accord.”

<b>Management mechanism</b>	<b>Exist</b>	<b>Does not exist</b>	<b>Has negative impact</b>	<b>Has neutral impact</b>	<b>Has positive impact</b>
Conflict resolution mechanisms	1; 4,5,6; 7; 10; 12; 13; 14	2; 3; 8; 9; 11	3	1; 2; 8; 9; 10; 11; 12; 14	4,5,6; 7; 13
Water allocation practices	1; 3; 4,5,6; 7; 10; 12; 13; 14	2; 8; 9; 11	9; 10; 12	1; 2; 3; 8; 11	4; 5; 6; 7; 13; 14
Water variability	1; 4,5,6; 7; 10; 12; 13; 14	2; 3; 8; 9; 11	3; 8; 9	2; 11; 14	1; 4,5,6; 7; 10; 12; 13
Joint practices	1; 2; 3; 4,5,6; 7; 10; 11; 12; 13; 14	8; 9	3	8; 9	1; 2; 4,5,6; 7; 10; 11; 12; 13; 14
Internal factors	1; 2; 3; 4,5,6; 7; 8; 9; 10; 11; 12; 13; 14		3; 8; 9; 10; 11; 12; 14	1; 13	2; 4,5,6; 7
External factors	1; 3; 4,5,6; 7; 8; 9; 10; 11; 12; 13; 14	2	3	2; 14	1; 4,5,6; 7; 8; 9; 10; 11; 12; 13
Past water conflicts	1; 3; 10; 12; 14	2; 4,5,6; 7; 8; 9; 11; 13	1; 3; 10; 12; 14		2; 4,5,6; 7; 8; 9; 11; 13

Table 2. Application of the modified De Stefano et al framework to the TBUs

Initially, it was anticipated that the TBUs would be managed unilaterally due to severe inter-party disagreements, territorial disputes, and limited international representation, and therefore, few if any management mechanisms would exist. The first main finding of this study is that, as it can be seen from the table above, these cases commonly featured transboundary management mechanisms despite their troubled invisible borders. After investigating the impacts of the management mechanisms, the number of negative impacts for each TBU were summed. The TBUs that contain 0, 1, or 2 negative impacts are considered to be at low risk, 3 or 4 negative impacts at moderate risk, and 5, 6, or 7 negative impacts at high risk of hydro-political tensions. The fourteen TBUs and their estimated risk for hydro-political tension were inserted in the table below.

<b>Transboundary Basin Unit (TBU)</b>	<b>Unit Riparians</b>	<b>TBU</b>	<b>Score</b>
Enguri River	Abkhazia and Georgia	TBU1	1
Psou River	Abkhazia and Russia	TBU2	0
Southwestern Danube basin	Kosovo and Serbia	TBU3	6
Eastern Drin basin	Albania and Kosovo	TBU4	0
Northern Drin basin	Kosovo and Montenegro	TBU5	0
Southern Drin basin	Kosovo and North Macedonia	TBU6	0
Northwestern Vardar basin	Kosovo and North Macedonia	TBU7	0
Center and Western Mesaoria aquifer	Northern Cyprus and Republic of Cyprus	TBU8	2

Kokkinochoria aquifer	Northern Cyprus and Republic of Cyprus	TBU9	3
Coastal aquifer	Israel and Palestine	TBU10	3
Eastern Jordan basin	Jordan and Palestine	TBU11	1
Western Jordan basin	Israel and Palestine	TBU12	3
Atui basin	Mauritania and Western Sahara	TBU13	0
Northwestern Kura Araks basin	Georgia and South Ossetia	TBU14	2

Table 3. Hydro Political Tension Risks of the TBUs

As it can be seen from the table above, ten TBUs are low, three TBUs are deemed medium, and one TBU is considered a high risk for hydro-political tensions. Before the study was conducted, it was anticipated that the TBUs would be managed unilaterally regardless of the need for joint actions since various difficulties in most of these regions exist such as inter-party conflicts, territorial disputes, limited international representation, and most importantly invisible borders. Therefore, it was anticipated that the TBUs would have high hydro-political tension risks. In fact, management of the TBUs are disturbed by the political impasse. However, surprisingly, in most cases, there was more cooperation than conflict over TWM. There were lower hydro-political tension risks than expected in most of the cases. The main factors that enabled the managing parties to work with each other in the context of invisible borders were: political incentives offered by external parties with the condition of cooperation, necessity to work together for improving individual benefits obtained from shared water, third parties mediating co-management, cultural and spiritual approaches improving TWM cooperation, and low-politics technical-level management.

