State-of-the-art review of transboundary water governance in the Euphrates–Tigris river basin

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ABSTRACT

This article reviews the state of the art of transboundary water governance in the Euphrates–Tigris river basin, which is characterized by both political confrontation and cooperative institutional development. First, research on the physical characteristics of the basin is presented, with references to the literature on large-scale water development projects that underpin transboundary water interactions. Then, contending approaches to transboundary water governance are discussed, with specific references to the evolution of institutions. Finally, bearing in mind that transboundary water governance in the basin occurs in volatile political circumstances, current issues such as control of the water infrastructure by non-riparian actors and protection of water during armed conflict are scrutinized.

Introduction

The concept of water governance first reached the international stage at the Second World Water Forum in The Hague in 2000, where ministers called for governing water wisely to ensure good governance (Rogers & Hall, 2003). Since then, one of the most prominent definitions of the concept was produced by the United Nations Development Programme (UNDP, 2004, p. 10), which defines water governance as ‘the political, economic and social processes and institutions by which governments, civil society, and the private sector make decisions about how to best use, develop and manage water resources.’ In the same vein, the interface between transboundary and national water resources management should be an integral component of good water governance in transboundary river settings.

This article reviews the state of the art of transboundary water governance in the Euphrates–Tigris (ET) river basin, with specific reference to institutions in the forms of bilateral treaties, protocols and joint mechanisms. Transboundary water governance in the ET basin has been studied and analyzed by a variety of disciplines, ranging from geography to political science and from international law to critical hydropolitics and institutions.

As the bulk of the scholarly work on ET transboundary water governance has tended to focus on inter-state relationships, taking state actors as the key players in transboundary
water affairs, this review adopts an institution-focused approach by examining how power and institutions play a key role in transboundary water governance in the ET basin. Suhardiman and Giordano (2012) point out that a process-focused approach in transboundary water governance research can help us identify and understand key issues and actors as part of the overall mechanisms and structure that shape the logic of transboundary water governance in a particular basin. In this respect, only a limited number of scientific studies have concentrated on the role of transnational actors (social and environmental NGOs, international agencies and donors, contractors, credit agencies) as the key actors in shaping actual decision-making processes in transboundary water governance in the ET basin (Conker, 2014; Harris & Alatout, 2010; Warner, 2012). In this context, Warner’s (2012) work on Turkey’s Ilisu Dam shows how an international NGO protest can influence the basin’s balance of power, adding weight to downstream resistance to upstream dam construction. But despite the withdrawal of international credit agencies from the Ilisu Dam project, Turkey completed the construction in 2017, using domestic financial sources.

While paying some attention to this interesting work, which focuses on non-state actors with multiscalar perspectives, this article takes into its scope the extensive literature on power structures and institutional development in the ET basin. Hence, this article commences with a brief description of the physical characteristics of the ET basin, which, according to many experts, constitute the foundations of transboundary water interactions there. Therefore, this article touches on the studies a group of experts have conducted on the geography, hydrology and climatic conditions of the ET basin, aiming to improve our knowledge of the impacts of water development projects on transboundary relations there (Altinbilek, 2004; Beaumont, 1998; Bozkurt & Sen, 2013; Hillel, 1995; Kliot, 1994; Kolars & Mitchell, 1991; UN-ESCWA & BGR, 2013).

Since the emergence of large-scale water development projects in the early 1960s, initiated by the major riparians Turkey, Syria and Iraq, an ongoing debate has arisen among scholars in various fields of science on the likelihood of a conflict that could be the result of the worsening water supply situation and demand imbalances in the basin. In this context, this article highlights the ‘water wars’ literature, which was among the first to draw attention to the likelihood of interstate conflict in the ET basin (Bulloch & Darwish, 1993; Cooley, 1984; Naff & Matson, 1984; Starr, 1991; Starr & Stoll, 1987).

Although such works presented the ET basin as being one of the pivotal regions for water wars, an international war over this scarce resource did not break out. A critical hydropolitics research agenda analyzed the transboundary water interactions in the ET basin as dynamic and as characterized by varying intensities of both conflict and cooperation (Cascão & Zeitoun, 2010; Zeitoun & Warner, 2006). According to this literature, conflict and cooperation over transboundary waters, like all relationships, are played out in power-determined contexts. This article reviews that literature, defining upstream Turkey with its material and discursive power as the ‘hydro-hegemon’ and portraying downstream riparian Syria as a non-hegemon, using its bargaining power as a response (Daoudy, 2008).

The links established between transboundary water issues and non-riparian issues have played a significant role in transboundary water governance processes in the ET basin. This article, therefore, features scholarly writings that evaluate issue linkages in the context of conflict and cooperation in the ET basin (Daoudy, 2009; Eder & Carkoglu, 2001; Kibaroglu & Gursoy, 2015; Scheumann, 1998; Warner, 2012).
This article devotes the bulk of its attention to the work of institutionalists, who analyzed negotiation processes by focusing on the claims and counter-claims of riparian states over transboundary waters (Gurun, 1994; Kibaroglu & Scheumann, 2013; Kibaroglu & Unver, 2000). Relying on major premises of international water law, institutionalists examined customary international water law principles applicable to the transboundary water interactions in the ET basin (Elver, 2002; Kirschner & Tiroch, 2012). In the same vein, institutionalists scrutinized historical and contemporary water treaties in the basin, paying special attention to the mandate and performance of the Joint Technical Committee (JTC) as the sole joint mechanism at the transboundary level (Kibaroglu, 2002). With these backgrounds in mind, this article will, therefore, present the institutionalist approach in more detail, along with other contending approaches to water governance in the ET basin.

Given the current state of affairs in the region, it goes without saying that the biggest challenge that stands out in water governance in the ET basin is to coordinate transboundary water resources management and establish transboundary water cooperation. The Syrian civil war and the deterioration of the bilateral political relations between any pair of the riparians constitute a highly unfavourable environment for realizing good water governance in the basin. This article will analyze the current and emerging issues and priorities in the basin, elaborating on the impacts of the Syrian civil war on transboundary water governance discourse and practices. It is also observed that contacts between Turkey and Iraq over transboundary water issues have been sustained even in times when high-level political relations have not been harmonious. This article, therefore, adds further analysis to the Turkey–Iraq track, comprising an enabling protocol and a series of bilateral negotiations at ministerial and technocratic levels as well as cooperative initiatives taken up by various actors.

**Physical geography underpinning transboundary water governance**

The early literature on transboundary water issues in the ET basin is particularly informative on the geographical, hydrological and climatic conditions that persist in the basin. Indeed, understanding the physical characteristics of the basin is crucial to understanding the effects water management projects have on the rivers (Figure 1).

The Euphrates and the Tigris are the two main rivers of the Middle East. In the analyses of leading geographers, the two rivers are examined as constituting a single transboundary watercourse system (Anderson, 1986; Beaumont, 1992; Bilen, 1994; Kliot, 1994). They are connected by their natural course, merging at the Shatt-al-Arab. Moreover, the man-made Thartar Canal links the Tigris to the Euphrates through the Thartar Valley in Iraq (Kibaroglu, Klahake, Kramer, Scheumann, & Carius, 2005).

