

The Role and Relevance of the Draft Articles on the Law of Transboundary Aquifers in the European Context

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Abstract

In 2008, the *UN International Law Commission* adopted a set of 19 articles as a contribution to the codification and development of international groundwater law, and submitted them to the UN General Assembly. In view of the ILC's report, UNGA Resolution 63/124 takes note of the Draft Articles; commends them to the attention of governments; encourages States to apply and adjust the Draft Articles as a basis to negotiate specific aquifer agreements; and decides provisionally to examine the question of the final form that might be given to those articles at that body's 66th Session. The Draft Articles offer an important basis for the progressive development of the law governing transboundary aquifers, in particular by acknowledging the complementary relationship between universal and regional or aquifer-specific legal instruments. In this context, the paper will assess the potential role and relevance of the Draft Articles' text, as it now stands, to guide European States in the sound management of the aquifers shared in the region. It will do so by comparing and evaluating the relationship between the Draft Articles and relevant European legal instruments, with particular focus on the issues of sustainability, planned measures, monitoring, emergencies, and the geographic scope of freshwater agreements. The analysis will show that, while these global and regional instruments can be mutually supportive, some important differences exist in the extent and content of the obligations under each of them.

Keywords

transboundary aquifers, Draft Articles, WFD, GWD, Europe, sustainable use, monitoring, planned measures, emergencies

I. Introduction

Protection of groundwater resources worldwide is imperative. Globally, more than 90% of freshwater resources are contained in aquifers, many of which cross States.¹ Over half of the world's population depends on aquifers as sources of potable water. In Europe, urban and rural populations alike rely mainly on groundwater for drinking supplies.² In EU countries, groundwater accounts for about 70% of all drinking water, reaching up to 93% in Italy and 98% in Denmark.³ The demand for groundwater is likely to increase in the future, including as a response to the need to offset declining surface water availability due to increased consumption and climate change.⁴

In this context, recent developments that aim to improve the legal framework for managing transboundary groundwaters are significant. Most notable among these are the *Draft Articles on the Law of Transboundary Aquifers* ("Draft Articles"),⁵ adopted by the International Law Commission (ILC) in 2008. The Draft Articles attempt to fill a gap left by the *Convention on the Law of the Non-Navigational Uses of International Watercourses* ("UNWC"):⁶ the latter deals with groundwater only insofar as it is connected to shared surface water bodies. It defines an *international watercourse* as a "system of surface waters and groundwaters constituting by virtue of their relationship a unitary whole and normally flowing into a common terminus."⁷ This definition takes into account the interconnections within the hydrological cycle between surface and underground waters. The *ILC Resolution on Confined Transboundary Groundwater*⁸ ("ILC Resolution") recommends that States be guided by the

¹⁾ E. Brown-Weiss, The Evolution of International Water Law, in: *Recueil des cours*, 2007, pp.201-211.

²⁾ C. Yamada, First Report on Shared Natural Resources, U.N. Doc. A/CN.4/533/Add.1 (2003), para.16.

³⁾ S. C. McCaffrey, The Law of International Watercourses 2nd ed., 2007, Oxford University Press, p.29.

⁴⁾ On the expected impact of climate change on groundwater, see M.L. Parry et al. (eds.), Climate Change, Impacts, Adaptation and Vulnerability, 2007, p.185.

⁵⁾ International Law Commission, Draft Articles on the Law of Transboundary Aquifers, with Commentaries, Y.B. Int'l L.Comm'n, 2008, vol. II, part II, also available at http://untreaty.un.org/ilc/texts/instruments/english/commentaries/8_5_2008.pdf.

⁶⁾ Convention on the Law of Non-Navigational Uses of International Watercourses, 21 March 1997, U.N. Doc. A/51/869 (not yet in force).

⁷⁾ *Id.* Article 2 (a).

⁸⁾ International Law Commission, Resolution on Confined Transboundary Groundwater, Y.B. Int'l L Comm'n, 1994, vol. II, part II.

principles contained in the 1994 *Draft Articles on the Law of the Non-Navigational Uses of International Watercourses*—which formed the negotiating basis for the UNWC—in managing aquifers not connected to transboundary surface waters.⁹

The integrated approach under the UNWC and the ILC Resolution is sound, since surface and underground waters are often the same natural resource—just at different stages of the hydrologic cycle.¹⁰ Still, it may be argued that groundwater resources require special rules under international law due to their unique characteristics, such as their greater vulnerability to long-term damage from contamination and over-exploitation, the need to protect the recharge process and the fact that groundwater is not always directly hydraulically connected to surface waters. Such special rules, however, do not entail the development of an independent legal regime, but rather reflect the need to apply and adjust general international water law to the special case of groundwater. In this sense, the Draft Articles offer a legal basis to enable States to manage cooperatively the transboundary aquifers underlying their territories, by proposing special norms to govern those resources.¹¹ They call on States to use shared aquifers in accordance with the principle of equitable and reasonable utilization, as part of the broader global push for optimal and sustainable development of water resources.¹² The Draft Articles are a proposed codification of international law and thus lack any binding force upon States except to the extent that they may codify widely accepted principles and procedures of international customary law.

At the regional level, Europe offers interesting examples of the law governing transboundary groundwaters, especially through the *EU Water Framework Directive* (“WFD”),¹³ and the associated *Groundwater Directive*

⁹) International Law Commission, *Draft Articles on the Law of the Non-Navigational Uses of International Watercourses*, in Report of the International Law Commission to the General Assembly, U.N. GAOR, 49th Sess., Supp. No. 10, U.N. Doc. A/49/10 (1994), p.89–135.

¹⁰) S. C. McCaffrey, *supra* note 3, p.497. See also M. J. Vick, International Water and Sovereignty: A Discussion of the Draft Articles on the Law of Transboundary Aquifers, Pac. McGeorge Global Bus. & Dev. L.J., 2008 (21), p.191, 193.

