

Transboundary water governance in the European Union: the (unresolved) allocation question

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Abstract

While the European Union (EU) has one of the most extensive and sophisticated supranational water policy worldwide, its transboundary governance framework has certain structural deficiencies that may eventually give rise to significant cooperation gridlocks over shared river basins. Most prominently, EU water law as well as the numerous European basin treaties almost comprehensively ignore transboundary water quantity management and allocation questions. This lacuna is due to a series of hydro-geographical, political and institutional factors prevailing at the time when the foundations of today's European framework of transboundary water governance were laid down in the 1980s and 1990s. Yet, changing hydrological conditions points to increasing fluctuations in water quantities in European river basins. Due to their one-sided ecological focus, however, the existing European governance mechanisms may prove unable to handle a growing competition for water among riparian states in case of flow variations beyond historical ranges. This article investigates the roots and the possible future implications of the unresolved transboundary allocation question within the EU.

Keywords: European water law; Hydropolitics; Shared river basins; Water allocation

Introduction

Around 47% of the Earth's surface waters lie in river basins shared by at least two countries. These basins are home to some 40% of the world's population and account for about 60% of the global river flow (Wolf *et al.*, 1999). The various human-induced pressures of the past decades – population growth, urbanisation and climate change – are leading to a massive decline in the quality and availability of freshwater resources worldwide. As a result, by 2030, the world is projected to face a 40% water deficit, if current negative trajectories remain unchanged (UNESCO, 2015). This condition elevates the question of transboundary water management, and more particularly, the issue of water sharing into the forefront of international political discourse.

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Most legal and political studies on transboundary water allocation focus on regions characterised by scarce water resources, growing competition for water and/or low levels of co-riparian cooperation, such as the Nile-basin, the Tigris-Euphrates, the Aral Sea basin or the Mekong. As a result, hydropolitical analyses have, thus far, conspicuously ignored the European Union (EU) that is often perceived as the picture-perfect land of voluntary cooperation. Indeed, transboundary water governance in the EU has had remarkable achievements, whose crown jewel – the so-called Water Framework Directive (WFD) – is probably the most sophisticated supranational water protection instrument globally (Reichert, 2016).

Yet, the EU is home to the highest number of shared river basins in the world whose consensual co-management comes more and more under pressure in view of rapidly changing hydrological conditions. Thus, mounting evidence suggests that the success of future hydro-cooperation within the EU will – as elsewhere – largely depend on the reconciliation of competing national water demands, a political challenge that has so far largely spared EU member states and institutions.

Problem-setting: the role of water quantity management in hydropolitics

Water quantity management and water allocation: mechanisms clarified

Water quantity management in a transboundary context has several dimensions. The most apparent facet is the distribution of flow volumes among riparian states in *regular conditions*, including natural variations. Another dimension of water quantity management is the control of stream flow in *extreme situations*, i.e. where volumes exceed the regular ranges of fluctuation for reasons of natural character (floods, droughts) or of human origin (accidental releases). Finally, water quantity management includes *deliberate human interventions* to control river flow (volumes, timing) by way of water infrastructure (e.g. reservoirs) and other management measures (e.g. reduction of upstream water abstraction in times of drought). A critical, albeit not, quintessential element of quantity management is the deliberate partition of volumes of water among riparian states: *water allocation*. (Although much of the relevant literature refers to ‘quantity management’ and ‘allocation’ as interchangeable terms, this article refers to allocation as a subset of the broader category of water quantity management.)

Legal and institutional arrangements for water allocation can take several shapes. In their comprehensive analysis, Drieschova *et al.* (2008) classify the patterns of water-sharing regimes as follows:

- *Direct allocation mechanisms*: these clearly stipulate how the water is to be divided between the parties. Direct allocation mechanism can be *flexible*, i.e. distributing the resource by percentages or fixed quantities according to water availability or *fixed mechanisms* that divide water by absolute volumes.
- *Indirect allocation mechanisms*: indirect allocation mechanisms establish processes through which actual allocations are to be determined, but without setting precise quantities or proportions to be shared. These include:
 - consultations between parties,
 - obligation to notify when water needs arise,
 - requirement for co-riparian states to consent to any increased water use and
 - prioritisation of uses.
- *Allocation principles and guidelines*: these are broader ideas or concepts for determining how water should be allocated. Such principles include:

- equitable and reasonable utilisation,
- rational use,
- sustainable use,
- no harm,
- protection of existing uses.

Each mechanism has benefits and drawbacks. *Direct mechanisms* provide clarity, but it can be difficult to reach agreement on actual quantities of water every time the issue is (re-)negotiated. Direct fixed mechanisms may effectively ignore natural fluctuations in water quantity, let alone out-of-range variations triggered by climate change. If the allocation mechanism is rigid and inflexible, the parties may be less able to honour their commitments once natural water availability changes. *Indirect mechanisms* are flexible, but open-ended, which may turn problematic when precise direction is needed. Such ambiguity may allow parties to reach an agreement relatively easily, but may also lead to controversy later, especially when the availability of water does not satisfy all parties' needs (Dinar *et al.*, 2014). The latter conclusion applies particularly to the broad legal principles of water sharing, such as equitable and reasonable utilisation, that – as Giordano and Wolf have demonstrated – have very little practical impact on the actual practice of water allocation (Giordano, 2002).

Water allocation in the context of hydropolitics

Conventional wisdom and empirical study suggest that quantity management, and in particular allocation of water among riparian states, is one of the most frequent and powerful drivers of interstate disputes in a transboundary basin context (Figure 1). In other words, the relative importance of allocation questions in co-riparian relation correlates with the hydropolitical complexity of a given basin.