The upper parts of the ET basin have features of a cold continental climate, whereas the lower parts are classified as hot desert or hot semi-arid (Bozkurt & Sen, 2013). The rivers overflow in spring when the snow melts, augmented by seasonal rainfall, which is at its heaviest between March and May. The summer season is hot and dry, resulting in extensive evaporation and low humidity during the day. Evaporation increases water salinization and water loss in major reservoirs in the three riparian countries (Kliot, 1994; Naff & Matson, 1984).

The Euphrates has 32 billion cubic metres (BCM) of average yearly flow. Ninety per cent of the Euphrates originates in Turkey, while 10% is contributed from Syria. The mean annual flow of the Tigris is 52 BCM. Turkey contributes 40% to the Tigris flow, while 51% and 9% come from Iraq and Iran, respectively. The overall Tigris-Euphrates flow calculations show
variations from 68 BCM to 84.5 BCM (Altinbilek, 2004; Belül, 1996; Kolars, 1994; Kolars & Mitchell, 1991).

More recent research on transboundary water resources provides up-to-date information on the physical conditions of the river basin, paying special attention to hydrology, land use, water balance, water quality, impacts of climate change and the status of the groundwater. Kavvas et al. (2011) consider the Tigris–Euphrates watershed as a single hydrologic unit and performed a scientific assessment of its water resources. An inventory of land use/land cover, vegetation, soils and existing hydraulic structures in the watershed was performed; a regional hydroclimate model of the watershed was developed; and a hydrologic model was also developed to route streamflows within the river network of the watershed. An algorithm for operating the reservoirs in the watershed was developed and utilized to perform dynamic water balance studies under various water supply/demand scenarios to establish efficient utilization of water resources to meet the water demands of the riparian countries in the basin.

Cullmann (2013) underlines the fact that the hydrologic dynamics in the ET basin changed drastically after the large dams were finished. For an integral assessment of the potential benefits of water management, he suggests that it would be necessary to conduct a multi-objective optimization exercise that integrates all existing infrastructure in the basin.

The Inventory of Shared Water Resources in Western Asia is a systematic effort to catalogue and characterize ‘shared’ surface water and groundwater systems throughout the Middle East (UN-ESCWA & BGR, 2013). It analyzes the Euphrates and Tigris river basins separately with their geographical, hydrological characteristics as well as water resources management

**Figure 1.** Map of the Euphrates–Tigris river basin. Source: Orkan Ozcan.
patterns, with specific emphasis on water development and use in Turkey, Syria, Iraq and Iran. It particularly highlights water quality and environmental issues. The existing agreements, cooperation frameworks and outlook for the future are briefly described. It dedicates particular chapters to the shared tributaries of the Euphrates (the Sajur, Balikh and Khabour) and the Tigris (the Feesh Khabour, Greater Zab, Lesser Zab and Diyala) by looking into their hydrological characteristics, with special attention to transboundary agreements as well as water quality and environmental issues. It devotes separate chapters to less studied shared aquifer systems in the ET basin, such as the Jezira Tertiary Limestone Aquifer System, and the Halabja-Khurmal and Central Diyala Basins in the areas that extend into the Taurus-Zagros mountain range across Iran, northern Iraq and Turkey. It examines hydrogeology (aquifer and groundwater characteristics), groundwater abstraction and use, and groundwater quality issues, as well as agreements, cooperation frameworks and the outlook for the future.

The impacts of climate change on the Euphrates and Tigris Rivers have been thoroughly studied by Bozkurt and Sen (2013). Their findings indicate significant decreases in the Tigris and Euphrates flows: in the Turkish part of the ET basin, flows will drop by 23.5% in the Euphrates and by 28.5% in the Tigris by the end of the twenty-first century. Lower precipitation is the prime cause of lower surface runoff. But higher temperatures also cause faster evapotranspiration (Bozkurt & Sen, 2013). Surface flow decreases will have important impacts on the basin: water for irrigation, energy production and domestic and industrial use will decline drastically (Yucel, Guventurk, & Sen, 2014).

Venturia and Capozzolib (2017) analyzed 1970–2010 flow data for the Euphrates River at the Turkish–Syrian border to assess the effect of upstream dam construction, comparing flow data between Syria and Iraq in a period with no dam construction in those countries. They collected water samples from the Turkish–Syrian and Syrian–Iraqi borders to identify levels of salinity through laboratory analysis. They complemented their data analysis with fieldwork along the river basin and with evidence from the literature. Contrary to the arguments that dam construction and irrigation projects in Turkey and Syria reduced the flow of the Euphrates River and raised salinity levels, they found that the slight flow reduction and the increasing downstream salinity are both associated with natural aspects of the landscape rather than with human actions.

The Centre for Environmental Studies and Resource Management (CESAR) study was conducted with publicly available data from Turkey and authorized national data from Syria and Iraq; this led to a comprehensive analysis of the water management systems of the two rivers (Trondalen, 2008). Based on this technical study, but also putting it into perspective, Trondalen claimed that unless the three countries found ways of cooperating, the water quality of the rivers might shortly find itself in a grave condition, particularly that of the Euphrates River in Iraq, and subsequently in the southern part of Syria. Of equal importance was the fact that if water resources were not used effectively, the shortfall between need and availability would grow even larger. Moreover, a serious challenge currently facing irrigation is the high concentration of salt in the topsoil. Highly intensive irrigation as a basis for food production as well as the area's socio-economic growth has characterized all the advanced hydraulic civilizations in Mesopotamia right up to the present day, causing the salinization process to continue, not only in Iraq but also in Syria and even in Turkey. This process is expected to go on unless mitigating measures are taken (Trondalen, 2008).

The salinity issues in the two rivers, especially in the Euphrates, have also been studied by international consultants for the Iraq government. The Iraq Salinity Assessment, for
example, is the result of a three-year research project on soil salinity in central and southern Iraq by the government of Iraq and an international research team led by the International Center for Agricultural Research in the Dry Areas (Christen & Saliem, 2012). After conducting historical, regional and field-scale soil salinity surveys as well as systematic studies on surface water salinity, including longitudinal profiles of and time series trends in river salinity, the research team concluded that action was needed in four areas: Iraq’s irrigation and drainage systems need to be upgraded; strategies are needed for farm-level water management, improved salinity control and irrigation management; management of drainage water and other saline inflows to the river systems is needed; and water use policies and institutions need to be strengthened. The findings of this important study also examined, *inter alia*, the physical conditions of the river basin and provided a sound basis for discussions of transboundary water governance practices in the basin.

This group of studies, then, has been instrumental in improving our understanding of interactions between physical and political processes, as well as the institutions created for the development and management of water resources.

**Major water development projects triggering transboundary water interactions**

The initiation of large-scale water development projects triggered transboundary water disputes when, in the late 1960s, Turkey and Syria started systematically building dams and irrigation systems in the ET basin (Beaumont, 1998). Iraq was also keen to expand its irrigation schemes (Kibaroglu et al., 2005). In this context, Turkey’s South-Eastern Anatolia Project (GAP is the Turkish acronym), Syria’s Euphrates Valley Project and Iraq’s Thartar Canal Project were implemented without proper coordination (Figure 1).