¹¹) The Draft Articles define an *aquifer* as “a permeable water-bearing geological formation underlain by a less permeable layer and the water contained in the saturated zone of the formation;” and a *transboundary aquifer* as “an aquifer or aquifer system, parts of which are situated in different States.” Draft Articles, *supra* note 5, ILC Draft Article 2 (a) & (c).

¹²) Draft Articles, *supra* note 5, Preamble.

¹³) Council Directive 2000/60/EC establishing a framework for Community action in the field of water policy, OJ L 327.

(“GWD”).¹⁴ This legislation has driven improvements in water management within the European Union.¹⁵ The WFD is focused principally on the question of the quality of both surface and groundwaters, managed in an integrated way through administrative units known as river basin districts.¹⁶ Achievement of the directive’s environmental objectives drives the programmes of measures to be prepared by Member States as part of the river basin management process. Although river basin districts may be limited to the territory of a single State, the reality is that the vast majority of the region is covered by international basin districts, either between EU Member States or between them and non-members.¹⁷

The WFD and the GWD represent specific cases of supra-national law within a regional organization, which is different from the *Convention on the Protection and Use of Transboundary Watercourses and International Lakes* (“UNECE Water Convention”).¹⁸ The UNECE Water Convention aims to promote and facilitate interstate cooperation over all shared freshwater systems, including transboundary aquifers.¹⁹ That convention, however, lacks norms dealing with the specific characteristics of groundwater.

In this context, all of the aforementioned instruments, despite differing in nature, may influence the relations between European States with regard to transboundary aquifers. This is especially true since existing water agreements often lack specific provisions on groundwater and aquifer-specific treaties are largely lacking: the *Convention on the Protection, Utilization, Recharge and Monitoring of the Franco-Swiss Genevese Aquifer* (“2008 Genevese Aquifer Convention”) is the only example of an aquifer-specific agreement in

¹⁴⁾ Council Directive 2006/118/EC on the protection of groundwater against pollution and deterioration, OJ L 372/19.

¹⁵⁾ P. Wouters, What Lessons from Europe? A Comparative Analysis of the Legal Frameworks that Govern Europe’s Transboundary Waters, 36 ELR, p.12, 13, available at <http://www.dundee.ac.uk/media/dundeewebsite/water/documents/Pat%20on%20What%20Lessons%20from%20Europe.pdf>.

¹⁶⁾ WFD, *supra* note 13, Article 3.

¹⁷⁾ Detailed river basin district maps for the European Union as a whole are available in the Water Framework Directive section of the website of the European Commission’s Environment Directorate at http://ec.europa.eu/environment/water/index_en.htm.

¹⁸⁾ Convention on the Protection and Use of Transboundary Watercourses and International Lakes, 17 March 1992 (in force 6 October 1996).

¹⁹⁾ UNECE, Guide to Implementing the Convention, adopted by the Fifth Session of the Meeting of the Parties, 2009, UN Doc. ECE/MR. WAT/2009/L.2, paras.72-73, available at http://www.unece.org/env/documents/2009/Wat/mp_wat/ECE_mp.wat_2009_L2_%20E.pdf. See also S. McCaffrey, *supra* note 3, p.487.

Europe.²⁰ In principle, therefore, European States could look to the Draft Articles for guidance when negotiating agreements dealing with specific transboundary aquifers. For example, in 2007, a conference held between France, Wallonia and Flanders (Belgium) stressed the need for an agreement on a transboundary carboniferous limestone aquifer that they share.²¹

Hence, this study compares the approaches advocated by the Draft Articles with those under the European system. In order to frame the analysis, the authors selected a few key aspects of groundwater management: the extent to which those instruments promote and facilitate sustainable groundwater use (below 2.); the assessment and consideration of possible negative effects of planned measures (3.) the respective robustness of the monitoring frameworks established to support adequate groundwater management and to facilitate enforcement and compliance (4.); issues pertaining to emergency situations (5.); and the geographic scope of freshwater agreements (6.).

2. Sustainability of Recharging Aquifers

Draft Article 4 incorporates the principle of reasonable and equitable utilization, stating:

Aquifer States shall utilize transboundary aquifers or aquifer systems according to the principle of equitable and reasonable utilization, as follows:

- (a) They shall utilize transboundary aquifers or aquifer systems in a manner that is consistent with the equitable and reasonable accrual of benefits therefrom to the aquifer States concerned;
- (b) *They shall aim at maximizing the long-term benefits derived from the use of water contained therein;*

²⁰⁾ *Convention relative à la protection, à l'utilisation, à la réalimentation et au suivi de la nappe souterraine franco-suisse du genevois*, 18 December 2007 (in force 1 January 2008), available at <http://www.waterlaw.org/documents/regionaldocs/2008Franko-Swiss-Aquifer.pdf>. See G. de Los Cobos, “The transboundary aquifer of the Geneva region (Switzerland and France): successfully managed for 30 years by the State of Geneva and French border communities,” ISARM Conference Pre-Proceedings, December 2010 (on file with authors).

²¹⁾ *Agence française de développement, H. Machard de Gramont et al.* (eds.), *Vers une gestion concertée des systèmes aquifères transfrontières*, Guide méthodologique, 2010, p.91. See also: *V. Maatschappij voor Watervoorziening*, Reviewing the Criteria for the Sustainable Management of the Carboniferous Limestone Aquifer at the Belgium-France Border, ISARM Conference

- (c) They shall establish individually or jointly a comprehensive utilization plan, taking into account present and future needs of, and alternative water sources for, the aquifer States; and
- (d) *They shall not utilize a recharging transboundary aquifer or aquifer system at a level that would prevent continuance of its effective functioning.*²²

While this makes no direct reference to the idea of sustainability in the use of recharging aquifers, two further provisions in the instrument make explicit mention of the principle: the Preamble and Draft Article 7(1), which establishes a general obligation to cooperate. Notwithstanding the latter two provisions, from the commentaries that accompany the Draft Articles, the concept of yield maximization, rather than a strict rule of sustainable use, guides the utilization of both recharging and non-recharging aquifers: “it is not necessary to limit the level of utilization to the level of recharge.”²³ In this sense, Draft Article 4 does not include a limitation on extractions to either respect the level of recharge, “even as an average over a period of years,”²⁴ or to consider the rates of the aquifer’s discharge into connected bodies of water.