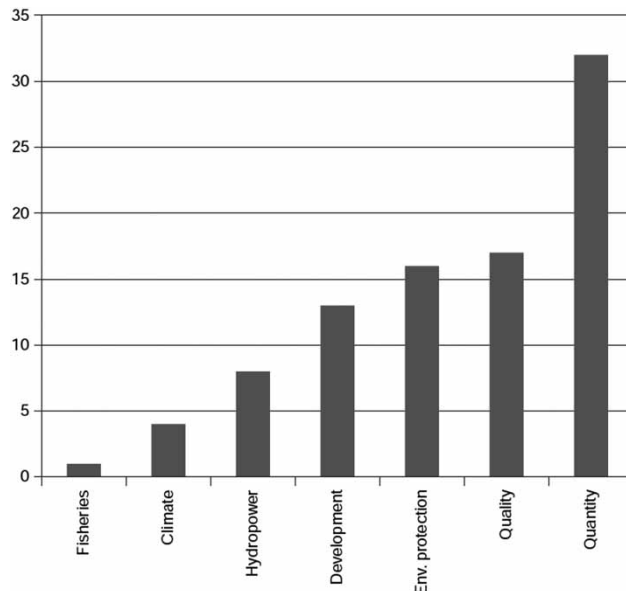


Fig. 1. Relative importance of issues in transboundary water disputes (the columns represent the number of instances involving a particular collective action problem from a sample of 116 transboundary river basins). *Source:* Schmeier (2013), Figure 3.3, p. 68.

In fact, as Aaron Wolf – a leading authority on hydropolitics – contends, it is the ‘question of equitable allocations’ that lies ‘at the heart of most international water conflicts’ (Wolf, 1999). It is, therefore, not surprising that much of the world’s water-related legal apparatus is primarily concerned with water sharing, since the presence of allocation mechanisms may confer resilience to any given transboundary governance scheme.

Recently, the impact of water allocation mechanisms on the stability of co-riparian relations was tested through quantitative mathematical modelling by (Dinar *et al.* 2014). It was found that the presence of a water allocation mechanism *per se* is no panacea. There are several basins that display a high degree of hydropolitical stability despite the absence of allocation mechanisms in their transboundary governance arrangements. This – conclude the authors – flows from an endogeneity issue: in basins where no hard allocation problems are likely to arise riparian states tend not to negotiate and institutionalise water-sharing mechanisms. In a paradoxical fashion, it was also established that certain types of allocation mechanism do more harm than good to hydropolitical stability. As mentioned, rigid and inflexible water-sharing arrangements that ignore actual or future hydrological variations are more likely to contribute to the rise of co-riparian tensions than to alleviate them. Similarly, ambiguity and vagueness in water allocation may negatively affect the relations among states. In conclusion, the mere presence of an allocation mechanism does not necessarily increase resilience. On the other hand, allocation mechanisms that are both flexible and specific tend to increase the likelihood of cooperative behaviour among riparian states (Dinar *et al.*, 2014).

Water allocation mechanisms in the world: a global overview

Historically, quantity management, in general, and allocation, in particular, have been *a dominant feature* of international water treaties. In fact, water-sharing schemes have been the primary focus of almost 40% of all transboundary water agreements concluded during the 20th century (Rieu-Clarke *et al.*, 2012). Allocation schemes feature equally high in contemporary water treaties. Based on a comparative analysis of basin-specific agreements concluded between 1980 and 2002, Drieschova *et al.* found that 60% of such agreements contained one of the three allocation mechanisms referred to above, while 26% included one or more direct allocation mechanisms. An indirect mechanism is employed in about half of the treaties, often complementing a direct mechanism (Drieschova *et al.*, 2008).

Yet, the most authentic codification of contemporary international water law, the 1997 *UN Convention on the Law of Non-navigable Use of International Watercourses*, does not set out water allocation mechanisms. It nonetheless lays down the principle of equitable and reasonable utilisation (Art. 5.1) that is meant to provide core guidance for all allocation mechanisms (Rieu-Clarke *et al.*, 2012). Importantly, however, no hard and fast rules can be derived from the equitable and reasonable utilisation imperative, nor is it supported by robust international judicial practice (Baranyai & Bartus, 2016). In fact, the weak guidance given by the principle does not even amount to a common frame for reference (Wolf, 1999). As a result, the equity concept has very little practical impact on actual water-sharing mechanisms (Giordano, 2002).

At regional and basin levels, however, a significant number of agreements actually do address allocation in a more elaborate fashion. For example, the 2000 *Revised Protocol on Shared Watercourses in the Southern African Development Community* (the SADC Revised Protocol) specifically covers certain critical uses riparian states may rightfully pursue (agricultural, domestic, environmental and

industrial use, Art. 3.2) and flow regulation measures by riparian states (Art. 1.1). Importantly, the region has a large number of international rivers that are subject to specific basin agreements and commissions that lay down precise allocation rules or define mechanisms for water allocation on the basis of the SADC Revised Protocol (e.g. the 2002 IncoMaputo Agreement concerning the Incomati and Maputo rivers).

Several multilateral basin treaties also contain some kind of allocation mechanisms. For example, the *1995 Agreement on the Sustainable Development of the Mekong River Basin* sets minimum and maximum flow requirements for the mainstream for the dry season, the wet season as well as defines acceptable minimum monthly natural flows (Arts. 5, 6). It also lays down mechanisms and institutions for the determination of actual flow quantities in the lower Mekong basin (Art. 26). Similarly, the *2002 Water Charter for the Senegal River* lays down a list of principles and priorities as to how to apportion water among different uses and sectors in the entire basin. Actual transboundary allocations are to be determined by the Permanent Water Commission according to the principles and the modalities set out in the Annexes to the Charter (Art. 19). Another well-known basin-wide water-sharing mechanism is instituted among the central-Asian republics of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. In this case, the water resources of the Aral Sea basin are allocated among the riparian states by the Interstate Commission on an annual basis in accordance with a series of agreements.