The ET basin includes almost one-third of the surface water supply in Turkey. An integrated water and land resources development programme was designed with the particular aim to irrigate the fertile lands in south-eastern Anatolia, about one-fifth of the country’s irrigable land (Altinbilek, 1997; Kolars & Mitchell, 1991; Tigrek & Kibaroglu, 2011; Unver, 1997). For this purpose, Turkey implemented the GAP, which included 22 large dams, 19 hydropower plants and several irrigation schemes (Nippon Koei & Yuksel Proje, 1989). When fully developed, the GAP will provide irrigation for 1.7 million hectares of land, 474,528 hectares of which are now operational (GAP Administration, 2017).

Although they have brought tangible economic and social gains, the GAP, and in particular the construction of large dams, have come in for sharp criticism. Objections, in particular, concern resettlement issues, environmental and cultural aspects and the implications of sharing water with Syria and Iraq. Yalcin and Tigrek’s (2015) proposal, for example, claimed that the cultural assets surrounding the Ilisu Dam could be saved from inundation while preserving the projected energy production from the dam.

Alongside Turkey’s broader objectives regarding hydropower generation and agricultural productivity, the GAP also aimed to improve the socio-economic conditions in Turkey’s economically underdeveloped south-east (Tortajada, 2000). Based on their personal experience and previous systematic research on the GAP, Altinbilek and Tortajada (2012) conclude that, in spite of the project’s shortcomings, there has been significant progress in some sectors of the GAP region, such as energy generation and irrigated agriculture, as a direct
result of the project. Driven by a top-down policy process that failed to fully appreciate the complexities behind the region’s socio-economic underdevelopment, the GAP mostly achieved its technical objectives in terms of hydropower generation and agricultural productivity, but came short of achieving its social agenda (Harris, 2002; Sayan & Kibaroglu, 2016).

The waters and land resources of the Euphrates river basin are considered of strategic importance in Syria as they include 65% of the surface water supply and 27% of the total land resources. Before oil exploration in the early 1980s, agriculture was the main driver of the Syrian economy. Though oil contributed significantly to export earnings, fluctuations in world oil prices urged Syria to keep guarding its agricultural development for food self-sufficiency (Richards & Waterbury, 1990). So Syria implemented the Euphrates Valley Project in the early 1960s. A major dam, the Tabqa Dam, was completed in 1973. In the framework of the Euphrates Valley Project, Syria aimed to irrigate 640,000 hectares of land, produce electricity for growing cities and industry, and control flooding (Bakour, 1992; Meliczek, 1987; Wakil, 1993). But these objectives have been only partly realized in the Euphrates basin in Syria over the course of five decades.

The Euphrates and Tigris Rivers provide vital freshwater supply in Iraq. Construction of dams on the Euphrates and the Tigris began in the 1950s with the basic aim of flood prevention. The Samarra Dam was completed on the Tigris in 1954, and the Euphrates Dam in 1956. In 1958, Iraq became a semi-industrialized economy, with large amounts of oil exports and food imports. In the 1970s, the Iraqi government expanded irrigated areas with the aim of providing food security, which was made possible with the growing income from oil after the oil companies were nationalized in 1972 (Allan, 1990; McLachlan, 1991). In the 1980s, Iraq constructed a complex network of canals on the ET system, such as the Tharthar Canal. Taking into consideration the constraints of water salinity in the Tharthar Reservoir and the amount of water that can be saved and transferred from the Tigris to the Tharthar, it may be assumed that about 6 BCM of water could be transferred annually from the Tharthar reservoir to the Euphrates River (Cullmann, 2013). Yet, Tharthar Lake alone is presently responsible for more than 50% of the evaporative losses from Iraq’s reservoirs. To better conserve water resources, Tharthar Lake will most likely be used solely for flood control purposes in the future (Tice, 2016).

Contending approaches to transboundary water governance in the ET basin

It is widely recognized that water is essential for human survival and socio-economic development. Since the early 1970s, intergovernmental and nongovernmental organizations have convened at international conferences and engaged in activities to address global water issues such as water scarcity and the lack of access to clean water and sanitation (Salman, 2003). But certain regions of the globe have attracted more attention than others, with surface and groundwater resources shared between two or more countries. In this context, the ET basin is regarded as a pivotal region. Each and every reason for a global water crisis to arise is present in the basin: a rapidly growing population; varying levels of economic development; limited amounts of water supply, which are unevenly and irregularly distributed; and frequent and prolonged droughts, due to climate change, misuse and poor water management and water allocation practices both within and between states.
The ‘water wars’ literature

The popular press was the first to announce water as a sensational issue (Cowell, 1990; Gowers, 1989; Murphy, 1990), before scholarly interest followed. An ongoing debate then arose among scholars in various fields on the likelihood of a conflict that would be the result of the worsening water supply situation and the demand imbalances in the ET basin (Table 1). This was how the literature proceeded to draw attention to the high likelihood of interstate conflict in the ET basin, assuming that the struggle over limited and threatened water resources could sever the already fragile ties between riparian states and lead to armed conflict in the basin (Bulloch & Darwish, 1993; Cooley, 1984; Naff & Matson, 1984; Starr, 1991; Starr & Stoll, 1987). Water, these authors asserted, was both a historical and a future cause of interstate warfare.

As there are striking asymmetries (it was held) among the riparians in terms of resource and power endowments (Lowi, 1993), disputes over water distribution in the major river basins of the Middle East were likely to lead to conflict. It was also highly unlikely that cooperative outcomes could be achieved in river basins such as the ET basin because the upstream riparian, keen to protect its advantageous position, would not be motivated to meet the downstream riparians’ needs (Waterbury, 1999). Furthermore, it was asserted, cooperation was only likely if it served the interests of a dominant power, which implied that in most cases the upstream riparian, such as Turkey in the ET basin, would take the lead in creating cooperative arrangements and enforcing compliance with its rules.

Critical hydropolitical theory

Although this literature presented the ET basin as one of the critical regions where water wars might take place, an international war over this scarce resource has yet to happen. Hence, another growing body of literature, ‘critical hydropolitical theory’ (Cascão & Zeitoun, 2010; Zeitoun & Warner, 2006) or ‘critical transboundary water interaction analysis’ (Zeitoun & Mirumachi, 2008; Zeitoun et al., 2017), asserts that the ‘consistent association of hydropolitics with conflict or security issues has led to an impoverished debate and hindered understanding of hydropolitics as a dynamic and ongoing process involving several other key dynamics – notably society, environment and culture’ (Cascão & Zeitoun, 2010, p. 29). This body of literature intends to contribute to the theoretical underpinning necessary for the effective interpretation and implementation of transboundary water governance by specifically focusing on the role of power and hegemony.

Critical hydropolitical theory was not the first school to conclude that power is the ultimate factor in determining the control of water in transboundary water issues. But it differs from the water wars literature in of its focus on the discursive as well as the material power of riparian states (Conker, 2014). Mirumachi and Allan (2007, p. 1) argue that the transboundary relations in the major river basins of the Middle East, including the ET basin, are dynamic and characterized by varying intensities of both conflict and cooperation: ‘Like all relationships, conflict and cooperation over transboundary waters are played out in power-determined contexts.’