According to the ILC, the provision in question “reflects a conscious decision-making process that determines what constitutes a benefit, what benefits are desirable, how many benefits should be enjoyed and the time period over which benefits should be enjoyed. Such decisions are entirely for the aquifer States concerned to make.”²⁵ Under this rationale, one could argue, for example, that aquifer States would be in a position to jointly decide to mine a certain aquifer for irrigation purposes for a certain period, leading to its exhaustion beyond that time. This approach leaves excessive room for States’ discretion that might overlook the needs of vulnerable communities and fragile ecosystems dependent on the aquifer in question. This is especially true since, while Draft Article 10 requires States to “take all appropriate measures … to ensure that the quality and quantity of water retained in an aquifer…, as well as that released through its discharge zones, are sufficient to protect and preserve”²⁶

Pre-Proceedings, Paris December 2010 (on file with authors). The latter stresses the need for a strong monitoring system to protect the quality of the aquifer.

²² Draft Articles, *supra* note 5 (emphasis added).

²³ *Id.* at p. 42.

²⁴ International Law Association, *Study Group on the International Law Commission’s Draft Articles on the Law of Transboundary Aquifers*, Report on the ILC Draft Articles on Transboundary Aquifers, 2008, p. 7 (“ILA Study Group”).

²⁵ *Report of the International Law Commission on the work of its 58th Session*, 61 U.N. GAOR, 10th Sess., Supp. No. 10, p. 205, U.N. Doc. A/61/10 (2006) (“2006 ILC Report”) (emphasis added).

²⁶ Draft Articles, *supra* note 5, draft Article 10.

the ecosystems contained in or dependent upon that aquifer, the accompanying commentaries point out that this obligation extends only to ‘relevant’ ecosystems, allowing States flexibility to prioritize other justifiable uses.²⁷ In this respect, it is important to note that “rapidly falling water tables might not appear until some years after a serious overdraft begins, by which time it might be too late to do much about it.”²⁸

According to Special Rapporteur Yamada, States should not be limited by a strict rule of sustainable use, as this would “in reality deny aquifer States the right to utilize the valuable water resource accumulated over the years”.²⁹ Yet, a solid and widely accepted legal standard of sustainability applies in the case of renewable natural resources, including freshwater.³⁰

For example, Article 5(1) of the UNWC refers to “optimum and sustainable utilization” as the fundamental goal to be attained through the equitable and reasonable use and development of international watercourses and any related water bodies, including aquifers. Article 40(1) of the Berlin Rules calls on States to “give effect to the principle of sustainability in managing aquifers, taking into account natural and artificial recharge.”³¹ Existing international agreements, including some of those governing specific European river basins, follow the same approach, e.g., the *Danube River Protection Convention* (“Danube Convention”)³² and the *Convention for the Cooperation for the Protection and Sustainable Use of the Waters of Portuguese-Spanish Hydrological Basins* (“Albufeira Convention”).³³ At the regional level, the UNECE Water Convention incorporates the principle of sustainable water management in Article 3(1)(i).

EU Law follows the same approach, establishing specific and clear requirements on States to ensure the sustainable use of both surface and groundwater resources. Article 4(ii) of the WFD requires Member States to balance abstraction and recharge rates “with the aim of achieving good groundwater status.”³⁴ In addition, Member States have to take into account the amount of water

²⁷) *Id.* at p. 55.

²⁸) *International Law Association*, Berlin Rules on Water Resources, 2004, p. 37 (“Berlin Rules”).

²⁹) C. Yamada, 3rd Report on Shared Natural Resources: Transboundary Groundwaters, U.N. Doc. A/cn.4/551 (2005), p. 9 (“Yamada 2005”).

³⁰) See *ILA Study Group*, *supra* note 24, at p. 8.

³¹) Berlin Rules, *supra* note 28, at p. 37.

³²) Convention on Cooperation for the Protection and Sustainable use of the Danube River, 29 June 1994) (in force October 1998).

³³) Convention about the Cooperation for the Protection and Sustainable Use of the Waters of Portuguese-Spanish Hydrological Basins, 30 November 1998 (in force 17 January 2000).

³⁴) WFD, *supra* note 13.

exchanged between aquifers and connected surface waters. The WFD defines good quantitative status for groundwater as “the level of groundwater in the groundwater body [being] such that the available groundwater resource is not exceeded by the long-term annual average rate of abstraction.”³⁵ The definition of available groundwater resource then introduces ecological requirements: “the long-term annual average rate of overall recharge of the body of groundwater less the long-term annual rate of flow required to achieve (*sic*) the ecological quality objectives for associated surface waters specified under Article 4.”³⁶ Hence, the WFD goes further than simply balancing recharge and abstraction, but reduces the potential abstraction rate still further to accommodate ecological requirements in relation to linked surface waters.

Unsustainable use of aquifers may endanger ecosystems within or dependent upon transboundary aquifers.³⁷ In this sense, according to the International Court of Justice (ICJ):

The environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn. The existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment.”³⁸

During negotiations on the Draft Articles, numerous delegations, including those from European nations, voiced their support for the principle of sustainable use to be a fundamental cornerstone of the Draft Articles. The ambiguity of the term “effective functioning” was also recognized.³⁹ The Netherlands pointed out that, as the Draft Articles stand and if they were to prevail over the UNWC, transboundary aquifers would be subject to a less

³⁵) *Id.* Annex V, para. 2.1.2.

³⁶) *Id.* Article 2.