The management of the TBUs are vastly influenced by the relations among the riparians. Due to this reason, in some of the TBUs, there was cooperation despite the lack of management mechanisms (TBU 2, 11), while in some cases there was conflict despite abundance of management mechanisms (TBU 6). Political incentives appear to be very vital for the research cases too. In many TBUs (TBU 1, 3, 4, 5, 6, 7, 8, 9, 14), the riparians hope to join the EU, which requires its members and aspiring members to comply with the UNECE water convention and the WFD. Those frameworks encourage cooperative management of transboundary water resources. Hence, in those TBUs, the riparians took actions that improved TWM. Supporting the existing literature, this study also showed that necessity to work together for improving individual benefits obtained from a shared water resource could trigger cooperation over TWM.<sup>52</sup> For TBU 10, 11, and 12, the desalination project is needed for mitigating water scarcity in the region. This project has required the riparians to work together and played a significant role for cooperation regarding TWM. Similarly, for TBU 1, Enguri Hydropower Plant, a cross-border infrastructure requiring co-management, played a vital role for TWM cooperation. Third parties are influential too. They have greatly affected and facilitated the process for many TBUs: SEPA, UNECE, GWP-Med (TBU 4, 5, 6), Government of Finland, OSCE (TBU 7), and EUMM (TBU 14). In addition, in some of the TBUs, perhaps because of politics and historical ties, third countries play a significant role: Russia (TBU 1, 14), Greece, Turkey (TBU 8, 9), and the United States (TBU 10, 12). Cultural, traditional, and spiritual approaches are also essential. In TBU 13, along with Dr. Wolf's (2000) findings, extensive TWM cooperation exists due to the teachings of the Bedouin philosophy in the cross-

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<sup>52</sup> Lowi, *Water and Power*.



border region.<sup>53</sup> Supporting the existing literature, this study also found that management scale is relevant for TWM.<sup>54</sup> In cases where high politics were avoided when managing TWM, better outcomes surfaced overall. For instance, in TBU 8 and TBU 9, management was conducted at a larger scale and many politics negatively influenced TWM. In TBU 14, however, the management was given to technical level personnel, and easy and instant communication between them were enabled. This caused a smoother TWM.

## CONCLUSION

Scholars and international governmental organizations tend to encourage cooperative transboundary water management, because those practices have been shown to facilitate water sustainability and environmental peacebuilding.<sup>55</sup> Cooperative TWM usually exists among countries that have friendly relations, while countries with poor or even hostile relations generally do not cooperate over TWM. This study suggests that while inter-party conflicts were common for most transboundary water features, there are more instances of TWM cooperation than conflict. This study underlines that inter-party conflicts greatly influence TWM, but they are not the sole factor in determining the degree of cooperation. In fact, many separatist regions and their nominal states cooperated with each other despite very problematic inter-party relations (recent wars, invisible borders, ongoing clashes). The most significant factors facilitating cooperative TWM included: 1) political incentives offered by external parties conditional upon cooperation; 2) necessity to work together for improving individual benefits obtained from shared water resources; 3) third parties mediating co-management; 4) cultural and spiritual approaches improving TWM cooperation; and 5) technical-level management.

In all the cases, the invisible border plays a powerful role, as there was very little cross-border interaction among the parties. However, the transboundary nature of their shared waters forced them to manage water resources jointly for the various reasons mentioned above. Even in the most closed, limited, and staunchly maintained invisible borders, there was a considerable amount of cross-border interaction for water. These common aspects are often overlooked by scholarly studies. Perhaps conflict-cooperation existence is not only the case for high politics, but it also might be the case in lower politics such as joint water arrangements. Overall, this research suggests that water is usually not a source of conflict but in fact can be managed cooperatively even in the most troublesome situations.

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<sup>53</sup> Wolf, "Indigenous Approaches to Water Conflict Negotiations and Implications."

<sup>54</sup> Altinoguz et al., *Promoting Development in Shared River Basins*; Altinoguz and Ali, "Environmental Cooperation in Conflict Zones."

<sup>55</sup> For example, Ali, *Peace Parks*; Wolf et al., "Managing Water Conflict and Cooperation."