In this literature, therefore, the framework of ‘hydro-hegemony’ is used as an analytical approach, recognizing that a characteristic common to most international river basins is the existence of hydro-hegemonic configurations based on power plays, including the influence
### Table 1. Overview of the state of the art of transboundary water governance in the Euphrates–Tigris river basin.

<table>
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<tr>
<th>Research agenda</th>
<th>Key premises</th>
<th>References</th>
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<tr>
<td><strong>Physical geography</strong></td>
<td>Understanding the physical characteristics of the basin is crucial to understanding the effects water management projects have on the rivers. The nature of transboundary water governance has been closely shaped by the construction of major development projects.</td>
<td>Altinbilek, 2004; Beaumont, 1998; Bozkurt &amp; Sen, 2013; Hillel, 1995; Kliot, 1994; UN-ESCA &amp; BGR, 2013; Venturia &amp; Capozzoli, 2017</td>
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<tr>
<td><strong>Water resources development</strong></td>
<td>The nature of transboundary water governance has been closely shaped by the construction of major development projects.</td>
<td>Allan, 1990; Altinbilek, 1997; Bakour, 1992; Kolars &amp; Mitchell, 1991; Meliczek, 1987; McLachlan, 1991; Tortajada, 2000; Unver, 1997; Wakil, 1993</td>
</tr>
<tr>
<td><strong>Contending theoretical approaches</strong></td>
<td><strong>Water wars literature</strong> The struggle over limited water resources could sever already fragile ties among riparian states and lead to armed conflicts in the basin. <strong>Critical hydropolitical theory</strong> Transboundary relations in the basin are dynamic and characterized by varying intensities of co-existing conflict and cooperation. Conflict and cooperation over trans-boundary waters are played out in power-determined contexts. <strong>Issue linkages</strong> Issue linkages established between transboundary water issues and non-riparian security issues play a significant role in transboundary water governance processes in the basin. <strong>Institutionalists</strong> Solutions to the water dispute could be realized through the institution-building efforts of the concerned parties. International water law (custom, treaties, protocols) and joint mechanisms (JTC and ETIC) have significant roles to play in reducing the risks of water-related conflicts.</td>
<td>Bulloch &amp; Darwish, 1993; Cooley, 1984; Naff &amp; Matson, 1984; Starr &amp; Stoll, 1987; Starr, 1991; Cascão &amp; Zeitoun, 2010; Daoudy, 2008; Mirumachi &amp; Allan, 2007; Warner, 2008; Zeitoun &amp; Mirumachi, 2008; Zeitoun &amp; Warner, 2006; Zeitoun et al., 2017</td>
</tr>
<tr>
<td><strong>Current and emerging issues and priorities</strong></td>
<td>Emergence of violent actors urges states to be prepared for attacks on water infrastructure, and to protect water during and after armed conflicts. When official tracks stall and cut, other initiatives can still provide channels for dialogue.</td>
<td>Hashim, 2014; Saatci, 2015; Tignino, 2010; Vishwanath, 2015; Von Lossow, 2016; Waslekar, 2017</td>
</tr>
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</table>

Source: the author.
of transboundary institutions and regimes. Hydro-hegemony is taken as ‘hegemony at the river basin level, achieved through water resource control strategies … that are enabled by the exploitation of existing power asymmetries’ (Zeitoun & Warner, 2006, p. 435).

The original work on hydro-hegemony was developed by examining three transboundary water contexts: the Jordan, Nile, and ET basins. That study revealed that open or ‘overt’ forms of power – such as ‘material’ power in the form of military force or economic might – are not as common as the water wars literature would make them out to be. The same and similar studies showed that in fact more hidden or ‘covert’ forms of power were much more prevalent in transboundary water contexts (Cascão & Zeitoun, 2010).

Updates to hydro-hegemony theory were provided to consider four fields of power. These identified material power (economic or military might) and riparian position as visible or overt forms of power, and bargaining power (during the negotiations process) and ideational power (the ability to frame perceptions and establish mindsets) as more hidden or ‘covert’ forms of power. An example of bargaining power the negotiations by the government of Syria, with the bargaining strategy being informed by linking Turkey’s multi-dam GAP with the latter’s interests in ending support of Kurdish separatist groups (Warner, 2008), as well as Syria’s repeated calls for applying international water law principles to the case (Daoudy, 2008). Bargaining power, therefore, offers key potential for non-hegemons’ attempts to challenge an inequitable status quo in a basin (Cascão, 2009).

The brief consideration of the hydro-hegemonic configurations in the Jordan, Nile and ET river basins revealed that, in each case, control was exerted by the hydro-hegemon through a combination of various fields of power. The theory emphasized, however, that configurations of power asymmetry are not static, and that current configurations are changing and are likely to respond to changing political or physical circumstances (Cascão & Zeitoun, 2010).

**Non-riparian issues**

The ‘issue linkages’ established between transboundary water issues and non-riparian security issues also played a significant role in transboundary water governance processes in the ET basin. Hence, another strand of literature argues that it is not water scarcity that is the defining variable in the riparians’ conflictive attitudes but non-water issues, such as domestic and international security concerns (Daoudy, 2009; Eder & Carkoglu, 2001; Scheumann, 1998; Warner, 2012). The regional context in which water issues may lead to interstate conflict and the role that non-water issues (e.g. territorial claims, support for separatist movements, security issues in general) played in the ET basin have been analyzed, for example, by Beschorner (1992), Scheumann (2003) and Lorenz and Erickson (1999). According to this line of reasoning, neither water conflict nor water cooperation can be understood without taking into consideration the broader political context of transboundary water relations between riparian states (Lowi, 1993).

Linkages are also identified between water conflict and other political conflicts at different scales (Harris, 2002). In this context, according to Eder and Carkoglu (2001), a perceived link between water resources development, socio-economic modernization and national integrity can clearly be identified in the rationale behind the GAP as Turkey’s largest regional development project. Water resources development, therefore, is an important tool in
establishing state legitimacy and authority in general; in addition, security concerns such as the territorial integrity of the state have played an important role in the context of the GAP (Eder & Carkoglu, 2001).

Scheumann analyzes how high-level Turkish decision-making structures established a link between water and security when concluding the 1987 Turkish–Syrian Protocol on Economic Cooperation: its conclusion was made possible by simultaneous negotiations on security matters and water issues. Then Turkish Prime Minister Turgut Ozal, the decisive political actor at the time, promised a certain flow of the Euphrates River over the Turkish–Syrian border, with the intention of reaching an agreement with Syria on security matters (Scheumann, 1998, 2003). At the same time, they signed a Mutual Security Accord, setting out that each state would prevent activities against the other from originating in its territory and that criminals responsible for terrorist activities would be extradited. Ozal believed that the Kurdistan Workers’ Party (PKK) would cease its attacks if Syria stopped supporting it. For a while, it seemed he was right, but the dramatic upsurge in fighting between Turkish security forces and the PKK in 1988–89 led to renewed Turkish concerns about Syrian PKK support.