³⁷) It has been noted that the sustainability includes the protection of water resources and “the need to consider long-term horizons in planning processes (*Sic*). Sustainability without (*sic*) protection of the environment is simply impossible”. *A. Hildering*, International Law, Sustainable Development and Water Management, 2006, p.102.

³⁸) ICJ Judgment, Gabcikovo Nagymaros Project, Hungary/Slovakia (1997), para.53. *See also* ICJ, Request for the Indication of Provisional Measures, Pulp Mills on the Uruguay River, Argentina/Uruguay (2006), para.72.

³⁹) *See International Law Commission*, Shared Natural Resources: Comments and Observations by Governments on the Draft Articles on the Law of Transboundary aquifers, U.N. Doc. A/CN.4/595 (2008), pp.11, 13, 25 (“ILC 2008 – Commentaries”).

strict standard—that of maximization of long-term benefits—than that applied to surface waters.⁴⁰ This state of affairs would go against the very motivations for adopting the Draft Articles, i.e., the recognition that groundwater systems are more vulnerable to irreversible harm than surface waters.

The idea of maximizing the yield in the long-term is appropriate in the case of non-renewable resources, such as fossil aquifers.⁴¹ Transboundary recharging aquifers, however, should be subject to the principle of sustainable use. As the WFD highlights, “surface waters and groundwaters are in principle renewable natural resources.”⁴² For recharging aquifers, abstractions that consider only the formation’s storage capacity over the years, i.e., which do not reflect *current* recharge and discharge rates, disregard the aquifer’s natural renewal, leading to its gradual exhaustion. Therefore, maintaining, to the extent possible, an overall balance between rates of extraction and discharge, and actual rates of natural or artificial recharge is vital for ensuring the *conservation* of renewable groundwater resources.

The WFD’s approach of applying the concept of sustainability, rather than that of mere maximization of long-term benefits, to *recharging* aquifers should guide the progressive development of international groundwater law. Allowing for abstractions to exceed the rate of recharge should be seen as an exception, applicable, e.g., to cases of prolonged drought, and when sustainable and feasible alternatives for meeting vital human needs are absent. In such a case, there should be a requirement, once the crisis has passed, for the relevant users to compensate for periods of over-exploitation by limiting their extractions. For instance, recharge during wet seasons or wet years, when groundwater requirements are commonly less significant, could make up for excessive extractions during a dry season or dry years, when recharge is at its lowest and water needs tend to be higher.⁴³ In this sense, Article 4(7) of the WFD creates an exception to the rule of sustainability, carefully establishing the conditions under which countries would be exempt from complying with that rule.

⁴⁰) *Id.* at p. 18.

⁴¹) See, in this sense, ILA Study Group, *supra* note 24, at p.8, noting that, “for non-recharging aquifers, the application of the principle of sustainability is more difficult, for any withdrawals will necessarily diminish the aquifer. Such non-recharging aquifers should be treated the same way as any other depletable resource: Its exploitation should be done in a fashion that aims to maximize long-term benefits.”

⁴²) WFD, *supra* note 13, Preamble, para. 28.

⁴³) ILA Study Group, *supra* note 24, at p.6.

3. Planned Measures and the Obligation to Suspend Activities during Consultations and Negotiations

The Draft Articles contain only few procedural provisions when it comes to planned measures. The UNWC, on the other hand, includes detailed provisions on the duties to notify, consult, provide information, and cooperate in relation to the use and development of an international watercourse in a reasonable and equitable manner.⁴⁴ Those norms reflect the recognition that international water law should incorporate the developments in international environmental law. In this regard, the ICJ has noted: “it is by cooperating that the States concerned can jointly manage the risks of damage to the environment that might be created by the plans initiated by one or other of them, so as to prevent the damage in question, through the performance of both the procedural and the substantive obligations”.⁴⁵ This recognition is especially important in the case of transboundary groundwaters.

Draft Article 15 establishes the principles and procedures applicable in the case of planned measures that may affect a transboundary aquifer and, thereby, potentially result in significant adverse effects upon another State. However, this provision does not include a duty on the notifying State to suspend the project’s implementation during consultations and negotiations with neighbouring countries that may be affected by the project in question. The commentary to the Draft Articles states that “a minimalist approach is taken ... due to the scarcity of state practice with respect to aquifers.”⁴⁶

While State practice with respect to aquifers, specifically, may be lacking, a duty of suspension of measures associated with consultation and negotiation procedures is no stranger to international water law. In this sense, Articles 14(b) and 17(3) of the UNWC incorporate the obligation of suspension of measures during time-bound consultations and negotiations, thereby addressing potentially harmful planned measures with caution with regard to transboundary watersheds. The commentaries that accompany the 1994 ILC Draft Articles recognize this duty as necessary for the effectiveness of the overall procedure created thereunder to ensure compliance with equitable and reasonable use:

⁴⁴) UNWC, *supra* note 6, Articles 11–19.

⁴⁵) ICJ, Judgment, Pulp Mills on the Uruguay River, Argentina/Uruguay (2010), para.77.

⁴⁶) Draft Articles, *supra* note 5, at p.66.

[T]hese procedures are designed to maintain a state of affairs characterized by the expression ‘equitable utilization’... If the notifying state were to proceed with implementation before the notified state had had an opportunity to evaluate the possible effects of the planned measures and inform the notifying state of its findings, the notifying state would not have at its disposal all the information it would need to be in a position to comply with articles 5 to 7. The duty not to proceed with implementation is thus intended to assist watercourse States in ensuring that any measures they plan will not be inconsistent with their obligations under articles 5 and 7.⁴⁷

The fact that this is not reflected in the Draft Articles seems to contradict the precautionary approach highlighted in Draft Article 12. In fact, allowing for implementing activities to continue while the aquifer States concerned discuss the potential for significant transboundary harm may hamper the broader objectives of groundwater protection, preservation, and management.