Even more prominent is the presence of allocation principles, rules and mechanisms in bilateral water treaties. Examples include the 1909 Boundary Waters Treaty between the United States and Canada, the 1944 Frontier Water Treaty between the United States and Mexico, the 1977 and 1996 Indian-Bangladeshi Ganges Treaties, and the 1960 Indus Waters Treaty between Pakistan and India.

Challenges of water quantity management and allocation in European river basins: why the matter is relevant

Characteristics of transboundary river basins within the EU

Despite its relatively small size, Europe has the *highest number of international river basins* among all UN regions in the world. Wolf *et al.* (1999) account for 69 transboundary basins, while a 2012 study commissioned by the European Commission identified 75 international river basins in European continent (Vogel *et al.*, 2012).

Although the European continent itself is much larger than the EU, the concentration of international basins still remains the highest in the world within the EU itself. Altogether around 60% of the EU territory is covered by international river basins, expanding to about 3.3 million km². These basins vary greatly in terms of size, hydrological conditions and political complexity. For example, the Danube catchment (with over 800,000 km² of surface area) singlehandedly makes up 25% of the total EU international basin area, while another five rivers (Rhine, Vistula, Elbe, Oder and Nemunas) cover another 25%. The Danube basin itself is the most international catchment area worldwide with 19 riparian states (14 countries having more than 2,000 km² of the basin). Other complex basins include the Rhine, shared by nine countries, the Meuse, by five countries, the Ems, Daugava, Nemunas and Struma, each covered by four countries. The remainder of the relevant basins are shared by two or three countries (Vogel *et al.*, 2012). Such topographical diversity and political fragmentation results in a very high transboundary exposure for most EU countries. *Most EU countries rely heavily on waters that originate outside*

their territories: Germany, Greece, Luxembourg and Portugal receive 40% of their surface waters from abroad, the Netherlands and Slovakia 80%, while Hungary receives 95% (Rieu-Clarke, 2009).

Emerging transboundary allocation challenge

The European continent is generally perceived as a water abundant region, with 3,200 m³ of water available annually for every European citizen (Rieu-Clarke, 2009). However, the key determinants of water availability: precipitation, river flow and storage vary highly within the continent and the EU. Annual average precipitation figures range from less than 400 mm/year in parts of the Mediterranean region and Central Europe to more than 1,000 mm/year along the Atlantic shores and the Alps. Similarly, river flow quantities diverge grossly within the EU, from less than 50 mm/year in Southern Spain up to more than 1,500 mm/year in the Atlantic coast or the Alps (EEA, 2009).

Water use shows similar diverse patterns. Energy production is the largest consumer of the resource (over 50%) in Central and Western Europe, followed by public water supply and industry. In Southern Europe, agriculture is by far the biggest user, responsible for over 60% of the total volume. The EU's main source of water use is surface water, accounting for 80% of the total volume abstracted. The most important user is the energy sector that relies on surface water almost exclusively, while more than 75% of the water used in industry and agriculture also comes from surface sources (EEA, 2009).

All Southern European basins suffer from severe water stress. Equally important, however, is the fact that large Western European river basins, including the Rhine, Meuse, Rhone, Elbe, Seine and Oder, are also above the warning threshold of water stress. In fact, the Alps, that singlehandedly provide 40% of Europe's freshwater, have experienced temperature increases twice the global average (1.48 °C) in the last 100 years. Glaciers are melting, the snowline is rising and the mountain range is gradually changing the way it collects and stores water in winter and distributes it in the summer months (EEA, 2009). For Northern Europe, projections point to less snowfall, lake and river ice cover, increased winter and spring river flows. For North-Western Europe, higher winter precipitation is expected to increase the intensity and frequency of winter and spring river flooding. The most severe effects will be felt in Central and Eastern Europe where river flow droughts are already widespread and are projected to further increase with prolonged and more intense dry periods. Decreasing water availability is projected to exacerbate water stress, especially in Southern Europe (EEA, 2012).

The above data clearly indicate that *water stress* is emerging as a *widespread phenomenon* in the EU, and, where it already exists, is projected to worsen. As water availability becomes more and more unpredictable in most parts of the EU, the *competition for water* among riparian countries will be likely to elevate the issue of cross-border water allocation to political prominence, even in basins hitherto characterised by sufficient river flows for all. (The scale of competition for shared water resources can already be extrapolated from recent co-riparian tensions triggered by exceptionally low water levels in the Lake Constance and the Rhine basin or the Lake of Geneva and the river Rhône; Pflieger & Bréthaut, 2015.)

General framework of transboundary water governance in the EU

European model of transboundary water governance

Since the 1970s, the EU has developed a *distinct model of transboundary water governance*. The most characteristic features of this model stem from the unique constitutional construction of the EU.

Under its founding treaties, notably the Treaty on the European Union (TEU) and the Treaty on the Functioning of the European Union (TFEU), the EU maintains an autonomous supranational legal system that – in case of a conflict – supersedes national law and, under certain conditions, public international law.