Interestingly, ‘issue linkages’ are also evaluated in the context of transboundary water cooperation. Multi-resource linkages may offer more opportunities for creative solutions, enabling greater economic efficiency through a ‘basket of benefits’ (Wolf, 1999, p. 181). One productive approach to the development of transboundary waters was to take a regional view of the benefits that were to be derived from the basin (Sadoff & Grey, 2005). The ET case supports the observation that if negotiations focus solely on water sharing, upstream and downstream differences are exacerbated, giving greater prominence to water gains and losses. This has regularly required the riparians to see water as more than just a commodity that is to be divided—a zero-sum, rights-based view—and to develop a positive-sum, integrative approach that ensures the equitable allocation of the benefits derived from water.

Some authors, therefore, have advocated ‘benefit sharing’ as a concept, which implies a change from the allocation of water in mere volumetric terms to the allocation of the benefits derived from the use of the river (Dombrowsky, 2009; Sadoff & Grey, 2002, 2005). This concept suggests that countries can turn the perceived zero-sum game of water allocation into a positive-sum game. Rather than conceptualizing water use in quantitative terms, states should conceive of a river as a productive resource and attempt to increase and, ideally, maximize the economic benefits of its use. The notion of benefit-sharing in the use of shared rivers is advanced _inter alia_ by Sadoff and Grey (2002) and was taken up by Kibaroglu (2002) and Kibaroglu and Gursoy (2015) for the ET basin.

Kibaroglu (2002) explains that Turkey suggested in the 1980s that rather than sharing waters through simple arithmetic, as demanded by Iraq and Syria, the benefits of water-based development projects and water structures could be shared by way of conducting joint inventory studies of water and land resources as a basis for a trilateral allocation agreement in the ET basin. Turkish policy makers argued that the benefit-sharing approach fitted Turkey’s historical position and provided opportunities for win-win solutions. In the early 2000s, Turkey came up with more concrete proposals, such as the joint dam development projects in the river basins, as initiatives for enhancing mutual benefits related to hydropower, irrigation and flood control (Rende, 2002).
Institutionalists

Another group of scholars and experts, the ‘institutionalists’, claim that water-related disputes stem from inefficient and inequitable utilization and management of limited water resources (Beschorner, 1992; LeMarquand, 1977; Rogers & Lydon, 1994). Hence, they argue that achieving effective management of water resources may also ameliorate political relations between the riparian states. Institutionalists believe that solutions to water disputes can be found through the institution-building efforts of the parties concerned (Jagerskög, 2003).

The quantitative work on the Transboundary Freshwater Dispute Database, led by Wolf (2002), has been instrumental in demonstrating that cooperative forms of interaction such as the creation of joint institutions over transboundary waters are not exceptional. An increasing number of joint institutions with different mandates can be identified in various transboundary water contexts across the globe (Wolf, Kramer, Carius, & Dabelko, 2005). Institutionalists assume, therefore, that water-related disputes are more likely to lead to political confrontations and negotiations than to violent conflict.

While there are still real concerns over the equitability of distribution, they believe that water wars are highly unlikely in the region (Beschorner, 1992). They emphasize that water-related disputes are a consequence rather than a catalyst of deteriorating relations between states (Giordano, Wolf, & Giordano, 2008). Institutionalists insist, moreover, that it would be too simplistic to argue that an upstream riparian, being the sole hegemon, would engage in unilateral appropriation or diversion of a shared watercourse without consultation because this would fail to take into account the complex political and economic relationships among the riparian states. Institutionalists point out that there has been a significant trend towards collaboration, even though this is largely confined to technical matters, such as cooperation on the exchange of hydrological data, flood forecasting, joint hydroelectric power and water-recovery ventures.

In the context of the ET basin, institutionalists have analyzed the early ad hoc technical negotiation processes (1960s–1980s), along with recurrent diplomatic crises (Kibaroglu, 2002; Kibaroglu & Unver, 2000). The main theme of these technical negotiations was the impact of the construction of the Keban Dam in Turkey and the Tabqa Dam in Syria on Iraq’s historical water use patterns. While Turkey proposed the establishment of a Joint Technical Committee to determine the water and irrigation needs of the riparians, Iraq insisted on a guarantee of specific flows and a water-sharing agreement. Though Turkey released certain flows during the construction and impounding of its Keban Dam, no final allocation agreement was reached even after numerous technical meetings (Gurun, 1994).

Throughout this period, transboundary water issues were regarded by each country’s political leadership as falling between economic and technical objectives, which could be handled by official technical delegations. Water negotiations were held, therefore, by technocrats from the riparians’ central water agencies, accompanied by diplomats who advised and monitored the negotiations, particularly when international legal and political aspects were under discussion (Kibaroglu & Scheumann, 2013). The early technical negotiation processes, however, were unable to prepare the ground for a comprehensive treaty on equitable and effective transboundary water management. And so, even though a hot conflict over water did not occur in the basin, a true institution-based cooperation framework failed to come to fruition.
Institutionalists argue that international water law has a significant role to play in reducing the risks of water-related conflicts and supplying guidelines for better management and allocation of transboundary water resources (Cano, 1989; Caponera, 1985; Garretson, Hayton, & Olmstead, 1967; McCaffrey, 1991). In the specific case of the ET basin, concerned scholars and experts have provided legal analyses of the treaties and customary laws applicable to transboundary water governance (Burleson, 2005; Dellapenna, 1996; Elver, 2002; Kaya, 1998; Kibaroglu, 2002, 2014; Kirschner & Tiroch, 2012; Wouters, 2013; Wouters, Kibaroglu, & Ahmad, 2014). The existing bilateral agreements between the ET states have been analyzed, describing their key provisions as well as the institutions created, and evaluations of the legal effectiveness of these institutions have been conducted. The focus has been on legal analysis and a chronological overview of the international legal relations between the ET states in relation to transboundary governance, as well as on identifying and elaborating aspects related to cooperation and conflict (Kirschner & Tiroch, 2012).

Though the effectiveness of international water law is questionable in many transboundary settings, states frequently invoke international customary law principles during water negotiations (McCaffrey, 2007). The ET basin water negotiations, for example, have witnessed several instances of riparian diplomats raising international customary water law principles to support their political positions; on several occasions, they raised the two cornerstone customary law principles of the equitable and reasonable utilization of water resources between states and of no significant harm being done to transboundary waters.

Yet, over the course of the negotiations, the three major riparians had diverging opinions regarding the application of the equitable utilization principle in the ET basin. Syria and Iraq acted together in claiming their historical rights. They also insisted on sharing the Euphrates River based on an arithmetical formula. Turkey, on the other hand, claimed that the waters of the ET basin could only be allocated on the basis of objective calculations of the riparians’ needs, and so Turkey put forward the Three-Stage Plan, encompassing studies and examinations of water and land resources in the ET basin and evaluating the riparians’ needs according to these studies as the third stage (Turkish Ministry of Foreign Affairs, 1996).

According to Scheumann (1998), the positions of the upstream riparian (Turkey) and downstream riparians (Syria and Iraq) were largely shaped by the water and land resources development plans. That is to say, while Syria and Iraq tried to protect their existing water uses and resisted any change in the flow of the rivers, Turkey emphasized its increasing needs from the rivers and the necessity of developing new water structures. International customary water law incorporates a non-exhaustive list of guidelines for determining equitable and reasonable shares (ILA Helsinki Rules, 1966). The ET basin riparians, however, could not agree on such factors and could not develop common criteria for equitable utilization (Kirschner & Tiroch, 2012).