In an attempt to address this problem, the commentary to Draft Article 15 goes on to state that,

The lack of explicit detailed procedures should not be construed as authorizing any action which would nullify the purpose of this draft article. For instance, the States concerned would in principle refrain, upon request, from implementing or permitting implementation of the planned activity during the course of the consultation or negotiation which must be amicably completed within a reasonable period of time.⁴⁸

Due to the importance of the duty in question and the special vulnerability of aquifers, it would have been better for the text of the Draft Articles itself to include a clear obligation on countries to suspend implementation measures in the course of time-bound negotiations and consultations. Ultimately, if the Draft Articles were to be used as a basis for the conclusion of agreements, they could encourage State practice based on less strict provisions for the implementation of measures pertaining to transboundary aquifers than those applicable to transboundary river basins.

From the European perspective, in terms of transboundary cooperation, the WFD requires Member States to coordinate (or endeavour to do so, in the case of basins extending beyond the boundaries of the Community) on its implementation across the entire river basin.⁴⁹ The GWD goes further, referring specifically to monitoring, the setting of threshold values, and the

⁴⁷ 1994 ILC Draft Articles, *supra* note 9, at p. 114. See also ILC 2008 – *Commentaries*, *supra* note 5, at p.42.

⁴⁸ Draft Articles, *supra* note 5, at p.68.

⁴⁹ See WFD, *supra* note 13, Preamble, para.35, Articles 3(4)-(5).

identification of relevant hazardous substances.⁵⁰ Nevertheless, the GWD does not touch the issue of interstate consultations and negotiations on planned measures and related obligations.

In the wider UNECE region, Article 10 of the UNECE Water Convention governs interstate consultations regarding the issues covered thereby, which would include planned measures.⁵¹ However, this provision also does not incorporate an obligation on States to suspend the implementation of projects in the course of the consultations and negotiations.

In terms of European watercourse agreements, the Danube Convention suspends implementation while countries are consulting on planned measures.⁵² The same is true with respect to the Albufeira Convention.⁵³ Both agreements apply to the entire river basin, i.e., to surface and underground waters.⁵⁴ Consequently, they would have served as useful precedents for including a suspension provision into the Draft Articles, as well as into future agreements dealing with transboundary aquifers specifically.

In sum, the Draft Articles should have incorporated an obligation to suspend the implementation of planned measures during consultations and negotiations between States, as reflected in the UNWC and some European water agreements. This would have contributed to the progressive development of principles and procedures applicable to transboundary aquifers in line with the ongoing advances in broader international water law.

In our view, it is crucial to ensure coherence between the law on transboundary aquifers and the law on international watercourses, in order to prevent fragmentation within international water law.⁵⁵ Specific rules such as those on transboundary aquifers should not be considered in isolation from more general norms on transboundary waters, i.e., as an independent legal regime for which State practice is not abundant. Rather, the Draft Articles should be viewed as a specific application of the rules embodied in the UNWC,

⁵⁰) *Id.* Preamble, Para.16, and Article 3(3).

⁵¹) UNECE Water Convention, *supra* note 18, Article 2(h) & (j).

⁵²) The Danube Convention *supra* note 32, Article 11.

⁵³) The Albufeira Convention *supra* note 33, Article 8(6).

⁵⁴) See, respectively, Danube Convention, *supra* note 32, Article 1(b), and Albufeira Convention, *supra* note 33, Article 1(b).

⁵⁵) O. McIntyre, Fragmentation in International Water Resources Law: Reconciling the International Law Commission's 2008 Draft Articles on Transboundary Aquifers with the 1997 UN Watercourses Convention, ISARM Conference Pre-Proceedings, Paris, December 2010 (on file with authors).

adjusting such rules to the extent necessary to address the particularities of groundwater.

4. Monitoring and Assessment

There is much less information available on transboundary aquifers than on international watercourses. Monitoring and assessment are thus prerequisites for enabling States to share information on the characterization and description of transboundary aquifers. In going from general appraisal to more precise assessments, monitoring is necessary to inform cooperation in Europe and beyond. In view of this, the Draft Articles go further than the UNWC⁵⁶ by requiring States not only to share information on the characteristics of transboundary aquifers,⁵⁷ but also to establish groundwater monitoring activities.⁵⁸

Under the Draft Articles, interstate data-sharing should encompass information relating to the special characteristics of aquifers, i.e., on hydrological, geological and hydrogeological aspects.⁵⁹ Monitoring parameters should include rates of flows and abstraction, as well as parameters dealing with chemical status.⁶⁰ Exchange of information relating to pollutants, to the volume of water extracted and the authorizations and licences granted for the use of the groundwaters is of particular importance, so as to allow States to effectively monitor and assess the quantitative and qualitative status of aquifers. Data collected by aquifer States should be comparable, available for integration with information coming from a variety of sources, and easily aggregated spatially and temporally. A major concern is that aquifer States harmonize techniques and methodologies applied in the generation and processing of data and information.⁶¹ Aquifer States should ideally implement *joint* monitoring, on the basis of an agreed conceptual model of the aquifer.⁶²

⁵⁶) See UNWC, *supra* note 6, Article 9.

⁵⁷) Draft Articles, *supra* note 5, Draft Article 8.

⁵⁸) *Id.* Draft Article 13.

⁵⁹) According to the ILC, *geology* describes age, composition and structure of the aquifer matrix; and *hydrogeology* describes the ability of the aquifer to store, transmit and discharge groundwaters. Draft Articles, *supra* note 5, p.52.

⁶⁰) See WFD, *supra* note 13, Annex V and GWD, *supra* note 14, Annex IV.

⁶¹) G. E. Eckstein, Commentary on the U.N. International Law Commission's Draft Articles on the Law of Transboundary Aquifers, *Colo. J. Int'l Envtl. L. & Pol'y* 2007 (18:3), p. 591.

⁶²) Yamada 2005, *supra* note 29, p.13, para. 30.

In Europe, monitoring of aquifers is often covered by agreements on transboundary watersheds. Region-wide, however, monitoring needs to be improved at the national level and strengthened or established at the trans-boundary level.