In most policy fields – water included – the EU and its member states share responsibilities that implies that EU institutions can and do adopt legislation that is directly binding on member states. The EU also concludes international agreements that become automatically binding on EU institutions and member states alike (irrespective of national ratification). Importantly, through the prism of EU law, all international water agreements of the member states to which the EU itself is not a party are basically considered as inferior to EU law. In other words, *EU law restricts member states' powers to adopt water-related measures* both internally and in the international arena (Baranyai, 2015).

As a result, transboundary water governance within the EU is regulated by no less than *four layers of supranational law*:

- *EU primary law*: the founding treaties and the jurisdiction of the Court of Justice of the European Union not only define the remit of member state action in the field of water policy, but also establishes horizontal institutional requirements – for example on dispute settlement – that apply to water issues irrespective of the provisions of multi- or bilateral treaties.
- *International water treaties ratified by the EU*: importantly, the EU is a key player in the international water policy arena. Any treaty to which the EU accedes becomes automatically binding on EU institutions and member states, even if a member state chooses not to become a party on its own right,
- *EU secondary law*: the bulk of EU water law is adopted by EU institutions (secondary legislation) mainly in the form of directives. Such secondary legislation has to conform to primary EU law as well as international treaties to which the EU is a party,
- *Bilateral, regional and basin treaties concluded by EU member states*: the daily practice of cross-border water management takes place through so-called frontier (border) water treaties and basin treaties. These treaties have to comply with and be interpreted in light of the above-mentioned norms of EU law.

EU water law

Water issues in the EU fall under the broader category of *environmental policy* as defined by the TFEU. As a result, the EU adopts its own water-related legislation through the so-called ordinary legislative procedure, i.e. by the joint legislative act of the Council of Ministers (voting by qualified majority) and the European Parliament (Art. 192.1). There is, however, one major exception to this rule: ‘measures affecting the quantitative management of water resources or affecting, directly or indirectly, the availability of those resources’ can only be adopted through a special legislative procedure (Art. 192.2). This implies that the Council acts with unanimity and the European Parliament is only consulted (i.e. cannot block or amend the legislation). Arguably, this exception is designed to safeguard member states’ sovereignty to regulate the flow of water by way of granting veto power to any member state (Reichert, 2016).

The centrepiece of EU water law is Directive 2000/60/EC establishing a framework for community action in the field of water policy, i.e. the WFD. The WFD lays down a comprehensive framework for

the protection and the improvement of the aquatic environment. It covers all inland surface and ground-water bodies within the territory of the EU as well as wetlands and other terrestrial ecosystems directly dependent on water (Art. 1). Its regulatory approach is based on the integrated management of the aquatic environment, with, however, a clear focus on chemical, biological, ecosystem and morphological aspects. It establishes environmental objectives for surface waters, groundwater and so-called protected areas (e.g. nature conservation areas and drinking water resources, Art. 4). These objectives are collectively expressed as ‘good water status’, comprising a set of ecological and chemical parameters for surface waters and chemical and quantitative parameters for groundwater (Annex V).

The planning and implementation framework of the WFD is the *river basin*. Member states are obliged to identify river basins in their territory and assign them to river basin districts. If a river basin is shared by more than one member state, it has to be assigned to an international river basin district (Art. 3). The environmental objectives of the WFD have to be achieved through a complex planning and regulatory process that, in the case of international river basin districts, requires the active cooperation of member states (Arts. 3, 13). The main administrative tools of member state action are the *river basin management plans* and the programmes of measures to be drawn up for each river basin district (or the national segment of an international river basin district). Member states are obliged to carry out extensive monitoring of the quality of the aquatic environment along EU-wide coordinated methodologies (Art. 8, Annex V).

The WFD, as its name suggests, provides only a framework for water, a coordinated EU water policy. There exists a range of additional legislative acts addressing various specific water-related issues, such as urban waste water (Directive 91/271/EEC), nitrates pollution from agriculture (Directive 91/676/EEC), discharges of hazardous substances into surface waters (Directive 2008/105/EC) and groundwater quality (Directive 2006/118/EC). There exists, however, only one such secondary legal act that is directly concerned with the quantitative aspects of water management, the so-called Floods Directive (2007/60/EC).

Importantly, the EU is also a party to a number of international legal instruments concerning the management of transboundary watercourses, such as the *1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes* (UNECE Water Convention) or the *1994 Convention on Co-operation for the Protection and Sustainable Use of the River Danube* and the *1999 Convention on the Protection of the Rhine*. As mentioned above, these international agreements form an integral part of EU law and, in case of conflict, supersede the EU’s water-related directives.

UNECE Water Convention

The UN’s Economic Commission for Europe (UNECE) has been a driving force for the improvement of transboundary water governance in the European continent and the post-Soviet region for decades. Its flagship international instrument, the *Convention on the Protection and Use of Transboundary Watercourses and International Lakes* (the UNECE Water Convention), was adopted in 1992 and entered into force in 1996. Over the years, it has evolved into a fully-fledged platform for transboundary water cooperation worldwide, contributing significantly to the development of international water law (Tanzi *et al.*, 2015).

Parties’ core obligations under the Convention include the following:

- *To prevent, control and reduce adverse transboundary impacts* on the environment, human health and socio-economic conditions. Transboundary impact is defined broadly to include effects on human

health and safety, flora, fauna, soil, air, water, climate, landscape and historical monuments or other physical structures or the interaction among these factors. They also include effects on the cultural heritage or socio-economic conditions resulting from alterations to those factors (Art. 1.2).

- To manage shared waters in a *reasonable and equitable manner* in line with the ecosystem approach and the precautionary principle and the polluter-pays principles (Art. 2).
- *To preserve and restore ecosystems* (Art. 2, 3).
- To carry out *environmental impact assessments*, to draw up contingency plans, set water quality objectives and minimize the risk of accidental water pollution (Art. 2, 3, 14).
- To enter into specific *basin agreements* and to establish *joint bodies* (Art. 9).