International customary water law principles could become clearer and more effective through multilateral conventions. The adoption (1997) and entering into force (2014) of the UN Watercourses Convention, therefore, is a remarkable achievement in the codification and progressive development of rules of international water law which would, in turn, assist countries in building institutions to tackle mismanagement and misallocation problems in major international water controversies. Both Iraq and Syria signed and ratified the convention. Turkey has not signed it and was, moreover, one of the three states that voted against its adoption in the UN General Assembly.
The Turkish position on the convention is perceived as an impediment to a consensus on the rules applicable in the ET basin (Wouters, 2013). Even though the convention is an important source of international water law, however, there is an evolving set of customary international water law which defines rights and obligations with regard to transboundary water cooperation. Hence, ET basin riparian states must comply with the existing rules of customary international water law regardless of whether they are party to the UN Watercourses Convention (Kirschner & Tiroch, 2012). Customary international water law embodies universal principles and norms, and those principles need to be operationalized and institutionalized through the rules of basin-specific agreements.

**Treaty law: the 1987 Turkey–Syria and 1990 Syria–Iraq protocols**

Even though historical bilateral treaties, which were concluded between the young modern Turkish Republic and its neighbours, included some clauses on water usage and development (Kirschner & Tiroch, 2012), including the comprehensive 1946 Protocol between Turkey and Iraq (Kibaroglu, 2002), the current legal framework for transboundary water governance in the ET basin is basically bound by the 1987 Turkey–Syria and 1990 Syria–Iraq bilateral protocols as legally binding instruments of international law (Kibaroglu et al., 2005).

Turkey and Syria signed the Protocol on Economic Cooperation in 1987. It contains, among other things, provisions related to the allocation of the waters of the Euphrates River. Turkey guaranteed to release 500 m$^3$ of water per second from the Euphrates, with deficiencies in any month to be compensated the next month (Article 6). It was also agreed that Turkey and Syria would invite Iraq for reaching an agreement to allocate the waters of the rivers Euphrates and Tigris in the shortest possible time (Article 7). Article 8 sets forth that the two sides agreed to step up the work of the Joint Technical Committee on Regional Waters. Both states also agreed to build and jointly operate irrigation and hydroelectric power projects (Article 9).

In 1989, Turkey had to interrupt the flow of the Euphrates for some weeks when the Atatürk Dam reservoir was filled. This caused anxieties on the Syrian and Iraqi sides. They agreed to determine their bilateral shares from the Euphrates before such interruptions occurred again as the GAP progressed. At the 13th meeting of the JTC in Baghdad, therefore, a bilateral agreement between Syria and Iraq was signed (on 16 April 1990), according to which 58% of the Euphrates waters coming from Turkey would be released to Iraq by Syria (Law No. 14 of 1990). The protocol stipulates: ‘The contingent of water to Iraq passing through the Syrian-Iraqi border is to be a permanent annual total rate of 58 per cent of the river water passing into Syria at the Syrian-Turkish border. The Syrian contingent of the river waters is to be the rest of the waters, totalling 42 per cent of the waters passing through the Syrian-Turkish border.’

Both protocols are bilateral and pertain only to sharing the waters of the Euphrates River. They do not provide any conditions for efficient and equitable use and management of transboundary water resources in the ET basin. Institutionalists believe that an integrated approach should be adopted in transboundary water management in order to be able to respond to challenges and needs, allowing, for example, water quantity and quality issues to be handled concomitantly with the protection of environmental resources. By focusing narrowly on water quantity issues, both protocols fall short of adopting Integrated Water Resources Management. Furthermore, they lack institutional mechanisms for overseeing the implementation of their provisions. The protocols are inadequate for addressing
variability in the flow of the Euphrates River. Droughts and floods, which often happen in the basin, produce substantial changes in the river flow regime, but the protocols do not include clauses providing for adjustments under the impact of climate change (Kibaroglu & Scheumann, 2013).

A holistic approach to transboundary water governance: memoranda of understanding

In 2008 and 2009, the governments of Turkey, Syria and Iraq embarked on cooperative foreign policy initiatives. Cooperative initiatives related to transboundary waters were agreed by signing a series of bilateral memoranda of understanding (MOUs) on the protection of the environment, water quality management, water efficiency, drought management and flood protection with a view to addressing the adverse effects of climate change.

In this context, Turkey and Iraq signed a protocol on water in 2009 (Memorandum of Understanding, 2009a), covering issues such as sharing hydrological and meteorological data; efficient use and management of regional waters; appraisal of water resources that are under stress due to increasing water use and climate change; harmonization of existing hydrological measurement facilities; modernization of existing irrigation systems; avoidance of losses in the domestic water sector; building water supply and water treatment infrastructure in Iraq with the involvement of Turkish companies; and joint investigation, planning and implementation for flood control and drought management. The protocol demonstrates that the authorities concerned emphasized relevant aspects of good transboundary water governance rather than insisting on corresponding water rights.

Turkey and Syria signed four protocols involving the waters of the Euphrates, Tigris and Orontes Rivers. These protocols encompass issues such as jointly building a dam on the border where the Orontes passes from Syria into Turkey, utilization of water by Syria where the Tigris River is the border between Turkey and Syria, drought management, efficient water management, improved water quality management, and protection of the environment (Memorandum of Understanding, 2009b; Memoranda of Understanding, 2009c). In contrast with the 1987 protocol, which concentrated on sharing of the Euphrates waters, these MOUs emphasized the patterns and levels of water development, use and management and dealt particularly with drought management and environmental protection.

These bilateral MOUs could not be put into practice due to regional instability and increased political tensions between the riparian states. The MOUs also faced the ever-present challenges of incompatibilities in national, institutional and legal frameworks, complex national water management systems and uncoordinated water management practices among the basin countries (Wouters et al., 2014). The existing water protocols, therefore, can only be properly implemented when the riparians’ institutional capacities are upgraded and harmonized in more conducive political circumstances.

The Joint Technical Committee

International water law embodies principles and norms that instruct riparian states to create joint mechanisms for dealing with transboundary water issues in a cooperative manner (e.g. Article 24 of the UN Watercourses Convention, 1997). By the late 1970s, transboundary water relations in the ET basin became competitive and complex. The accelerated development of the Euphrates by Turkey and Syria caused significant anxiety on the Iraqi side. With water development projects in the ET basin progressing rapidly, there arose a need to establish
regular contacts and technical information exchange. In this context, Iraq proposed to establish a permanent technical institution: the JTC, which was established at the first meeting of the Joint Economic Commission between Turkey and Iraq in 1980. With Syrian participation in 1983, it became a trilateral body, whose mandate was to determine ways and means of producing a formula for reasonable and equitable utilization of the ET basin waters (Final communiqués of the 16 Joint Technical Committee meetings, 1980-1993).