Under EU Law, groundwater monitoring is an integral part of the river basin district's management and is essential to enable States to meet the objective of *good groundwater status*. Under the WFD, EU Member States must ensure the establishment of monitoring programmes covering both the quantity and chemical status of groundwater bodies within each river basin district. This involves setting up the groundwater level monitoring network and assessing groundwater quantitative and chemical status,⁶³ with a view to providing a *coherent and comprehensive overview* of the status of groundwaters.⁶⁴

Furthermore, the WFD's general provisions on groundwater pollution require the adoption of specific measures of prevention and control,⁶⁵ as further refined in the GWD. According to the latter, monitoring programmes should be designed to identify "significant and sustained upward trends in concentrations of the pollutants."⁶⁶ Other than with respect to nitrates and pesticides, the GWD leaves it to Member States to establish threshold values for the particular polluting substances that are most locally problematic for each of them. If groundwater quality standards are not adequate for achieving the environmental objectives set out in WFD, Member States must establish more stringent values.⁶⁷

Although the WFD and the GWD establish a common approach towards monitoring, they do not mandate joint monitoring activities with respect to transboundary aquifers. Nevertheless, the GWD points out that in the case of groundwater bodies "shared by two or more Member States and for bodies of groundwater within which groundwater flows across a member state's boundary,"⁶⁸ threshold values on pollutants must be developed *in coordination* between Member States.⁶⁹ Member States "may, for this purpose, use existing structures stemming from international agreements."⁷⁰ When a groundwater

⁶³⁾ WFD, *supra* note 13, Annex V, Articles 2 (2)(1) & 2 (4)(1).

⁶⁴⁾ *Id.*, Article 2(4)(1),

⁶⁵⁾ *Id.*, Article 17(1).

⁶⁶⁾ GWD, *supra* note 14, Annex IV, part A, Article 1.

⁶⁷⁾ *Id.* Annex I.

⁶⁸⁾ *Id.* Article 3 (3).

⁶⁹⁾ *Id.* Article 3(3).

⁷⁰⁾ WFD, *supra* note 13, Article 3(4).

body extends beyond the boundaries of the Community, threshold values have to be decided “in coordination with the non-member state(s) concerned.”⁷¹ In order to facilitate the obligations on monitoring, a guidance document under the umbrella of the *Common Implementation Strategy* regroups Member States, Norway, Switzerland and the countries applying for accession.⁷²

Member States should coordinate their monitoring programmes for international river basin districts, including when they cover the territory of non-member States. A monitoring programme exists under the Danube Convention, covering both EU and non-EU member States. The *Trans National Monitoring Network* (TNMN), established in 1995 and revised in 2004, constitutes a joint monitoring programme for 14 Danube basin countries. It now includes monitoring mechanisms of the status of *groundwater of basin-wide importance*.⁷³ Aquifers can be qualified as such “due to the size of the groundwater body, which means an area larger than 4000 km²” or “due to various criteria pertaining, e.g., to socioeconomic value, uses, impacts, pressures, and interaction with aquatic ecosystems.”⁷⁴ The TNMN identifies 11 groundwater bodies of basin-wide importance and includes a 6-year reporting system.⁷⁵ The monitoring programme feeds into the *Danube River Basin Management Plan*, which is to provide information on the status of those groundwater bodies.

As indicated above, the 2008 Genevese Aquifer Convention is the only example of an aquifer-specific agreement in Europe.⁷⁶ The Genevese Aquifer is exploited for drinking water supplies by ten wells on the Swiss side and five wells on the French side. The withdrawals amount to an average of 15–17 million m³ per annum, with about 2 million m³ withdrawn by France. The 2008 Genevese Aquifer Convention establishes a joint monitoring programme for the Swiss and French authorities to execute within their respective territories.⁷⁷ Each party controls water levels and water quality. The results of their

⁷¹) GWD, *supra* note 14, Article 3(4).

⁷²) Common Implementation Strategy for the Water Framework Directive 2000/60/EC, Guidance Document n°15 on Groundwater Monitoring, 2007.

⁷³) *International Commission for the Protection of the Danube*, Water Quality in the Danube River Basin TNMN Yearbook, 2007, p.5, available at <http://www.icpdr.org/icpdr-pages/tmnnyearbooks.htm>.

⁷⁴) *Id.* at p.51.

⁷⁵) *Id.*

⁷⁶) Genevese Aquifer Convention, *supra* note 20.

⁷⁷) *Id.*, Article 10(1).

respective analysis are periodically reported to the joint body created under the agreement, and may be controlled at the request by one or the other delegation at any time.⁷⁸

Other instruments that might promote common practices on monitoring are the 2000 *Guidelines on monitoring and assessment of transboundary groundwaters*,⁷⁹ and the 2006 *Strategies for monitoring and assessment of transboundary rivers, lakes and groundwaters*,⁸⁰ both adopted within the framework of the UNECE Water Convention. The 2000 Guidelines cover technical aspects related to monitoring. They indicate that specific features of groundwater monitoring include “characterisation of the transboundary aquifer (geometry), the flow conditions, including recharge and discharge areas, and the evolution of the groundwater quality”.⁸¹ In turn, the 2006 Strategies stress that monitoring on surface and groundwater should be tailored to the specificities of the river basin and address climate change and extreme events.⁸²

Although joint monitoring provides the ideal situation to gain knowledge regarding the conditions of transboundary groundwaters, it still represents an exception in Europe. The Draft Articles and the UNECE instruments, emphasizing the importance of having joint monitoring and harmonized standards to assess data and information resulting from monitoring, may be useful in this regard to inform negotiations on future aquifer agreements.

5. Emergency Situations

Droughts and floods are traditionally seen as disasters affecting or caused by surface waters. The role of groundwater, for example, in mitigating drought conditions or in the loss of potable water as the result of saltwater intrusion, is often overlooked. In Europe, in particular, the Mediterranean region is

⁷⁸⁾ *Id.* Article 10(2).