The UNECE Water Convention is supported by a robust *institutional framework*, including the regular meetings of the parties, a compliance mechanism, various working and expert groups and a highly active secretariat. The Convention bodies are engaged in a very broad range of activities, including the assessment of the state of water bodies, information exchange and capacity building. The Convention has also successfully ventured out into such new progressive topical areas as climate change adaptation or the payment for ecosystem services (Bernardini, 2015).

Importantly, as mentioned above, the EU and its member states are party to the UNECE Water Convention. This implies that, in principle, the provisions of the UNECE Water Convention take precedence over secondary EU water law but remain subject to the limitations of the TFEU.

European basin treaties

Most river basins in the EU are subject to formalised governance schemes. The principal European basin treaties include the 1990 Convention on the International Commission for the Protection of the Elbe, the 1994 Convention on Co-operation for the Protection and Sustainable Use of the River Danube, the 1996 Convention on the International Commission for the Protection of the Oder, the 1999 Convention on the Protection of the Rhine, the 2002 Framework Agreement on the Sava River Basin and the 2002 International Agreement on the Meuse. These treaties cover the bulk of the international watersheds within the EU.

Bilateral water treaties

According to a recent survey by the European Commission (Vogel *et al.*, 2012), most EU member states have concluded bilateral water cooperation agreements with their neighbours. In the broader EU area, there are only three international basins with no formal cooperation agreement in place: the Marica-Evros/Meric between Greece, Bulgaria and Turkey, the Axios/Vardar between Greece, Macedonia, Serbia and the Adige/Etsch basin between Italy and Switzerland. All other transboundary watercourses and lakes are subject to at least one dedicated treaty. The majority of such treaties also establish river basin organisations or some kind of formal cooperation bodies, at least a frontier water commission (Vogel *et al.*, 2012). In this context, particular mention must be made of the *1998 Convention on Cooperation for the Protection and Sustainable Use of the Waters of Luso-Spanish River Basins* (Albufeira Convention), which is considered as one of the most complex and sophisticated bilateral agreements in the world (Canelas de Castro, 2009).

In addition to comprehensive bilateral water treaties, there exist a number of bilateral agreements covering just a single water body or a particular water issue (e.g. hydropower). Several bilateral treaties (also) involve the constituent units of federal countries or autonomous regions (e.g. the 1977 Arrangement between the State of Geneva and Haute-Savoie on the Protection, Utilization and Recharge of the Franco-Swiss Aquifers) (Louka, 2006).

Transboundary water allocation in the EU: an analysis

Introduction

As shown above, the evolution of EU and UNECE water law as well as the major European basin agreements has been predominantly *shaped by water quality and ecological considerations*. This is not at all surprising in view of the fact that these instruments were originally conceived by economically developed, environmentally conscious countries with abundant water resources (McIntry, 2015). In other words, the collective action problems (Figure 1) influencing transboundary water cooperation in Europe were relatively benign, with the major shared basins displaying relatively low hydropolitical complexity.

As a result, the three multilateral layers of European water law: EU law, the UNECE framework and the major basin treaties almost completely *ignore quantitative issues*, let alone water allocation. On the other hand, a handful of bilateral treaties do contain certain allocation mechanisms. These individual arrangements, however – apart from the Albufeira Convention – usually do not amount to comprehensive and sophisticated water-sharing regimes that cater for the projected massive future fluctuation in river flow.

EU water law

The point of departure as regards water quantity management under EU law is Article 192.2, point (b) of the TFEU which subjects the adoption of ‘measures affecting the quantitative management of water resources or affecting, directly or indirectly, the availability of those resources’ to the so-called consultation procedure. This, on the one hand, implies an unfettered veto power by any member state and, on the other, excludes from the legislative process the meaningful participation of the European Parliament, usually a powerful counter-balance to member state egoism. Although the said article of the TFEU permits member states to deviate from the unanimity rule, arriving at such a decision requires unanimity among member states in the first place too.

Importantly, the restrictive water quantity management clause is relatively new as, in its current form, it was incorporated only by the 2003 amendment of the founding treaties in reflexion to the findings of the Court of Justice of the European Union in a case launched by Spain against the ratification of the 1994 Danube Protection Convention (C-36/98, Spain vs. Council). This judgement introduced a sharp and rather artificial *distinction between water quality and water quantity management*. As a result, today both the treaty language and the explicit jurisprudence of the Court refer quantitative measures squarely to the unanimity box, which in practice amounts to a natural *political break* on any significant consideration of major water quantity issues at EU level (Baranyai, 2015).

It follows that quantitative aspects of water management appear in EU water law only sporadically. This is best illustrated by the fact that the WFD itself begins with reinstating the secondary role of water quantity (Recital (19)) by way of declaring that '[t]his Directive aims at maintaining and improving the aquatic environment in the Community. This *purpose is primarily concerned with the quality of the waters* concerned. Control of *quantity is an ancillary element* in securing good water quality and therefore measures on quantity, serving the objective of ensuring good quality, should also be established' (emphasis added).

In a slightly contradictory manner, however, the WFD does make reference to water quantity management in so far as it underlines the 'the need for action to protect Community waters in qualitative as well as in quantitative terms' (Recital (4)), the necessity of laying down 'common principles [...] to coordinate Member States' efforts to improve the protection of Community waters in terms of quantity and quality' (Recital (23)) and the 'need for a greater integration of qualitative and quantitative aspects of both surface waters and groundwaters, taking into account the natural flow conditions of water within the hydrological cycle' (Recital (34)).