But in 1993, after 16 unproductive meetings, the JTC was suspended. Analysis of the minutes of its meetings shows that the JTC could not make any progress due to the riparians’ diverging positions on the scope and aim of the negotiations. While Turkey insisted that the negotiations should comprise the entire ET basin as a single river basin, Iraq and Syria maintained that talks should focus on the Euphrates. A common understanding of the aim of the negotiations was also lacking. While Turkey proposed a trilateral plan (the Three-Stage Plan) for determining the ‘utilization of transboundary watercourses’, Iraq and Syria strongly insisted on reaching a ‘sharing formula’ for the ‘international river’. Iraq and Syria considered the Euphrates an international river and suggested that an instant sharing treaty be concluded, based on the demand declared by each country. Turkey, however, considered the Euphrates and the Tigris as constituting a single transboundary river basin, whose waters should be allocated according to objective needs (Kirschner & Tiroch, 2012).

With its flawed structure and functioning, the JTC failed to create a proper setting for fruitful discussions over the riparians’ prime concerns and requirements as a basis for addressing regional water problems. In fact, the riparian states did not share any information or experience on their water use and management practices. No progressive exchanges took place over how legislative and institutional structures were to be harmonized. Contrary to the expectations of the institutionalists, the JTC did not become a medium for transboundary Integrated Water Resources Management. One should also add that JTC meetings were closely related to the overall political relations in the region at the time and that the overarching Cold War framework with its imposed tense political atmosphere had a negative impact on the performance of the JTC (Kibaroglu & Scheumann, 2013).

Track II in transboundary water governance: the Euphrates-Tigris Initiative for Cooperation

Institutionalists also believe that Track II initiatives are instrumental in establishing and sustaining good water governance (Huntjens et al., 2016). In this respect, a significant development in the ET basin is the Euphrates-Tigris Initiative for Cooperation (ETIC), which was established in May 2005 by a group of scholars and professionals from the three main riparian countries (ETIC, 2017). The overall goal of the initiative is to promote cooperation among the three riparians with a view to achieving technical, social and economic development in the ET region (Kibaroglu, 2008). In line with this vision, the ETIC implemented joint training and capacity-building programmes in 2006–2011 for professionals, practitioners and government officials from Iraq, Iran, Syria and Turkey on dam safety, river hydrology, conflict management and geographic information systems (ETIC, 2017).

The ETIC also conducted the research project Collaborative Planning and Knowledge Development in the Tigris Euphrates Region between 2009 and 2012. The objectives of the project were to foster collaboration and build confidence among practitioners from the riparian countries, establish a data inventory for the ET region, harmonize it, organize
capacity-building courses and produce a clearinghouse. The project team was composed of eight universities in Iraq, Syria and Turkey.

Thus, the ETIC has demonstrated that it is possible to successfully design and implement a technically complex and politically sensitive activity across national borders. Due to the positive outcome of this riparian collaboration, the methodology developed in implementing this activity attracted the attention of government officials and raised the profile of the ETIC. Since then, officials of the riparian countries have been informed by the ETIC about the activity results, and some of them have expressed an interest in enlisting as a Track II diplomacy organization to provide support in the ET region (USAID, 2010).

Conclusion: current and emerging issues and priorities

Control of water resources by non-state violent actors

Notwithstanding the failures in inter-state water cooperation and the shortcomings and loopholes in the existing water agreements, the present overarching challenge in the ET basin is to coordinate water resources management and establish good transboundary water governance in the midst of the current state of affairs. The Syrian civil war and overall political instability, which have had deep impacts and spillover effects in the region, demonstrate that, while the genesis of the conflict is a complicated narrative, water is certainly part of it. With the rising violence and instability in the region, and with no regional coordination and poor security schemes along the rivers themselves, violent non-state actors such as the Islamic State (IS) have been able to use water both as a resource and as a weapon. Not only have they destroyed water-related infrastructure, such as pipes, sanitation plants, bridges, and cables connected to water installations, but they have also used water as an instrument of violence by deliberately flooding towns, polluting bodies of water and ruining local economies by disrupting electricity generation and agriculture (Vishwanath, 2015).

In 2014, for instance, when IS shut down Fallujah's Nuaimiyah Dam, the subsequent flooding destroyed Iraqi fields and villages. In June 2015, they closed the Ramadi barrage in Anbar Province, reducing water flows to the famed Iraqi Marshes and forcing the Arabs living there to flee. The capture of the Mosul Dam, while it was in the group's possession for a few weeks in August 2014, gave IS control of nearly 20% of Iraq's electricity generation (Von Lossow, 2016). Since the civil war erupted in Syria, furthermore, IS has seized the opportunity to control territory in the conflicted region by joining the fight against the Assad regime (Hashim, 2014).

IS subsequently lost control of all of the dams, but not before using them to flood or starve downstream populations and pressure them to surrender. At the same time, governments and militaries have used similar tactics to combat IS, closing the gates of dams or attacking water infrastructure under their control, thus also causing the surrounding population to suffer. The Syrian government has been repeatedly accused of withholding water, reducing flows or closing dam gates during its battles against IS or other rebel groups, and of using the denial of clean water as a coercive tactic against many Damascus suburbs thought to be sympathetic to the rebels. Water contamination is widespread, disastrously increasing the incidence of deadly water-borne diseases.

The emergence of IS as the non-state violent actor in the region means that riparian states must be thoroughly prepared for and responsive to possible attacks on the region's water
supplementary development infrastructure. This should also convince the riparian states of the need to establish regional security arrangements to preserve and protect their resources. With collaborative management underpinning collective protection, water – often a source of competition and conflict – could become a facilitator of peace and cooperation (Waslekar, 2017).

**Protection of water during conflict**

Tignino (2010) analyzes the link between water and international peace and security by focusing on the impact of armed conflict on water. She concludes that ensuring access to water, along with protecting water resources, contributes to preventing conflicts and to the transition to peace in post-conflict states. The Global High-Level Panel on Water and Peace, which was launched in Geneva in 2015 to develop a set of proposals for strengthening the global architecture to prevent and resolve water-related conflicts, also produced recommendations for protecting water during and after armed conflict (Geneva Water Hub, 2016).

As the Syrian civil war is pushing the riparian states to develop new water governance principles and practices in conflict and post-conflict situations, the riparian states in the ET basin should improve their understanding of the strategic role that water and water supply infrastructure play in armed conflicts and to reflect on possible ways to improve the protection of water under international law during and after armed conflicts. The linkage between international humanitarian law (Additional Protocols of 1977 to the Third and Fourth Geneva Conventions of 1949) and the law on transboundary water resources (Article 29, UN Watercourses Convention, 1997) may ensure better protection of water during armed conflict. The riparian states should also envisage joint ways of dealing with transboundary water resources during reconstruction and rehabilitation efforts in the post-conflict phase.

**Enduring cooperation frameworks: the Turkey–Iraq track**

After years of suspension, JTC meetings were revitalized in 2007. A series of meetings were held on a bilateral and trilateral basis, although irregularly, until the civil war erupted in Syria. After years of deadlock in transboundary water relations, due to uncertainties imposed by the Syrian civil war, Turkey and Iraq decided, at the ministerial level, to reopen dialogue on their transboundary water resources. In this context, the Minutes of the Bilateral Cooperation Meeting between Turkey and Iraq (signed by the deputy undersecretary of the Ministry of Forestry and Water Affairs, Turkey, and the head of the unit for Neighbouring Countries and Law of the Ministry of Foreign Affairs, Iraq, 15 May 2014) encompass principles, modalities and issues of bilateral water cooperation.