⁷⁹⁾ Adopted by the 2nd Meeting of the Parties to the UNECE Water Convention, available at <http://www.unece.org/env/water/publications/documents/guidelinesgroundwater.pdf> (“UNECE 2000 Guidelines”).

⁸⁰⁾ Adopted at the 4th Meeting of the Parties to the UNECE Water Convention, available at <http://www.unece.org/env/water/publications/documents/StrategiesM&A.pdf> (“UNECE 2006 Guidelines”).

⁸¹⁾ UNECE 2000 Guidelines, *supra* note 79, at p.9.

⁸²⁾ UNECE, *Strategies for monitoring and assessment of transboundary rivers, lakes and groundwaters*, Note by Secretariat, ECE/MR.WAT/2006/12 (2006), para.5.

projected to be among the areas that climate change will hit most severely.⁸³ Expected effects include decreasing summer rainfall, average run-off and summer flows, as well as increasing frequency and severity of droughts and floods. In that respect, aquifers are often vulnerable to contamination by floodwaters and, as a result, may become unfit for supplying drinking water during emergencies. The 2002 floods in Central Europe, for example, affected groundwater resources and, in some circumstances, alternative sources of water were necessary to serve the affected populations.⁸⁴

Draft Article 17(1) defines *emergency* as “a situation, resulting suddenly from natural causes or from human conduct, that affects a transboundary aquifer or aquifer system and poses an imminent threat of causing serious harm to aquifer States or other States.”⁸⁵ Hence, the elements required to trigger the application of this provision are the *serious harm* to other States and the *suddenness* of the emergency situation. Draft Article 17 covers both events predicted by weather forecast or resulting from factors accumulated over a period of time if they pose a threat of serious harm.⁸⁶

The provision in question goes on to establish an obligation of notification and cooperation to prevent, mitigate and eliminate harmful impacts on other aquifer States that could possibly result from an emergency. The UNWC contains a similar provision.⁸⁷ However, the Draft Articles includes a special clause derogating from the obligations spelled out in Draft Articles 4 and 6 in the case of natural or human-induced disasters, where necessary to satisfy vital human needs.⁸⁸

At the EU level, Directive 2007/60/EC on the assessment and management of flood risks⁸⁹ complements the WFD, by establishing a framework for assessing and managing flood risks and mitigating the associated impacts on human

⁸³) Intergovernmental Panel on Climate Change (IPCC), *B.C. Bates et al.* (eds.), Climate Change and Water, Technical Report, 2008, Geneva, p.55.

⁸⁴) UNESCO-IHP, *J. Vrba & B. Th. Verhagen* (eds), Groundwater for Emergency Situations, A Framework Document, IHP-IV Series on Groundwater No.12, 2006, p. 9, available at <http://unesdoc.unesco.org/images/0014/001427/142762e.pdf>.

⁸⁵) Draft Articles, *supra* note 5.

⁸⁶) Yamada 2005, *supra* note 29, at p. 18. See also Draft Articles, *supra* note 5, at p. 73.

⁸⁷) UNWC, *supra* note 6, Article 28.

⁸⁸) Draft Articles, *supra* note 5, draft Article 17(3).

⁸⁹) Directive 2007/60/EC on the assessment and management of flood risks, OJ 2007 L 288/27. See also UNECE, Transboundary Flood Risk Management: Experiences from the UNECE Region, 2009, available at http://www.unece.org/env/water/mops/Transboundary_Flood_Risk_Managment.pdf.

health, the environment, and economic activities.⁹⁰ That directive, however, does not contain specific provisions on groundwater resources.

Beyond Europe, provisions on emergency situations and its impacts on groundwater resources are rare in international documents. The *Bellagio Draft Treaty* provides one of the few examples.⁹¹ This document calls on the preparation of drought management plans in order to alleviate the consequences of drought, allowing for either increasing or reducing groundwater withdrawals.⁹² Aquifers are often less immediately affected by drought than surface waters can be, and may provide crucial water storage to be used during reduced river flows.⁹³

Finally, the UNESCO-IHP's project *Groundwater for Emergency Situations* (GWES) aims to propose methodologies to identify groundwater resources to be tapped during emergency situations. This document informs the preparation of the *Guidelines for the identification and management of strategic groundwater bodies to be used for emergency situations resulting from extreme events or in case of conflicts*, expected to be adopted in the next few years.⁹⁴

6. Geographical Extent of Basin Management Agreements

This section discusses the extent to which interstate management agreements cover the waters, whether on the surface or underground, relevant to the comprehensive management of shared watercourses and/or aquifers. For example, sustainable management of shared aquifers will most likely materialize in circumstances where full multilateral agreements are in place covering all watercourse and aquifer States. Questions arise, however, in relation to the degree to which agreements governing the use of transboundary

⁹⁰) *Id.* Article 1.

⁹¹) Transboundary Groundwaters: The Bellagio Draft Treaty, *Natural Resources Journal* 1989 (29) p.663-720, also available in: S. Burci, K. Mechelm, *Groundwater in International Law. Compilation of Treaties and other Legal Instruments*, FAO Legislative Study 86, 2005, pp.536-550 ("Bellagio Draft Treaty").

⁹²) See *id.* Article XII. Under the Bellagio Draft Treaty, *drought* is defined as a "condition of abnormal water scarcity in a specific area resulting from natural conditions." *Id.* Article I (8).

⁹³) The Bellagio Draft Treaty suggests that certain transboundary aquifers or specific well sites may be reserved for use in times of drought and authorizations may be given to use such designated and reserved aquifers in such times. *Id.* Article XII 3 (a)-(b)(3).

⁹⁴) Information available at: <http://www.unesco.org/water/ihp/archives/publications/2005.shtml>.

aquifers cover the entirety of the surface area that may be relevant to the health of the groundwater contained therein.