As a result, despite the restrictive constitutional background, EU law nonetheless regulates certain aspects of water quantity management as follows:

- As regards *groundwater*, the WFD considers the qualitative and quantitative dimensions on equal footing (Art. 2). To a much lesser extent, quantity aspects also appear with respect to *surface waters* in so far as the 'quantity and the dynamics of water flow' is regarded as a factor of water quality (Annex V).
- The WFD covers a number of physical interventions that affect the availability of water. In particular, it calls for the introduction of control measures (e.g. authorisation) over the *abstraction* of fresh surface water and groundwater, the *impoundment* of fresh surface water or artificial *recharge or augmentation* of groundwater (Art. 13.3).
- Finally, a complete directive is dedicated to transboundary cooperation over *flood protection*, a par excellence quantitative aspect of water management (Directive 2007/60/EC).

This legislative ambiguity concerning water quantity management transpires through the EU's existing water policy documents too. The current water policy manifesto of the EU, the 2012 *Blueprint for Europe's Waters*, does recognise the pivotal interlinkages between quality and quantity, considering the latter as an important factor in the achievement of good water status (European Commission, 2012). In Section 2.1, it underlines '[the] need [...] to put quantitative water management on a much more solid foundation' (emphasis added). This is further elaborated in a guidance document issued by the European Water Directors entitled '*Ecological flows in the implementation of the Water Framework Directive*' (European Commission, 2015). The ecological flow concept, however, remains inherently limited in terms of legal status (no formal recognition by the WFD) and scope as it ignores the water demand of sectors other than the natural environment.

Against this backdrop, it is no surprise that *EU law does not in any way address the question of transboundary allocation*. At the same time, it creates almost insurmountable *legal and political obstacles* to address the issue in the future in any substantial manner, let alone on equal footing with water quality management. Hence, all that remain in place to guide member states concerning transfrontier water allocation are the principles of equitable and reasonable utilisation and the no-harm rule, incorporated into EU law through the backdoor of the UNECE Water Convention.

UNECE Water Convention

The UNECE Water Convention does not explicitly address the transboundary allocation of water resources. It does, however, contain a number of important provisions that provide useful guidance to basin states in the quantitative management of water. Also, in an important UNECE sub-region – Central Asia – the Convention has played a key role in pacifying co-riparian relations usually characterised by highly politicised allocation disputes. Finally, the Convention bodies have lately started to address the allocation issue as a key aspect of transboundary water governance.

Although both EU law and the Convention are primarily driven by quality considerations, the UNECE regime goes much further in accommodating and regulating quantitative aspects of transboundary water management. First and foremost, the Convention requires riparian states to ‘ensure that transboundary waters are used in a reasonable and equitable way, taking into particular account their transboundary character, in the case of activities which cause or are likely to cause transboundary impact’ (Art. 2.2(c)). The Convention defines ‘*transboundary impact*’ broadly, covering not only ecological impacts but also ‘effects on socio-economic conditions’ caused, for example, by changes in river flow (Article 1.2.). The official Guide to the Convention further specifies that ‘a real impairment of [any] significant use’ must be construed as being covered by the Convention (UNECE, 2013), including those affecting industry or property. Importantly, however, unlike its UN counterpart, the UNECE Water Convention does not specify any criteria for the interpretation of equitable and reasonable utilisation. Nonetheless, the Guide refers back to Article 6.1 of the 1997 UN Watercourses Convention that enlists a range of relevant non-ecological factors, such as the *social and economic needs* of the watercourse states concerned, the *population* dependent on the watercourse, and other existing and potential uses. Article 6.1 also establishes the relative precedence of *vital human needs* in case of conflict among competing uses. In summary, while the Convention does not specify direct allocation rules or mechanisms, it nonetheless goes beyond ordinary EU law by way of recognising the importance of water quantity management on equal footing with quality control, as well as by way of constraining states’ room for manoeuvre in the context of river flow manipulation (Baranyai, 2015).

The UNECE’s own practice also offers important lessons that underline the significance of the Convention in the field of water allocation. Most notable is the example of the *Aral Basin* that is characterised by pressing water-sharing disputes among riparian states that emanate from the extreme difference in upstream–downstream water supply and demand conditions as well as strategically different flow time requirements. Here, the provisions and the mechanism of the Convention as well as the practical assistance provided by the UNECE have contributed considerably to the relative hydropolitical stability of the region (Mosello, 2008).

Furthermore, recently, the Convention bodies have dedicated greater attention to the political complexities future changes in river flow are likely to trigger. The Convention’s Task Force on Water and Climate has acknowledged the evident conflict potential of the issue as well as the necessity to consider allocation questions at transboundary or basin level (UNECE, 2014). Despite such relatively open engagement, the issue of transboundary water sharing is not a political priority in the Convention’s current work programme.

Multilateral basin treaties

The *1994 Danube Protection Convention* covers several aspects of water quantity management. While its main focus area remains water quality improvement, it is nonetheless based on a broad

notion of sustainable water management that incorporates quantitative dimensions too. This is best illustrated by the collective and individual requirement to establish basin-wide and national *water balances* (Art. 9.3) that describe ‘the relationship characterising the natural water household of an entire river basin as to its components (precipitation, evaporation, surface and underground runoff)’, including ‘man-made effects originating from water use and influencing water quantity’ (Art. 1(g)). Moreover, the Convention makes it clear that riparian states are under an obligation to cooperate with regard to existing and planned flow control measures, water power utilisation, and water transfer and withdrawal, so long as these measures/uses are likely to give rise to transboundary impacts (Art. 3.2). While water quantity management is expressly covered by the Convention, *water allocation is not mentioned in the text* even indirectly. Water balances are prepared for monitoring purposes, rather than for use in water-sharing mechanisms. All that the Convention provides for in this context is the observance of general principles of international water law – sustainable and equitable utilisation of water resources and the prevention of transboundary harm – and a set of notification and consultation procedures (Arts. 6, 10, 11, 12).