According to this official document, both sides agreed in principle to continue to hold meetings aiming to further develop transboundary water relations. Both sides agreed to advance technical collaboration, to further develop and diversify technical training, and to engage in technical cooperation on issues relating to irrigation systems. It was decided to establish a joint working group with a mandate to make preparations for projects on the Hacibey Stream and the Lesser Zab (Tigris River tributaries). This working group would prepare a report to be presented to the ministers of both countries. Turkey agreed to notify the Iraqi side six months prior to impoundment of the Ilisu Dam and further agreed to provide an impoundment plan to the Iraqi side. A visit by the Iraqi delegate to the Ilisu Dam site was planned for a later date under appropriate conditions. It was agreed that the Iraqi side would
extend official demands to the Turkish side concerning technical help for preventing water losses in the Mosul Dam. It was decided to establish bilateral cooperation on environmental matters relating to the Tigris River. It was also agreed that each side would provide technical support to each other if the need arose.

On 25 December 2014, furthermore, the 2009 Turkish–Iraqi MOU on Water (Memorandum of Understanding, 2009a) was revisited, and Article 2 (paragraph ‘a’) was amended. It was decided that ‘Cooperation on joint projects on the water resources management in the Euphrates and Tigris shall further be developed. This cooperation will include the assessment of water resources and the increase in water use (agricultural, industrial, municipal and drinking water) and climate change. Turkey will release equitable and reasonable river waters to Iraq according to the above assessment. During the joint studies, the current situation of the water resources in respect to the meteorological and hydrological conditions in the Euphrates and Tigris will be determined’ (Saatci, 2015).

As a follow-up activity, water experts from concerned ministries in Turkey and Iraq met in Istanbul in 2016 (SUENa, 2016). They discussed the enhancement of water cooperation between Turkey and Iraq, joint technical studies on climate change and the organization of technical training programmes. Both parties agreed to complete the legislative processes required to put the Memorandum of Understanding (2009a) into force. Parties also agreed to form a joint expert committee to study and investigate the proposed Hacibey and Karadag friendship dam projects on the Turkish–Iraqi border.

The Turkish Water Institute (SUEN, Turkish acronym), founded in 2011 as a national think tank under the Ministry of Forestry and Water Affairs, conducted training programmes for the Iraqi experts. A delegation of 10 experts from the Ministry of Water Resources of the Republic of Iraq attended a short course at SUEN in 27–31 March 2017, with a programme of lectures covering the planning of water resources, water and wastewater treatment, water quality management and river basin planning. Field trips were made to the drinking water and wastewater treatment plants in Istanbul (SUENb, 2017).

Thanks to this enabling political atmosphere, created by the state institutions concerned, various other actors of transboundary water governance have taken initiatives to foster cooperation between Turkey and Iraq. The Strategic Foresight Group (SFG), a Mumbai-based think tank, facilitated dialogue between Iraq and Turkey, involving policy makers and experts from the two countries. With the support of the Swiss Agency for Development and Cooperation, the SFG organized a series of meetings in 2013–14, with stakeholders from both countries deciding to focus on the Tigris River, as the situation in Syria did not allow any basin-wide cooperation on the Euphrates River.

As a culmination of its efforts, the SFG organized a meeting between senior representatives from Iraq and Turkey in June 2014. The delegations, comprising senior advisors of the prime ministers, former cabinet ministers, members of parliament, officials of water ministries and water authorities and experts from Iraq and Turkey, established consensus on a Plan of Action to promote exchange and calibration of data and standards pertaining to Tigris River flows. The plan was expected to contribute significantly to transforming water from a source of crisis into an instrument of peace. Such a change in the role of water in a challenging region such as the Middle East requires institutional arrangements. On several occasions, the governments of Iraq and Turkey have agreed in principle to promote exchange and harmonization of water data. The SFG initiative intended to help both countries take the agreement to the next level of an operative plan of action.
The Center for Middle Eastern Strategic Studies (ORSAM, Turkish acronym), a non-profit research centre in Ankara, organized a workshop called Water Issues in Turkey-Iraq Relations for 15 March 2017, in cooperation with the Nahrain Center, Iraq, and the Iraqi Embassy in Ankara. The Iraqi water resources minister participated as the keynote speaker. The workshop was attended by diplomats, bureaucrats and academics from both countries and addressed the following issues: the importance of water in bilateral relations; the importance of the Tigris and Euphrates Rivers to the Iraqi people; inefficient water policies in Iraq before 2003; the impact of IS presence on water management in Iraq; the situation of the Iraqi water infrastructure and reconstruction projects; and the management of irrigation waters in Iraq.

The Turkey–Iraq track, involving official as well as non-official contacts, demonstrates that, when multilateral negotiations became impossible, riparians can continue talks on their transboundary waters at a bilateral level even in volatile times. Turkish and Iraqi government officials as well as water professionals have made sustained efforts to create new areas for water cooperation, such as developing projects for building joint dams on the border.

Yet, the Turkey–Iraq track fell short of adopting joint strategies for response the actions of violent non-state actors and could not build a basin-wide understanding for protecting water resources during and after conflict. New water cooperation frameworks, therefore, should address these thorny issues. Moreover, on the eve of the referendum that took place 25 September 2017 by the Kurdistan Regional Government (KRG), Messoud Barzani, president of the KRG, stated that the ‘referendum is for independence’. He added that ‘after the referendum, we will start dialogue with Baghdad and other parties’, noting that ‘the issues of borders, water, and oil would be among those being discussed’. The possibility of an independent Kurdish entity would certainly exacerbate tensions in transboundary water relations and would be very likely to result in non-recognition of that entity by Turkey, Syria, Iraq and Iran, the riparian states of the ET basin. This would lead to a protracted political struggle in the region.

This state-of-the-art review shows that the existing transboundary water institutions, such as the JTC, could act as a multilateral platform for implementing water cooperation frameworks. Compared to bilateral water sharing treaties, moreover, the existing MOUs, with their broader outlook, can provide useful guidelines for comprehensive transboundary water cooperation. However, these bilateral MOUs should be synthesized into a multilateral protocol involving all of the riparian states and all of the stakeholders concerned, including civil society organizations and private companies in the energy, agriculture, environment and health sectors as well as relevant development-related sectors.

Whenever there is an opportunity to do so, transboundary water cooperation should be resumed from a variety of perspectives that may provide opportunities for regional cooperation. These should include, among other things, joint initiatives for collecting reliable data on surface and groundwater resources. In fact, water technocrats drafting the MOUs have already emphasized this aspect by referring to the issue of the assessment of water resources and the calibration of existing hydrological measurement stations in the bilateral protocols. Such objective and consistent knowledge of the river system would allow joint projects to be conducted in water-related development fields, such as energy, agriculture, the environment and health (Kibaroglu & Scheumann, 2013).
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