The Draft Articles are primarily designed around the definition of aquifer States, i.e., those States “in whose territory any part of a transboundary aquifer or aquifer system is situated.”⁹⁵ A distinction is thus made between those States under which the geological formation actually lies, and those within the larger watershed: *recharge-only States*, i.e., those that contribute water through infiltration to a transboundary aquifer; or *watercourse States*, i.e., those that are home to connected surface waters upstream to or downstream from the aquifer. It is therefore possible for recharge-only and watercourse States to exist in addition to aquifer States. With respect to a recharge-only State, for instance, there will be clear implications for an aquifer if that State engages in activities that are detrimental to the quality of the water flowing into that aquifer or that in any way interfere with the recharge process. This suggests that any framework for the management of a transboundary aquifer should involve not only aquifer States, but all States with a significant relationship to a transboundary aquifer.⁹⁶

The Draft Articles address such third States in Article 11, but only insofar as they attempt to impose an obligation on such States to cooperate with aquifer States to protect groundwaters that may be affected by the actions of the former. As Eckstein points out, there is no incentive for recharge-only States to participate in any aquifer management agreements, because they derive no benefit from such aquifers.⁹⁷ The wording in the latter parts of the Draft Articles is potentially more significant with respect to these non-aquifer States. For example, Articles 15 and 17, relating to Planned Activities and Emergencies, respectively, are not limited to aquifer States. Still, without specifically recognizing their rights and involving them in formal data exchange arrangements at the very least, as the basis for better cooperation,⁹⁸ the scope for prevailing on non-aquifer States to comply with such duties may be practically limited.

The Draft Articles are not alone in failing to adequately address such situations. Neither the Bellagio Draft Treaty nor the UNECE Water Convention

⁹⁵) Draft Articles, *supra* note 5, Draft Article 2.

⁹⁶) See also Eckstein, *supra* note 61, at p. 586–9; and S. McCaffrey, The International Law Commission Adopts Draft Articles on Transboundary Aquifers, *A.J.I.L.*, Vol. 103, No. 2 (Apr. 2009), p.278.

⁹⁷) Eckstein, *supra* note 61, at p. 586.

⁹⁸) S. Toope, Emerging Patterns of Governance and International Law, in Byers, M., ed., *The Role of Law in International Politics* (Oxford University Press, UK, 2000), 104–5.

explicitly address the issue. The same is true of the Seoul Rules on International Groundwaters.⁹⁹

The WFD/GWD regime, however, takes a somewhat different tack. Under the WFD, underground and surface waters must be administered on the basis of the river basin district system. A river basin district is defined as an “area of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters.”¹⁰⁰ The delineation of the districts by Member States should also include groundwaters that “do not fully follow a particular river basin”.¹⁰¹ Where the river basin district straddles the boundaries of two or more Member States, an international river basin district will be established, as is the case, for example, in relation to the Danube basin. Member States are therefore not bound by the hydrology or hydrogeology of a particular basin, and may include within a particular river basin district ground and surface waters that are not hydraulically connected, always in the context of the overriding environmental objectives imposed by Article 4 of the WFD.

The common legislative foundation relevant to all EU Member States allows a degree of administrative and management flexibility that is not present in the Draft Articles. This falls down, however, when it comes to international river basin districts that extend beyond the territory of the European Union. Article 3(5) of the WFD obliges Member States to ‘endeavour’ to establish coordination mechanisms that will allow environmental objectives to be met. In effect, this is no better than the position under the Draft Articles. Member States must still work to elicit some degree of cooperation from non-EU basin States, and the benefits of the administrative nature of the river basin district concept may be lost because these latter States are under no obligation to extend the management area in the manner that Member States must.

The key to the potential success of the WFD/GWD approach within the EU is the duty imposed on Member States to meet the WFD’s environmental objectives. Even if a recharge-only State existed within the EU, it would still be part of an international river basin district so that the environmental objectives for all EU waters could be met. The Draft Articles are not helped by their narrow focus on the geological formation of the aquifer and the WFD regime must be said to be potentially more useful at least within the borders of the EU.

⁹⁹) The Seoul Rules on International Groundwaters. (Adopted by the International Law Association at the Sixty-second conference held at Seoul in 1986).

¹⁰⁰) WFD, *supra*, note 13, Article 2.

¹⁰¹) *Id*, Article 3(1).

7. Conclusions

The Draft Articles are important in that their adoption by the ILC underscores the need for specific provisions addressing the particular characteristics of groundwater. However, some of the Draft Articles' provisions should have been more specific and detailed in their content with a view to ensuring a firm protection to transboundary aquifers. Although European practice dealing specifically with transboundary groundwater is scant, the analysis of this practice illustrates that the law on international watercourses and aquifers has to be developed and interpreted in a coherent way to guarantee a more complete protection to transboundary waters and prevent risks of conflicts within international water law. Of course, one cannot expect the Draft Articles, as a universal framework, to be as comprehensive and strict as European law. As such, however, the Draft Articles may still guide the negotiation of treaties on specific transboundary aquifers, which are almost nonexistent in the European region.

When taken together, both universal and regional developments on groundwaters, such as the Draft Articles and the GWD, may be of utility to fill the gaps in existing water agreements covering surface and groundwaters in the European region. In such cases, it is of crucial importance to adopt measures taking into account the specific characteristics of groundwaters, which are more vulnerable to risks of contamination and overexploitation than surface waters.¹⁰²

In conclusion, the Draft Articles may offer a common platform and serve as a model for agreements on transboundary aquifers concluded between EU Member States and between EU states and non-members. Their adoption by the ILC could serve as a strong incentive for European states to pay greater attention to the need for aquifer-specific agreements and rules, where appropriate. However, it is crucial that States, when negotiating such agreements, take also into consideration relevant European legal instruments. In particular, the European practice illustrates that agreements dealing with transboundary surface water have often included groundwater resources. This reinforces the notion that international groundwater law is but a specific application of existing international water law, rather than an independent legal regime.

¹⁰²⁾ S. C. McCaffrey, *supra* note 3, at p.483.