The *1999 Rhine Protection Convention* focuses almost exclusively on water quantity measures, save a meagre reference to cooperation on flood protection. Quantitative dimensions of transboundary water management come under the scope of the Convention indirectly, under the broad objectives of ‘environmentally sound and rational management of water resources’ or the ‘principle of sustainable development’ (Arts. 3.1(e), 4(g)). Despite its relatively narrow focus commentators underline that the Rhine governance regime is indeed based on the broad concept of *integrated water resources management* (Jekel, 2015). Consequently, in line with this integrated approach the implementing body of the Convention, the International Commission for the Protection of the Rhine embraces a range of issues that are not of predominantly ecological characters, such as low water flow.

As opposed to the Danube and Rhine Conventions, *the 2002 Sava Framework Agreement* follows a different, more comprehensive regulatory approach. Instead of one specific area (e.g. pollution) or dominant approach (water quality protection), the Sava Agreement is based on a more holistic view, encompassing all major water uses and transboundary impacts, including navigation, water quality and hydropower. Thus, the starting point of the Agreement is the ‘*water regime*’, that is, the ‘quantity and quality conditions of the waters [...] in space and time influenced by human activities or natural changes’ (Art. 1.3). Hence, the core objective of the cooperation is to ‘regulate all issues’ with a view to securing the ‘integrity of the water regime in the Sava River Basin’ (Art. 8.1). This requires the handling of water quantity and quality considerations on equal footing. Consequently, the core obligation of riparian states is to ensure the availability of ‘water in sufficient quantity and of appropriate quality for [...] aquatic ecosystems’, ‘water in sufficient quantity and of appropriate quality for navigation and other kinds of use/utilization’ as well as the ‘effective control of the water regime’ (Art. 11(a),(b),(c)). However, the Agreement does not go into any detail as regards to the allocation of water among riparian states, should competition for the resource arise. It merely reiterates the equitable and reasonable utilisation principle and the no-harm rule when it comes to sharing the benefits of water use (Art. 7.9).

Unlike the Sava Agreement, the other three major multilateral basin agreements addressed by this study, the *1990 Elbe*, *the 1996 Oder Conventions* and *the 2002 Meuse Agreement* almost completely ignore quantitative issues. In fact, the Elbe and Oder treaties are mainly concerned with institutional questions regarding the establishment and the operation of their respective basin commissions. These commissions are tasked with various programmatic exercises whose main focus is pollution prevention

and control, monitoring, planning and early warning systems (although both are supposed to measure and assess the quantitative status of their respective river basins too). As such, neither of the two Conventions contains rules governing water quantity management, let alone allocation mechanisms. While the focus of the Meuse Agreement is also water quality, it nonetheless makes reference to other important aspects of water management such as flood protection and droughts, or water uses relevant for spatial planning, agriculture and forestry, underlining the importance of ‘sustainable and integrated’ water management in view of the ‘multi-functionality’ of the resources of the river (Art. 2). Beyond these distant references, however, the Agreement does not, in any way, address the issues of water quantity management and allocation.

Bilateral water treaties

While at UNECE, EU and multilateral basin-level water quantity issues are afforded hardly any attention, several bilateral water treaties contain provisions that address water allocation in a substantive fashion.

Most prominent in this respect is the *Albufeira Convention*, the comprehensive water management treaty between Spain and Portugal. Given the predominantly arid conditions prevailing in the shared basins of the Iberian Peninsula as well as the extensive use of storage and other flow manipulation facilities in both countries for centuries, water-sharing agreements are not at all a new feature of the bilateral relations (Canelas de Castro, 2009). The Albufeira Convention and its 2008 amendment (Additional Protocol), however, go further than previous allocation schemes. It lays down an elaborate water-sharing arrangement for each of the five river basins shared by the two countries both in terms of procedure and substance (Arts. 15–16.). It sets precise *minimum average volumes* that each of the rivers entering the territory of the downstream riparian must carry on annual, quarterly and weekly bases (Annex 2 to the Additional Protocol). The annexes also determine for each basin the conditions of *exceptional circumstances* – practically precipitation levels 30–40% below historic averages – when the minimum flow requirements are temporarily suspended. Importantly, these figures have not been derived from the august principles of international water law, but are based on historic uses, actual needs and future water availability projections. Empirical studies show that the complex Spanish–Portuguese water distribution regime has contributed considerably not only to the stability of bilateral political relations but also benefited both countries (even upstream Spain) in terms of net economic gain (Chatterjee, 2013). Yet, experience also suggests that the dominant supply-management logic of the Convention leads to water management practices that clearly fall short of the ecological standards of the WFD (Costa et al., 2008). Thus, while the Albufeira Convention performs well at resource allocation (at least from a hydropolitical perspective), it nonetheless fails to strike a balance between quantitative and qualitative aspects of transboundary water governance.

There exist a significant number of other bilateral treaties between EU member states that contain some kind of general or project (use)-specific water allocation rules (Wolf, 1999). One such example is the 1958 French–Spanish Agreement regarding the *Lake Lanoux*, adopted in the wake of the 1957 Lake Lanoux Arbitral Award, one of the best-known water-sharing dispute in recent legal history. The agreement defines that the precise amount of water France must release to the Carol River that outflows from Lake Lanoux to Spain. Another important bilateral water-sharing arrangement has been developed between Finland and the Russian Federation under the 1964 Finnish–Soviet frontier water agreement for the *Vuoksi river basin* that also includes the Lake Saimaa in Finland. In accordance

with the so-called 1991 Discharge Rule, upstream Finland and downstream Russia cooperate closely on maintaining the flow quantity of the Vuoksi River in a ‘normal zone’, defined by the Rule with reference to historically prevailing natural flow volumes. Should extreme floods or extreme low water levels appear, discharge rates must be adapted by upstream Finland with a view to minimising adverse effects downstream. Finland monitors the flow conditions continuously and forecasts indicative discharge rates. The discharge programme is negotiated annually by the two riparian states (Belinskij, 2015). Less specific is the 1966 Austrian–Swiss–German agreement concerning withdrawals from the *Lake Constance* that mainly defines principles and procedures that riparian states must follow when planning to abstract water from the lake beyond a certain quantity. Finally, there are a number of bilateral water frontier treaties that reinstate the rights of riparian states for the use of water quantities defined by ‘existing water rights’ or lay down a 50–50% rule for sharing transboundary river flows (Wolf, 1999).

Evaluation and conclusions

The main conclusion that can be drawn from the above analysis is that *transboundary water allocation considerations are almost completely absent from European water law*. As such, the European model represents an outlier in global comparison as, until relatively recently, the evolution of water treaties worldwide has been largely shaped by water quantity management issues (Giordano *et al.*, 2014).

The dominance of ecological issues in contemporary European water law could very well be justified by the abundance of freshwater in north-western European countries – the core states of European integration – as well as by the prevalence of cross-border pollution issues in the first decades of the development of UNECE/EU water policy. In other words, the nature of the collective action problems in co-riparian relations did not require much attention to the question of water allocation at the time.

The recent relative stability of co-riparian relations in Europe has also given rise to a widely held view in the EU that wherever allocation issues nonetheless arise, they tend to be bilateral and/or use-specific in nature. Consequently, goes the conventional judgement, they are better left to be resolved by the concerned riparian states themselves. This complacent approach is practically ossified by the unanimity requirement under the TFEU that renders it almost impossible to adopt water-sharing rules at EU level. As a result, the relevant legal literature and political discourse almost completely ignore the issue of transboundary water allocation or downplays its significance. Götz Reichert, a monographer of EU water law, even sees such ‘bilateralisation’ as a guarantee of (upstream) sovereignty: ‘it seems appropriate not to allow an affected Member State to be overruled on such a potentially contentious issue’, since ‘with regard to the delicate decision on water apportionment [...] it seems more suitable [...] to leave it to the regulation of the actually affected riparian states within the domain of international water law’ (Reichert, 2016).

Such complacency seems to be ill-founded on several grounds.

First, while most parts of the EU have, thus far, been spared from dramatic water shortages caused by extreme droughts, over-abstraction or flow manipulation, all relevant studies project that *water quantity fluctuations with significant transboundary repercussions are on the rise*. In other words, transboundary water allocation may not have been a contentious issue historically, but it is likely to become so in the foreseeable future. Against this background, the absence of allocation mechanisms in the EU bodes significantly for increased hydro-political vulnerability.

Second, EU countries and their immediate neighbours share some of the geographically most complicated river basins in the world, characterised by relatively short streams and a high number of riparian states. As a result, should major changes emerge in flow quantities and timing in one part of a given basin, their consequences are likely to cascade through a large number of countries in a short period of time. Thus, water *allocation* challenges tend to have a *basin-wide*, rather than bilateral *character*, multiplying the political complexity of the question.

Third, given the massive dominance of water quality and ecological requirements adopted at UNECE, EU and basin level, European states are subject to a *gross regulatory asymmetry*. On the one hand, they have to comply, individually and collectively, with uniform and precisely defined water quality requirements. On the other hand, EU water law takes hardly any notice of the quantitative aspects of freshwater quality. Consequently, member states are almost completely deprived of legal rights and mechanisms to demand that the necessary amount of water is made available to them. As a result, states with high exposure to exogenous water discharge may infringe their EU water quality obligations for the lack of sufficient quantity despite their best intentions and efforts.

Finally, the complacent official view of European institutions, certain EU member states and some basin organisations ignore or downplay *the highly contentious nature of water allocation negotiations*. While Europe has not yet seen the type of colourful, widely mediated disputes (‘water wars’) that frequently occur in the Western or Southern United States or the Aral Basin, there are a number of negative examples in the EU too that should caution decision-makers. These examples suggest that the highly sophisticated transboundary governance regime of the EU does not, on its own, increase the cooperative behaviour of an upstream riparian when it comes to releasing more water downstream. Take, for example, one of the best-known international legal conflicts, the *Gabčíkovo-Nagyymaros* case, which in its current state is essentially a water allocation dispute for a 30-km-long section of the Danube. Upstream Slovakia and downstream Hungary have not been able to implement the 1997 judgement of the International Court of Justice that clearly calls for – in view of the equitable and reasonable utilisation principle – the release of more water by Slovakia into the joint section of the River Danube. Here, the accession of the two countries to the EU in 2004 and their (uncontested) compliance with the WFD has not moved the parties an inch closer to the resolution of the outstanding allocation issue (Baranyai & Bartus, 2016).

In summary, the almost complete absence of water quantity and allocation considerations and rules from European water law is likely to become a critical hydropolitical gap in the EU as the effects of climate change intensify with significant impacts on transboundary river flow variations and competition for shared water resources.

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